BREASTFEEDING INITIATION AND MAINTENANCE AMONG AFRICAN AMERICANS AND BLACKS ENROLLED IN A NURSE HOME VISITATION PROGRAM: AN OUTCOMES FOCUSED PROGRAM EVALUATION

By

Jennifer L. Henderson, Maj, USAF

Dissertation submitted to the Faculty of the
Medical and Clinical Psychology Graduate Program
Uniformed Services University of the Health Sciences
In partial fulfillment of the requirements for the degree of
Doctor of Philosophy 2014

UNIFORMED SERVICES UNIVERSITY, SCHOOL OF MEDICINE GRADUATE PROGRAMS
Graduate Education Office (A 1045), 4301 Jones Bridge Road, Bethesda, MD 20814

DISSERTATION APPROVAL FOR THE DOCTORAL DISSERTATION IN THE MEDICAL AND CLINICAL PSYCHOLGY GRADUATE PROGRAM

Title of Dissertation: "Breastfeeding Initiation and Maintenance Among African Americans and Blacks Enrolled in a Nurse Home Visitation Program"

Name of Candidate: Jennifer Henderson
Doctor of Philosophy Degree
December 11, 2013

DISSERTATION AND ABSTRACT APPROVED:

DATE: 5/12/14

Dr. Marian Tanofsky-Kraff
DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Committee Chairperson

5-12-14

Dr. Tracy Sbrocco
DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Dissertation Advisor

Marjan G. Holloway, PhD. 5-12-14

Dr. Marjan Holloway
DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Committee Member

5/13/2014

Dr. Mark Stephens
DEPARTMENT OF FAMILY MEDICINE
Committee Member

ACKNOWLEDGMENTS

I would like to express my appreciation to Dr. Tracy Sbrocco, my advisor, whose support and mentorship is greatly appreciated. She remains a staunch advocate for me and the other students she mentors, making the acquisition of a doctorate degree a little easier. I also must acknowledge the support provided by my dissertation committee and Dr. Cara Olsen, who has provided invaluable assistance in making this project a finished reality. I would also like to thank and applaud the women associated with the African American Health Program. They offer incredible support to the community and have shown tremendous leadership in reducing the prevalence of health disparities in Maryland. Their gracious support of my research fostered a genuine passion in me for promoting maternal-infant health now and in the future. Last but certainly not least, it would be impossible to achieve success in graduate school without the commitment, support, and patience of one's family. This endeavor has truly been a family affair, and could not have been achieved without my beloved husband's and daughter's support.

DEDICATION

This project is dedicated to the African American Health Program's past and present staff, and to the countless women whose lives they enrich.

COPYRIGHT STATEMENT

The author hereby certifies that the use of any copyrighted material in the dissertation manuscript entitled "Breastfeeding Initiation and Maintenance Among African Americans and Blacks Enrolled in a Nurse Home Visitation Program: An Outcomes-Focused Program Evaluation" is appropriately acknowledged and, beyond brief excerpts, is with the permission of the copyright owner.

Jennifer L. Henderson

February 21, 2014

ABSTRACT

Breastfeeding Initiation and Maintenance among African Americans and Blacks Enrolled in a Nurse Home Visitation Program: An Outcomes-Focused Program Evaluation

Jennifer L. Henderson, M.S., 2013

Thesis directed by: Tracy Sbrocco, Ph.D., Associate Professor, Medical and Clinical Psychology

Rationale: Despite the numerous health benefits of breastfeeding, data reveal that African Americans have lower breastfeeding rates than any other race/ethnicity in the United States. Moreover, those that do initiate breastfeeding report doing so for a shorter duration and with less exclusivity.

Purpose: The purpose of this study was to examine breastfeeding behaviors among a sample of women participating in the Start More Infants Living Equally Healthy (SMILE) Program, a nurse home visitation program promoting maternal-infant health among African Americans/Blacks residing in Montgomery County, Maryland. The examination was done in partnership with the African American Health Program in order to provide program relevant information that could assist the program in understanding and improving outcomes.

Methods: This outcomes-focused program evaluation consisted of three phases. Phase One entailed qualitative stakeholder analysis to solicit the background information needed to culturally frame the context of the research and to refine programmatic evaluation objectives. Phase Two was quantitative in nature and identified the sociocultural factors associated with breastfeeding behaviors among this sample of women. Phase Three framed the results within the

context of the community-driven perspective regarding this health disparity while identifying lessons learned.

Participants: Program managers and nurse case managers were engaged to develop the program and discuss dissemination. Participants for the quantitative analyses were 502 women selected from the 807 African American/Black women participating in the SMILE Program. Inclusion was restricted to those who had documented breastfeeding practices in one or more of their infants' well-baby check-ups.

Variables: The following variables were examined for their association with breastfeeding behaviors: socioeconomic status (SES), nativity, high-risk birth outcomes (low birth weight, prematurity), and postpartum considerations. Breastfeeding outcome variables were breastfeeding initiation, maintenance to at least six months, and breastfeeding exclusivity.

Results: Nearly 70% of the infants were breastfed, and 63% of the women maintained breastfeeding for at least six months. Breast feeding practices were negatively associated with low birth weight ($p<.01$), prematurity ($p<.01$), and NICU admittance ($p<.01$). Maternal-specific factors included age ($p<.02$) and education ($p<.01$); these were positively associated with breastfeeding behaviors. Earlier program enrollment ($p<.01$) and level of SMILE Program participation (e.g., participation throughout the infant's first year of live; $p<.02$) were also positively associated with breastfeeding. Additionally, results were used to celebrate breastfeeding practices and women in a community event.

Conclusion: These data suggest that the SMILE Program effectively promotes breastfeeding among this at-risk demographic. Although there was no control group, the prevalence of breastfeeding among their clients clearly exceeds national averages. This study replicates previous research identifying maternal-infant biopsychosocial factors as being either

protective (e.g., college education) or detrimental (e.g., infant prematurity) to breastfeeding behaviors. The program evaluation data were used to inform local DHHS program officials, SMILE program managers, and SMILE nurses of program effectiveness. SMILE program managers and nurses engaged in an iterative process designed to develop suggestions for improving the program and data collection. Future research should examine participant attitudes towards breastfeeding to assess for what they consider to be beneficial or detrimental to program goals. Additionally, it would be salient to address the benefits of the psychoeducation component of the SMILE Program by assessing maternal knowledge of breastfeeding prior to home visits and at the conclusion of participation to measure belief change and its association with breastfeeding behaviors. The SMILE Program may be applicable for other at-risk communities as well, so future research should examine to what extent these results are generalizable beyond the African American community.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: Introduction

Benefits of Breastfeeding and Recommendations

Breastfeeding offers significant and enduring health benefits for both mother and child (3; 44; 141-143). Consequently, most public health organizations to include the American Academy of Pediatrics (AAP) advocate exclusive breastfeeding—usually defined using criteria established by Labbok and Krasovec (148)—for the first six months of a newborn's life (3). Based on the benefits of breastfeeding, the AAP states that the breastfed infant should be the normative reference for all feeding methods with regard to growth and health outcomes (2). Despite this, the nation continues to fall short of the Healthy People 2020 goals calling for an increase in the proportion of infants who are ever breastfed to nearly 82% and increasing the proportion of infants still breastfeeding at six months to nearly 61%. According to the most recent reporting from the Centers for Disease Control (CDC) and garnered from the United States National Immunization Surveys (NIS), the national rate of breastfeeding initiation was 77% while continued breastfeeding at six months was 49% reflecting a significant increase from 35% prevalence in 2000 (44). While this marks an improvement in breastfeeding rates from previous years, and the largest annual increase of breastfeeding initiation over the past decade, it remains short of healthy targets.

Disparities in Breastfeeding

Perhaps more importantly, there exist significant health disparities in the prevalence and duration of breastfeeding. Health disparities—inequities occurring due to gender, race or ethnicity, sexual orientation, disability, geographic location, education or income—remain one of the most troubling aspects of American health improvement priorities. Health disparities are of

significant concern for many reasons, not the least of which is because they reflect social inequities that are often institutionalized, systemic, and avoidable (40; 84; 263). Breastfeeding as a health disparity is particularly troubling given that Forste and colleagues (88) found that when comparing Black and non-Black women in the United States, while controlling for a host of demographic and SES factors (e.g., income, age, marital status, geographic location), breastfeeding accounted for infant mortality racial differences as much as the prevalence of low birth weight (LBW).

Unfortunately, research has consistently shown racial ethnicity to be a significant demographic variable associated with breastfeeding initiation and maintenance. African Americans consistently have lower breastfeeding rates than Caucasian or Hispanic women, and those that do breastfeed report premature weaning and less exclusivity (13; 88; 150; 154; 179; 209; 228). The most recent CDC reporting (based on NIS data from 2008) indicates that the prevalence of breastfeeding initiation among African Americans was 58.9% compared to 75.2% among Caucasians (179). These same African American infants were also more likely to be prematurely weaned than Caucasian infants; 30.1% of African American infants were breastfed to at least six months compared to 46.6% of Caucasian infants (179). Looking more specifically at prevalence rates by state, the CDC's 2004-2008 NIS data for children born during 2003-2006 found that most states failed to achieve the Healthy People 2010 targets for breastfeeding for any racial/ethnic group. Furthermore, non-Hispanic Blacks had a lower prevalence of breastfeeding initiation than non-Hispanic Whites in all but two states. In fact, in 13 states the difference between non-Hispanic Blacks and non-Hispanic Whites was $\geq$20 percentage points. Additionally, the prevalence of breastfeeding initiation among non-Hispanic Blacks was less

than 45% in six states (42). Ultimately, African American women have steadily maintained the lowest breastfeeding rates of any racial ethnicity (228).

Given the importance of breastfeeding and the substantial disparity in breastfeeding among African Americans, the purpose of the present study was to examine factors associated with breastfeeding initiation, maintenance, and exclusivity among a sample of women participating in the Start More Infants Living Equally Healthy (SMILE) Program, a nurse home visitation initiative designed to decrease infant mortality and promote infant health among African American/Black women in Montgomery County, Maryland. Recognizing the importance of breastfeeding to promote African American health, the SMILE Program has provided targeted support to educate women and new mothers about these benefits. Given the needs of the program and importance of this topic to the broader community, an outcomes-focused program evaluation was conducted. It began with a stakeholder analysis of the SMILE Program. Next, a records review was conducted utilizing the program's client database from which the maternal and infant characteristics expected to be associated with breastfeeding were identified for analysis. The program evaluation concluded with dissemination of findings, recommendations for quality improvement initiatives, and collaborative discussions on how to act upon the findings of the program evaluation. Continual staff analysis during all phases of research is an integral component of both community-based participatory research (CBPR) and program evaluation, and was integrated throughout this multi-phase evaluation.

Ultimately, this study is important given the need to increase breastfeeding initiation and maintenance among African American/Black women, and to address subpopulations of African American/Black women that may be at greater or less risk. As the review below illustrates, breastfeeding is a health behavior that may reduce many of the health disparities (e.g., infant

mortality, obesity, health complications related to prematurity, low birth weight) disproportionately affecting African Americans in the United States. Such well-documented health disparities (42; 117; 135; 171; 229) necessitate the study of specific factors that promote timely if not early intervention. One such intervention is that of breastfeeding promotion. By examining what factors contribute to or are associated with breastfeeding behaviors, more effective interventions can be tailored to this at-risk demographic.

Importance of Breastmilk: Benefits to Mother and Baby

Extensive research documents the tremendous benefits both infants and their mothers gain from breastfeeding (3; 44; 141; 143). The literature addressing the benefits of breastfeeding for the mother-infant dyad is summarized below, followed by a review of the literature pertaining to breastfeeding barriers.

Physical health benefits.

Infectious disease. Breastmilk contains a plethora of bioactive components, which provide passive immunoprotection against pathogenic microbes, impact the infant's physiology to protect against harmful pathogens, and/or modulate the infant's intestinal microbiology to influence mucosal and systemic immune maturation and function (97; 209; 222). This is important for several reasons, including known postnatal developmental delays in the infant's immune system which are compensated for or augmented by breastmilk. Furthermore, defense agents in breastmilk protect against microbial pathogens without provoking an inflammatory response in the infant, and many of these act synergistically with one another (97). Additionally, defense agents in breastmilk interact with some pathogens such that the infant develops an adaptive immune response without symptomatic infection, not altogether unlike immunizing with an attenuated microbial pathogen. Finally, many of the immunomodulating components of

breastmilk lessen the infant's risk of developing certain immune-induced diseases long after weaning (97).

Numerous studies conducted in both developed and developing countries conclude that breastfeeding decreases the incidence and severity of infectious diseases (3; 113). Among the diseases and conditions breastmilk has proven helpful in controlling are bacterial meningitis, ear infections, bacteremia, diarrhea, respiratory tract infection, necrotizing entercolitis, urinary tract infection, sudden infant death syndrome (SIDS), and late onset sepsis in preterm infants (3; 16; 71; 122; 159; 193; 211). This is particularly important given that research suggests African American infants may suffer disproportionately from such conditions (33; 41; 47; 63; 203; 205; 247).

Pediatric and adolescent obesity. For children and adolescents aged 2-19 years, overweight is defined as being in the sex-specific $85^{th} - 94.9^{th}$ percentile body mass index (kg/m^2, BMI) for age growth charts established by the CDC; obesity is defined as a BMI at or above the sex-specific 95^{th} percentile (196). Several studies have shown breastfeeding to be associated with pediatric and adolescent obesity (3; 22; 100; 271). For example, Woo and colleagues recently found that having been breastfed for ≥ 4 months was associated with a lower adolescent BMI and lower odds of being overweight/obese independent of race/ethnicity and parental education (271). These authors suggest that increasing breastfeeding duration could reduce adolescent obesity for all racial and socioeconomic groups and may minimize socioeconomic disparities in obesity (271). This is consistent with meta-analyses that found a dose-response relationship duration between BMI and breastfeeding (69).

Such conclusions are not without some controversy, and it should be noted that even Woo and colleagues report inconsistency in the literature regarding the association between

breastfeeding and pediatric obesity (271). Several studies find little to no relationship between breastfeeding behaviors and pediatric obesity, while others suggest that whatever relationship exists may be confounded by factors associated with SES (36; 37; 52; 111; 156; 186; 204). For instance, Owen and colleagues conducted meta-analyses examining 36 studies, which had reported an association between a lower BMI in those who were breastfed versus those who were fed formula (204). Despite the reported benefits of breastfeeding, further examination indicated that the small effect breastfeeding had on BMI was eliminated when adjusted for maternal BMI, SES, and smoking; moreover, some of these studies were methodologically flawed (e.g., small sample size, single BMI measurements) or benefited from publication bias (e.g., studies without significant effect being less likely to be published; 28, 176).

Ultimately, it is not clear why breastfeeding may affect pediatric and adolescent obesity. Hypothesized mechanisms include: metabolic programming (e.g., leptin, insulin, consequences of high protein intake early in life), learned self-regulation of energy intake (e.g., breastfeeding more likely to enable intake based on internal satiety cues), and residual confounding by parental attributes (e.g., parental healthier lifestyle, highly controlled feeding practices; 57). Despite the absence of a definitive mechanism of action and lack of conclusive evidence regarding the association between breastfeeding and subsequent obesity, the potential benefits lend support for breastfeeding as a potential intervention to reduce obesity later in life.

This may be an important public health intervention for African Americans in particular. While obesity is the most common disease of childhood, it is one disproportionately experienced by African Americans. Recent analysis of the National Health and Nutrition Examination Survey (NHANES) data reveals that in 2009-2010, African American youth were more likely to be obese than any other racial ethnic group. Specifically, while 14% of Caucasian youth were

obese, African American obesity was almost double (24.3%; 166). Additionally, these differences are not new. Data pertaining to obesity prevalence between 1999 and 2010 reveals that the odds of being obese have been significantly higher for African American youth than their Caucasian counterparts after controlling for age and survey period (166). Ultimately, overweight/obese children are more likely to have this continue on through adulthood, and are more likely to experience adverse physiological (e.g., cardiovascular disease, asthma, diabetes mellitus, chronic inflammation, insulin resistance) and psychological (e.g., psychosocial stigmatization) consequences (166).

Additional infant health benefits. Studies indicate that breastmilk offers protection for a number of other health conditions, to include: allergic airway inflammation (163); cancer, particularly lymphoma, Hodgkins disease, and leukemia (209); gastrointestinal illness (71; 143); sudden infant death syndrome (3; 100); reduction in incidence of Type 1 and Type 2 diabetes (3); and health complications related to prematurity and hospitalization within the neonatal intensive care unit (3; 27; 221; 238; 262). Breastfeeding also facilitates healthy neurodevelopment in newborns, particularly in those who may otherwise be at risk of developmental delays due to prematurity or their low birth weight (118; 119; 153; 182; 215; 253).

Infant mortality. Breastfeeding has also been associated with reduced infant mortality rates in the U.S. and worldwide (3; 105; 190). In the U.S., infant mortality remains highest among racial and ethnic minorities. For the past decade, it has been highest among non-Hispanic African Americans (91; 185). Additionally, it was recently reported that postneonatal infant mortality rates in the U.S. are reduced by 21% in breastfed infants. In fact, it has been suggested that if every infant were exclusively breastfed from birth to six months, an estimated 1.5 million lives might be saved each year (209).

Maternal health benefits. One of the benefits of breastfeeding for mothers is postpartum weight reduction. For most women, weight gain is a normal part of pregnancy. Normal weight women, defined as a BMI between 18.5-24.9 kg/m^2 can safely gain upwards of about 25 pounds. Overweight or obese women with a BMI greater than or equal to $25kg/m^2$ ideally should gain between 11 and 20 pounds (116). Current research suggests that obese women can safely gain even less weight (76; 77; 254). Excess weight gain in overweight/obese women is highly cautioned against due to its associated risk of pregnancy complications (e.g., gestational diabetes, hypertension), which in turn can elevate risks for premature delivery and other adverse health outcomes such as LBW and juvenile diabetes (224).

Difficulty in losing pregnancy weight further elevates health complications associated with being overweight or obese. While many studies have shown breastfeeding to promote postpartum weight loss and a return to pre-pregnancy weight (19; 70; 72; 109; 201; 202; 224), still others find this benefit to be dose-dependent, negligible, transient, or inconclusive (70; 89; 124; 143; 272). This question is particularly salient for African American women given that overweight/obesity and obesity-related health conditions disproportionately affect African American women (28; 34; 115; 256). In fact, non-Hispanic African American women have the highest rates of overweight or obesity as compared to any other group in the United States. Recent reporting suggests that upwards of 60% of African American women are obese as compared to approximately 32% of Caucasian women (87).

Finally, research suggests numerous additional health benefits of breastfeeding. These benefits include decreased postpartum bleeding, reduction in blood pressure, decreased menstrual blood loss, decreased risk of cancer, and potentially decreased risk of osteoporosis

during the woman's postmenopausal period (10; 50; 62; 72; 90; 129; 134; 149; 174; 206; 227; 273).

Psychological benefits.

Infant wellbeing. It has been argued that breastfeeding transcends merely providing a nutritionally and immunologically optimized meal, in that breastfeeding builds a lasting psychosocial bond between the mother and her infant (217). Research typically suggests that breastfed infants may be more alert, less colicky, perceive maternal care more strongly, have reduced mental health problems in adolescence, and engage more readily in their interactions with their parents than those fed formula (18; 79; 85; 194).

Maternal wellbeing. While the research is inconclusive regarding the psychological outcome differences between women who breastfeed versus those who bottle-feed (32; 79), it is widely accepted that at least in the short-term, breastfeeding benefits breastfeeding women through the release of oxytocin. In addition to the physiological benefit of oxytocin to hasten uterine involution and reduce postpartum bleeding, this hormone is also associated with maternal-child bonding and maternal behavior (209; 259; 260). Other research has suggested that mothers' perception of closeness with their infants was higher among those who were breastfeeding versus those who relied on bottle feeding (168).

Advances in medical technology have also revealed interesting differences in the neurobiological aspects of maternal behavior associated with breastfeeding (136). Kim and colleagues (136) conducted a study using functional magnetic imaging (fMRI) to examine maternal brain activation in response to her own baby's cry versus a control baby cry. Maternal sensitivity was compared between mothers exclusively breastfeeding at 2-4 weeks postpartum versus those who were exclusively formula feeding. At three to four months postpartum,

breastfeeding women showed greater activations in the superior frontal gyrus, insula, precuneus, striatum, and amygdala as compared to the formula feeding mothers. This may suggest a neurobiological link between breastfeeding and the brain regions associated with maternal-infant bonding and empathy (136).

Summary of breastfeeding benefits.

Breastfeeding offers numerous health benefits for the mother-infant dyad. For the developing infant, breastmilk offers substantive immunological protection, may reduce the prevalence of pediatric and adolescent obesity, reduces infant mortality particularly for those born prematurely and/or at LBW, and ultimately protects against a host of conditions (e.g., SIDS) in ways that are still not clearly understood. These health benefits are not one sided, and both mother and infant experience numerous health benefits from breastfeeding. Not only are these important health benefits, but it is equally important to note that these same health conditions ameliorated by breastfeeding are disproportionately experienced by African Americans. That is, breastfeeding is protective for many conditions disproportionately experienced by African Americans as described above (28; 34; 47; 63; 105; 153; 190; 203; 247; 253; 256). Thus, it is particularly important to promote breastfeeding among African Americans as a targeted intervention for such health inequities.

The present study attempted to examine selected infant health outcomes for SMILE program participants. The program database does not contain information relating to maternal health outcomes, but does contain information pertaining to infant health outcomes potentially related to breastfeeding. Specifically, the following infant health outcomes were examined: medical concerns (e.g., recurrent hospitalizations, neurological delays) and nurse case manager perception of mother-infant bonding. It should be noted, however, there were substantive

limitations in the available data, which precluded the ability to report on the variety of infant health outcomes breastfeeding is known to affect. Gaps in the database relevant to mother-infant health outcomes (e.g., maternal health outcomes) were addressed in the course of this program evaluation.

Barriers to Breastfeeding

Despite the many benefits of breastfeeding, women experience common barriers to breastfeeding. Barriers to breastfeeding are numerous despite the efforts to promote it within the United States by hospitals (e.g., Baby Friendly Health Initiative [BFHI]), public health campaigns (e.g., La Leche League), and community health initiatives (e.g., African-American Breastfeeding Alliance). Some of these breastfeeding obstacles include NICU admittance, maternal demographic considerations (e.g., SES, employment), maternal knowledge of and attitudes about breastfeeding, and maternal obesity. African American women share these barriers and may also experience an exacerbation of common barriers due to socio-ecological considerations (13; 24; 25; 164; 191; 209; 228). In addition, there are clear contraindications for breastfeeding, some of which may disproportionately affect African American women. These barriers must be understood and addressed in order to develop effective breastfeeding programs for African American women. These specific barriers are reviewed below and are then followed by a focus on those barriers particularly salient to African American/Black women in the United States.

Hospital practices.

General practices. The AAP states that hospitals should adopt practices that promote successful lactation. Such practices include promoting skin-to-skin contact between healthy infants and their mothers immediately after delivery until the first feeding is accomplished.

Towards this end, the AAP encourages birth centers to delay weighing, measuring, bathing, immunizations, blood draws, and eye prophylaxis until after the first feeding is completed except under unusual circumstances such as if the infant is born prematurely (2).

The Baby Friendly Hospital Initiative (BFHI) was established to overcome these systemic, institutionalized obstacles within hospitals and birthing centers across the world. This is a global program sponsored by the World Health Organization (WHO) and UNICEF to encourage and recognize those hospitals and birth centers, which provide the optimal level of breastfeeding support. Hospitals designated as Baby Friendly actively promote and facilitate the evidence-based "Ten Steps to Successful Breastfeeding" (see *Appendix A*).

However, the guidelines established by the AAP and BFHI are not always met. The CDC, for example, conducts an annual Maternity Practices in Infant Nutrition and Care (mPINC) survey to assess how well maternity care practices at hospitals support breastfeeding. This measure is scored 0-100, with a higher score indicating better utilization of evidence-based maternity care. While the mPINC score has steadily increased, rising to a 70 in 2011, it should be noted that less than 2% of births occurred in facilities designated as being Baby Friendly (38). In fact, while there are more than 19,000 facilities designated as Baby Friendly, there are only 143 hospitals designated so in the U.S. as of 2012. Ultimately, many mother-infant dyads are not receiving the quality of care most likely to promote successful breastfeeding (44).

Two recent studies highlight the importance of hospital practices on creating an environment conducive to breastfeeding, particularly for new mothers. DiGirolamo and colleagues sought to assess the impact Baby Friendly hospital practices and other maternity care practices (e.g., rooming in, breastfeeding initiation within an hour of birth, breastfeeding on demand, not using a pacifier) had on breastfeeding duration (67). Their study focused on nearly

2,000 mothers who initiated breastfeeding and had prenatally expressed an intention to breastfeed for at least two months. Of the women participating in the study, only 8% experienced all six Baby Friendly practices and most importantly, mothers experiencing none of the Baby Friendly practices were approximately 13 times more likely to prematurely stop breastfeeding (75). Their study is consistent with the literature that finds the Baby Friendly Hospital Initiative well suited to substantially promote breastfeeding (4; 233; 234; 261).

Given the scarcity of Baby Friendly hospitals in the United States, it might be reasonable to hypothesize that African Americans are less likely to deliver in hospitals complying with the "Ten Steps to Successful Breastfeeding," which form the basis of the Baby Friendly Hospital Initiative. Unfortunately, no study to date has been conducted to determine what percentage of African Americans deliver at Baby Friendly hospitals. However, studies have been conducted on the prevalence of breastfeeding in Baby Friendly hospitals and these studies have consistently demonstrated a reduction in or elimination of the breastfeeding disparity between African Americans and Caucasians (176; 177; 210).

In addition to hospital practices, the perceived breastfeeding attitudes of physicians and hospital staff also impact breastfeeding (74; 96; 200). For example, DiGirolamo and colleagues surveyed more than 1,600 women prenatally and up to their infants' first birthday (67). For this particular study, the authors examined whether there was an association between breastfeeding beyond six weeks and mother's perceptions of her prenatal physician's and hospital staff's attitudes toward breastfeeding. Many of the women reported not receiving positive breastfeeding messages during their prenatal care, and 61% reported that their physicians were "neutral" on the subject. Perhaps not surprisingly, 41% of the women had discontinued breastfeeding prior to their sixth postpartum week. These findings suggest that neutrality on the part of the prenatal

physician and hospital staff was associated with a failure to breastfeed beyond six weeks (74). Moreover, at least one study found that while African Americans were more likely to have ante-natally discussed breastfeeding with a health care provider than Caucasian women, these same women were less likely to receive hospital instruction and/or support for breastfeeding than Caucasian women (94).

NICU admittance. Research suggests that perinatal conditions requiring admittance to the neonatal intensive care unit (NICU) are one of the strongest predictors of breastfeeding and ultimately has a significant deleterious effect on breastfeeding initiation and duration (53; 60; 64; 82; 106; 126; 160; 214). In one of the largest studies to examine the influence of NICU admittance on breastfeeding rates, Colaizy and Morriss examined PRAMS data for the years 2000 to 2003 (53). More than 138,000 surveys were examined, which included nearly 30,000 infants who had been admitted to the NICU. They found that mothers of term NICU-admitted infants were significantly less likely to initiate or continue breastfeeding to four weeks than mothers of term infants who were not hospitalized in the NICU (53). This is particularly salient for African Americans who are significantly more likely to experience adverse birth outcomes (e.g., LBW, prematurity) resulting in NICU admittance (12; 162).

Medical and perceived contraindications. Although breastfeeding is optimal for infants and mothers alike, there are short- and long-term health conditions wherein breastfeeding may not be an appropriate choice. Generally speaking, breastfeeding is contraindicated if infants are diagnosed with classic galactosemia and if mothers have untreated tuberculosis disease, if they are receiving diagnostic or therapeutic radioactive isotropes or have recently been exposed to radioactive materials, are receiving antimetabolites or chemotherapeutic agents (until such agents clear the milk), are using drugs of abuse, are currently taking certain prescribed medications

(e.g., metronidazole, atenolol, lithium, ergotamine), and have herpes simplex lesions on the breast (3).

Certain infectious diseases also require special consideration, particularly human immunodeficiency virus (3; 57) especially given that HIV/AIDS is a significant health disparity afflicting African Americans more than Caucasians. In 2008 alone, an estimated 430,000 children became infected with HIV and 90% of these were due to vertical transmission, which occurs during pregnancy, labor, delivery, and postpartum through breastfeeding (274). Despite this staggering number, there is no guarantee that children born to HIV-positive women will contract HIV themselves (55; 56; 137; 245; 252). A variety of factors contribute to the risk of vertical transmission. In the mother, these risk factors include timing of maternal infection, maternal viral load, immune function, nutritional status of both mother and child, appropriate use of antiretrovirals (ARV), breast health (e.g., nipple pathology, mastitis), and type of breastfeeding. In the infant, the biggest contributing risk is the presence of oral lesions (3; 112; 147; 180; 274).

Due to the potential risks, HIV-positive mothers in the United States are advised not to breastfeed their infants. In contrast, in developing nations where infectious disease and nutritional deficiencies are leading causes of infant mortality, the benefits of breastfeeding for at least six months may outweigh the possible risk of acquiring HIV (3). In fact, a recent study by Coovadia and Kindra conclude that the totality of studies conducted—principally with African mother-infant dyads—suggest exclusive breastfeeding for six months can still be recommended for HIV-positive mothers (56). However, it has been suggested that without any intervention, approximately 6% of exposed infants would become infected via breastfeeding if they were to be exclusively breastfed for six months (139; 274).

Maternal factors.

Socioeconomic status (SES). Breastfeeding behaviors have been linked to age, marital status, and education. Generally speaking, breastfeeding has been positively associated with age, education, and higher SES (17; 38; 49; 68; 132; 231; 232; 240). It has also been suggested that receiving assistance through the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) has deleterious effects on breastfeeding rates, despite programmatic requirements to promote breastfeeding (24; 231; 246; 276). Examination of the breastfeeding rates among those receiving WIC compared against those not receiving WIC consistently indicate that breastfeeding rates among WIC participants have been are far lower than those not receiving WIC for the last 25 years; WIC status remains a strong negative predictor of breastfeeding with non-WIC twice as likely to breastfeed (231).

This health disparity is further exacerbated due to race/ethnicity. While far fewer African Americans (19.3%) than Caucasians (60.9%) utilize WIC (258), African Americans/Blacks participating in WIC are even less likely to breastfeed than their Caucasian counterparts (24; 246). African Americans receiving WIC assistance are more likely to be encouraged to formula feed and less likely to receive breastfeeding advice by their WIC counselors than Caucasian women (24). Breastfeeding support services within WIC programs have also been shown to vary based on the race/ethnicity of the principal population served (83).

Nativity. Nativity also plays an important role in explaining United States breastfeeding disparities. Foreign born women in the U.S. are more likely to initiate breastfeeding than their native born counterparts (29; 88; 150; 175), even when controlling for socioeconomic variables (243). In fact, a study among low income, inner city women found breastfeeding to be more common among immigrant Black women than U.S.-born Caucasian or African American

mothers (150). Moreover, it should be noted that acculturation has been shown to adversely affect breastfeeding initiation and duration among immigrants (243).

Maternal employment. Maternal employment often poses a significant barrier to sustaining breastfeeding (7; 20; 170; 189; 195; 255). Ryan and colleagues examined a national sample of nearly 230,000 mothers to determine what affect employment or lack thereof had on breastfeeding initiation and duration (232). Women working part-time had a higher rate of breastfeeding than those who were employed full time with full-time employment negatively related to breastfeeding duration. While full-time working mothers have shown an increase in breastfeeding rates over the past two decades, unemployed mothers were more than twice as likely to continue breastfeeding at six months as those working full time (232). Research suggests that maternal employment plays a particularly significant role in the premature weaning of African American infants. It has been suggested that African American mothers tend to return to work more quickly than Caucasians, and when surveyed, many African Americans cite early return to work as the predominant reason for not continuing to breastfeed their young infant (35; 150).

Breastfeeding knowledge and attitudes. Knowledge of the health benefits of breastfeeding and intention to breastfeed are predictors of breastfeeding behavior, particularly among African Americans (25; 54; 165; 240; 249). Stuebe and Bonuck surveyed nearly 900 women regarding their intentions to breastfeed, feeding choices, knowledge of infant health benefits associated with breastfeeding, and attitudes towards breastfeeding (249). Their work found maternal knowledge about the health benefits of breastfeeding to be positively associated with breastfeeding, both mixed and exclusively (249). Additionally, other research has found that lack of maternal confidence in ability to breastfeed and concerns about milk production (e.g.,

anxiety about insufficient milk supply) are associated with premature cessation of breastfeeding (17; 54; 80; 255; 275).

Additionally, studies have also shown that most African Americans express a general comfort with formula feeding. Nommsen-Rivers and colleagues interviewed 532 expectant first-time mothers regarding whether they knew others who had breastfed, how comfortable they were with breastfeeding, how comfortable they were with formula feeding, and breastfeeding self-efficacy (191). While breastfeeding self-efficacy and comfort were associated with breastfeeding, comfort with formula feeding strongly predicted and mediated the ethnic disparity in breastfeeding among African American women. More importantly, comfort with formula feeding had a significantly greater influence on the decision to breastfeed than did comfort with the idea of breastfeeding (191). This is consistent with other research that has similarly found that a common reason cited by African Americans for not breastfeeding is comfort with and preference for bottle feeding (88).

Postpartum depression and psychopathology. Due to a variety of factors, women often experience some degree of psychological distress following the birth of their child. This distress manifests along a continuum of mild (i.e., "baby blues") to severe (e.g., postpartum psychosis), with postpartum depression lying somewhere in the middle. It has been suggested that the prevalence of postpartum depression among mothers ranges from 10% to 60% (102). Additionally, there is some evidence to suggest that African Americans are more likely to experience postpartum depression than Caucasians. One study, for instance, found that 44% of African Americans reported depressive symptoms as compared to 31% of Caucasians (121). Moreover, African Americans are also less likely to seek or receive adequate mental health care for their mental health problems (95; 107; 223; 277).

The research further suggests a negative association between postpartum depression and breastfeeding, such that postpartum depression contributes to premature weaning of young infants (66; 108; 110; 241). The reduction in breastfeeding by those experiencing postpartum depression or other forms of psychopathology may be due to the relevant symptomology (e.g., fatigue, anxiety, feelings of sadness or inadequacy) as well as fear that pharmacological interventions may be passed through the breast milk and harm the infant (66). This latter concern may well be a misconception as it has been suggested that the majority of antidepressants are not usually contraindicated, particularly those classified as SSRIs, and the positive maternal-infant health benefits of breastfeeding outweigh the possible adverse effects of antidepressant drugs (5; 66).

Sociocultural factors. Some have suggested sociocultural factors may contribute to disparities in breast feeding (150). This includes taboos about public exposure of the breast, breastfeeding self-efficacy, fear that large breasts would suffocate an infant, sexualization of the breast, unfavorable opinions about breastfeeding, perceptions that breastfeeding is painful, historical association between slavery and service as a wet nurse, and absence of a social support network actively promoting breastfeeding (25; 150; 166). Public breastfeeding, in particular, has been shown to negatively influence an African American woman's decision to breastfeed (59).

Obesity. Maternal obesity is negatively associated with breastfeeding initiation and duration, although the reasons for this association is not well understood (132; 146; 152; 172; 219; 220; 270). A myriad of socioecological factors may contribute to this association, including psychological, behavioral, and cultural influences (11). Several studies acknowledge that there may be a biological component contributing to the inverse relationship between maternal obesity and breastfeeding. Rasmussen found maternal obesity contributed to slower onset of lactogenesis

II (i.e., onset of copious milk secretion), which in turn, reduced the likelihood of breastfeeding for the recommended duration (219). Rasmussen's previous work examined decreased prolactin section as a potential mechanism for this delay given that both spontaneous and response-driven prolactin secretion is generally reduced in obese subjects (220). Overweight and obese women had a lower prolactin response to suckling than normal weight women, potentially compromising the women's ability to produce milk and thus potentially contributing to premature infant weaning. This is particularly important because the prolactin response to suckling prior to and immediately after onset of lactogenesis II is critically important for milk production more so than it is later in lactation (187; 188; 220; 251).

Summary of breastfeeding barriers.

While the literature demonstrates clear health and psychological benefits of breastfeeding to the mother-infant dyad, significant obstacles to breastfeeding exist and may differentially and adversely impact breastfeeding behaviors. Some factors known to be associated with failure to breastfeed include younger maternal age, concerns about infant satiation and insufficient milk production, SES, lack of social support, negative life events, being unmarried, and certain maternal hospital experiences, which may lead to formula supplementation. Moreover, these same obstacles may be more prevalent among African Americans, perhaps further exacerbating other socioecological factors negatively impacting a woman's decision to breastfeed. Among these include the increased likelihood of NICU admittance, utilization of WIC and differential experience at WIC, maternal employment, increased comfort with formula feeding, negative associations of breastfeeding with historical inequities, and a higher incidence of postpartum depression. Ultimately, despite the enumerated benefits of breastfeeding, many barriers exist and continue to reduce both the prevalence and duration of breastfeeding, particularly among racial

and ethnic minorities who arguably would benefit most from the enduring health benefits of breastfeeding.

In light of the breastfeeding barriers so commonly experienced by African Americans, the SMILE Program seeks to reduce such potential obstacles, offering psychoeducation, social support, and breast pump loans to SMILE enrollees. What has yet to be done within the SMILE Program is to examine the prevalence of breastfeeding initiation and maintenance and to evaluate what barriers to breastfeeding initiation and maintenance exist. The present study filled that gap by examining associative factors within this population, specifically examining how demographics, SES, nativity, health (e.g., HIV status), birth outcomes (e.g., NICU admittance, LBW, jaundice, prematurity), postpartum considerations (e.g., nipple/sucking problems), and psychosocial stressors affect breastfeeding behavior. Unfortunately, key variables (e.g., breastfeeding attitudes, WIC usage, obesity) regarding breastfeeding were not available, and were addressed with program staff as a potential area for future improvement in their data collection efforts.

Interventions to Promote Breastfeeding

Research clearly demonstrates breastfeeding offers numerous health benefits to the mother-infant dyad. These health benefits may potentially reduce health disparities among minority populations. The research also indicates that we are far from achieving recommended breastfeeding goals for both initiation and duration of breastfeeding. Those engaged in public health policy and programs face a significant conundrum—how to effectively promote breastfeeding among at-risk populations who are otherwise far less likely to initiate and maintain breastfeeding for the recommended duration than their Caucasian counterparts.

Effective interventions for breastfeeding. Studies conducted both in the United States and abroad indicate that effective interventions to promote breastfeeding include changes in maternity care practices (e.g., pursuing BFHI designation), employment lactation programs, peer support, maternal and social support education, and nurse home visitation programs (8; 51; 78; 242). In the CDC's systematic review of the literature, the effectiveness of 38 randomized clinical trials (RCTs) in promoting breastfeeding was examined (242). The data were primarily from developed nations, seeking to improve breastfeeding outcomes (initiation, duration, and exclusivity) utilizing a variety of intervention strategies (e.g., lactation consultants, peer counselors, etc.) in different settings (e.g., home, clinic, hospital). Targeted breastfeeding interventions were consistently shown to be more effective than "usual care" controls in increasing breastfeeding rates and duration, particularly programs employing a multi-faceted approach (242). Another recent review, which included 53 randomized and quasi-randomized controlled trials, evaluated the effectiveness of breastfeeding initiatives in promoting exclusive breastfeeding. There was a significant association between these programs and both initiation of "any" breastfeeding and exclusive breastfeeding for up to six months, particularly in developing countries (123). Similarly, Hall reviewed the effectiveness of four community-based interventions to promote exclusive breastfeeding in low- and low-middle income countries. Intervention strategies differed (e.g., home visits, breastfeeding education incorporated in other community-based services) and were conducted by birth attendants, health workers, and/or trained peer counselors (103). Each of these community-led initiatives was successful in promoting exclusive breastfeeding (103).

Home visitation programs. An approach to promoting breastfeeding, which is particularly relevant for the current study, is the utilization of community-based programs

offering mother-to-mother and peer support for breastfeeding. Such programs may overcome many of the barriers associated with initiation and some associated with maintenance. Within this type of intervention are nurse home visitation (NHV) programs, loosely defined as a targeted health care service delivered within a family's home for the express purpose of providing health information and social support to childbearing women and their children (65; 98; 269). These programs offer structured services in home settings (e.g., referrals, education), care provided by a nurse or other trained provider, and are designed to provide social support while influencing the mothers' health knowledge, beliefs, and practices (104; 248; 264).

Considerable research has been done examining the effectiveness of nurse home visitations on improving maternal-infant health outcomes (48; 192; 197-199). In 2009, the Home Visiting Evidence of Effectiveness (HomVEE) was launched through the Department of Health and Human Services to conduct a thorough literature review of the effectiveness of home visiting program models (15). Their review of the more than 16,000 studies identified 14 home visitation models that met DHHS criteria as an evidence-based early childhood home visiting program (e.g., Child FIRST, Early Intervention Program for Adolescent Mothers [EIP], Healthy Families America [HFA], Home Instruction for Parents of Preschool Youngsters [HIPPY], and Nurse Family Partnership [NFP]). These 14 home visitation models were selected because all had 1) at least one high- or moderate-quality study with at least two favorable and statistically significant impacts in two different domains (e.g., school readiness and reduction of child maltreatment) or 2) had at least two high- or moderate-quality studies using non-overlapping study samples with statistically significant, favorable impacts in the same domain (e.g., child health).

Of the 14 protocols identified by HomVEE as effective, evidence-based home visitation models, only three (i.e., Healthy Steps, Maternal Early Childhood Sustained Home Visiting

Program, and Nurse Family Partnership) had examined breastfeeding outcomes (127; 133; 138). Only Kitzman and colleagues utilized a predominantly African American sample (138). This study evaluated the effectiveness of the NFP home visitation program in promoting maternal care-giving and reducing childhood injuries by offering home visits up to the child's second birthday. Inclusion criteria limited participation to women at a Memphis TN medical center with no previous live births, without chronic illnesses that might adversely affect the fetus, and with at least two socioeconomic risk factors (e.g., unmarried, less than 12 years of education, and unemployed). More than 90% of the participants were African American and unmarried, and 85% came from households with incomes at or below the federal poverty guidelines (138). In addition to other variables assessed (e.g., birth weight, gestational age, childhood injuries), the authors also assessed for breastfeeding initiation and found that women receiving home visitations were more likely to initiate breastfeeding than those who did not receive home visitations (138). No information was provided on differences in breastfeeding maintenance or exclusivity rates.

Kemp and colleagues also targeted a high-risk population (133). They provided the first Australian RCT of a home visitation program offering prenatal and postpartum home visits to families living in a socioeconomically disadvantaged community. All women received usual antenatal midwifery, obstetric, and birthing services (i.e., usual care). Those in the intervention group also received an average of 16.3 nurse home visits from 26 gestational weeks to the child's second birthday. In addition to other factors assessed by the study (e.g., parent-child interaction, infant psychomotor development, maternal smoking), the authors also evaluated breastfeeding maintenance. Data analysis suggested that infants in the intervention group were breastfed significantly longer than those in the comparison group; no information was provided on

differences in breastfeeding initiation rates, exclusivity, or on specific amount of time infants were breastfed (133).

Lastly, Johnston and colleagues assessed the effectiveness of usual care versus prenatal home visitation offered via Healthy Steps (127). Predominantly Caucasian women randomized in the intervention group received three home visits providing psychoeducation (e.g., fetal and infant development, home safety, and material needs of young infants). Outcome data on child health and development, parenting practices, and parental well-being were collected within two weeks postpartum, when the infant was three months old, and then finally when the children were 30 months old. Breastfeeding initiation and maintenance to six months were assessed. Even though the home visitations were limited to the prenatal period, women in the intervention group were more likely to initiate breastfeeding and maintain for at least six months postpartum. In fact, while 82% of the women in the intervention group breastfed their infants at least six months, only 64% of those receiving usual care did the same (127). The study did not assess for breastfeeding exclusivity. Ultimately, in these three studies identified by HomVEE as effective, all showed positive effects of NHV program efforts in promoting breastfeeding initiation and/or breastfeeding maintenance, although only two focused on recruiting socioeconomically disadvantaged participants (134; 139) and only one (139) utilized a predominantly African American sample.

As demonstrated by the HomVEE research, while much has been done to assess the effectiveness of home visitation programs to broadly affect positive outcomes in maternal-child health and wellbeing, far less has been done exploring the benefits of nurse home visits on promoting breastfeeding, particularly for at-risk populations. Appendix B provides a summary table of 23 home visitation studies that assessed at least some breastfeeding behavior. The table

columns characterize the population (i.e., at-risk, African American), the intervention duration (i.e., short-term, intermediate, long-term), and the specific breastfeeding behaviors examined (i.e., initiation, maintenance, exclusivity; *see* Appendix B); of these studies, several are particularly salient to the present study and are examined in more depth below. Ultimately, what literature exists suggests that home visitation programs increase breastfeeding initiation, duration, and exclusivity more than standard of care (e.g., hospital provided services, booklets). Most of the studies entailed short-duration interventions wherein nurses engaged in home visits up to one month postpartum (14; 23; 30; 73; 81; 92; 93; 130; 157; 161; 169; 181; 207; 212). Very few interventions continued from five weeks up to six months postpartum (58; 144; 145; 167; 213), and fewer still continued past seven months postpartum (173; 266; 267).

What becomes immediately apparent when reviewing Appendix B is that very few studies assess programs that offer comparable home visitation services to the SMILE Program. Programmatic comparability is defined as those programs targeting at-risk populations (e.g., disadvantaged SES), predominantly African American participants, and long-term interventions. As to this latter domain, two of the three studies conducted on long-term interventions utilized the "Healthy Beginnings" protocol funded by the Australian National Health and Medical Research Council (266; 267). In both of these studies, participating women received up to six home visits by a community health nurse trained in providing a staged home-based intervention. In addition to other positive health outcomes observed (e.g., decreased age of infants beginning "tummy time," reduction of risk factors of childhood obesity), duration of breastfeeding was significantly associated with the nurse home visitation. In the earlier Wen and colleagues (267) study, the rate of continued breastfeeding to 12 months was significantly higher than national averages (36% vs 18%). In the latter study, the rate of continued breastfeeding to 12 months was

significantly higher than the control group (266). The only other long-term intervention offered nurse home visitations to at-risk Swedish youth and included between 40-60 home visits from pregnancy to up to two years postpartum (173). This intervention sought to decrease antenatal smoking and increase breastfeeding. In addition to the beneficial effects of the program on reducing smoking among this at-risk demographic, the program also appears to have positively impacted breastfeeding prevalence such that significantly more women in the intervention group maintained breastfeeding at six months postpartum (173).

Five studies evaluated programs offering home visitation services to families of disadvantaged SES (161; 173; 212; 213; 266); two of these were discussed in the preceding (174; 267) section as they entailed long-term interventions. Only two studies (213; 214) had predominantly African American participants. Of the studies predominantly seeking mothers with disadvantaged SES, only one offered a moderate intensity program (214). In this Pugh and colleagues (213) study, participants included women receiving WIC benefits and who had initiated breastfeeding; almost 90% of the participants were African American. The intervention protocol included hospital visits by a breastfeeding support team, home visits over the first 24 postpartum weeks, telephone support, and 24 hour pager access. Data analysis revealed that while the intervention promoted initial breastfeeding efforts up to the first six postpartum weeks, differences were no longer statistically significant at 12 and 21 postpartum weeks (214). Earlier work spearheaded by Pugh (212) similarly engaged low income, predominantly African American participants in a short-duration intervention. The intervention protocol included standard hospital care for the infants' delivery, home visitations by community health nurses and peer counselors at predetermined time points (i.e., at 1, 2, and 4 postpartum weeks), and weekly telephone support until six months postpartum. Their research indicated that women receiving

the home visitations were significantly more likely to initiate and maintain breastfeeding to six months, as well as engage in exclusive breastfeeding, than those receiving standard of care (212).

The only other study whose participants came from predominantly disadvantaged SES was conducted by Mannan and colleagues (161). This study was conducted in Bangladesh and compared standard of care with home visitations led by community health workers. The short-term intervention protocol included two prenatal home visits in the second and third trimesters, as well as three home visits in the first postpartum week. During these latter visits, the community health workers assessed maternal breastfeeding techniques (e.g., latching difficulties), provided counseling, and hands-on support. The authors did not assess for breastfeeding behaviors and instead evaluated only for affect on self-reported breastfeeding difficulties. Data analysis indicated that the intervention protocol significantly reduced breastfeeding difficulties (from 34% in standard care to 6% in those receiving home visits) within three days postpartum. Moreover, those who did not receive home visits were more than eleven times more likely to report feeding problems as late as seven days postpartum than those receiving the home visits (161).

Ultimately, not all home visitation programs utilize nurses to promote breastfeeding; some, for example, may utilize peer counselors, especially in developing nations where infant mortality is particularly high and could be reduced by increased breastfeeding initiation, duration, and exclusivity (45; 128; 250). Peer support has been defined as the systematic support between two or more persons, engaging in an equal partnership, wherein at least one individual functions in the role of "supporter" and at least one receives said support. Such peer counselors exclude health professionals but would include individuals such as partners, family members, friends, or other breastfeeding mothers (131).

Kaunonen and colleagues recently conducted a systematic review evaluating the effectiveness of peer support initiatives in Europe, North America, Australia, and New Zealand (131). The authors found that the interventions studied were significantly effective in promoting initiation, duration, and exclusivity. Perhaps as importantly, these same interventions were generally found to generate healthcare savings, were seen as empowering by the women receiving the services, and increased women's confidence and satisfaction with breastfeeding (131). This is consistent with other research conducted in the United States and abroad (e.g., Australia, Africa, Mexico, Nigeria, Brazil, Philippines, Turkey, Cambodia, Bangladesh, Uganda, Zambia) suggesting that nurse or paraprofessional home visits promoted breastfeeding initiation, duration, and/or exclusivity (6; 9; 46; 47; 58; 61; 86; 101; 133; 151; 155; 161; 178; 183; 216; 218; 225; 257), especially among at-risk populations (6; 26; 140).

It should be noted, however, that not all home visitation interventions have been shown to effectively promote breastfeeding behaviors. One protocol offering a program of intermediate duration (up to six weeks postpartum) showed no statistically significant effect of the program under investigation (167). This lone study evaluated an Australian, extended midwifery support program. Participants included nearly 850 Australian women who had given birth to healthy, term, singleton infants and who had previously expressed a desire to breastfeed. Women in the intervention condition received an individualized educational session as well as weekly home visits with a midwife until their infant was six weeks old. The control group received standard postnatal midwifery support. The authors found no difference between groups at six months postpartum for either breastfeeding maintenance or exclusivity, leading the authors to conclude that this particular intervention did not improve breastfeeding rates in women who already had expressed a high intention to breastfeed (167). Similarly, several studies indicated short-term

interventions (i.e., those offering home visits up to the first postpartum month) were not effective in promoting breastfeeding, despite evidence that women participating in these interventions expressed significantly greater satisfaction with their overall level of care and/or had fewer problems with breastfeeding (30; 73; 81; 157; 181).

Ultimately, the above discussion reflects the considerable progression of work aimed at identifying and disseminating quality programming designed to improve the health and wellbeing of women and children. This new emphasis on identifying and highlighting effective home visitation programs was eventually codified in the Patient Protection and Affordable Care Act. The Affordable Care Act (P.L. 111-148) established a Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) to provide nearly two billion dollars over five years to states in order for them to establish home visitation programs for socioeconomically disadvantaged pregnant women and children (15). Seventy-five percent of the funds, however, must be used for programs with demonstrable evidence of effectiveness. Thus, evaluating existing programs like the SMILE Program is critical to establish through credible evidence that the program successfully promotes breastfeeding and accomplishes its programmatic objectives.

Present Study

The SMILE Program: Overview. One of the first steps to an effective program evaluation according to the CDC's Framework is developing an understanding of the program under investigation, clarifying its components and intended outcomes (43). The CDC's Framework provides specific, evidence-based guidance on the implementation of program evaluations within diverse public health contexts. The evaluation process entails six steps that can be conceptualized as existing within three interconnected phases as depicted in Figure 1; these are further elucidated in the Methods section. As each of these steps is accomplished, the

research is informed and guided by principles of utility (e.g., who needs the results), feasibility (e.g., is the evaluation appropriate given resources), propriety (e.g., does the evaluation protect the rights and interests of stakeholders), and accuracy (e.g., are the results appropriately reflecting the needs of stakeholders; 43). These issues are discussed, as relevant, in the Results and Discussion sections.

Figure 1. **Phases of Public Health Program Evaluations**

Phase 1: Preparation
1. Stakeholder engagement
2. Program description

Phase 2: Evaluation
3. Evaluation design
4. Gather evidence

Phase 3: Feedback
5. Justify conclusions
6. Disseminate findings and share lessons learned

Consistent with the CDC's preparatory steps (Phase 1), this section describes the program. In 1999, the SMILE Program was developed by the African American Health Program (AAHP) and overseen by the Montgomery County Department of Health and Human Services to address disparities in infant mortality. At the time, the African American infant mortality rate in Montgomery County was greater than 13% and 2-3 times greater than that of Caucasian residents. Since its inception, the SMILE Program has offered education, community referrals, and social support to African American and Black women residing in Montgomery County. At its launch, the program employed just one registered nurse. Since then, the program has expanded to include three nurse case managers, all of whom are licensed lactation consultants who promote breastfeeding as early as the first family visit. The goal of the program is to reduce infant mortality among this at-risk demographic, and in the immediate postpartum period, to promote mother-infant health and wellbeing up to discharge from the program at the infant's first birthday. Eligibility requirements for the SMILE Program are liberal, requiring only that the woman be an African American or of African descent and be a

resident of Montgomery County; there is no age, income, educational, or insurance requirement (1).

The philosophy underlying the SMILE Program's breastfeeding promotion efforts is that breastfeeding is ultimately best for both mother and baby. Consequently, some of the key components of the program designed to promote breastfeeding include breastfeeding instruction and promotion, childbirth and lactation classes, hospital-grade breast pump lending, group classes at AAHP, and follow-up care provided in the home by the nurse case managers (e.g., assistance with latching). Additionally, the nurse case managers also provide psychosocial education about a host of maternal-infant health considerations, including, but not limited to, "baby blues," the "Back to Sleep" initiative, SIDS, importance of breastfeeding, how to handle accidental infant poisonings, and value of social interactions with infants. Every visit entails some degree of client monitoring and evaluation, social support, and psychoeducation. There is no other comparable program targeting this at-risk demographic in Montgomery County. With that said, the program remains subject to budgetary constraints and cuts, and having sufficient funds for increasing the number of employed nurses and large scale promotion of the program remain ongoing challenges according to the stakeholders.

The USU Center for Health Disparities (USUCHD) and Westat, an independent and nationally recognized research firm, have partnered with AAHP to conduct two program evaluations focused on global program outcomes related to infant mortality (e.g., low birth weight, gestational age, birth anomalies). Results suggest the program effectively reduces adverse birth outcomes associated with the disproportionate burden of infant mortality experienced by African Americans (114; 265). These evaluations, however, did not address breastfeeding behaviors or the relationship of breastfeeding to maternal-infant health outcomes.

The nature of the SMILE Program lends itself to examining breastfeeding behaviors such as initiation and maintenance among this particularly at-risk demographic given that the women can remain in the SMILE Program throughout the infant's first year of life. The present study examines the effect of SMILE, a nurse home visitation program on breastfeeding behaviors. The partnership was conducted within the context of a community-academic partnership between the African American Health Program (AAHP) and the USU Center for Health Disparities. Before examining the purpose, aims, and hypotheses of this study, a brief review of community based participatory research (CBPR) techniques and the program evaluation framework followed in this study are presented.

Community Based Participatory Research (CBPR). Community based participatory research refers to a research approach whereby the community is engaged in all phases of the research endeavor. This includes identification of the research question of interest, methods for analysis, study conduct, data interpretation and analysis, and application of the findings. A strength of the CBPR approach is the potential to tailor questions, methods, interpretation, and dissemination to the specific community. In so doing, however, it is recognized that the approach may not generalize to other communities. In this way, CBPR may run counter to the goals and basic premise underlying the traditional scientific paradigm, specifically replication and generalizability of findings. However, for the past decade, CBPR approaches have been recognized as a critical approach to study health disparities and underserved communities. In fact, the World Health Organization has stated that "the use of randomized control trials to evaluate health promotion initiatives is, in most cases, inappropriate, misleading, and unnecessarily expensive" (268) and the International Union for Health Promotion has asserted

that "randomized controlled trials or corresponding experimental designs should not be used to measure the effectiveness of health promotion interventions" (226).

The bedrock upon which any effective CBPR occurs is collaboration. This collaborative research process equitably engages researchers and community participants on a topic of particular importance to the community. The fundamental aim of such collaboration is to combine the knowledge gained from research with social action to improve community health and often reduce health disparities (125). As a collaborative process, researchers and community stakeholders come together to examine a public health concern, conceptualize the problem, design and conduct research, interpret the results collaboratively, and communicate the results to the wider community. There are many advantages to CBPR; to include the ability to bring together stakeholders of diverse expertise to address complex public health problems, enhance the relevance and utility of data, increase trust and bridge cultural gaps within the community affected by the research question, and ultimately benefit both the wider community and researchers through the knowledge gained (125). Towards this end, the present study—which is both CBPR and program evaluation—incorporated quantitative and qualitative elements to promote collaborative, equitable co-learning and capacity building among the stakeholders involved with the SMILE Program (21; 125). The Uniformed Services University Center for Health Disparities (USUCHD) has worked collaboratively with the AAHP for a decade. AAHP set the evaluation of the SMILE Program (then named the Black Baby Smile Program) as its top priority almost eight years ago. Since that time, the AAHP-USUCHD partnership has worked to develop an electronic database for the nurse case managers, assisted programmers in putting this database on tablet based platform for use in the community, and conducted two previous program evaluations (114; 265). The present study was based on interest in describing

breastfeeding practices of SMILE Program participants with the intent to 1) assess the effectiveness of the program in promoting breastfeeding behaviors and 2) identify women most at risk to not breastfeed their infants or to prematurely wean them.

Outcome-focused program evaluation. The research undertaken for this project was conceptualized as an outcomes-focused program evaluation. Program evaluations generally fall into one of two categories: implementation/process or effectiveness/outcome (43). Implementation or process evaluations address whether a program has been implemented and is operating as intended. Such evaluations are typically conducted early in the program's life-cycle and explore questions such as who in the program is conducting the activities, whether sufficient resources have been allocated to the program, and whether actual performance of the program was consistent with the program's initial conceptualization (43; 67). In contrast, outcome evaluations assess programs that have been operating for a number of years in order to examine how effective that program is in achieving its stated goals. For the current project, the impact of the SMILE program on breastfeeding outcomes were examined along with demographic factors associated with outcomes.

Application of program evaluation to investigate breastfeeding outcomes in the SMILE Program. Investigating factors associated with breastfeeding behaviors among an at-risk demographic in an attempt to reduce health disparities and ultimately improve health would be an important topic of inquiry in and of itself. This project also makes a practical contribution by providing an important outcomes-driven program evaluation of a community health program in Montgomery County. Program evaluations for nurse home visitation programs are important for multiple reasons. The Affordable Care Act mandates the evaluation and outcomes documentation of such public health programs and requires demonstrable effectiveness for

funding (15). Moreover, they help to: identify and promote best practices while ensuring resources are not wasted on ineffective or redundant programs, especially given resource constraints; improve cost effectiveness; provide a feedback mechanism; identify program strengths and challenges, enabling program staff to capitalize on successes while striving for continuous quality improvement; justifies the program to internal and external stakeholders; and establishes the program as an evidence-based practice (15; 43; 67). Ultimately, program evaluations promote accountability, highlight effective practices, and may be used to justify further funding, increased support, and policy changes which could contribute to further improvement of health outcomes (43).

Study Aims. This program evaluation study first sought to identify and describe the demographic factors associated with breastfeeding rates, duration, and exclusivity among African American/Black women enrolled in the SMILE Program. Secondly, having collaboratively defined the research objectives of the study, the study investigators and program staff then examined these outcomes within the framework of an outcomes-focused program evaluation to develop recommendations for the SMILE Program geared toward improving or maximizing breastfeeding behaviors. Specifically, the study had the following three aims:

Aim 1: Qualitative stakeholder analysis. This was achieved using semi-structured interviews among the stakeholders to: solicit background information used to frame the analytical context of the present research, discuss known variables influencing breastfeeding initiation and maintenance, expand upon these within the context of the community served by SMILE, identify potential confounds and/or gaps in the data, and refine programmatic evaluation objectives. This aim was accomplished with the first two steps of the CDC's Framework in mind (i.e., stakeholder engagement and program description).

Aim 2: Identify factors associated with initiation and maintenance of breastfeeding. This aim comprised the quantitative element of the research. Based on the literature review presented above, it was anticipated that the following factors would be inversely associated with breastfeeding initiation: low SES, full time employment, medical assistance utilization, less paternal involvement, presence of negative life events which may contribute to postpartum fatigue and stress, and presence of adverse birth outcomes (e.g., LBW, prematurity, NICU admittance). It was also hypothesized that non-Hispanic Black immigrants would be more likely to initiate breastfeeding than African Americans, although it was expected that this trend would diminish the longer the immigrant resides in the United States. With regards to breastfeeding maintenance at six months or greater, it was expected that these same biopsychosocial variables would contribute to the duration of breastfeeding such that these factors (e.g., low SES, full time employment, presence of adverse birth outcomes) and breastfeeding specific problems (e.g., nipple/sucking problems) would be inversely associated with breastfeeding maintenance. This aim focused on step 3 and 4 of the CDC's Framework (i.e., evaluation design and gather evidence).

Aim 3: Program recommendations. This aim framed results within the context of the community-driven perspective regarding this health disparity, and sought to identify culturally relevant potential solutions and program changes while simultaneously obtaining mutual investment in applying these results to generate the best possible intervention for the at-risk group of women served by the SMILE Program. This was accomplished with dissemination of results, lessons learned, and implications for practice for other nurse home visitations programs serving African American women. This aim focused on the last two steps of the CDC's Framework (i.e., justify conclusions and dissemination of results/lessons learned).

Ultimately, this research, particularly the program evaluation component, is important because while there have been thousands of studies evaluating the effectiveness of various types of home visitation programs (e.g., peer counselors, nurses, midwives) in affecting maternal-child health outcomes, there are very few studies which have specifically examined the effectiveness of NHV programs in promoting breastfeeding among at-risk populations. The overwhelming majority of these few studies entail short interventions that are not targeted at socioeconomically disadvantaged African Americans. The only program studies comparable to the SMILE Program (i.e., long-term intervention aimed at a socioeconomically disadvantaged population) examined primarily Caucasian women in Sweden (173) and Australia (266; 267). Consequently, this research fills a gap in the literature while complying with the Affordable Care Act mandate to document outcomes of home visitation programs and identify best practices (15).

CHAPTER 2: Methods

Study Design

Project approval from AAHP and the Uniformed Services University of Health Science (USUHS) institutional review board was obtained for this study. The study was a program outcomes evaluation conducted utilizing the six-step conceptual framework established by the CDC (43) carried out in three phases.

Phase 1: Preparation. The first phase was preparatory in nature and sought to gain stakeholder insight into the health concern under investigation. This phase incorporates the first two steps detailed in the CDC's Framework (43), stakeholder engagement and program description, and entails a thorough exploration of the SMILE Program's background, its operating practices, and ultimately engendered stakeholder investment in the evaluation process. This was completed through semi-structured conferences between USUCHD and AAHP to

engage the program stakeholders in program evaluation, to familiarize the research team with the program's background, to identify what data was already being collected, and to determine what the research interests are of the program (*see* Appendix C). This was also used to generate a logic model for the program (*see* Appendix D). This logic model graphically presents how the SMILE Program is structured to achieve its intended outcomes; in short, the logic model provides the conceptual link between stakeholder analysis and the quantitative portion of the program evaluation research (43).

Phase 2: Evaluation. Completion of the preceding two steps naturally leads to the third step of the CDC's Framework: focus the evaluation design. Here, researchers and stakeholders collaborate to generate the evaluation questions, develop the appropriate research design, and formulate the data plan (43). Additionally, researchers and stakeholders identify the variables under consideration. Given the depth of the variables maintained in the SMILE Program's client database, it was important to AAHP to get as holistic and complete a picture as possible of what specific factors were particularly salient for their clientele so that they could better target their services in their community outreach efforts. Ultimately, this step and the two preceding it comprise the qualitative component of the present study and involved a dialogue between the research team and SMILE Program stakeholders, specifically the nurse case managers and past/present program directors of the SMILE Program.

The second phase continues with a fourth step, data gathering. This step involved a longitudinal investigation evaluating the maternal demographic factors associated with breastfeeding behaviors among women enrolled in the SMILE Program and comprises the bulk of the Methods and Results portions of the present study. Step four parallels traditional research data collection. Despite the similarity, it is important to understand that fundamental differences

separate the two such that step four of program evaluations may not and need not always follow a purely academic research model (43). In fact, while academic research has increasingly embraced participatory models, there remains a certain truism in the adage "Research seeks to prove; evaluation seeks to improve" (43). Within step four then, the principal difference between pure academic research and program evaluation is that academic research focuses on hypothesis testing in controlled environments while program evaluations focus on improving program practices within field settings during the course of normal operations (43). For step four of the program evaluation, the data was already gathered in the central database maintained by AAHP. Data included client demographic information (e.g., age, education, nativity), infant characteristics (e.g., LBW, prematurity, health complications), infant feeding practices, and psychosocial characteristics of the mothers (e.g., social support, presence of negative life events). This information is maintained to facilitate nurse case management and to potentially flag participants for additional resources (e.g., referrals). But merely collecting credible evidence is insufficient in program evaluation; it must also be "justified" or interpreted not only through the process of data analysis but also from the perspective of stakeholders' values (43).

Phase 3: Feedback. This phase includes such justification in step 5 as well as the sixth, final step of disseminating findings and lessons learned. Thus, the fifth step of this study was an iterative process involving collaborative examination of findings and interpretation of results. Here again there exist notable differences between pure academic research and program evaluation. In academic research, there is a tendency for the results to "speak for themselves," while in program evaluation, it is understood that results must be interpreted within the perspectives and values of the stakeholders (43). As such, this step entailed a series of meetings with researchers and the SMILE Program's stakeholders and ultimately evolved into the sixth,

and final, step of program evaluation. In traditional research, a study typically concludes with dissemination of results. In effective program evaluations, however, presentation of quantitative findings is insufficient. The sixth step of program evaluation addresses programmatic recommendations and lessons learned for quality improvement initiatives (43). During this step, researchers and the program leaders collaborate on developing a set of follow up priorities and dissemination strategies. The findings and recommendations generated by the program evaluation need to be disseminated to key individuals and/or organizations. Many traditional research initiatives end at dissemination of results; what makes good program evaluations useful in community health settings is the ability to translate evidence into actionable plans for program improvement (43).

Participants: Stakeholders and SMILE Program Participants

Participants for Phase 1 included USUHS, Westat, and AAHP staff affiliated with the SMILE Program. This included past and present SMILE Program Directors, nurse case managers, and others with primary investment as immediate stakeholders (e.g., those involved with day-to-day operations of the SMILE Program. These same individuals also comprised some of the participants consulted in Phase 3 of the study. Additional community stakeholders involved as participants in Phase 3 included representatives from Kaiser Permanente, Living Well Black, Holy Cross Hospital Perinatal Education and Outreach, the AAHP Steering Committee, Montgomery County Department of Health and Human Services, and USUCHD.

Participants for Phase 2, the quantitative data analysis, were chosen from an existing database consisting of non-Hispanic Caribbean, African American, or African-descent women enrolled in the SMILE Program from January 2003 and August 2012. Inclusion in the study was restricted to those with documented breastfeeding practices at one or more well baby check-ups.

At the time of data collection, there were 807 women who had enrolled in the SMILE Program. Of these, 502 women received at least one well baby visit by the time their infant was 12 months of age and had documented infant feeding practices, thus meeting inclusion criteria. Overall breastfeeding behaviors (i.e., breastfeeding and breastfeeding exclusivity) were examined on the entire sample. A subset of women was also examined to assess for breastfeeding maintenance. The program divides well baby visits into two time periods: those occurring when the infant is between 0-5 months of age and those occurring when the infant is between 6-12 months of age. Two hundred women, comprising the subsample, received well baby visits in both of these time periods and were thus suitable for analyses relating to breastfeeding maintenance. The same analyses were conducted on both groups of women.

Maternal demographics. Demographic characteristics were calculated for the total sample (n=502) as well as those receiving visits in both time periods (n=200). Missingness of these variables was small, ranging from a low of 4% (nativity) to a high of 15.9% (level of SMILE participation); the missingness average was 6.8%.

When looking at the entire sample, the women received an average of 4.5 home visits (SD=3.72). The average age was 27.7 (SD=7.30) and most (60%) were born in the United States. Of those that were foreign born, the average number of years spent in the United States was 8.7 (SD=7.518), with more than half (67.8%) reporting that they had lived in the United States for ten years or less. Nearly half of the women reported being in a coupled relationship (46.7%), and the average number of children living at home with them was 1.29 (SD=1.34). Most of the women reported having received their high school diploma/GED (36.9%) or attended college (47.8%), and only 15.3% had not completed at least high school. Approximately 28% of the women were employed full time, 12.1% were employed part time, and 59.6% were unemployed.

In the smaller subset used for the maintenance analyses, the women received an average of 8.21 home visits (SD=3.12). The average age was 28.73 (SD=7.47) and most (63.4%) were born in the United States. Of the foreign-born women, the average number of years in the United States was 11.07 (SD=8.40), and half of these (53.7%) reported that they had lived in the United States for ten years or less. The majority of the women reported being in a coupled relationship (57.5%), and the average number of children living at home with them was 1.33 (SD=1.33). Approximately 11% of the women had not attended high school; most had attended college (53.4%) or had at least received their high school diploma/GED (36%). More than 37% were employed full time, 12.4% were employed part time, and 49.7% were unemployed.

Infant demographics. Demographic characteristics were calculated for the number of infants (n=523) born to the total sample of women. Just over 14.1% of the infants were born at a LBW, and 17.6% were born prematurely at less than 37 gestational weeks. Almost 10% were admitted to the NICU. Approximately 6% were born with jaundice and 6.7% received phototherapy as part of their jaundice treatment. Other medical conditions were documented for the infants, including: cardiac abnormalities (4.2%), gastrointestinal problems (2.0%), in utero drug exposure (1.3%), receipt of transfusions to treat anemia (1.7%), and respiratory problems (6.7%). The number of adverse birth outcomes ranged from zero to nine (Mean=0.82, SD=1.59). More than half of the infants (65.2%) did not experience any adverse birth outcome, while 11.1% experienced three or more.

Variables

Independent variables. Because this study was a collaborative, community-driven endeavor, the principal researchers and stakeholders jointly identified the variables under consideration after carefully reviewing the literature to ascertain what factors are believed to be

relevant predictors of breastfeeding among African Americans. Given the depth of the variables maintained in the SMILE Program's client database, it was important for AAHP to get as holistic and complete a picture as possible of what specific factors were particularly salient for their clientele so that they could better target their services in their community outreach efforts. Consequently, the following variables were examined for their association with breastfeeding behaviors: demographics (e.g., education, employment), nativity, level of SMILE Program participation, maternal HIV status, infant birth outcomes (e.g., NICU admittance, LBW, prematurity, jaundice), trouble breastfeeding (e.g., nipple/sucking problems), and psychosocial stressors (e.g., negative life events).

Dependent variables. The outcome variables were breastfeeding initiation, maintenance, and exclusivity. Initiation and exclusivity were measured at the infants' 0-5 month well baby visit. Maintenance was measured at the infants' 6-12 month well baby visit. Breastfeeding was operationalized based on criteria established by Labbok and Krasovec (148), and for the purpose of this study, the mother-infant dyad was considered to be breastfeeding if any breastfeeding occurred regardless of whether it was expressed or came exclusively from the breast. Exclusivity was determined by whether the nurse case managers noted any feeding supplementation, to include formula, cereal, and/or solid foods.

Analytic plan

Program review. The first component of the analytic plan entailed a qualitative review of the program to more fully explore the program's background, objectives, challenges, and successes as they pertain to breastfeeding promotion (i.e., step one and two of the CDC's Framework). This provided a qualitative context from which the study could begin (*see* Appendix B). These preliminary steps have occurred over several years through the course of the

collaborative partnership between USUCHD and AAHP. Stakeholder analysis was accomplished through semi-structured conferences between USUCHD and AAHP to engage the program stakeholders in program evaluation, to familiarize the research team with the program's background, to identify what data is being collected, and to determine what the research interests are of the program. Within these two preliminary steps of the program evaluation, the research team garnered information from program staff and past/present program directors about areas of concern, perceived strengths and areas of improvement, and perceived outcomes. This then was used to generate a logic model for the program (*see* Appendix D).

Quantitative analyses. The quantitative steps of the research (i.e., Phase 2) utilized descriptive statistics. Data management and statistical analysis were performed using SPSS v21.0. Statistical significance was set at an alpha level of 0.05, two-tailed. In this investigation, the principal source for error was the presence of missing data. Unless missing data pertained to the principal outcome variables, client data was included in the analysis despite the presence of missing data.

Missing data. As with any study, and particularly those occurring in the course of CBPR, the issue of missing data is of concern and typically unreported in studies. To address the issue of missing data and adjust for its existence, a multiple imputation procedure was used. To do so, analyses were run on each of the five imputed datasets and estimates were pooled using the standard method of Rubin (230). The multiple imputation approach was chosen for numerous reasons. It is: a robust procedure superior to earlier forms of imputation (e.g., hot deck, mean substitution, regression imputation); appropriate for use with the categorical variables under investigation (236); well-reviewed as a viable method of accounting for missing data (99; 235; 237; 244); generally considered the optimal approach for dealing with missing data (237; 239);

and finally, while multiple imputation assumes that data is at least missing at random, it is robust enough to be effective without strictly meeting this assumption and may be appropriate for missing not at random data (158; 184).

Given these benefits, multiple imputation was used when the missingness percentage warranted it. There is no consensus regarding the percentage of missing data that becomes

Table 1. Variables with missing data, % of missingness

Category	Variable Name	% Missing
Infant factors	Pacifier use	6.7%
	Frequent hospital/ER visits	12.6%
	Prematurity	5.4%
	Attentive to others	3.4%
	Neurological developmental delay	18%
Maternal factors:		
	Nativity	4%
Client demographics	Years in the U.S. if foreign born	7.6%
	English as primary language*	47.8%
	Relationship status	3.4%
	Father present in home*	44%
	Father active in home*	39.2%
	Education	9%
	Income*	48.4%
	Private insurance*	27.9%
	Medical assistance utilization*	20.8%
	Employment	12%
	Number of children living at home	15.3%
	Presence of disabilities	5.4%
	Sucking/nipple problems	7.8%
Clinical characteristics	Number of gravida*	33.8%
	Receipt of prenatal care*	25.9%
	Trimester prenatal care began*	34.3%
	Currently smoking*	25.5%
	Depression screening*	20.3%
	Substance abuse*	20%
	Smoking history*	22.3%
	History of sexually transmitted disease	5.4%
	HIV status	5.4%
	Presence of negative life events	5.4%

* *Asterisked variables were excluded due to having a missingness of ≥ 20%*

problematic for their inclusion via imputation. Some have suggested that the cutoff be no more than 5% (236), while others set the cutoff at a far higher 20% (158; 208). Whichever cutoff is used, the underlying concern is that when missing data exceeds the defined cutoff, any statistical analyses conducted will be biased. For the purposes of this investigation, a cutoff of 20% was set. Table 1 presents detailed information about each variable which had missing data, includes their percent missing, and details whether they were excluded from analysis due to having a ≥20% missingness value. Ten variables were excluded from analyses due to missing data (i.e., five maternal demographic variables and five maternal clinical variables). Five mother demographic variables were excluded and five mother clinical variables were excluded from analyses due to missing data.

Predicting breastfeeding. Logistic regression, chi-square, and Fisher's exact tests were used to determine what biopsychosocial factors were associated with breastfeeding behaviors following the imputation of the missing data. Logistic regression is an appropriate measure given that the dependent variables were dichotomous in nature, and given its utility in conducting univariate pooled analyses with imputed data. Fisher's exact test and chi-square tests are also appropriate statistical measures when the purpose of the research is to test the relationship between two categorical variables. It is important to note that one of the commonly accepted assumptions of chi-square tests is that the expected frequencies should not be too small and typically not less than five. When the expected cell frequencies were less than 5 and the results were significant ($p<.05$), the cell frequency was appropriately annotated even though chi-square tests are sufficiently robust to withstand the occurrence of small expected frequencies (31; 39; 120) and ultimately produce few Type I errors as long as the total sample size is at least eight (39). Where appropriate, Fisher's exact test was used to confirm significance if a significant

result was found utilizing a chi-square test. Using the Fisher's exact test reduced the likelihood of any errors arising from this approximation of significance. Similarly, where appropriate, odds ratios are presented to enable examination of the relative odds of the occurrence of the outcome variable of interest (e.g., breastfeeding initiation) given exposure to another variable of interest (e.g., infant prematurity). Utilization of odds ratios was appropriate for several reasons, to include: it has been considered the recommended measure of choice for measuring effect or association, is appropriate for such a retrospective study design, is particularly well suited for greater than two level variables, and may be more appropriate than relative risk for use with logistic regression analyses.

Program consultation and review. Finally, because this was a program evaluation, the final component of the analytic plan entailed reviewing the quantitative findings with the program's stakeholders. This occurred in two steps as previously discussed: justification of conclusions and presentation of findings/lessons learned to the stakeholders. This entailed evaluating the quantitative data collected and reporting on the findings with particular emphasis on whether the program has met its objectives while synthesizing this with an evaluation of the program's strengths, challenges, lessons learned, and recommendations for programmatic improvement. Importantly, this final, sixth step of program evaluation entailed presenting this information to the stakeholders in an actionable format that could be used to capitalize on what has been done well, improve where there may be weaknesses, and identify opportunities for moving forward both in future program and research endeavors. This involved several conferences with program stakeholders in order to collaboratively interpret results to generate avenues of further research. Ultimately, it has been suggested that the evidence garnered from

such program evaluations do not necessarily speak for themselves, and instead must be weighed from the perspectives of the stakeholders; this phase accommodates this necessity (21; 43).

Results

Breastfeeding. Overall, the SMILE Program proved to effectively promote breastfeeding, as shown in the following sections. The prevalence of breastfeeding in the total sample (n=502) was 69.3%, and 63% of those for whom maintenance data was available continued breastfeeding to 6 months. This study's prevalence rates for breastfeeding initiation and maintenance are significantly higher than the national (58.9% and 30.1%, respectively) and Maryland (63.6% and 35.1%, respectively) prevalence rates. Two sample t-tests between percents were conducted to compare the percentages drawn from these independent samples (i.e., study, national data, and state data) to determine whether there was a statistically significant difference between breastfeeding initiation and maintenance prevalence rates amongst these samples. When comparing this study's data and national averages, the t-statistic was significant at the .05 critical alpha level, indicating that breastfeeding initiation ($t[3,099]=4.365$, $p<.001$) and maintenance ($t[2,797]=9.576$, $p<.001$) were significantly higher for SMILE participants than the national average. When comparing this study's data and Maryland averages, the t-statistic was also significant, indicating that breastfeeding initiation ($t[1,376]=2.145$, $p=.03$) and maintenance ($t[1,074]=7.259$, $p<.001$) were significantly higher for SMILE participants than Maryland state's average.

Breastfeeding: Infant specific factors. From the total sample of women (n=502) there were 523 infants from which analyses could be run to examine whether there were infant specific factors that were associated with breastfeeding and breastfeeding exclusivity. These variables include: LBW, prematurity, jaundice, NICU admittance, medical anomalies (e.g., respiratory

problems, cardiac problems), in utero drug exposure, and requiring anemia-related transfusions. Some variables (e.g., number of home visits [i.e., dosing], frequent hospital/ER visits, and pacifier use) may reflect outcomes associated with a parental-infant interaction, but are still infant specific and so are considered in this context. Overall, of the 523 infants in the sample, 361 (69%) were breastfed and 79 (15.1%) were exclusively breastfed.

The relationships between infant specific variables and any breastfeeding are presented in Table 2, which contains the unadjusted significance of chi-square tests. Results for exclusive breastfeeding are presented in separate analyses. Where appropriate, the significance level reflects that which was generated by the Fisher's exact test. Results from these chi-square tests were as expected with the presence of an adverse birth outcome (e.g., LBW, NICU admittance) associated with a decreased likelihood of being breastfed. Similarly, higher numbers of home visits were associated with an increased likelihood of being breastfed. Overall, the strength of these associations was low, with the three strongest associated variables being LBW, NICU admittance, and number of adverse birth outcomes.

Table 2. Chi-square analyses of infant factors and "any" breastfeeding versus no breastfeeding (n=523)

Factor	χ^2	DF*	*P*	V	OR	95% CI	
						Lower	Upper
Dosing	6.06	1	.015	.11	1.64	1.104	2.434
LBW	14.59	1	<.001	.17	.39	.234	.636
NICU admit	26.68	1	<.001	.23	.23	.124	.412
Jaundice	1.21	1	.310				
Cardiac anomalies	11.46	1	.002	.15	.24	.098	.583
Gastrointestinal anomalies	2.92	1	.104				
Infant drug exposure**	5.43	1	.032	.10	.18	.034	.911
Anemia-related transfusion	9.38	1	.005	.13	.12	.025	.601
Respiratory anomalies	9.53	1	.004	.14	.35	.175	.698
Neurological developmental delay**	2.27	1	.211				
Number of adverse birth outcomes	30.86	2	<.001	.24	*n/a*		

* DF= Degrees of freedom

** 2 cells (50%) have an expected cell count of less than 5; the minimum expected count was 2.17.

Examining these independent variables in more detail, LBW decreased the odds that infants would be breastfed by approximately 61%. Similarly, 37.3% of the infants admitted to the NICU for an indeterminate length of stay were breastfed, and this too reflected a significant disparity between these infants and those that were not admitted to the NICU of whom 72.5% were breastfed. Finally, as one might expect, higher numbers of medical issues at birth were associated with a decreased likelihood of breastfeeding; only 37.9% of infants with three or more adverse birth outcomes were breastfed.

Additionally, due to missing data, logistic regression analyses were conducted to determine whether pacifier use, premature birth, frequent hospital/ER visits, and the infant being attentive to others were associated with breastfeeding. Pacifier use was significantly associated with whether the infant was breastfed such that pacifier use was associated with a decreased odds of being breastfed by 62% (B=-.96, p=.003, OR=.38, 95% CI [.203, .718]). Unsurprisingly, prematurity was also significantly associated with breastfeeding (B=-.747, p=.002, OR=.474, 95% CI [.294, .762]); premature birth decreased the odds that infants would be breastfed by nearly 53%. Neither frequent hospital/ER visits (p=.702) or being attentive to others (p=.536) were associated with breastfeeding. There were no substantive differences between the original, nonimputed analyses and the pooled, imputed results.

Breastfeeding exclusivity: Infant specific factors. The unadjusted significance of chi-square tests for the infant specific variables with exclusivity is presented in Table 3. Only dosing and NICU admittance were associated with exclusivity; the strength of the association was notable only for dosing. While number of home visits was positively associated with any breastfeeding, it was inversely associated with exclusivity. Although exclusivity was low overall (15%), 2% of women receiving five or more visits were breastfeed exclusively compared to

23.3% of those receiving fewer visits; this finding may reflect the fact that women with a higher number of biopsychosocial stressors (e.g., higher adverse birth outcomes, lower social support, higher number of negative life events) were more likely to seek out and/or accept more home visits by the nurse case managers.

Table 3. Chi-square analyses of infant factors and breastfeeding exclusivity (n=523)

Factor	χ^2	DF*	*P*	V	OR	95% CI	
						Lower	Upper
Dosing	46.32	1	<.001	.298	.05	.016	.161
LBW	1.24	1	.299				
NICU admit	5.51	1	.014	.103	.21	.050	.879
Jaundice	.08	1	.516				
Cardiac anomalies	.65	1	.555				
Gastrointestinal anomalies	.32	1	.486				
Infant drug exposure	1.00	1	.286				
Anemia-related transfusion	1.63	1	.368				
Respiratory anomalies	2.58	1	.142				
Neurological developmental delay	1.26	1	.602				
Number of adverse birth outcomes	5.66	2	.059				

* DF= Degrees of freedom

Logistic regression analyses were conducted to determine whether pacifier use, prematurity, frequent hospital/ER visits, and the infant being attentive to others were associated with exclusivity after imputing missing data for these three variables. Pacifier use remained significantly associated with exclusivity and was found to be associated with decreased odds of being breastfed by 76.5% (B= -1.45, p <.001, OR= .24, 95% CI [.137, .405]). While being attentive to others had not been associated with breastfeeding, it was significantly associated with exclusivity (B=-1.46, p<.001, OR=.23, 95% CI [.138, .391]). Although prematurity had been associated with breastfeeding, it was not significantly associated with exclusivity (p=.441). Finally, frequent hospital/ER visits were not associated with exclusivity (p=.570). There were no substantive differences between the original, nonimputed data results and the pooled, imputed data results.

Breastfeeding (Any): Maternal specific factors, total sample. Chi-square, Fisher's exact tests, and logistic regressions were conducted to examine whether maternal demographic factors were associated with breastfeeding and breastfeeding exclusivity. These variables include: referrals for physical abuse, sexual abuse, or depression; age; nativity; if foreign born, amount of time lived in the United States; relationship status; employment; education; number of children living at home; endorsement of prior delivery or postpartum complications; disability; diagnosis of a STD; diagnosis of HIV; and obesity. Clinical characteristics examined for their possible association with breastfeeding behaviors included: endorsement of either sucking or nipple problems, mother-infant bonding, and level of SMILE participation (e.g., receiving visits only in the well-baby 0-5 month timeframe, only in the well-baby 6-12 month timeframe, or receiving visits in both timeframes) were also examined as independent variables.

The unadjusted significance of chi-square tests for the individual, maternal specific variables with "any" breastfeeding are presented in Table 4; where appropriate, the significance level reflects that which was generated by the Fisher's exact test. Level of SMILE participation, age, history of prior drug and cigarette usage, and enrollment timing were significantly associated with breastfeeding. The strength of the association was low, with the strongest association observed between breastfeeding and age and enrollment timing. Women aged 19 or younger were less likely to breastfeed than those who were older. Just over 49% of the women aged 19 or less breastfed their infants, as compared to 77.6% of those aged 30 or older.

Time of enrollment in the SMILE Program was also significantly associated with breastfeeding such that those who enrolled prenatally were more likely to breastfeed than those who enrolled either in the immediate postpartum period or sometime before the infant's first birthday. While just over 76% of those who enrolled prenatally breastfed, this number dropped to

about 53% for those enrolling after the infant's birth. Level of SMILE participation was significantly associated with breastfeeding. More than 73% of the women who received well-baby visits throughout their infant's first year of life breastfed, in comparison to the 40% who only received well baby visits between 6-12 months and 67.9% who only received well baby visits between 0-5 months.

Table 4. Chi-square analyses of maternal factors and breastfeeding (n=502)

Factor	χ^2	DF*	*P*	V	OR	95% CI	
						Lower	Upper
Level of SMILE participation	7.96	2	.019	.126	*n.a.*		
Age	21.61	3	<.001	.207	*n.a.*		
Referral:							
Physical abuse	.42	1	.504				
Sexual abuse	.02	1	1				
Depression	3.09	1	.085				
History of prior:							
Delivery problems	.18	1	.630				
Postpartum problems	3.73	1	.088				
Drug use	11.67	1	.002	.152	.11	.022	.503
Alcohol use	3.73	1	.088				
Cigarette use	14.60	1	<.001	.171	.05	.007	.424
Enrollment timing	39.04	2	<.001	.273	*n.a.*		
Obesity	.85	1	.458				

* DF= Degrees of freedom

Due to missing data, logistic regression analyses were conducted to determine whether sucking or nipple problems, mother-infant bonding, nativity, years in the United States, relationship status, education, employment, number of children living at home, maternal disability, diagnosis of STD and/or HIV, and endorsement of negative life events were associated with breastfeeding. As expected, nativity was significantly associated with breastfeeding such that women who were foreign born were nearly 3.12 times more likely to breastfeed than women born in the United States (B=1.14, p<.001, OR=3.12, 95% CI [1.98, 4.91]). While the majority of women breastfed, 83.9% of the foreign born women breastfed compared to 60.6% of the African Americans. In fact, being African American decreased the

odds of an infant being breastfed by 53.4%. For the women who were not born in the United States, the number of years spent living in the United States was used as a proxy for acculturation, a factor known to affect breastfeeding among immigrants. Those more newly immigrated to the United States (i.e., residing in the U.S. for ≤ 10 years) were more likely to breastfeed (B=.99, p=.001, OR=2.69, 95% CI [1.53, 4.73]) than those born in the U.S.; however, this same relationship did not hold true for the foreign born women living in the U.S. for 20 or less years (p=.180).

Relationship status was also significantly associated with breastfeeding (B=1.33, p<.001, OR=3.77, 95% CI [2.44, 5.82]). The odds of women who report being in a coupled relationship (i.e., married or unmarried couple) breastfeeding were nearly 3.8 times as likely as women who were not in a coupled relationship. In our sample, while 83.6% of the coupled women breastfed, only 57% of those who were not in a coupled relationship breastfed their infants. There was also an association between mother-infant bonding and breastfeeding behaviors; this relationship was significant (B=1.16, p<.001, OR=3.17, 95% CI [1.75, 5.75]) such that women who breastfed their infants were more likely to be assessed as bonding well with their infants (73%) than those who did not breastfeed their infants (46%).

Education and employment, variables typically found to be associated with breastfeeding, were examined. Women who were college educated were more than four times as likely to breastfeed as those who were not college educated (B=1.40, p<.001, OR=4.04, 95% CI [2.29, 7.12]). Just over 82% of the college educated women breastfed, compared to 60.9% for those with a high school diploma/GED and 52.9% for those who had not completed high school. Alternatively, not having at least completed high school/received a GED decreased one's odds of breastfeeding by 75.2%, while only having completed high school/GED decreased one's odds of

breastfeeding by 65%. Full-time employment was positively associated with breastfeeding. Eighty-three percent of the women employed full-time breastfed, compared to those working part-time or the unemployed (63% and 67.9%, respectively). Part-time employees were 64.5% less likely to breastfeed compared to women employed full-time (B= -1.03, p=.007, OR=.36, 95% CI [.168, .752]). Similarly, unemployed women were 53.1% less likely to breastfeed than women employed full-time (B=-.76, p=.007, OR=.47, 95% CI [.272, .808]).

The endorsement of negative life events (e.g., family problems/loss of a significant other, work stress, financial difficulties, etc.) was associated with breastfeeding (B=-.38, p=.051, OR=.68, 95% CI [.464, 1.00]), such that endorsement of negative life events decreased the odds of breastfeeding by nearly 32%. Experiencing an increasing amount of negative life events also impacted breastfeeding, such that every additional stressor decreased the odds of breastfeeding by 14.6% (B=-.16, p=.020, OR=.85, 95% CI [.748, .976]). Of note, even without imputation of missing data for these variables, their associations with breastfeeding were still significant (p<.05).

Several maternal factors were not significantly associated with breastfeeding including the number of children who were living at home with the woman. This variable was dichotomized as those with two or fewer children living at home, and those with three or more, based on the mean number of children reported as living at home. This was not significantly associated with breastfeeding (p=.101). Endorsement of sucking or nipple problems was not significantly associated with breastfeeding (p=.466). Finally, diagnosis of physical or mental disability (p=.075), STD (p=.398), and HIV (p=.402) were not associated with breastfeeding.

Breastfeeding exclusivity: Maternal specific factors, total sample. Chi-square analyses of individual, maternal specific variables and exclusivity are presented in Table 5. Level of

SMILE participation, age, referral for depression, a history of delivery problems, and referral timing were significantly associated with exclusivity. The strength of associations was generally low, although there was a moderately strong association between exclusivity and level of SMILE participation. Women enrolling in the SMILE Program prenatally were more likely to breastfeed exclusively; approximately 18% of the women enrolling in the antepartum period exclusively

Table 5. Chi-square analyses of maternal factors and breastfeeding exclusivity (n=502)

Factor	χ^2	DF*	*P*	V	OR	95% CI	
						Lower	Upper
Level of SMILE participation	61.16	2	<.001	.35	*n.a.*		
Age	10.19	3	.017	.14	*n.a.*		
Referral:							
Physical abuse	1.88	1	.374				
Sexual abuse	1.31	1	.603				
Depression	5.04	1	.022	.10	.94	.916	.962
History of prior:							
Delivery problems	6.01	1	.024	.11	3.12	1.20	8.08
Postpartum problems	.74	1	.508				
Drug use	1.88	1	.374				
Alcohol use	.74	1	1				
Cigarette use	1.69	1	.367				
Enrollment timing	5.95	2	.051	.107	*n.a.*		
Obesity	.01	1	1				

* DF= Degrees of freedom

breastfed their infants as compared to 10.6% of those enrolling later. As with "any" breastfeeding, younger women were less likely to breastfeed exclusively than any other age group. Just under 7% of the women aged 19 or younger exclusively breastfed, compared to 15.5% for those in their 20s, 37% for those in their 30s, and 7.1% for those in their 40s. In fact, just over 13% of those aged 29 or younger exclusively breastfed, as compared to the 19% of those aged 30 or older.

Logistic regression analyses were conducted to determine whether sucking or nipple problems, mother-infant bonding, nativity, years in the United States, relationship status, education, employment, number of children living at home, maternal disability, diagnosis of

STD and/or HIV, and endorsement of negative life events were associated with breastfeeding. Nativity remained significantly associated with breastfeeding behaviors such that foreign born women were 2.04 times more likely to exclusively breastfeed than women born in the United States (B=.710, p=.005, OR=2.04, 95% CI [1.24, 3.34]). As expected, those who were more newly immigrated to the United States were more likely to breastfeed exclusively than those that had been in the United States for 19 or more years, and this relationship was significant for those who had been in the United States for 5 or fewer (B=.73, p=.013, OR=2.08, 95% CI [1.17, 3.70]) and 10 or fewer (B=.76, p=.004, OR=2.13, 95% CI [1.28, 3.55]); it was not significant for those who had been in the United States for 19 or less years (p=.208).

Relationship status remained a significant variable associated with exclusivity. Women reporting that they were in a coupled relationship were 1.9 times more likely to breastfeed exclusively than their uncoupled counterparts (B=.65, p=.011, OR=1.91, 95% CI [1.16, 3.13]). Regarding the relationship between education and exclusivity, women who had attended college were more likely to exclusively breastfeed than those with less education. This was, however, only significant when compared to those who had not completed high school (B=-1.00, p=.025, OR=.37, 95% CI [.154, .881]) and was not significant when compared to those who had earned their high school diploma/GED (p=.065).

Employment was not significantly associated with breastfeeding exclusivity (p >.6). While the number of children living at home was not associated with breastfeeding, it was associated with exclusivity such that those with 3 or more children living at home were 60.6% less likely to breastfeed exclusively than those with fewer children (B=-.93, p=.053, OR=.39, 95% CI [.153, 1.01]). While mother-infant bonding and "any" breastfeeding were associated, bonding was not significantly associated with breastfeeding exclusivity (p=.226). Similarly,

while endorsement and number of negative life events had been significantly associated with breastfeeding, these were not significantly associated with exclusivity (p>.120). Finally, endorsement of sucking or nipple problems (p=.576), disabilities (p=.178), STD diagnosis (p=.398), and HIV diagnosis (p=.304) were also not significantly associated with breastfeeding exclusivity.

Maternal specific factors, subsample. The subsample included the 200 women with documented infant feeding practices at both well baby visit time periods. Chi-square, Fisher's exact tests, and logistic regression analyses were conducted to examine whether there were maternal specific demographic and clinical factors influencing breastfeeding. These variables include: referrals for physical abuse, sexual abuse, or depression; age; nativity; if foreign born, amount of time lived in the United States; relationship status; employment; education; number of children living at home; endorsement of prior delivery or postpartum complications; disability; diagnosis of a STD; diagnosis of HIV; and obesity. Clinical characteristics examined for their possible association with breastfeeding behaviors included: endorsement of sucking or nipple problems, mother-infant bonding, and endorsement of negative life events. Less than ten women in the subsample exclusively breastfed their infants, thus preventing analysis of exclusivity as a dependent variable given that the frequency count assumption was violated to an extent that made interpretation of the results questionable.

Breastfeeding (Any): Maternal specific factors, subsample. Table 6 reflects the unadjusted significance of the maternal specific variables examined for their relationship with breastfeeding observed when chi-square tests were conducted; where appropriate, the significance level reflects that which was generated by the Fisher's exact test. For the subsample, only age and mother-infant bonding were significantly and moderately associated with

Table 6. Chi-square analyses of maternal factors and any breastfeeding, subsample (n=200)

Factor	χ^2	DF*	*P*	V	OR	95% CI	
						Lower	Upper
Age	11.09	3	.011	.24	*n.a.*		
Referral:**							
Physical abuse	.15	1	.657				
Sexual abuse	.01	1	1				
Depression	2.06	1	.160				
History of prior:							
Delivery problems	2.79	1	.265				
Postpartum problems	2.789	1	.265				
Drug use	.07	1	1				
Alcohol use	.36	1	1				
Cigarette use	5.60	1	.069				
Obesity	2.99	1	.134				
Sucking/nipple problems	2.74	1	.138				
Mother-infant bonding	17.16	1	<.001	.29	.89	.805	.976

* DF= Degrees of freedom

** Violated chi-square frequency count assumption by 50% or more.

breastfeeding. Younger mothers were less likely to breastfeed than older ones. In this subsample, 48% of the women aged 19 or younger breastfed their infants, as compared to those in their 20s (77.2%), 30s (79.5%), and 40s (69.8%). Nearly 69% of those aged 29 or younger breastfed their infants, as compared to 77.7% of those aged 30 or older. A significant association was also observed between breastfeeding and mother-infant bonding. While very few women were observed as not bonding well with their infants (n=6), none of these mothers breastfed their infants; in contrast, nearly 76% of those who were bonding well did breastfeed their infants.

Due to missing data, logistic regression analyses were conducted to determine whether nativity, years in the United States, relationship status, education, employment, number of children living at home was associated with breastfeeding, maternal disability, diagnosis of STD and/or HIV, postpartum depression screening, and endorsement of negative life events were associated with breastfeeding. Nativity, relationship status, education, and number of children at home were significantly associated with breastfeeding. As expected, nativity was associated with breastfeeding (B=.82, p=.033, OR=2.26, 95% CI [1.07, 4.80]) such that foreign born women

were more likely to breastfeed than African Americans; in this subsample, 85.7% of the foreign born women breastfed their infants as compared to the 68.6% of the African Americans who breastfed.

Being in a coupled relationship was also associated with breastfeeding (B=1.13, p=.001, OR=3.10, 95% CI [1.57, 6.10]); nearly 83% of the women who reported being in a coupled relationship breastfed their infants, compared to 61% of uncoupled women who breastfed. College education was significantly associated with breastfeeding (B=1.52, $p<.004$, OR=4.56, 95% CI [1.64, 12.76]) such that women who were college educated were more than four times as likely to breastfeed than those who were not college educated. In this subsample, over 85% of the college educated women breastfed, compared to 65.6% for those with a high school diploma/GED and 52.6% for those who had not completed high school. Not having at least completed high school/received a GED decreased one's odds of breastfeeding by 78%, while having only completed high school/GED decreased one's odds of breastfeeding by about 61%.

The number of children who were living at home with the woman was associated with breastfeeding, such that those with 3 or more children living at home were 61% less likely to breastfeed than those with fewer children (B=-.95, $p=.013$, OR=.39, 95% CI [.184, .821]). The following factors were not significantly associated with breastfeeding: number of years lived in the United States if foreign born ($p>.33$), employment ($p>.08$), maternal disability ($p=.326$), diagnosis of a STD ($p>.05$) or HIV ($p=.416$), and endorsement of negative life events ($p=.828$). For most of the variables analyzed, there was no substantive difference between the nonimputed data and the imputed data. However, there were two variables where the original data showed a significant association (presence of maternal disability and number of years lived in the United States) which lacked significance once imputed.

Finally, with the subsample, duration of breastfeeding was examined. This was calculated based on if a woman breastfed at any point during the well-baby 0-5 month time period and whether this was maintained or discontinued by the first well baby 6-12 month visit. For this group of women, 37% of those who initiated breastfeeding discontinued by six months postpartum and 63% of those who had breastfed were continuing to do so at least six months postpartum. Exclusivity at six months postpartum was not expected, and this was borne out by this subsample of women; more than 89% of those who had been exclusively breastfeeding their infants had discontinued doing so by six months postpartum. No maternal factors were significantly associated with duration of breastfeeding except for education. There was a marginal association between education and duration of breastfeeding (p=.06), such that not having at least completed high school/received a GED decreased the likelihood of maintaining breastfeeding for at least six months by more than 77%.

Dissemination: Final steps of the program evaluation (Phase 3)

Once data analysis was completed, the evaluation entered the third, final stage of the program evaluation comprised of steps five and six of the CDC's Framework (*see* Appendix E). The research team first reviewed the quantitative findings with the community stakeholders with particular emphasis on whether the program has met its objectives and collaboratively synthesized this with an evaluation of the program's strengths, challenges, lessons learned, and recommendations for programmatic improvement. For this to be done effectively, it must be done in an actionable format that the program can use to capitalize on what has been done well, improve where there may be weaknesses, and identify opportunities for moving forward both in future program and research endeavors.

To accomplish steps five and six of the CDC's Framework, semi-structured conferences with program stakeholders to include representatives from Kaiser Permanente, Living Well Black, Holy Cross Hospital Perinatal Education and Outreach, the AAHP Steering Committee , Montgomery County Department of Health and Human Services, USUCHD, and SMILE Program staff (e.g., Program Director and nurse case managers) were conducted in order to collaboratively interpret results and to generate avenues of further research. This presentation of findings provided the first empirical review of the SMILE Program's effectiveness in promoting maternal-infant health outcomes to the wider public health community and was received very positively and viewed as being a critical step to promote the organization's successful public health initiatives and contributions to the African American community. The program nurses and program managers received many compliments from county public health officials, local medical institutions and academics based on the results. They were active in hypothesizing, in some detail, the reason for some of the results. Their explanations were often quite conceptually sophisticated and important in terms of helping the program generate ideas for areas of improvement. There was also a sense of pride and accomplishment from the program staff as they received a great deal of recognition for their program, their efforts, and their insight. Lastly, there was recognition that while data entry is time consuming and often seems to take away from patient care, there are very clear benefits from a partnership that can make use of such data. The conclusion of this six step program evaluation culminated with a community dinner and event in August 2013 celebrating World Breastfeeding Awareness Month and featuring a special presentation of this research to highlight the tremendous impact the SMILE Program has had on the African American community. Appendix F includes the community dinner and event invitation and flyer (*see* Appendix F).

One of the lessons learned as it pertains to future collaborative research efforts concerned data refinement. Data refinement issues reflect an inherent potential limitation of CBPR in which research needs are not the driving impetus behind the program's efforts. Such factors negatively affecting the program's dataset included minor keying errors (e.g., typos, misspellings) to more significant inaccuracies (e.g., discrepancies between categorical responses and narrative responses to the same query). Additionally, ways of streamlining the response fields were identified. This included ways to reduce complexity, reduce the chance for errors in data entry, and potentially increase the utility of statistical queries run by the program. These areas of data refinement were identified and presented to the staff given that quality improvement initiatives today will facilitate continued outcome-based assessments later as the program continues to operate and expand.

CHAPTER 3: Conclusion

Since 1999, the SMILE Program—a nurse home visitation initiative operated by the African American Health Program—has sought to improve the maternal-infant health outcomes in a demographic most likely to experience adverse health disparities. Previous program evaluations have found that the SMILE Program effectively reduces the prevalence of LBW and prematurity among African Americans (114; 265), but no study until now has examined the success of its breastfeeding promotion initiative. Consequently, this study had two purposes: provide an outcomes-focused program evaluation for the SMILE Program, and identify biopsychosocial factors associated with breastfeeding behaviors among African American women given that the data shows such a significant disparity among African American breastfeeding prevalence compared to other races/ethnicities. While the former is an important component of any public health program to promote evidence-based health policy initiatives and

to ensure appropriate allocation of limited resources, the latter reflects the need for continued examination of what factors detrimentally affect African Americans' breastfeeding efforts.

While breastfeeding rates have consistently improved over the past decade, as a nation, the prevalence of breastfeeding still lags behind what is recommended by pediatricians and public health organizations. This is particularly true for African Americans who have steadily maintained the lowest breastfeeding rates of any race/ethnicity, with up to a startling ≥ 20 percentage point difference separating African Americans from Caucasians (42). In fact, the most recent reporting from the CDC (44) suggests that while the gap between African American and Caucasian breastfeeding initiation has narrowed, the percentage of African Americans who have ever breastfed was at a low 58.9% (as compared to 75.2% among Caucasians). There exists a similar gap in breastfeeding maintenance to six months, such that just over 26% of African Americans maintain to at least six months as compared to 43.2% among Caucasians (42).

Identifying biopsychosocial factors were associated with breastfeeding in the mother-infant dyads participating in the SMILE Program, in addition to contributing to the literature about this health disparity, this avenue of research was also intended to help the SMILE Program, community stakeholders, and public health organizations in Montgomery County and the state of Maryland effectively allocate their resources to promote breastfeeding for those most at risk of failing to do so or those most at risk for prematurely weaning their infants. From this program evaluation perspective, the results of the study were very promising. The SMILE Program effectively promoted breastfeeding among this at-risk demographic. Women participating in the SMILE Program exceeded the national average for breastfeeding initiation and maintenance. Just over 69% of the women breastfed their infants and 15.5% did so exclusively at some point during their infants' first year of life. Moreover, 63% of those who had

initiated breastfeeding were still continuing to do so at least six months postpartum, and 11% were exclusively breastfeeding at least six months postpartum. The effectiveness of the program in achieving its goal of breastfeeding promotion is notable and based on presentation of this study's findings to community stakeholders, may well serve as a role model for other public health initiatives seeking to improve breastfeeding prevalence among at-risk demographics.

When looking at infant-specific factors, many variables were significantly associated with breastfeeding (e.g., dosing, anemia-related transfusions, cardiac or respiratory anomalies, and pacifier use). The strength of association was notable for four factors: LBW, NICU admittance, number of birth anomalies, and prematurity. The presence of each of these decreased the odds that an infant would be breastfed between 61% and 77%. Dosing, pacifier use, and NICU admittance were significantly associated with being exclusively breastfed, although only dosing demonstrated a moderate association. The negative relationship between dosing and exclusivity was surprising, perhaps suggesting that the increased number of home visits was associated with increased need and/or stressors in the family, which may have interfered with breastfeeding exclusivity.

When examining maternal-specific factors, many variables found in the literature to be associated with breastfeeding behaviors were found to be significantly associated with breastfeeding in this sample as well. There was a significant association between breastfeeding initiation and age, level and timing of SMILE participation, relationship status, education, history of prior drug and cigarette usage, nativity, education, employment, presence of negative life events, and enrollment timing. The strength of the association was generally low, although the strongest association was observed in age and enrollment timing. As expected, younger women were less likely to breastfeed than those aged 30+ years; similarly, those not in a coupled

relationship, had not completed at least high school, and had an increasing number of negative life events were also less likely to breastfeed. In contrast, college educated women, women enrolling in the antepartum period, and women receiving visits throughout their infants' first year of life were more likely to breastfeed than their respective counterparts. Additionally, newly immigrated Blacks were more likely to breastfeed than African Americans. Factors that were not associated with breastfeeding initiation included: the number of children living at home, endorsement of sucking/nipple problems, maternal disability, diagnosis of HIV or STD, having a history of prior delivery and postpartum problems, obesity, and referrals for community services (e.g., physical abuse, sexual abuse, and depression).

Finally, only education was found to be marginally and significantly associated with breastfeeding maintenance to at least six months. Maintenance was calculated based on if a woman breastfed at any point during her infant's first five months of life and had either maintained or discontinued by her infant's well baby 6-12 month visit(s). The majority of women (63%) maintained breastfeeding. College educated women were 4.5 times more likely to maintain breastfeeding, while not having at least competed high school decreased odds of maintaining breastfeeding for at least six months by nearly 80%.

Study Strengths

The findings of this study were consistent with previous research which found specific infant factors (e.g., LBW, prematurity, NICU admittance) and maternal factors (e.g., nativity, age, education, relationship status) to be associated with breastfeeding initiation (12; 38; 49; 53; 60; 64; 68; 82; 132; 162; 164; 240). The study went further, examining what factors contribute to breastfeeding exclusivity (e.g., pacifier use, NICU admittance, maternal age, intervention enrollment timing, nativity, education) and breastfeeding maintenance to at least six months

postpartum (e.g., education). This information is important to the field as a whole, but especially important in the course of this program evaluation. A consistent concern from the nurses and previous program directors is that budgetary constraints have curtailed AAHP's efforts to fully expand their outreach initiatives. What this research has shown is not only that this is an effective program, but has provided clear evidence of who is particularly at risk to not breastfeed as recommended (e.g., younger African Americans without a college education and without a partner to help support their breastfeeding efforts) and that more client participation, not less, promotes healthy breastfeeding behaviors. This facilitates AAHP-led community outreach and marketing efforts, can be used to help community-stakeholders refer those most at risk to the program, and can be used as a guide for other county and state breastfeeding promotion initiatives.

Study Limitations

While this research provides the first empirical evidence of the effectiveness of the SMILE Program's efforts to promote breastfeeding, as with any research, it has limitations. First, the study is framed within the context of both a program evaluation and community based participatory research. This means that many of the methodologies common to formal research are not applicable (e.g., randomization, control group utilization). Consequently, the absence of a control group and randomization, as well as an inability to control for all clinical variables which might affect the study's outcomes, may affect the validity of the results. A related limitation is the prevalence of missing data, which was addressed by using multiple imputation to reduce whatever bias missing data might have added to the analyses. This approach to reduce the potential impact of missing data appears appropriate given that the results utilizing the imputed data were consistent with results found in the original, non-pooled data as well as being

consistent with the nurse case managers' knowledge of their clients. A third limitation of the study was the absence of certain variables of interest. Although the SMILE data contains a great deal of information, there are certain questions pertinent to clinical characteristics and outcomes that are not asked or fully explored by the program and its staff. For instance, while the program monitors whether women engage in breastfeeding, it does not query women about their knowledge and attitudes towards breastfeeding, nor does the program explore why they engaged in the specific breastfeeding behavior such as prematurely weaning their infants. Certain conclusions can be made by examining those factors known to affect breastfeeding behavior, but it would be useful to simply ask the question of the program participants. Similarly, the program does not substantively assess for health outcomes associated with their intervention (e.g., reduction in certain infections and prevalence of colic). Additionally, the program does not collect information on other clinical or demographic considerations that may affect breastfeeding behaviors, such as WIC utilization, degree of social support for breastfeeding, and principal sources of social support for breastfeeding (e.g., grandmother, spouse, friends). Through the course of the program evaluation, such missed opportunities for data collection were identified and presented to the staff during the feedback session in Phase 3.

Conclusion

Program evaluation should be an integral component of public health programs given its role in helping to identify and promote best practices while ensuring resources are not wasted on ineffective or redundant programs (43). One important public health program serving African American/Black women residing in Montgomery County, Maryland is the SMILE Program, an initiative promoting maternal-infant health. Through the AAHP-USUCHD partnership, able to infant-specific factors (e.g., LBW, prematurity, NICU admittance) and maternal factors (e.g.,

nativity, age, education, relationship status) associated with breastfeeding initiation were identified. Breastfeeding initiation is not enough, however, to meet with Healthy People 2020's breastfeeding goals. Accordingly, this study also examined what factors contributed to breastfeeding exclusivity and maintenance. Pacifier use, NICU admittance, maternal age, intervention enrollment timing, nativity, and education were significantly associated with exclusivity, and maternal education to be significantly associated with breastfeeding maintenance to at least six months postpartum.

Ultimately, this study provided an outcomes-focused program evaluation for the SMILE Program and identified biopsychosocial factors associated with breastfeeding behaviors among this at-risk demographic. While the initial goal of providing a focused program evaluation is an important component of any responsible public health initiative, the latter goal of identifying those factors associated with breastfeeding behaviors is particularly important as it reflects the need to continue contributing to the literature on what factors detrimentally affect African Americans' breastfeeding efforts and what community efforts may be best suited for improving African American health behaviors. Future research should examine participant attitudes towards participation in the SMILE Program to assess for what they consider to be beneficial or detrimental to program goals. The SMILE Program may be applicable for other at-risk communities as well, so future research should examine whether these results are generalizable beyond the African American community.

Appendix A

"Ten Steps to Successful Breastfeeding"

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within one hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
6. Give newborn infants no food or drink other than breastmilk, unless *medically* indicated.
7. Practice "rooming in" – allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no pacifiers or artificial nipples to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

Source: Baby Friendly Health Initiative (BFHI) USA, http://www.babyfriendlyusa.org/eng/10steps.html, accessed 23 October 2012.

Appendix B

Population Characteristics, Intervention Duration, and Breastfeeding Behaviors Assessed In Home Visitation Programs

Population Demographics	Duration of Intervention	Breastfeeding Behaviors Assessed
At risk pregnancy: • Karp et al., 2013 (130) • Mejdoubi et al., 2013 (173) Disadvantaged SES: • Mannan et al., 2008 (161) • Mejdoubi et al., 2013 (174) • Pugh et al., 2002 (212) • Pugh et al., 2010 (213) • Wen et al., 2011 (268) Predominantly African American: • Pugh et al., 2002 (213) • Pugh et al., 2010 (214)	Short-term (up to 1st month): • Askelsdottir et al., 2013 (14) • Bashour et al., 2008 (23) • Boulvain et al., 2004 (30) • Di Napoli et al., 2004 (73) • Escobar et al., 2001 (81) • Gagnon et al., 1997 (93) • Gagnon et al., 2002 (92) • Karp et al., 2013 (130) • Lieu et al., 2000 (157) • Mannan et al., 2008 (162) • McKeever et al., 2002 (169) • Morrell et al., 2000 (181) • Paul et al., 2012 (207) • Pugh et al., 2002 (213) Intermediate (up to 6 mos): • Coutinho et al., 2005 (58) • Kronberg et al., 2007 (145) • Kronberg, Vaeth, & Kristensen, 2012 (144) • McDonald et al., 2010 (167) • Pugh et al., 2010 (213) Long-term (≥ 7 mos): • Mejdoubi et al., 2013 (173) • Wen et al., 2009 (267) • Wen et al., 2011 (266)	Initiation: • Boulvain et al., 2004[b] (30) • Coutinho et al., 2005[a] (59) • Di Napoli et al., 2004[b] (74) • Gagnon et al., 1997[b] (94) • Gagnon et al., 2002[b] (93) • Karp et al., 2013[a] (130) • Lieu et al., 2000[b] (158) • McDonald et al. 2010[b] (168) • Morrell et al., 2000[b] (182) • Paul et al., 2012[a] (207) • Pugh et al., 2002[a] (213) • Pugh et al., 2010[a] (214) Maintenance: • Coutinho et al., 2005[a] (59) • Di Napoli et al., 2004[b] (74) • Kronberg, Vaeth, & Kristensen, 2012[a] (145) • Kronberg et al., 2007[a] (146) • Mejdoubi et al., 2013[a] (174) • Morrell et al., 2000[b] (182) • Paul et al., 2012[b] (207) • Pugh et al., 2002[a] (213) • Pugh et al., 2010[b] (214) • Wen et al., 2009[a] (269) • Wen et al., 2011[a] (268) Exclusivity: • Askelsdottir et al., 2013[a] (14) • Bashour et al., 2008[a] (23) • Coutinho et al., 2005[a] (59) • Di Napoli et al., 2004[b] (74) • Kronberg et al., 2007[a] (146) • McDonald et al. 2010[b] (168) • McKeever et al., 2002[a] (170) • Pugh et al., 2002[a] (213)

[a] Beneficial, statistically significant
[b] No statistically significant effect

Appendix C

Questions for the Phase 1 Qualitative Review

1. How and when did the program begin? How has the program evolved over time? How may the program continue to evolve?
2. Describe more fully the staff's perspectives regarding breastfeeding within this community (e.g., prevalence, barriers, interventions).
3. How are the program's goals and objectives (e.g., breastfeeding promotion) defined?
4. What, if any, philosophy or theory underlies the SMILE Program's breastfeeding promotion?
5. How are the program's activities and processes linked to targeted outcomes?
6. Describe more fully the resources engaged in promotion of breastfeeding within the program.
7. What else might be happening in the community that could impact the program?
8. What other processes, strategies, or programs have been tried in the community to promote breastfeeding within the African American community?
9. What do stakeholders consider to be lacking in terms of addressing breastfeeding promotion within this community?
10. What are specific areas of concern for the stakeholders pertaining to breastfeeding promotion within this community?
11. What additional services, resources, and/or interventions do the stakeholders feel they need that may or may not be available to help address this particular health disparity?
12. What additional services do the stakeholders feel they would like to offer if resources were available to do so?
13. What do stakeholders consider to be successes and challenges of the program?
14. What do stakeholders perceive as lacking in terms of addressing breastfeeding promotion within the community served by the SMILE Program?
15. What is the program hoping to learn from the program evaluation?
16. How is the program expecting to use the program evaluation?

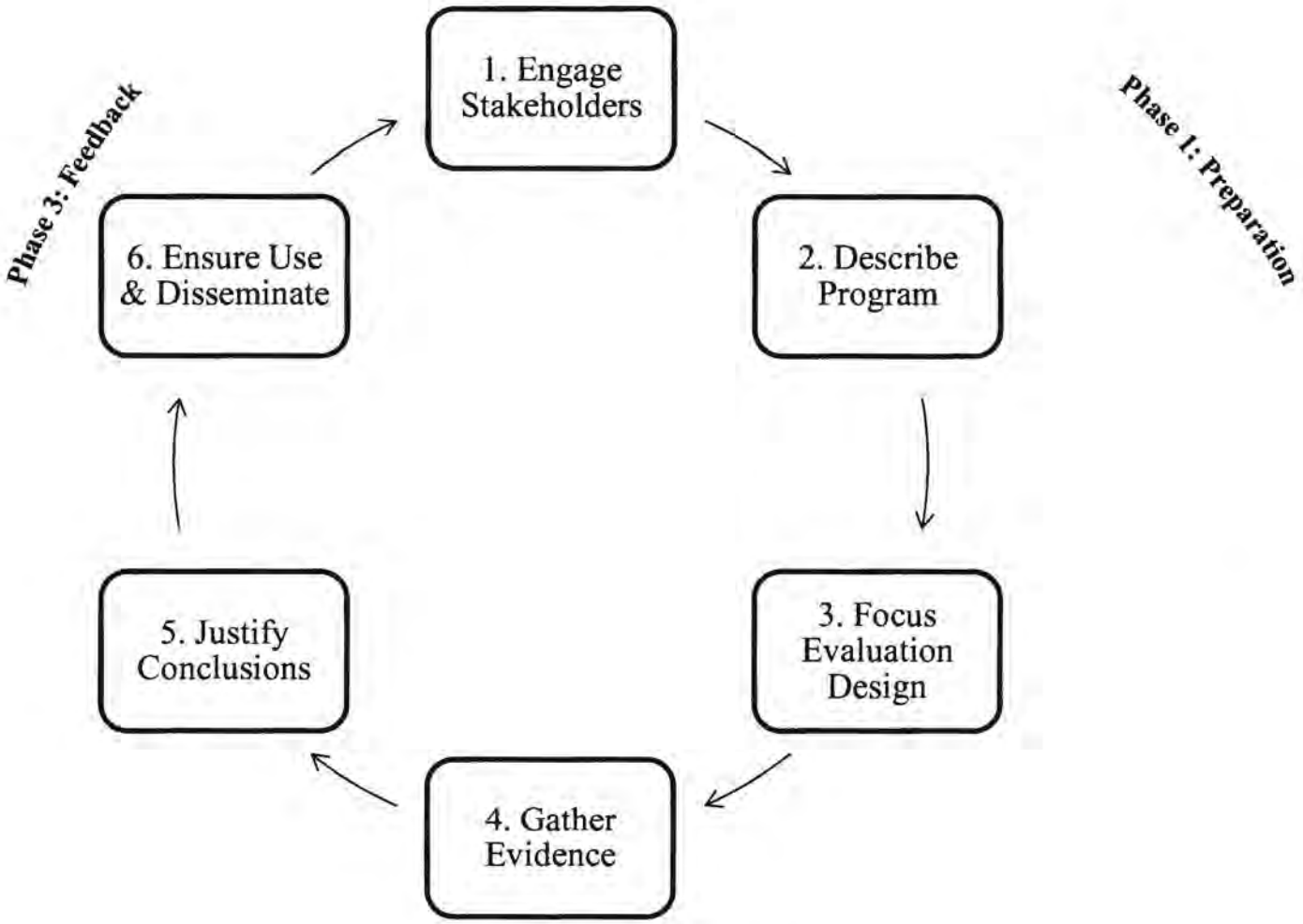
Appendix D

Logic Model of the SMILE Program

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	
• 3x nurse case managers: – 1x certified lactation consultant – 3x certified childbirth educators • Administrative staff • County support (e.g., space, funding, material aid) • Patient referrals from community health sources	• Monthly home visitation / case management • Community meetings with SMILE partners • Breast pump loan program to clients • Referral to health and social services • Promote awareness of infant mortality and health disparities • 2x yearly childbirth and breastfeeding education classes • Teen health classes in local community • Create/maintain case management database • Facilitate community outreach	• Database established, supported and aided in 3 studies evaluating effectiveness of the program • All education classes offer pre-/post-test, and evaluation to determine prior knowledge and effectiveness • Enrollment of women in the SMILE Program following participation in education classes • Client adherence with provided health education • Health behavior of enrolled clients tracked and monitored	Short-term: • Decline in number of adverse birth outcomes • Increased awareness / knowledge of: – Maternal-infant health indicators and behaviors – Prenatal and post-partum depression • Immediate access to resources during crisis • Prenatal / newborn care compliance • Creating a safe home environment for the family • Stress management	Long-term: • Maternal-infant health improvement • Enhance parenting skills • Facilitate access to community services • Birth spacing and reproductive health practices • Increased knowledge of factors negatively impacting family health • Increase community awareness of health disparities • Client empowerment (e.g., getting community services, education, parenting skills) • Health promotion of infants through first year (e.g., immunizations, safe sleep, discipline, and nutrition)

Appendix E

CDC's Framework for Program Evaluation



Appendix F

AAHP's Celebration of Breastfeeding Event

African American Health Program

14015 New Hampshire Avenue
Silver Spring, Maryland 20904
P: 301-421-5445 F: 301-421-5975
onehealthylife.org

August 19, 2013

Dr. Tracy Sbrocco,
Assoc. Professor
Dir, USU Center for Health Disparities
Dept Medical & Clinical Psychology
Uniformed Services University of the Health Sciences
4301 Jones Bridge Rd
Bethesda, MD 20814-4799

Dear Dr. Tracy Sbrocco:

Montgomery County's African American Health Program (AAHP) S.M.I.L.E. (Start More Infants Living Equally healthy) program will celebrate World Breastfeeding Awareness Month by honoring breastfeeding moms, expecting moms, fathers, and the families that support them at a celebratory event on Thursday, August 22, 2013.

Thank you for agreeing to present a short summary of the analysis of S.M.I.L.E. data at this event. AAHP appreciates your expertise in research and evaluation especially in providing us with feedback from your graduate student who worked on this data. We look forward to the wealth of knowledge and experience you will share with our moms and their families.

The event will take place from 6:00 to 8:30 p.m. at Brookside Gardens Reception Hall in Wheaton Regional Park, 1800 Glenallan Avenue, Wheaton, MD 20902. The agenda will be forthcoming for your viewing and please note that you are scheduled to speak on the S.M.I.L.E. data outcomes at 6:40pm. Parking is free at the location.

Please let us know if you require any special accommodations and/or audiovisual equipment for your presentation. We also welcome any questions you may have about the event. For further information about AAHP, you may wish to visit our website at www.onehealthylife.org. Please also feel free to contact me at 301-421-5761 or abimbola.idowu@montgomerycountymd.gov if I may be of assistance.

Thank you again for your commitment to this event. Your participation will help AAHP to make it a great success.

Sincerely,

Bimbola Idowu

Abimbola Idowu, DrPH
Project Director

The African American Health Program is funded by the Montgomery County Department of Health & Human Services and administered by SKTAH Associates, Inc.

Celebrate the Benefits & Beauty of Breastfeeding

African American Health Program

14015 New Hampshire Ave
Silver Spring, MD 20904
240.777.1833 | 301.421.5445
onehealthylife.org

S.M.I.L.E.

AGENDA

EMCEE: EUSI HOLT, AAHP S.M.I.L.E. COMMUNITY LIAISON

6:00 PM	**Dinner**
6:30 PM	**Welcome** Bola Idowu, DrPH, AAHP Project Director
6:40 PM	**The S.M.I.L.E. Experience** Tracy Sbrocco, PhD, Director Uniformed Services University Center for Health Disparities
7:00 PM	**Poetry Reading: More Than Milk** Verse by Grainne Evans Read by Erricka Bridgeford, Inspirational Speaker *Introduction by Tannyka Coleman, RN, BSN, CM/DN, AAHP S.M.I.L.E. Nurse*
7:05 PM	**Testimonials** Erricka Bridgeford, Inspirational Speaker Alana Hackshaw, PhD, S.M.I.L.E. Client Saundra Jackson, RN, BS, CBE, AAHP S.M.I.L.E. Nurse Karynn Jones, S.M.I.L.E. Client
7:20 PM	**Guest Speaker** Kathi Barber, CLC, Founder African American Breastfeeding Alliance *Introduction by Nia Williams-Myles, RN, MSN-Edu, MPH, AAHP S.M.I.L.E. Nurse*
7:45 PM	**Recognition and Appreciation** Heather Ross, AAHP Program Manager Montgomery County Department of Health and Human Services
7:55 PM	**Raffle Drawing** Nia Williams-Myles, RN, MSN-Edu, MPH, AAHP S.M.I.L.E. Nurse
8:00 PM	**Closing Remarks** Xenneser Kayodé, BSN, AAHP Deputy Project Director

REFERENCES

1. AAHP. 2012. *Infant Mortality*. http://www.onehealthylife.org/our-programs/infant-mortality.html
2. AAP. 1997. Breastfeeding and the use of human milk. *Pediatrics* 100:1035-9
3. AAP. 2005. Policy Statement: Breastfeeding and the Use of Human Milk. *Pediatrics* 115:496-506
4. Abrahams SW, Labbok MH. 2009. Exploring the impact of the Baby-Friendly Hospital Initiative on trends in exclusive breastfeeding. *International Breastfeeding Journal* 4:11
5. ACOG. 2008. ACOG Practice Bulletin: Use of psychiatric medications during pregnancy and lactation. *Obstetrics And Gynecology Clinics Of North America* 111:1001–20
6. Agrasada GV, Gustafsson J, Kylberg E, Ewald U. 2005. Postnatal peer counselling on exclusive breastfeeding of low-birthweight infants: a randomized, controlled trial. *Acta Paediatr* 94:1109-15
7. Ahluwalia IB, Morrow B, Hsia J. 2005. Why do women stop breastfeeding? Findings from the Pregnancy Risk Assessment and Monitoring System. *Pediatrics* 116:1408-12
8. Ahmed AH, Sands LP. 2010. Effect of pre- and postdischarge interventions on breastfeeding outcomes and weight gain among premature infants. *Journal Of Obstetric, Gynecologic, And Neonatal Nursing : JOGNN / NAACOG* 39:53-63
9. Aksu H, Kucuk M, Duzgun G. 2011. The effect of postnatal breastfeeding education/support offered at home 3 days after delivery on breastfeeding duration and knowledge: a randomized trial. *The Journal Of Maternal-Fetal & Neonatal Medicine : The Official Journal of the European Association of Perinatal Medicine, the Federation*

of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet 24:354-61

10. Alsaker MD, Opdahl S, Asvold BO, Romundstad PR, Vatten LJ. 2011. The association of reproductive factors and breastfeeding with long term survival from breast cancer. *Breast Cancer Research And Treatment* 130:175-82

11. Amir LH, Donath S. 2007. A systematic review of maternal obesity and breastfeeding intention, initiation and duration. *BMC Pregnancy And Childbirth* 7:9

12. Ashton D. 2006. Prematurity--infant mortality: the scourge remains. *Ethn Dis* 16:S3-58-62

13. Asiodu I, Flaskerud JH. 2011. Got milk? A look at breastfeeding from an African American perspective. *Issues in Mental Health Nursing* 32:544-6

14. Askelsdottir B, Lam-de Jonge W, Edman G, Wiklund I. 2013. Home care after early discharge: impact on healthy mothers and newborns. *Midwifery* 29:927-34

15. Avellar S, Paulsell D, Miller E, Del Grosso P. 2013. Home Visiting Evidence of Effectiveness Review: Executive Summary, US Department of Health and Human Services, Washington DC

16. Bachrach VR, Schwarz E, Bachrach LR. 2003. Breastfeeding and the risk of hospitalization for respiratory disease in infancy: a meta-analysis. *Archives of Pediatrics & Adolescent Medicine* 157:237-43

17. Bagwell JE, Kendrick OW, Stitt KR, Leeper JD, Espy ML, Gedel ML. 1992. Breastfeeding among women in the Alabama WIC Program. *Journal of Human Lactation: Official Journal of International Lactation Consultant Association* 8:205-8

18. Baildam EM, Hillier VF, Menon S, Bannister RP, Bamford FN, et al. 2000. Attention to infants in the first year. *Child: Care, Health And Development* 26:199-215

19. Baker JL, Gamborg M, Heitmann BL, Lissner L, Sorensen TI, Rasmussen KM. 2008. Breastfeeding reduces postpartum weight retention. *The American Journal Of Clinical Nutrition* 88:1543-51

20. Baker M, Milligan K. 2008. Maternal employment, breastfeeding, and health: evidence from maternity leave mandates. *Journal of Health Economics* 27:871-87

21. Baker Q, Davis D, Gallerani R, Sanchez V, Viadro C. 2000. An evaluation framework for community health programs. Durham, NC.: The Center for the Advancement of Community Based Public Health

22. Balaban G, Silva GA. 2004. Protective effect of breastfeeding against childhood obesity. *Jornal De Pediatria* 80:7-16

23. Bashour HN, Kharouf MH, Abdulsalam AA, El Asmar K, Tabbaa MA, Cheikha SA. 2008. Effect of postnatal home visits on maternal/infant outcomes in Syria: a randomized controlled trial. *Public Health Nurs* 25:115-25

24. Beal AC, Kuhlthau K, Perrin JM. 2003. Breastfeeding advice given to African American and white women by physicians and WIC counselors. *Public Health Rep* 118:368-76

25. Bentley ME, Dee DL, Jensen JL. 2003. Breastfeeding among low income, African-American women: power, beliefs and decision making. *The Journal of Nutrition* 133:305S-9S

26. Bland RM, Little KE, Coovadia HM, Coutsoudis A, Rollins NC, Newell ML. 2008. Intervention to promote exclusive breast-feeding for the first 6 months of life in a high HIV prevalence area. *AIDS* 22:883-91

27. Blaymore B, Oliver T, Ferguson A, Vohr B. 2002. Human milk reduces outpatient upper respiratory symptoms in premature infants during their first year of life. *Journal of Perinatology: Official Journal of the California Perinatal Association* 22:354–9

28. Blixen CE, Singh A, Xu M, Thacker H, Mascha E. 2006. What women want: understanding obesity and preferences for primary care weight reduction interventions among African-American and Caucasian women. *Journal of the National Medical Association* 98:1160-70

29. Bonuck KA, Freeman K, Trombley M. 2005. Country of origin and race/ethnicity: impact on breastfeeding intentions. *Journal of Human Lactation: Official Journal of International Lactation Consultant Association* 21:320-6

30. Boulvain M, Perneger TV, Othenin-Girard V, Petrou S, Berner M, Irion O. 2004. Home-based versus hospital-based postnatal care: a randomised trial. *BJOG: An International Journal Of Obstetrics And Gynaecology* 111:807-13

31. Bradley D, Bradley T, McGrath S, Cutcomb S. 1979. Type I error rate of the chi square test of independence in r x c tables that have small expected frequencies. Psychological Bulletin, 86, 1200-1297. *Psychological Bulletin* 86:1200-97

32. Britton JR, Britton HL, Gronwaldt V. 2006. Breastfeeding, sensitivity, and attachment. *Pediatrics* 118:e1436-43

33. Brown AK, Damus K, Kim MH, King K, Harper R, et al. 1999. Factors relating to readmission of term and near-term neonates in the first two weeks of life. Early Discharge Survey Group of the Health Professional Advisory Board of the Greater New York Chapter of the March of Dimes. *Journal of Perinatal Medicine* 27:263-75

34. Brown AL. 2008. Obesity and the metabolic syndrome in African American women. *Journal of the Cardiometabolic Syndrome* 3:126-8

35. Browne I. 2000. Opportunities Lost? Race, Industrial Restructuring, and Employment Among Young Women Heading Households. *Social Forces* 78:907-29

36. Burdette HL, Whitaker RC, Hall WC, Daniels SR. 2006. Maternal infant-feeding style and children's adiposity at 5 years of age. *Archives of Pediatrics & Adolescent Medicine* 160:513-20

37. Buyken AE, Karaolis-Danckert N, Remer T, Bolzenius K, Landsberg B, Kroke A. 2008. Effects of breastfeeding on trajectories of body fat and BMI throughout childhood. *Obesity (Silver Spring)* 16:389-95

38. Callen J, Pinelli J. 2005. A review of the literature examining the benefits and challenges, incidence and duration, and barriers to breastfeeding in preterm infants. *Advances in Neonatal Care: Official Journal Of The National Association of Neonatal Nurses* 5:72-88

39. Camilli G, Hopkins K. 1979. Testing for association in 2x2 contingency tables with very small sample sizes. *Psychological Bulletin* 86:1011-4

40. Carter-Pokras O, Baquet C. 2002. What is a "health disparity"? *Public Health Rep* 117:426-34

41. CDC. 2000. Preventing pneumococcal disease among infants and young children. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR. Morbidity and mortality weekly report. Recommendations and reports / Centers for Disease Control* 49:1-35

42. CDC. 2011. CDC Health Disparities and Inequalities Report: United States, 2011. *MMWR. Morbidity and mortality weekly report* 60 (Suppl.):1-114

43. CDC. 2011. Introduction to program evaluation for public health programs: A self-study guide. Office of the Director. Atlanta, GA: Centers for Disease Control and Prevention

44. CDC. 2013. Breastfeeding Report Card: United States, 2013. Atlanta

45. Chapman DJ, Morel K, Anderson AK, Damio G, Perez-Escamilla R. 2010. Breastfeeding peer counseling: from efficacy through scale-up. *Journal of Human Lactation: Official Journal of International Lactation Consultant Association* 26:314-26

46. Chapman DJ, Morel K, Bermudez-Millan A, Young S, Damio G, Perez-Escamilla R. 2013. Breastfeeding education and support trial for overweight and obese women: a randomized trial. *Pediatrics* 131:e162-70

47. Chapman DJ, Perez-Escamilla R. 2012. Breastfeeding among minority women: moving from risk factors to interventions. *Adv Nutr* 3:95-104

48. Chapman J, Siegel E, Cross A. 1990. Home visitors and child health: analysis of selected programs. *Pediatrics* 85:1059-68

49. Chin AC, Myers L, Magnus JH. 2008. Race, education, and breastfeeding initiation in Louisiana, 2000-2004. *Journal of Human Lactation: Official Journal of International Lactation Consultant Association* 24:175-85

50. Chua S, Arulkumaran S, Lim I, Selamat N, Ratnam SS. 1994. Influence of breastfeeding and nipple stimulation on postpartum uterine activity. *British Journal Of Obstetrics And Gynaecology* 101:804-5

51. Chung M, Raman G, Trikalinos T, Lau J, Ip S. 2008. Interventions in primary care to promote breastfeeding: an evidence review for the U.S. Preventive Services Task Force. *Annals of Internal Medicine* 149:565-82

52. Clifford TJ. 2003. Breast feeding and obesity. *BMJ* 327:879-80

53. Colaizy TT, Morriss FH. 2008. Positive effect of NICU admission on breastfeeding of preterm US infants in 2000 to 2003. *Journal of Perinatology: Official Journal of the California Perinatal Association* 28:505-10

54. Colin WB, Scott JA. 2002. Breastfeeding: reasons for starting, reasons for stopping and problems along the way. *Breastfeeding Revie : Professional Publication of the Nursing Mothers' Association of Australia* 10:13-9

55. Coovadia H, Brown E, Fowler M, Chipato T, Moodley D, et al. 2012. Efficacy and safety of an extended nevirapine regimen in infant children of breastfeeding mothers with HIV-1 infection for prevention of postnatal HIV-1 transmission (HPTN 046): a randomised, double-blind, placebo-controlled trial. *Lancet* 379:221-8

56. Coovadia H, Kindra G. 2008. Breastfeeding to prevent HIV transmission in infants: balancing pros and cons. *Current Opinion In Infectious Diseases* 21:11-5

57. Cortes F, Perez A, Ferrer L, Cianelli A, Cabieses V. 2006. HIV/AIDS and Breastfeeding. *Revista Chilena De Nutricion: Organo Oficial de la Sociedad Chilena de Nutricion, Bromatologia y Toxicologia* 33 suppl 2:334-41

58. Coutinho SB, de Lira PI, de Carvalho Lima M, Ashworth A. 2005. Comparison of the effect of two systems for the promotion of exclusive breastfeeding. *Lancet* 366:1094-100

59. Cricco-Lizza R. 2006. Black non-Hispanic mothers' perceptions about the promotion of infant-feeding methods by nurses and physicians. *Journal of Obstetric, Gynecologic, And Neonatal Nursing : JOGNN / NAACOG* 35:173-80

60. Cricco-Lizza R. 2009. Rooting for the breast: breastfeeding promotion in the NICU. *MCN. The American Journal Of Maternal Child Nursing* 34:356-64

61. Crookston BT, Dearden KA, Chan K, Chan T, Stoker DD. 2007. Buddhist nuns on the move: an innovative approach to improving breastfeeding practices in Cambodia. *Maternal & Child Nutrition* 3:10-24

62. Cumming RG, Klineberg RJ. 1993. Breastfeeding and other reproductive factors and the risk of hip fractures in elderly women. *International Journal Of Epidemiology* 22:684-91

63. Currie J. 2005. Health disparities and gaps in school readiness. *The Future of children / Center for the Future of Children, the David and Lucile Packard Foundation* 15:117-38

64. Dall'Oglio I, Salvatori G, Bonci E, Nantini B, D'Agostino G, Dotta A. 2007. Breastfeeding promotion in neonatal intensive care unit: impact of a new program toward a BFHI for high-risk infants. *Acta Paediatr* 96:1626-31

65. Daro D. 2006. Home visitation: Assessing progress, managing expectations. *Ounce of Prevention Fund and Chapin Hall Center for Children*

66. Davanzo R, Copertino M, De Cunto A, Minen F, Amaddeo A. 2011. Antidepressant drugs and breastfeeding: a review of the literature. *Breastfeeding Medicine: The Official Journal of the Academy of Breastfeeding Medicine* 6:89-98

67. DCoE. 2012. Program Evaluation Guide (Edition 1). Arlington, VA.

68. Dennis CL. 2002. Breastfeeding initiation and duration: a 1990-2000 literature review. *Journal of Obstetric, Gynecologic, And Neonatal Nursing : JOGNN / NAACOG* 31:12-32

69. Dewey KG. 2003. Is breastfeeding protective against child obesity? *Journal of Human Lactation : Official Journal of International Lactation Consultant Association* 19:9-18

70. Dewey KG. 2004. Impact of breastfeeding on maternal nutritional status. *Advances in Experimental Medicine And Biology* 554:91-100

71. Dewey KG, Heinig MJ, Nommsen-Rivers LA. 1995. Differences in morbidity between breast-fed and formula-fed infants. *The Journal of Pediatrics* 126:696-702

72. Dewey KG, Heinig MJ, Nommsen LA. 1993. Maternal weight-loss patterns during prolonged lactation. *The American Journal Of Clinical Nutrition* 58:162-6

73. Di Napoli A, Di Lallo D, Fortes C, Franceschelli C, Armeni E, Guasticchi G. 2004. Home breastfeeding support by health professionals: findings of a randomized controlled trial in a population of Italian women. *Acta Paediatr* 93:1108-14

74. DiGirolamo AM, Grummer-Strawn LM, Fein SB. 2003. Do perceived attitudes of physicians and hospital staff affect breastfeeding decisions? *Birth* 30:94-100

75. DiGirolamo AM, Grummer-Strawn LM, Fein SB. 2008. Effect of maternity-care practices on breastfeeding. *Pediatrics* 122 Suppl 2:S43-9

76. Dodd JM, Crowther CA, Robinson JS. 2008. Dietary and lifestyle interventions to limit weight gain during pregnancy for obese or overweight women: a systematic review. *Acta Obstetricia Et Gynecologica Scandinavica* 87:702-6

77. Dodd JM, Turnbull DA, McPhee AJ, Wittert G, Crowther CA, Robinson JS. 2011. Limiting weight gain in overweight and obese women during pregnancy to improve health outcomes: the LIMIT randomised controlled trial. *BMC Pregnancy And Childbirth* 11:79

78. Dyson L, McCormick F, Renfrew MJ. 2005. Interventions for promoting the initiation of breastfeeding. *Cochrane Database Syst Rev*:CD001688

79. Else-Quest N, Hyde J, Clark R. 2003. Breastfeeding, bonding, and the mother-infant relationship. *Merrill Palmer Quarterly* 49:495-517

80. Ertem IO, Votto N, Leventhal JM. 2001. The timing and predictors of the early termination of breastfeeding. *Pediatrics* 107:543-8

81. Escobar GJ, Braveman PA, Ackerson L, Odouli R, Coleman-Phox K, et al. 2001. A randomized comparison of home visits and hospital-based group follow-up visits after early postpartum discharge. *Pediatrics* 108:719-27

82. Espy KA, Senn TE. 2003. Incidence and correlates of breast milk feeding in hospitalized preterm infants. *Soc Sci Med* 57:1421-8

83. Evans K, Labbok M, Abrahams SW. 2011. WIC and breastfeeding support services: does the mix of services offered vary with race and ethnicity? *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 6:401-6

84. Falk-Rafael A. 2005. Speaking truth to power: nursing's legacy and moral imperative. *ANS Adv Nurs Sci* 28:212-23

85. Fergusson DM, Woodward LJ. 1999. Breast feeding and later psychosocial adjustment. *Paediatric and Perinatal Epidemiology* 13:144-57

86. Fetrick A, Christensen M, Mitchell C. 2003. Does public health nurse home visitation make a difference in the health outcomes of pregnant clients and their offspring? *Public Health Nurs* 20:184-9

87. Flegal KM, Carroll MD, Kit BK, Ogden CL. 2012. Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. *JAMA : The Journal of the American Medical Association* 307:491-7

88. Forste R, Weiss J, Lippincott E. 2001. The decision to breastfeed in the United States: does race matter? *Pediatrics* 108:291-6

89. Fraser AB, Grimes DA. 2003. Effect of lactation on maternal body weight: a systematic review. *Obstetrical & Gynecological Survey* 58:265-9

90. Freund C, Mirabel L, Annane K, Mathelin C. 2005. [Breastfeeding and breast cancer]. *Gynecologie, Obstetrique & Fertilite* 33:739-44

91. Fry-Johnson YW, Levine R, Rowley D, Agboto V, Rust G. 2010. United States black:white infant mortality disparities are not inevitable: identification of community resilience independent of socioeconomic status. *Ethn Dis* 20:S1-131-5

92. Gagnon AJ, Dougherty G, Jimenez V, Leduc N. 2002. Randomized trial of postpartum care after hospital discharge. *Pediatrics* 109:1074-80

93. Gagnon AJ, Edgar L, Kramer MS, Papageorgiou A, Waghorn K, Klein MC. 1997. A randomized trial of a program of early postpartum discharge with nurse visitation. *American Journal Of Obstetrics And Gynecology* 176:205-11

94. Gee RE, Zerbib LD, Luckett BG. 2012. Breastfeeding Support for African-American Women in Louisiana Hospitals. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine*

95. Ghods BK, Roter DL, Ford DE, Larson S, Arbelaez JJ, Cooper LA. 2008. Patient-physician communication in the primary care visits of African Americans and whites with depression. *J Gen Intern Med* 23:600-6

96. Gibbins SA, Green PE, Scott PA, MacDonell JW. 2000. The role of the clinical nurse specialist/neonatal nurse practitioner in a breastfeeding clinic: a model of advanced practice. *Clinical Nurse Specialist CNS* 14:56-9

97. Goldman AS. 2012. Evolution of immune functions of the mammary gland and protection of the infant. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 7:132-42

98. Gomby DS. 2000. Promise and limitations of home visitation. *JAMA : The Journal of the American Medical Association* 284:1430-1

99. Graham JJ, Cumsille P, Elek-Fisk E. 2003. Methods for handling missing data. In *Research Methods in Psychology, Volume 2.*, ed. J Schinka, W Velicer:87-114. NY: John Wiley & Sons. Number of 87-114 pp.

100. Grummer-Strawn LM, Mei Z. 2004. Does breastfeeding protect against pediatric overweight? Analysis of longitudinal data from the Centers for Disease Control and Prevention Pediatric Nutrition Surveillance System. *Pediatrics* 113:e81-6

101. Haider R, Ashworth A, Kabir I, Huttly SR. 2000. Effect of community-based peer counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a randomised controlled trial. *Lancet* 356:1643-7

102. Halbreich U, Karkun S. 2006. Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms. *J Affect Disord* 91:97-111

103. Hall J. 2011. Effective community-based interventions to improve exclusive breast feeding at four to six months in low- and low-middle-income countries: a systematic review of randomised controlled trials. *Midwifery* 27:497-502

104. Halpern R. 2000. Early childhood intervention for low-income children and families. In *Handbook of Early Childhood Intervention, 2nd Ed.*, ed. J Shonkoff, S Meisels:361-86. New York: Cambridge University Press. Number of 361-86 pp.

105. Hanson LA, Bergstrom S. 1990. The link between infant mortality and birth rates: The importance of breastfeeding as a common factor. *Acta Paediatrica Scand* 79:481-9

106. Hardy W. 2010. Evidence-based practice brief: promoting breastfeeding in the NICU. *Advances in Neonatal Care : Official Journal of the National Association of Neonatal Nurses* 10:40

107. Harris KM, Edlund MJ, Larson S. 2005. Racial and ethnic differences in the mental health problems and use of mental health care. *Medical Care* 43:775-84

108. Hasselmann MH, Werneck GL, Silva CV. 2008. Symptoms of postpartum depression and early interruption of exclusive breastfeeding in the first two months of life. *Cadernos de Saude Publica / Ministerio da Saude, Fundacao Oswaldo Cruz, Escola Nacional de Saude Publica* 24 Suppl 2:S341-52

109. Hatsu IE, McDougald DM, Anderson AK. 2008. Effect of infant feeding on maternal body composition. *International Breastfeeding Journal* 3:18

110. Hatton DC, Harrison-Hohner J, Coste S, Dorato V, Curet LB, McCarron DA. 2005. Symptoms of postpartum depression and breastfeeding. *Journal of Human Lactation : Official Journal of International Lactation Consultant Association* 21:444-9; quiz 50-4

111. Hediger ML, Overpeck MD, Ruan WJ, Troendle JF. 2000. Early infant feeding and growth status of US-born infants and children aged 4-71 mo: analyses from the third National Health and Nutrition Examination Survey, 1988-1994. *The American Journal Of Clinical Nutrition* 72:159-67

112. Heidari S, Mofenson L, Cotton MF, Marlink R, Cahn P, Katabira E. 2011. Antiretroviral drugs for preventing mother-to-child transmission of HIV: a review of potential effects on HIV-exposed but uninfected children. *J Acquir Immune Defic Syndr* 57:290-6

113. Heinig MJ. 2001. Host defense benefits of breastfeeding for the infant. Effect of breastfeeding duration and exclusivity. *Pediatric Clinics of North America* 48:105-23, ix

114. Henderson J, Sbrocco T, Tanofsky-Kraff M, Holloway M. 2012. Title. Volume:In press

115. Henry-Okafor Q, Cowan PA, Wicks MN, Rice M, Husch DS, Khoo MS. 2012. Effect of obesity on cardiovascular disease risk factors in African American women. *Biol Res Nurs* 14:171-9

116. Herring SJ, Rose MZ, Skouteris H, Oken E. 2012. Optimizing weight gain in pregnancy to prevent obesity in women and children. *Diabetes Obes Metab* 14:195-203

117. Hicken MT, Gee GC, Morenoff J, Connell CM, Snow RC, Hu H. 2012. A Novel Look at Racial Health Disparities: The Interaction Between Social Disadvantage and Environmental Health. *American Journal Of Public Health*

118. Holme A, MacArthur C, Lancashire R. 2010. The effects of breastfeeding on cognitive and neurological development of children at 9 years. *Child: Care, Health And Development* 36:583-90

119. Horwood LJ, Darlow BA, Mogridge N. 2001. Breast milk feeding and cognitive ability at 7-8 years. *Archives of Disease in Childhood. Fetal and Neonatal Edition* 84:F23-7

120. Howell D. 2010. *Statistical Methods for Psychology (7th Ed.)*. Belmont, CA: Cengage Wadsworth

121. Howell E, Mora P, Horowitz C, Leventhal H. 2005. Racial and ethnic differences in factors associated with early postpartum depressive symptoms. *Obstetrics & Gynecology* 105:1442-50

122. Howie PW, Forsyth JS, Ogston SA, Clark A, Florey CD. 1990. Protective effect of breast feeding against infection. *BMJ* 300:11-6

123. Imdad A, Yakoob MY, Bhutta ZA. 2011. Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries. *BMC Public Health* 11 Suppl 3:S24

124. Ip S, Chung M, Raman G, Chew P, Magula N, et al. 2007. Breastfeeding and maternal and infant health outcomes in developed countries. *Evidence Report/Technology Assessment*:1-186

125. Israel B, Eng E, Schulz A, Parker E, eds. 2005. *Introduction to Methods In Community-Based Participatory Research For Health*. San Francisco, CA: Jossey-Bass.

126. Jackson PC. 2010. Complementary and alternative methods of increasing breast milk supply for lactating mothers of infants in the NICU. *Neonatal Network : NN* 29:225-30

127. Johnston BD, Huebner CE, Anderson ML, Tyll LT, Thompson RS. 2006. Healthy steps in an integrated delivery system: child and parent outcomes at 30 months. *Archives of Pediatrics & Adolescent Medicine* 160:793-800

128. Jolly K, Ingram L, Khan KS, Deeks JJ, Freemantle N, MacArthur C. 2012. Systematic review of peer support for breastfeeding continuation: metaregression analysis of the effect of setting, intensity, and timing. *BMJ* 344:d8287

129. Jonas W, Nissen E, Ransjo-Arvidson AB, Wiklund I, Henriksson P, Uvnas-Moberg K. 2008. Short- and long-term decrease of blood pressure in women during breastfeeding. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 3:103-9

130. Karp SM, Howe-Heyman A, Dietrich MS, Lutenbacher M. 2013. Breastfeeding Initiation in the Context of a Home Intervention to Promote Better Birth Outcomes. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine*

131. Kaunonen M, Hannula L, Tarkka MT. 2012. A systematic review of peer support interventions for breastfeeding. *Journal of Clinical Nursing* 21:1943-54

132. Kehler HL, Chaput KH, Tough SC. 2009. Risk factors for cessation of breastfeeding prior to six months postpartum among a community sample of women in Calgary, Alberta. *Canadian Journal Of Public Health. Revue Canadienne De Sante Publique* 100:376-80

133. Kemp L, Harris E, McMahon C, Matthey S, Vimpani G, et al. 2011. Child and family outcomes of a long-term nurse home visitation programme: a randomised controlled trial. *Archives of Disease In Childhood* 96:533-40

134. Kennedy KI. 1994. Effects of breastfeeding on women's health. *International journal Of Gynaecology And Obstetrics: The Official Organization of the International Federation of Gynaecology and Obstetrics* 47 Suppl:S11-20; discussion S-1

135. Keppel KG. 2007. Ten largest racial and ethnic health disparities in the United States based on Healthy People 2010 Objectives. *Amer Journal Of Epidemiology* 166:97-103

136. Kim P, Feldman R, Mayes LC, Eicher V, Thompson N, et al. 2011. Breastfeeding, brain activation to own infant cry, and maternal sensitivity. *J Child Psychol Psychiatry* 52:907-15

137. Kindra G, Coutsoudis A, Esposito F, Esterhuizen T. 2012. Breastfeeding in HIV exposed infants significantly improves child health: a prospective study. *Maternal And Child Health Journal* 16:632-40

138. Kitzman H, Olds DL, Henderson CR, Jr., Hanks C, Cole R, et al. 1997. Effect of prenatal and infancy home visitation by nurses on pregnancy outcomes, childhood injuries, and

repeated childbearing. A randomized controlled trial. *JAMA : The Journal of the American Medical Association* 278:644-52

139. Kourtis AP, de Vincenzi I, Jamieson DJ, Bulterys M. 2012. Antiretroviral drugs during breastfeeding for the prevention of postnatal transmission of HIV-1. *Advances in Experimental Medicine And Biology* 743:173-83

140. Kozhimannil KB, Hardeman RR, Attanasio LB, Blauer-Peterson C, O'Brien M. 2013. Doula care, birth outcomes, and costs among Medicaid beneficiaries. *American Journal Of Public Health* 103:e113-21

141. Kramer MS. 2010. "Breast is best": The evidence. *Early human development* 86:729-32

142. Kramer MS, Kakuma R. 2002. Optimal duration of exclusive breastfeeding. *Cochrane Database Syst Rev*: CD003517

143. Kramer MS, Kakuma R. 2004. The optimal duration of exclusive breastfeeding: a systematic review. *Advances in Experimental Medicine And Biology* 554:63-77

144. Kronborg H, Vaeth M, Kristensen I. 2012. The effect of early postpartum home visits by health visitors: a natural experiment. *Public Health Nurs* 29:289-301

145. Kronborg H, Vaeth M, Olsen J, Iversen L, Harder I. 2007. Effect of early postnatal breastfeeding support: a cluster-randomized community based trial. *Acta Paediatr* 96:1064-70

146. Kugyelka JG, Rasmussen KM, Frongillo EA. 2004. Maternal obesity is negatively associated with breastfeeding success among Hispanic but not Black women. *The Journal of Nutrition* 134:1746-53

147. Kuhn L. 2008. Antiretroviral prophylaxis to prevent post-natal transmission of HIV through breastfeeding. *The Pan African Medical Journal* 1:6

148. Labbok M, Krasovec K. 1990. Toward consistency in breastfeeding definitions. *Studies in Family Planning* 21:226-30

149. Labbok MH. 2001. Effects of breastfeeding on the mother. *Pediatric Clinics of North America* 48:143-58

150. Lee HJ, Elo IT, McCollum KF, Culhane JF. 2009. Racial/Ethnic Differences in Breastfeeding Initiation and Duration Among Low-income, Inner-city Mothers. *Social Science Quarterly* 90:1251-71

151. Leite AJ, Puccini RF, Atalah AN, Alves Da Cunha AL, Machado MT. 2005. Effectiveness of home-based peer counselling to promote breastfeeding in the northeast of Brazil: a randomized clinical trial. *Acta Paediatr* 94:741-6

152. Lepe M, Bacardi Gascon M, Castaneda-Gonzalez LM, Perez Morales ME, Jimenez Cruz A. 2011. Effect of maternal obesity on lactation: systematic review. *Nutricion Hospitalaria : Organo Oficial de la Sociedad Espanola de Nutricion Parenteral y Enteral* 26:1266-9

153. Lewallen LP. 2012. Breastfeeding is important for cognitive development in term and preterm infants. *Evid Based Nurs* 15:85-6

154. Lewallen LP, Street DJ. 2010. Initiating and sustaining breastfeeding in african american women. *Journal of Obstetric, Gynecologic, And Neonatal Nursing : JOGNN / NAACOG* 39:667-74

155. Lewycka S, Mwansambo C, Rosato M, Kazembe P, Phiri T, et al. 2013. Effect of women's groups and volunteer peer counselling on rates of mortality, morbidity, and health behaviours in mothers and children in rural Malawi (MaiMwana): a factorial, cluster-randomised controlled trial. *Lancet* 381:1721-35

156. Li C, Goran MI, Kaur H, Nollen N, Ahluwalia JS. 2007. Developmental trajectories of overweight during childhood: role of early life factors. *Obesity (Silver Spring)* 15:760-71

157. Lieu TA, Braveman PA, Escobar GJ, Fischer AF, Jensvold NG, Capra AM. 2000. A randomized comparison of home and clinic follow-up visits after early postpartum hospital discharge. *Pediatrics* 105:1058-65

158. Little R, Rubin D. 2002. *Statistical Analysis with Missing Data, 2nd Ed.* NY: John Wiley and Sons

159. Lucas A, Cole TJ. 1990. Breast milk and neonatal necrotising enterocolitis. *Lancet* 336:1519-23

160. Maia C, Brandao R, Roncalli A, Maranhao H. 2011. Length of stay in a neonatal intensive care unit and its association with low rates of exclusive breastfeeding in very low birth weight infants. *The Journal Of Maternal-Fetal & Neonatal Medicine : The Official Journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 24:774-7

161. Mannan I, Rahman SM, Sania A, Seraji HR, Arifeen SE, et al. 2008. Can early postpartum home visits by trained community health workers improve breastfeeding of newborns? *Journal of Perinatology : Official Journal of the California Perinatal Association* 28:632-40

162. Martin J, Hamilton B, Ventura S, Osterman M, Wilson E, Mathews T. 2012. Births: Final data for 2010. Hyattsville, MD: National Center for Health Statistics

163. Matson AP, Thrall RS, Rafti E, Puddington L. 2009. Breastmilk from allergic mothers can protect offspring from allergic airway inflammation. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 4:167-74

164. Mattox KK. 2012. African American Mothers: Bringing the Case for Breastfeeding Home. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine*

165. McCann MF, Baydar N, Williams RL. 2007. Breastfeeding attitudes and reported problems in a national sample of WIC participants. *Journal of Human Lactation : Official Journal of International Lactation Consultant Association* 23:314-24

166. McCarter-Spaulding D, Gore R. 2009. Breastfeeding self-efficacy in women of African descent. *Journal of Obstetric, Gynecologic, And Neonatal Nursing : JOGNN / NAACOG* 38:230-43

167. McDonald SJ, Henderson JJ, Faulkner S, Evans SF, Hagan R. 2010. Effect of an extended midwifery postnatal support programme on the duration of breast feeding: a randomised controlled trial. *Midwifery* 26:88-100

168. McKee M, Zayas L, Jankowski K. 2004. Breastfeeding intention and practice in an urban minority population: relationship to maternal depressive symptoms and mother infant closeness. *Journal of Reproductive and Infant Psychology* 22:167-81

169. McKeever P, Stevens B, Miller KL, MacDonell JW, Gibbins S, et al. 2002. Home versus hospital breastfeeding support for newborns: a randomized controlled trial. *Birth* 29:258-65

170. McLeod D, Pullon S, Cookson T. 2002. Factors influencing continuation of breastfeeding in a cohort of women. *Journal of Human Lactation : Official Journal Of International Lactation Consultant Association* 18:335-43

171. Mehta N, Lee H, Ylitalo K. 2012. Child health in the United States: Recent trends in racial/ethnic disparities. *Soc Sci Med*

172. Mehta U, Siega-Riz A, Herring A, Adair L, Bentley M. 2011. Maternal obesity, psychological factors, and breastfeeding initiation. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 6:369-76

173. Mejdoubi J, van den Heijkant SC, van Leerdam FJ, Crone M, Crijnen A, Hirasing RA. 2013. Effects of nurse home visitation on cigarette smoking, pregnancy outcomes and breastfeeding: A randomized controlled trial. *Midwifery*

174. Melton LJ, 3rd, Bryant SC, Wahner HW, O'Fallon WM, Malkasian GD, et al. 1993. Influence of breastfeeding and other reproductive factors on bone mass later in life. *Osteoporosis International : A Journal Established As Result Of Cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA* 3:76-83

175. Merewood A, Brooks D, Bauchner H, MacAuley L, Mehta SD. 2006. Maternal birthplace and breastfeeding initiation among term and preterm infants: a statewide assessment for Massachusetts. *Pediatrics* 118:e1048-54

176. Merewood A, Mehta SD, Chamberlain LB, Philipp BL, Bauchner H. 2005. Breastfeeding rates in US Baby-Friendly hospitals: results of a national survey. *Pediatrics* 116:628-34

177. Merewood A, Patel B, Newton KN, MacAuley LP, Chamberlain LB, et al. 2007. Breastfeeding duration rates and factors affecting continued breastfeeding among infants

born at an inner-city US Baby-Friendly hospital. *Journal of human lactation : official journal of International Lactation Consultant Association* 23:157-64

178. Mesters I, Gijsbers B, Bartholomew K, Knottnerus JA, Van Schayck OC. 2013. Social cognitive changes resulting from an effective breastfeeding education program. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 8:23-30

179. MMWR. 2010. Racial and ethnic differences in breastfeeding initiation and duration, by state - National Immunization Survey, United States, 2004-2008. *MMWR. Morbidity and Mortality Weekly Report* 59:327-34

180. Mofenson LM. 2010. Prevention in neglected subpopulations: prevention of mother-to-child transmission of HIV infection. *Clinical Infectious Diseases : An Official Publication of the Infectious Diseases Society of America* 50 Suppl 3:S130-48

181. Morrell CJ, Spiby H, Stewart P, Walters S, Morgan A. 2000. Costs and benefits of community postnatal support workers: a randomised controlled trial. *Health Technol Assess* 4:1-100

182. Morrow-Tlucak M, Haude RH, Ernhart CB. 1988. Breastfeeding and cognitive development in the first 2 years of life. *Soc Sci Med* 26:635-9

183. Morrow AL, Guerrero ML, Shults J, Calva JJ, Lutter C, et al. 1999. Efficacy of home-based peer counselling to promote exclusive breastfeeding: a randomised controlled trial. *Lancet* 353:1226-31

184. Mustillo S, Kwon S. 2012. The Use of Multiple Imputation When Data are Missing Not at Random. In *American Sociological Association Annual Meeting*. Colorado Convention Center and Hyatt Regency, Denver CO

185. NCHS. 2011. Health, United States, 2010: With Special Feature on Death and Dying. Hyattsville, MD: National Center Health Statistics

186. Nelson MC, Gordon-Larsen P, Adair LS. 2005. Are adolescents who were breast-fed less likely to be overweight? Analyses of sibling pairs to reduce confounding. *Epidemiology* 16:247-53

187. Neville MC, Morton J. 2001. Physiology and endocrine changes underlying human lactogenesis II. *The Journal Of Nutrition* 131:3005S-8S

188. Neville MC, Morton J, Umemura S. 2001. Lactogenesis. The transition from pregnancy to lactation. *Pediatric Clinics of North America* 48:35-52

189. Noble S. 2001. Maternal employment and the initiation of breastfeeding. *Acta Paediatr* 90:423-8

190. Nommsen-Rivers LA. 2004. Does breastfeeding protect against infant mortality in the United States? *Journal of Human Lactation : Official Journal of International Lactation Consultant Association* 20:357-8

191. Nommsen-Rivers LA, Chantry CJ, Cohen RJ, Dewey KG. 2010. Comfort with the idea of formula feeding helps explain ethnic disparity in breastfeeding intentions among expectant first-time mothers. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 5:25-33

192. Norr KF, Crittenden KS, Lehrer EL, Reyes O, Boyd CB, et al. 2003. Maternal and infant outcomes at one year for a nurse-health advocate home visiting program serving African Americans and Mexican Americans. *Public Health Nurs* 20:190-203

193. Oddy WH. 2001. Breastfeeding protects against illness and infection in infants and children: a review of the evidence. *Breastfeeding Review : Professional Publication of the Nursing Mothers' Association of Australia* 9:11-8

194. Oddy WH, Kendall GE, Li J, Jacoby P, Robinson M, et al. 2010. The long-term effects of breastfeeding on child and adolescent mental health: a pregnancy cohort study followed for 14 years. *The Journal of Pediatrics* 156:568-74

195. Ogbuanu C, Glover S, Probst J, Liu J, Hussey J. 2011. The effect of maternity leave length and time of return to work on breastfeeding. *Pediatrics* 127:e1414-27

196. Ogden CL, Carroll MD, Kit BK, Flegal KM. 2012. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *JAMA : The Journal of the American Medical Association* 307:483-90

197. Olds DL, Henderson CR, Jr., Chamberlin R, Tatelbaum R. 1986. Preventing child abuse and neglect: a randomized trial of nurse home visitation. *Pediatrics* 78:65-78

198. Olds DL, Henderson CR, Jr., Tatelbaum R, Chamberlin R. 1986. Improving the delivery of prenatal care and outcomes of pregnancy: a randomized trial of nurse home visitation. *Pediatrics* 77:16-28

199. Olds DL, Robinson J, O'Brien R, Luckey DW, Pettitt LM, et al. 2002. Home visiting by paraprofessionals and by nurses: a randomized, controlled trial. *Pediatrics* 110:486-96

200. Ortiz Matos N, Garcia Fragoso L. 2008. Management of lactation and breastfeeding: role of the resident physician. *Boletin de la Asociacion Medica de Puerto Rico* 100:21-3

201. Ostbye T, Krause KM, Swamy GK, Lovelady CA. 2010. Effect of breastfeeding on weight retention from one pregnancy to the next: results from the North Carolina WIC program. *Preventive Medicine* 51:368-72

202. Ostbye T, Peterson BL, Krause KM, Swamy GK, Lovelady CA. 2012. Predictors of postpartum weight change among overweight and obese women: results from the Active Mothers Postpartum study. *J Womens Health (Larchmt)* 21:215-22

203. Overturf GD. 2000. American Academy of Pediatrics. Committee on Infectious Diseases. Technical report: prevention of pneumococcal infections, including the use of pneumococcal conjugate and polysaccharide vaccines and antibiotic prophylaxis. *Pediatrics* 106:367-76

204. Owen CG, Martin RM, Whincup PH, Smith GD, Cook DG. 2005. Effect of infant feeding on the risk of obesity across the life course: a quantitative review of published evidence. *Pediatrics* 115:1367-77

205. Parashar UD, Kilgore PE, Holman RC, Clarke MJ, Bresee JS, Glass RI. 1998. Diarrheal mortality in US infants. Influence of birth weight on risk factors for death. *Archives of Pediatrics & Adolescent Medicine* 152:47-51

206. Paton LM, Alexander JL, Nowson CA, Margerison C, Frame MG, et al. 2003. Pregnancy and lactation have no long-term deleterious effect on measures of bone mineral in healthy women: a twin study. *The American Journal Of Clinical Nutrition* 77:707-14

207. Paul IM, Beiler JS, Schaefer EW, Hollenbeak CS, Alleman N, et al. 2012. A randomized trial of single home nursing visits vs office-based care after nursery/maternity discharge: the Nurses for Infants Through Teaching and Assessment After the Nursery (NITTANY) Study. *Archives of Pediatrics & Adolescent Medicine* 166:263-70

208. Peng C, Harwell M, Liou S, Ehman L. 2006. Advances in missing data methods and implications for educational research. In *Real Data Analysis*, ed. S Sawilowsky:31-78. Greenwich, CT: Information Age. Number of 31-78 pp.

209. Philipp B, Jean-Marie S. 2007. African American Women and Breastfeeding. Washington DC: Joint Center for Political and Economic Studies, Health Policy Institute

210. Philipp B, Merewood A, Miller L, Chawla N, Murphy-Smith M, et al. 2001. Baby-friendly hospital initiative improves breastfeeding initiation rates in a US hospital setting. *Pediatrics* 108:677-81

211. Popkin BM, Adair L, Akin JS, Black R, Briscoe J, Flieger W. 1990. Breast-feeding and diarrheal morbidity. *Pediatrics* 86:874-82

212. Pugh LC, Milligan RA, Frick KD, Spatz D, Bronner Y. 2002. Breastfeeding duration, costs, and benefits of a support program for low-income breastfeeding women. *Birth* 29:95-100

213. Pugh LC, Serwint JR, Frick KD, Nanda JP, Sharps PW, et al. 2010. A randomized controlled community-based trial to improve breastfeeding rates among urban low-income mothers. *Academic Pediatrics* 10:14-20

214. Purdy IB, Singh N, Le C, Bell C, Whiteside C, Collins M. 2012. Biophysiologic and social stress relationships with breast milk feeding pre- and post-discharge from the neonatal intensive care unit. *Journal of Obstetric, Gynecologic, And Neonatal Nursing : JOGNN / NAACOG* 41:347-57

215. Quigley MA, Hockley C, Carson C, Kelly Y, Renfrew MJ, Sacker A. 2012. Breastfeeding is associated with improved child cognitive development: a population-based cohort study. *The Journal of Pediatrics* 160:25-32

216. Qureshi AM, Oche OM, Sadiq UA, Kabiru S. 2011. Using community volunteers to promote exclusive breastfeeding in Sokoto State, Nigeria. *The Pan African Medical Journal* 10:8

217. Raju TN. 2011. Breastfeeding is a dynamic biological process--not simply a meal at the breast. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 6:257-9

218. Ransjo-Arvidson AB, Chintu K, Ng'andu N, Eriksson B, Susu B, et al. 1998. Maternal and infant health problems after normal childbirth: a randomised controlled study in Zambia. *Journal of Epidemiology And Community Health* 52:385-91

219. Rasmussen KM. 2007. Association of maternal obesity before conception with poor lactation performance. *Annu Rev Nutr* 27:103-21

220. Rasmussen KM, Kjolhede CL. 2004. Prepregnant overweight and obesity diminish the prolactin response to suckling in the first week postpartum. *Pediatrics* 113:e465-71

221. Rautava L, Hakkinen U, Korvenranta E, Andersson S, Gissler M, et al. 2009. Health-related quality of life in 5-year-old very low birth weight infants. *The Journal of Pediatrics* 155:338-43 e1-3

222. Rautava S, Walker WA. 2009. Academy of Breastfeeding Medicine founder's lecture 2008: breastfeeding--an extrauterine link between mother and child. *Breastfeeding Medicine : The Official Journal Of the Academy of Breastfeeding Medicine* 4:3-10

223. Ray WA, Hall K, Meador KG. 2007. Racial differences in antidepressant treatment preceding suicide in a Medicaid population. *Psychiatr Serv* 58:1317-23

224. Rea MF. 2004. Benefits of breastfeeding and women's health. *Jornal de pediatria* 80:S142-6

225. Renfrew MJ, Craig D, Dyson L, McCormick F, Rice S, et al. 2009. Breastfeeding promotion for infants in neonatal units: a systematic review and economic analysis. *Health Technol Assess* 13:1-146, iii-iv

226. Rimpela A. 2000. Challenging current evaluation approaches: Lessons from the conference for the research community. In *Best Practices, Quality and Effectiveness of Health Promotion.* , ed. N L., W M. Helsinki, Finland: Finnish Centre for Health Promotion.

227. Roberts SB. 2001. Prevention of hypertension in adulthood by breastfeeding? *Lancet* 357:406-7

228. Robinson K, VandeVusse L. 2009. Exploration of African-American women's infant feeding choices. *Journal of National Black Nurses' Association : JNBNA* 20:32-7

229. Rossen LM, Schoendorf KC. 2012. Measuring health disparities: trends in racial-ethnic and socioeconomic disparities in obesity among 2- to 18-year old youth in the United States, 2001-2010. *Annals of Epidemiology* 22:698-704

230. Rubin D. 1987. *Multiple Imputation for Nonresponse in Surveys*. NY: Wiley & Sons

231. Ryan AS, Zhou W. 2006. Lower breastfeeding rates persist among the Special Supplemental Nutrition Program for Women, Infants, and Children participants, 1978-2003. *Pediatrics* 117:1136-46

232. Ryan AS, Zhou W, Arensberg MB. 2006. The effect of employment status on breastfeeding in the United States. *Women's Health Issues : Official Publication of the Jacobs Institute of Women's Health* 16:243-51

233. Saadeh R. 2012. The baby-friendly hospital initiative 20 years on: facts, progress, and the way forward. *Journal of Human Lactation : Official Journal of International Lactation Consultant Association* 28:272-5

234. Saadeh R, Casanovas C. 2009. Implementing and revitalizing the Baby-Friendly Hospital Initiative. *Food and Nutrition Bulletin* 30:S225-9

235. Saunders J, Morrow-Howell N, Spitznagel E, Dore P, al. E. 2006. Imputing missing data: A comparison of methods for social work researchers. *Social Work Research* 30:19-31

236. Schafer J. 1997. *Analysis of Incomplete Multivariate Data*. London: Chapman and Hall

237. Schafer J, Olsen M. 1998. Multiple imputation for multivariate missing data problems: A data analyst's persepctive. *Multivariate Behavioral Research* 33:545-71

238. Schanler RJ, Atkinson SA. 1999. Effects of nutrients in human milk on the recipient premature infant. *J Mammary Gland Biol Neoplasia* 4:297-307

239. Schlomer G, Bauman S, Card N. 2010. Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology* 57:1-10

240. Scott JA, Binns CW. 1999. Factors associated with the initiation and duration of breastfeeding: a review of the literature. *Breastfeeding Review : Professional Publication of the Nursing Mothers' Association of Australia* 7:5-16

241. Sharma V, Corpse CS. 2008. Case study revisiting the association between breastfeeding and postpartum depression. *Journal of Human Lactation : Official Journal of International Lactation Consultant Association* 24:77-9

242. Shealy KR, Li R, Benton-Davis S, Grummer-Strawn L. 2005. The CDC Guide to Breastfeeding Interventions. Atlanta: Centers for Disease Control and Prevention

243. Singh GK, Kogan MD, Dee DL. 2007. Nativity/immigrant status, race/ethnicity, and socioeconomic determinants of breastfeeding initiation and duration in the United States, 2003. *Pediatrics* 119 Suppl 1:S38-46

244. Sinharay S, Stern H, Russell D. 2001. The use of multiple imputation for the analysis of missing data. *Psychological Methods* 6:317-29

245. Slater M, Stringer EM, Stringer JS. 2010. Breastfeeding in HIV-positive women: What can be recommended? *Paediatric Drugs* 12:1-9

246. Sparks PJ. 2011. Racial/ethnic differences in breastfeeding duration among WIC-eligible families. *Women's Health Issues : Official Publication of the Jacobs Institute of Women's Health* 21:374-82

247. Spiers PS, Guntheroth WG. 2001. The black infant's susceptibility to sudden infant death syndrome and respiratory infection in late infancy. *Epidemiology* 12:33-7

248. Stoltzfus E, Lynch K. 2009. Home visitation for families with young children (CRS Report for Congress).

249. Stuebe AM, Bonuck K. 2011. What predicts intent to breastfeed exclusively? Breastfeeding knowledge, attitudes, and beliefs in a diverse urban population. *Breastfeeding Medicine : The Official Journal of the Academy of Breastfeeding Medicine* 6:413-20

250. Sudfeld CR, Fawzi WW, Lahariya C. 2012. Peer support and exclusive breastfeeding duration in low and middle-income countries: a systematic review and meta-analysis. *PloS one* 7:e45143

251. Svennersten-Sjaunja K, Olsson K. 2005. Endocrinology of milk production. *Domest Anim Endocrinol* 29:241-58

252. Taha TE, Kumwenda NI, Hoover DR, Kafulafula G, Fiscus SA, et al. 2006. The impact of breastfeeding on the health of HIV-positive mothers and their children in sub-Saharan Africa. *Bulletin of the World Health Organization* 84:546-54

253. Tanaka K, Kon N, Ohkawa N, Yoshikawa N, Shimizu T. 2009. Does breastfeeding in the neonatal period influence the cognitive function of very-low-birth-weight infants at 5 years of age? *Brain Dev* 31:288-93

254. Tanentsapf I, Heitmann BL, Adegboye AR. 2011. Systematic review of clinical trials on dietary interventions to prevent excessive weight gain during pregnancy among normal weight, overweight and obese women. *BMC Pregnancy And Childbirth* 11:81

255. Taveras EM, Capra AM, Braveman PA, Jensvold NG, Escobar GJ, Lieu TA. 2003. Clinician support and psychosocial risk factors associated with breastfeeding discontinuation. *Pediatrics* 112:108-15

256. Tilghman J. 2003. Obesity and diabetes in African American women. *The ABNF Journal: Official Journal of the Association of Black Nursing Faculty in Higher Education, Inc* 14:66-8

257. Tylleskar T, Jackson D, Meda N, Engebretsen IM, Chopra M, et al. 2011. Exclusive breastfeeding promotion by peer counsellors in sub-Saharan Africa (PROMISE-EBF): a cluster-randomised trial. *Lancet* 378:420-7

258. USDA. 2012. *WIC Program: Racial/Ethnic Group Enrollment by Category (April 2010).* http://www.fns.usda.gov/wic/racial-ethnicdata/2010racial-ethnicdata.htm

259. Uvnas-Moberg K. 1998. Oxytocin may mediate the benefits of positive social interaction and emotions. *Psychoneuroendocrinology* 23:819-35

260. Uvnas-Moberg K, Eriksson M. 1996. Breastfeeding: physiological, endocrine and behavioural adaptations caused by oxytocin and local neurogenic activity in the nipple and mammary gland. *Acta Paediatr* 85:525-30

261. Vannuchi MT, Monteiro CA, Rea MF, Andrade SM, Matsuo T. 2004. [The Baby-Friendly Hospital Initiative and breastfeeding in a neonatal unit]. *Revista de Saude Publica* 38:422-8

262. Vohr BR, Poindexter BB, Dusick AM, McKinley LT, Wright LL, et al. 2006. Beneficial effects of breast milk in the neonatal intensive care unit on the developmental outcome of extremely low birth weight infants at 18 months of age. *Pediatrics* 118:e115-23

263. Walker LO, Chesnut LW. 2010. Identifying health disparities and social inequities affecting childbearing women and infants. *J Obstet Gynecol Neonatal Nurs* 39:328-38

264. Wasik B, Bryant D. 2000. *Home visiting: Procedures for helping families (2nd Ed.)*. Thousand Oaks, CA: Sage Publications

265. Wells N, Sbrocco T, Hsiao CW, Hill LD, Vaughn NA, Lockley B. 2008. The impact of nurse case management home visitation on birth outcomes in African-American women. *Journal of the National Medical Association* 100:547-52

266. Wen LM, Baur LA, Simpson JM, Rissel C, Flood VM. 2011. Effectiveness of an early intervention on infant feeding practices and "tummy time": a randomized controlled trial. *Archives of Pediatrics & Adolescent Medicine* 165:701-7

267. Wen LM, De Domenico M, Elliott D, Bindon J, Rissel C. 2009. Evaluation of a feasibility study addressing risk factors for childhood obesity through home visits. *Journal of Paediatrics And Child Health* 45:577-81

268. WHO. 1998. Health Promotion Evaluation: Recommendations to Policymakers. Report of the WHO European Working Group on Health Promotion Evaluation. Copenhagen, Denmark: World Health Organization

269. Witgert K, Giles B, Richardson A. 2012. Medicaid Financing of Early Childhood Home Visiting Programs: Options, Opportunities, and Challenges. *Pew Center on the States*

270. Wojcicki JM. 2011. Maternal prepregnancy body mass index and initiation and duration of breastfeeding: a review of the literature. *J Womens Health (Larchmt)* 20:341-7

271. Woo JG, Dolan LM, Morrow AL, Geraghty SR, Goodman E. 2008. Breastfeeding helps explain racial and socioeconomic status disparities in adolescent adiposity. *Pediatrics* 121:e458-65

272. Wosje KS, Kalkwarf HJ. 2004. Lactation, weaning, and calcium supplementation: effects on body composition in postpartum women. *The American Journal Of Clinical Nutrition* 80:423-9

273. Yang L, Jacobsen KH. 2008. A systematic review of the association between breastfeeding and breast cancer. *J Womens Health (Larchmt)* 17:1635-45

274. Young SL, Mbuya MN, Chantry CJ, Geubbels EP, Israel-Ballard K, et al. 2011. Current knowledge and future research on infant feeding in the context of HIV: basic, clinical, behavioral, and programmatic perspectives. *Adv Nutr* 2:225-43

275. Zembo CT. 2002. Breastfeeding. *Obstetrics and Gynecology Clinics Of North America* 29:51-76

276. Ziol-Guest KM, Hernandez DC. 2010. First- and second-trimester WIC participation is associated with lower rates of breastfeeding and early introduction of cow's milk during infancy. *Journal of the American Dietetic Association* 110:702-9

277. Zuvekas SH, Fleishman JA. 2008. Self-rated mental health and racial/ethnic disparities in mental health service use. *Medical Care* 46:915-23