**California Department of Public Health**
**Center for Family Health**
**Maternal, Child and Adolescent Health Program**

# The Black Infant Health Program: Comprehensive Assessment Report and Recommendations

**University of California, San Francisco**
**Center on Social Disparities in Health**
**Department of Family and Community Medicine**
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# Executive Summary

**Background**

California's Black Infant Health (BIH) Program was established in 1989 to reduce high infant mortality rates among African-Americans in this State. The BIH Program provides health education, health promotion, social support, and service coordination to pregnant and parenting African-American adult women in 17 local health jurisdictions (LHJ) where approximately 94 percent of all African-American live births in this State occur.

In April 2006, the Maternal Child and Adolescent Health Program (MCAH) of the California Department of Public Health (CDPH, formerly California Department of Health Services) requested that Dr. Paula Braveman and her research team in the Department of Family and Community Medicine at UCSF conduct a detailed assessment of the BIH Program. MCAH also convened a State BIH Community Advisory Committee to provide input with a range of perspectives and expertise in the evaluation of the Program and recommendations for improvement.

The assessment was intended to provide a scientific basis for recommending interventions with measurable outcomes that would permit sound evaluation of the impact of the Program on the target population in the next phase of the BIH Program. This report is intended to provide a scientific basis for a process of in-depth discussion among MCAH staff, BIH staff and MCAH Directors at county level, with continued scientific input, that will ultimately shape BIH's next steps. It is not offered as a prescription, but as a point of departure.

**Methods**

The first product of the assessment (submitted June 30, 2006) summarized current literature relevant to reducing African-American infant mortality. The second product of the assessment (submitted December 31, 2006) reviewed the current local implementation of the BIH Program through site visits, meetings and teleconferences with local BIH staff and the State BIH Community Advisory Committee, and review of Branch documents; it also summarized discussions with key informants --

primarily but not exclusively in other states-- regarding experiences with programs aiming to reduce African-American infant mortality.

This third product of the assessment summarizes and synthesizes the work done in the two previous reports and, based on that work and further information gathering, provides draft recommendations for the next phase of the BIH Program; these draft recommendations are intended to stimulate discussion among MCAH Program staff and to stimulate discussion among local BIH staff and MCAH Directors as well as the Statewide Community Advisory Committee. The recommendations reflect a synthesis of input derived from the literature review, site visits, teleconferences with BIH Coordinators/MCAH Directors, meetings/teleconferences of the State BIH Community Advisory Committee, review of Branch documents, previous evaluations of the BIH Program, and key informant interviews. We believe these recommendations reflect current scientific knowledge as well as considerations of feasibility.

## Summary of Draft Recommendations for Discussion

*Note: The following draft recommendations assume that there will not be an increase in the funding available for the BIH Program through the MCAH Program in the immediate future.*

**This report makes two general recommendations:**

Recommendation I. Develop and implement a single core model for all local BIH Program sites that:

- Addresses health promotion, social support, empowerment, and health education throughout a woman's pregnancy and early parenting.
- Builds upon promising models such as the BIH Social Support and Empowerment model, the Centering Pregnancy and Centering Parenting approach, other models developed by BIH sites, and materials developed and tested elsewhere, adapting and synthesizing them in ways tailored to BIH's target population.
- Increases the number of pregnant or postpartum women served by using creative and efficient approaches to outreach, inter-agency linkages, group-based services, and targeted one-on-one support.
- Identify a set of specified, measurable outcomes reflecting the health of African-American women and infants.
- Is standardized across all sites.

► A standardized core model is crucial to permit a solid assessment of program outcomes. The BIH Program, like other public programs, is dependent on policy-maker support for ongoing funding. Because no single BIH site or even cluster of sites serves sufficient numbers of participants to have statistically significant results on its own, outcome information must be pooled across sites—a process that requires a shared set of core activities with consistent implementation at all sites. Without this fundamental standardization, BIH outcomes cannot be measured and reported in ways that can be meaningful and convincing for policymakers.

► The BIH Program has limited resources. It is worthwhile to seek promising strategies that could build on current strengths of the Program and potentially expand the population served and the Program's impact on each client, by combining existing components with other promising approaches. Approaches that should be considered include innovative group-based approaches for delivery of services that facilitate social support, empowerment, health education, and health promotion.

► The core model for the BIH Program should build on successful components of the existing BIH Program, while exploring other promising practices such as the Centering Pregnancy and Centering Parenting approach, which integrates recommended prenatal, postpartum, and infant medical care with social support, empowerment, health education, and health promotion.

► The ultimate goal for the BIH Program is improved maternal and infant health among African-Americans in California. Measurable objectives should include favorable patterns in outcomes such as those listed below as examples. The need to evaluate key measures must be balanced against the need to streamline data collection requirements and avoid excessive burden on local BIH staff:

- *Utilization of recommended preventive medical services* including prenatal, postpartum (including family planning), well-baby, and women's health care
- *Health knowledge* (prenatal, postpartum, infant, women's health)
- *Mastery/self-efficacy, self-esteem, life skills*
- *Social support* (including emotional and material/practical support)

- *Maternal mental health*
- *Parenting skills, child abuse/neglect*
- *Educational and occupational outcomes* for women
- *Health behaviors* including diet and breastfeeding, use of harmful substances, physical activity
- *Inter-pregnancy intervals*
- *Birth outcomes* (*birth weight, low birth weight*, *very low birth weight*, and *preterm birth*).

Recommendation II. Support effective implementation of the core BIH program model and enhance its impact on Black maternal and infant health by:

- Strengthening partnerships and linkages with other relevant agencies.
- Strengthening community engagement.
- Strengthening the use of media for community-wide outreach, health promotion and education, using materials developed by MCAH for statewide use, with substantial input from local sites, particularly those who through their own initiatives already have extensive experience with media use.
- Ensuring adequate training, technical assistance and staff development.

► Improving Black infant and maternal health will require coordinated efforts by multiple agencies, as well as policy changes at many levels and in many sectors beyond health care. The BIH Program should facilitate and build on linkages with programs that offer related or complementary services; such linkages can greatly increase the impact of the BIH Program, through increasing referrals into BIH and augmenting services received by BIH participants.

► Community engagement can lead to improved health of communities and can mobilize resources that would not be available with a more traditional "top-down" approach. The BIH Program should include efforts to increase the skills of BIH staff in promoting community engagement, strengthen local Community Advisory Boards by incorporating additional key stakeholders, increase community awareness of the BIH Program and its services, and increase community-level activities to promote Black maternal and infant health. All sites—and in particular those that currently are involved in few community engagement activities--need adequate training

and ongoing technical assistance; the staff of sites that are already involved in promoting community engagement can share their expertise on strengthening engagement activities with other sites by assisting in training and ongoing technical assistance. Ongoing guidance should be provided on utilizing local BIH Community Advisory Boards to incorporate key stakeholders and leaders who are likely to be effective in building community engagement.

► Media campaigns can increase public awareness and support of Black maternal and infant health concerns and also can increase enrollment of women in BIH services (through self-referral and referral by family, friends, other community members, and agencies). Media campaigns need to be strategic, with the multiple goals of outreach for potential BIH clients, community education about important health messages, and increasing awareness of and support for BIH among policy-makers and the public. MCAH should develop a coordinated statewide media strategy and materials, using professional media consultants to the extent that resources permit, and with significant input from local BIH staff. Local implementation of the media strategy should be under local leadership, but materials and guidance should be provided by the state as it is not affordable or efficient for each site to develop its own media materials separately.

► A transition to a single core BIH Program will present new challenges for many BIH staff. A shift in program focus is likely to occur for some local sites, which will require substantial retraining of staff. It is hoped that all current staff who are committed to BIH will continue in the future, with re-training and ongoing technical support. Regular meetings and teleconferences of State and local staff should include time for discussing challenges and approaches; local program staff should be actively involved in planning to ensure that changes in the program are reasonable and feasible. Opportunities for sharing expertise and maintaining morale should help to improve staff skills and increase program productivity and impact. Staff morale could also be enhanced through recognition of sites and/or staff at public events; these events would also provide opportunities for showcasing BIH to local politicians, community leaders, and agencies.

# Introduction

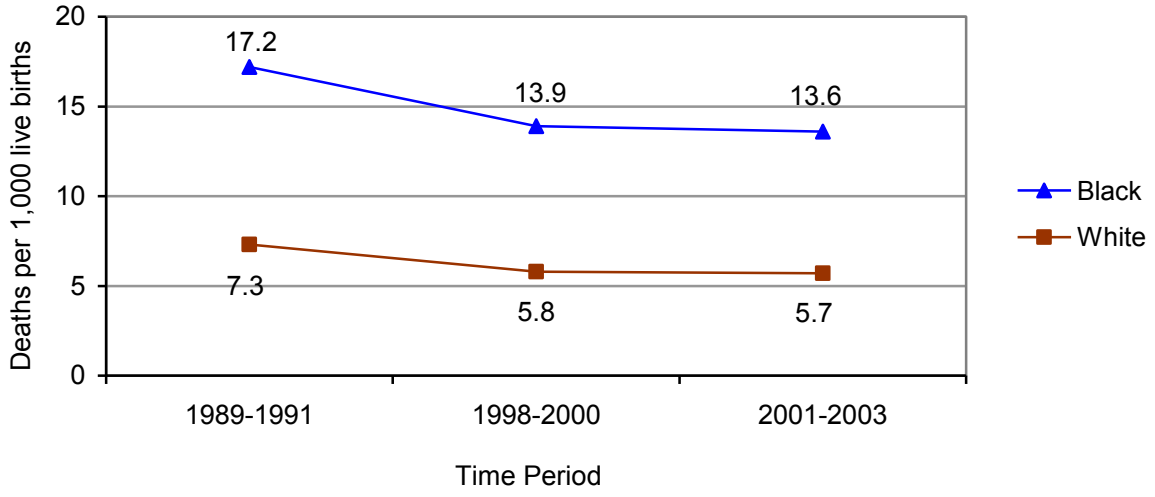
This section first reviews information on the large and persistent disparities in infant and maternal health that the BIH Program is intended to address, followed by background on the Program itself.

## Black-White Disparities in Infant and Maternal Health in the United States and in California

*Infant mortality, neonatal mortality and postneonatal mortality*

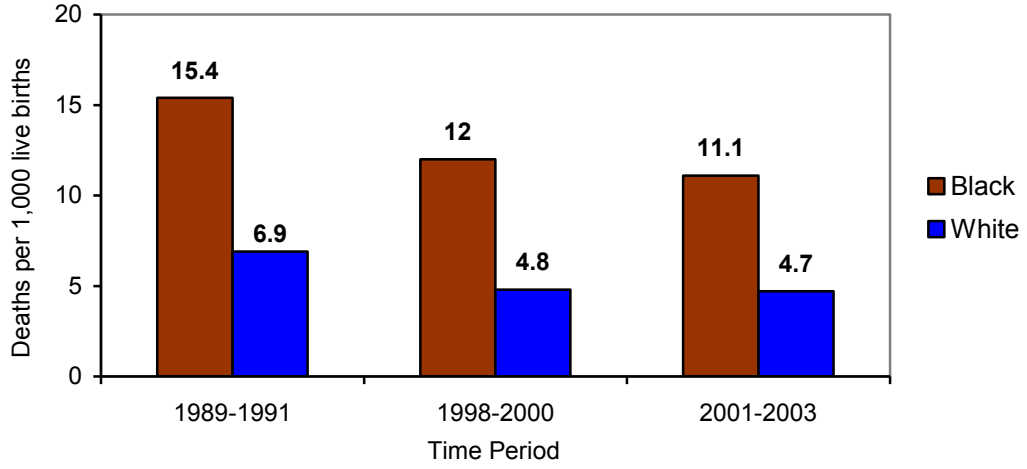
The infant mortality rate is the number of infants who die before reaching their first birthday, out of every 1,000 babies born alive. Infant mortality rates have improved over time among African-Americans and Whites both nationwide (Figure 1) and in California (Figure 2) since 1989-1991.[1] Rates of infant mortality in California are lower than in the United States overall among both African-Americans and Whites. Nevertheless, infant mortality rates remain very high among African-Americans both in California and nationally and the approximately two-fold disparity in infant mortality between African-American and White infants in the U.S. (Figure 1) and California (Figure 2) has persisted over time. The African-American infant mortality rate in California for the period of 2001-2003 was 11.1, more than twice the rate of 4.7 among White infants (Figure 2).

**FIGURE 1. Black-White disparity, infant mortality rates, United States.**




Source: National Center for Health Statistics. Health United States, 2006.

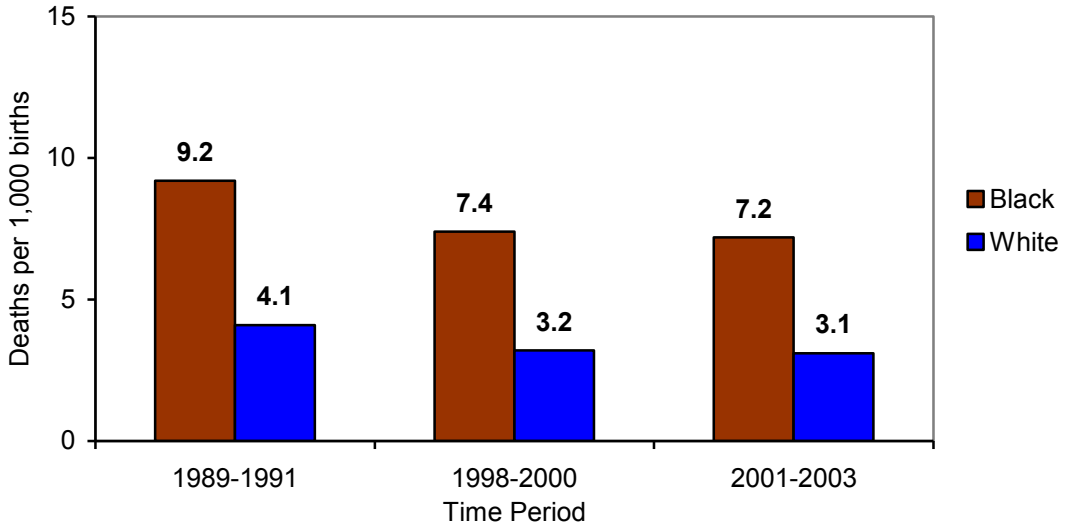
**FIGURE 2. Black-White disparity in infant mortality rates, California.**




Source: National Center for Health Statistics. Health, United States, 2006.

The neonatal mortality rate is the number of babies who die in the first 28 days of life, out of every 1,000 babies born alive. As one component of infant mortality, neonatal mortality largely reflects the quality of hospital care for sick newborns and for women with high-risk pregnancies. As shown in Figure 3, there have been substantial improvements over time in neonatal mortality among African-Americans in California; however, as seen with infant mortality overall, the more than two-fold Black-White disparity in neonatal mortality has persisted, which is widely thought to reflect the continued disparity in low birth weight and preterm birth.

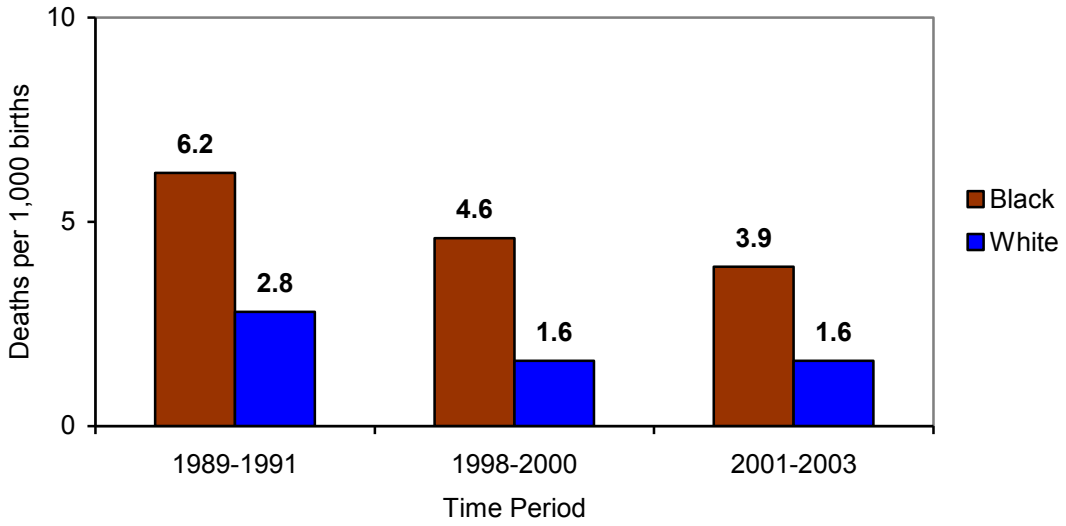
**FIGURE 3. Black-White disparity in neonatal mortality rates, California.**




Source: National Center for Health Statistics. Health United States, 2006.

The postneonatal mortality rate refers to the number of infants who die from 29 through 364 days of age, out of every 1,000 infants born alive. The postneonatal component of infant mortality largely reflects socioeconomic and social factors, although community-based medical care plays a role as well. As shown in Figure 4, postneonatal mortality rates among African-Americans in California are decreasing; however, the Black-White disparity in postneonatal mortality remains.

**FIGURE 4. Black-White disparity in postneonatal mortality rates, California.**

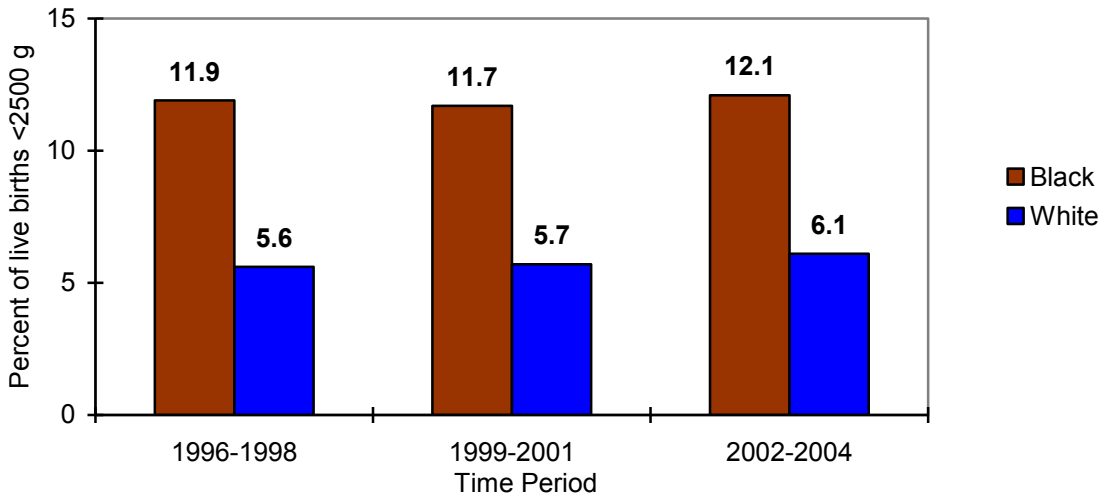



Source: UCSF analysis of National Center for Health Statistics, Health, United States, 2006.

*Low Birth Weight (LBW) and Preterm Birth (PTB)*

Low birth weight (being born too small—weighing less than 2500 grams) and prematurity (being born too soon—earlier than 37 weeks of gestation) are strong predictors of infant mortality as well as infant morbidity and childhood developmental delay or disability.[2] Associations also have been noted between LBW and PTB and major chronic diseases during adulthood,[3, 4], and poor birth outcomes are more likely among pregnant women who themselves were born with low birth weight.[5, 6] As shown in Figure 5, the percentage of infants with low birth weight increased slightly for both African-American and White infants in California between 1996-1998 and 2002-2004--possibly as a result of increased use of assisted reproductive technologies. The Black-White disparity in LBW has persisted over time.

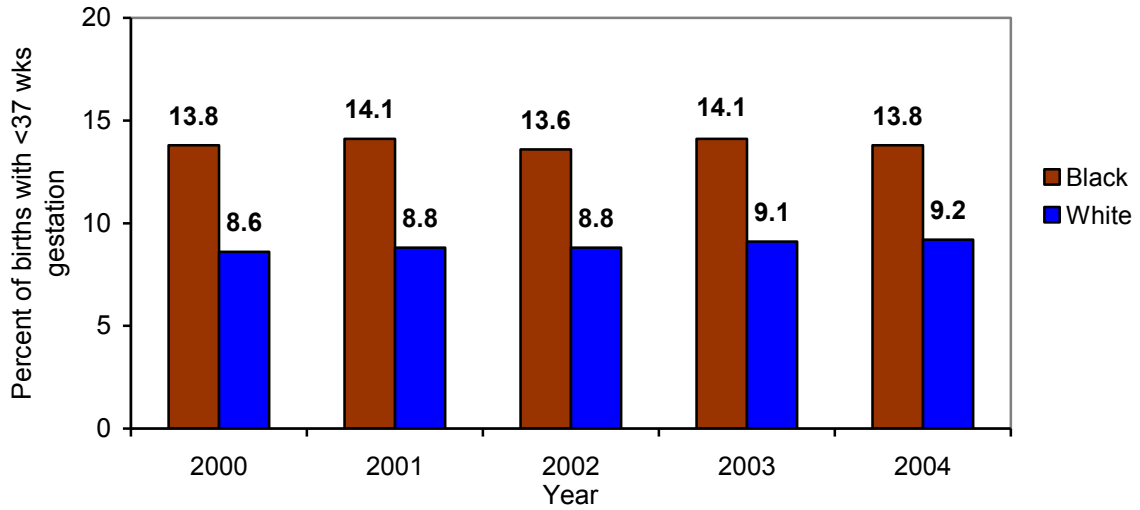
**FIGURE 5. Black-White disparity in low birth weight births, California.**




Source: National Center for Health Statistics. Health United States, 2006.

Figure 6, based on data from the National Center for Health Statistics' *VitalStats,*[7] shows the rates of PTB among both African-American and White infants over a five-year period from 2000 to 2004. While the percentage of PTB among African-Americans has remained relatively stable over the five-year period and has increased slightly for Whites, the Black-White disparity in PTB during this period has persisted.

**FIGURE 6. Black-White disparity in preterm births, California.**




Source: National Center for Health Statistics. VitalStats. http://www.cdc.gov/nchs/vitalstats.htm. Accessed March 29, 2007.

*Maternal Mortality*

Maternal mortality refers to death of a woman during pregnancy or within 42 days following termination of pregnancy, "irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes."[8] The maternal mortality ratio is the number of maternal deaths per 100,000 live births. Leading causes of maternal mortality include embolism, hemorrhage and hypertensive disorders of pregnancy. [9] Maternal mortality is widely considered to be highly preventable with receipt of quality prenatal and obstetrical care. Data from the National Center for Health Statistics' Health, United States, 2006 [10] show that pregnancy-related deaths have declined drastically over the past several decades, but progress has stalled in the reduction of maternal mortality overall since 1980. The overall U.S. maternal mortality ratio for all races in 1980 was 9.4 per 100,000 live births, while in 2004 the rate was 11.3 per 100,000.* African-American women are dying from maternal causes at rates higher than women of all other races. In 2004, the maternal mortality ratio for African-American women was 32.3 per 100,000 live births, a ratio over 4 times higher than that among White women (7.5). [10] Although the racial disparity in maternal mortality is very high, maternal mortality is a sufficiently rare event, even among Black women, that it is difficult to monitor maternal mortality below the national level.

The large and persistent Black-White disparities in LBW, PTB, neonatal and postneonatal mortality, and maternal mortality require continued, focused attention nationally and in California. High-quality prenatal, obstetric, and neonatal/postpartum medical care are crucial to preventing both neonatal and maternal mortality. Further progress in decreasing neonatal mortality, however, may depend on progress with LBW and PTB. Less is known about the causes and solutions for LBW and PTB, but there is a growing consensus about the likely need to address preconception/interconception as well as prenatal factors, and that having healthy babies may require having generally healthy women. Furthermore, a growing scientific literature supports the notion that social factors may play a crucial role in Black-White disparities in birth outcomes (LBW, PTB), and that social factors are key determinants of health across the entire lifecourse. Progress with

* Data on pregnancy-related deaths is calculated from death certificates. Due to underreporting of cause of death on death certificate, published rates of pregnancy-related deaths are likely to be conservative estimates of the true maternal mortality ratio. [11]

SIDS and injury mortality, which require community-level health promotion efforts, are crucial to reducing postneonatal deaths. These very serious adverse outcomes (LBW, PTB, infant and maternal mortality) should be viewed as extremes occurring on a long continuum with multiple opportunities to intervene not only to prevent catastrophe, but to promote health. The BIH Program needs to address not only maternal and infant mortality, but maternal and infant *health* among African-Americans, in efforts to close the persistent Black-White disparities. The BIH Program needs to be strategic in identifying where it can have the most impact with the level of resources available to it.

## California's Black Infant Health (BIH) Program

The BIH Program was created with the passage of Senate Bill 165, Budget Act of 1989 (Alquist, Chapter 93, Statutes of 1988) to address the disproportionate burden of infant mortality, low birth weight and prematurity in African-American communities throughout California. SB 165 initially appropriated $1.4 million for four demonstration projects aimed at reducing Black infant mortality in California. Since that time, the BIH Program has expanded to include sites in 17 local health jurisdictions, both cities and counties, with a total annual appropriation of $13.7 million.

The BIH Program provides community-based, culturally-sensitive health promotion and support services to pregnant and parenting African-American women at risk of adverse birth outcomes. The BIH Program utilizes a service coordination model called "Prenatal Care Outreach & Tracking," implemented by trained Community Health Outreach Workers (CHOWs) to facilitate access to health and social services and provide health education to women from pregnancy through the first postpartum year. Local programs have built upon this framework by adding social support groups and additional education courses; some have also added nurse case management, which includes home visiting for high-risk women, and/or have added support services for men who are expecting or parenting an African-American infant.

## Rationale for the Assessment Project

The UCSF assessment was requested by the MCAH Program based on concerns about the lack of progress in reducing infant health disparities and in improving birth outcomes among African-Americans in California, recognizing that these concerns apply nationwide as well. There was also interest in exploring ways to collect and analyze data that would more effectively inform policy-makers about the Program's impact; this was seen as particularly important given the general climate of budget constraints, putting increased pressure on all programs to justify their outcomes.

*The Larger Context: MCAH Program Priorities for 2006-2010*

The assessment of BIH was informed by considering the overall MCAH Program priorities for 2006-2010, listed below:

- Enhance preconception care and work toward eliminating disparities in infant and maternal morbidity and mortality.
- Promote healthy lifestyle practices among MCAH populations and reduce the rate of overweight children and adolescents.
- Promote responsible sexual behavior to decrease the rate of teenage pregnancy and sexually transmitted infections.
- Improve mental health and decrease substance abuse among children, adolescents, and pregnant or parenting women.
- Improve access to medical and dental services, including the reduction of disparities.
- Decrease unintentional and intentional injuries and violence, including family and intimate partner violence.
- Increase breastfeeding initiation and duration *(make breastfeeding the norm)*.

## Methods Used in This Assessment

This section describes the approach used in this assessment process.

### Literature Review

An extensive review of the literature on Black infant health was conducted through a search for published and non-published literature related both to interventions (clinical and public health programs) and causal factors, pathways and mechanisms leading to Black infant health outcomes. Published literature was located through computerized database searches (PubMed, Clinical Evidence, Cochrane Library, PsycINFO, HealthSTAR, BioethicsLINE, CINAHL), web searches for program interventions, and manual searches of key articles for relevant citations. Review articles, meta-analyses, and original research pieces were reviewed, along with published and unpublished program evaluations and reports on interventions.

The original literature review was recently updated with a more focused search (restricted to PubMed) on issues that emerged in the process of developing the recommendations. These issues include augmented prenatal care, home visiting, empowerment, community involvement, and use of mass media in health promotion.

### Key Informant Interviews

Interviews were conducted with staff at programs recognized as having interventions focused on African-American infant health; while these programs were located both in California and nationwide, the majority of programs were located outside the State. Programs were identified through inclusion in CityMatCH[*] "best practice" files (for maternal and infant health), suggestions from State MCAH Program staff, and knowledge of the Assessment team and its advisors. Key informants, who include several Healthy Start[†] program staff, were queried about the successes, challenges, and lessons learned for program implementation; we were particularly interested in any

[*] CityMatCH is a national organization comprised of city and county maternal and child health programs and leaders of urban communities.

[†] A federal initiative of the Health Resources and Services Administration (HRSA), Healthy Start funds local areas to develop community-based systems approaches to reduce infant mortality and generally improve maternal and infant health in at-risk communities.

information gained from experience that would not necessarily be captured in publications. A list of the interviewed key informants is provided in Appendix 1.

### Site Visits

Site visits were made to 16 of the 17* local BIH Programs to gain insight on local implementation of the BIH Program. Semi-structured interviews were conducted with local program staff on several topics, including program models utilized, subcontracts, linkages, client profiles, data systems, and community involvement. Successes and challenges of each local BIH Program were discussed, and staff identified local initiatives and unique aspects of their programs. At three BIH sites, we also interviewed program clients for their perspectives on the BIH Program.

### Review of MCAH Documents

Current and historical program documents pertaining to the implementation of the BIH Program were reviewed by the Assessment team. Documents included: MCAH Policy & Procedures; BIH programmatic models on (1) Prenatal Care Outreach and Tracking, (2) Social Support and Empowerment, (3) Case Management, and (4) Role of Men; Program & Policy Alerts; Management Information Systems (MIS) Data Reports; the BIH data collection booklet (also known as the "Green Book"); and previous BIH evaluations.

### Previous Evaluations

Researchers at San Diego State University (SDSU) conducted two previous evaluations of the BIH Program. Findings from both evaluations were reviewed for this Assessment report. In particular, we reviewed a comprehensive evaluation conducted in 2000-01 by SDSU, based on extensive input from the local jurisdictions on their perceptions of strengths, weaknesses, and recommendations for improvement of BIH. There was often consistency between those evaluations and many issues raised during our site visits and the teleconferences with local jurisdictions.

* During the site visit period, San Joaquin was without a BIH Coordinator.

### Teleconferences with BIH Coordinators and MCAH Directors

A series of six teleconferences were held with BIH Coordinators and local city/county MCAH Directors to explore local staff perspectives, including local implications of possible program recommendations. BIH Coordinators and MCAH Directors provided insights and perspectives about ways to improve the Program at both the local and statewide levels.

### State BIH Community Advisory Committee

To provide input and expertise in the Program evaluation and recommendations for improvement, the MCAH Program convened a group of individuals with a range of relevant experience to serve on the State BIH Community Advisory Committee. These individuals, named by the MCAH Program Chief, are listed at the beginning of this document. A series of thirteen meetings with the Advisory Committee overall (and three additional subcommittee meetings) helped shape the recommendations presented in this report in many important ways.

## The BIH Program: An Overview

### State Policies and Requirements for the BIH Program*

The stated goals of the MCAH Program for the BIH Program are: 1) increase the proportion of pregnant women receiving first trimester prenatal care to at least 90%, 2) reduce low birth weight to no more than 5% of all live births, 3) reduce the African-American infant mortality rate to no more than 11 per 1,000 live births, and 4) reduce the African-American maternal mortality rate to no more than 5 per 100,000 live births.

The BIH Program helps identify pregnant and parenting women at risk of adverse infant health outcomes and provides them with:

- Referrals to accessible, culturally appropriate health care providers
- Support for adherence to standardized medical guidelines for prenatal and well-baby care, immunizations, etc.
- Education on the importance of early access and maintenance of prenatal care, on the causes of low birth weight, and on the signs and symptoms of preterm labor.
- Referrals to related service agencies and providers
- Education on strategies to reduce the risks of Sudden Infant Death Syndrome (SIDS)
- Promotion of smoking cessation
- Coordination and referrals to alcohol and drug treatment
- Referrals, tracking and practical support to receive social services, including adequate housing and employment opportunities, child care, and assistance with food and transportation
- Referral to agencies addressing domestic or family violence

Education and support services are offered through four intervention models: (1) Prenatal Care Outreach & Tracking, (2) Case Management, (3) Social Support & Empowerment, and (4) Role of Men. All local BIH Programs must implement the Prenatal Care Outreach and Tracking model. Most sites implement at least one additional model, generally with modifications based on their experience.

* State polices and requirements for BIH are contained in the MCAH Policy & Procedures document, BIH Section (2007).

Each BIH program is responsible for holding at least two community events annually to increase cross-agency collaboration and community support for the Program in the local area. Each local program is also required to convene a culturally competent BIH Community Advisory Board to facilitate partnerships and obtain insight and advice on strategies to reduce poor birth outcomes in its community.

Each program also collaborates with local MCAH staff (county or city) to conduct a Community Needs Assessment every five years. The Needs Assessment identifies ways to improve perinatal services for pregnant and parenting African-American women, and helps to identify possible local initiatives for BIH programs to implement in addition to the required models.

**Local BIH Programs**

The BIH Program is implemented in the seventeen local health jurisdictions where 94% of all African-American live births occur in California (Figure 7). All but three BIH programs are operated at the county level; Berkeley, Long Beach, and Pasadena have their own BIH programs separate from the county in which they are located.

**FIGURE 7. Counties with a BIH program.***


* Berkeley (Alameda County), Pasadena (Los Angeles County), and Long Beach (Los Angeles County) have city-specific BIH programs.

Figure 8 displays the total number of births and birth outcomes for all U.S. born adult African-American women in California and in each of the health jurisdictions with a BIH program for 2003-2005.

**FIGURE 8. African-American birth outcomes in California counties and cities with a BIH program.**

| | Total Births* (2003-2005) | % Low Birth Weight** (2003-2005) | % Very Low Birth Weight** (2003-2005) | % Preterm** (2003-2005) | Infant Mortality Rate* (2002-2004) |
|---|---|---|---|---|---|
| **CALIFORNIA** | **75348** | **10.8** | **2.4** | **14.4** | **12.3** |
| Alameda | 6215 | 10.4 | 2.2 | 11.3 | 9.4 |
| Berkeley | 273 | 14.1 | *** | 14.2 | *** |
| Contra Costa | 3003 | 10.7 | 2.1 | 13.4 | 9.7 |
| Fresno | 2086 | 10.5 | 2.1 | 17.9 | 14.3 |
| Kern | 1919 | 11.7 | 1.8 | 16.8 | 11.2 |
| Los Angeles | 25815 | 11.4 | 2.6 | 15.2 | 12.8 |
| Long Beach | 2790 | 9.6 | 2.4 | 13.5 | 10.7 |
| Pasadena | 513 | 15.0 | 3.3 | 18.3 | *** |
| Riverside | 3779 | 9.9 | 2.0 | 13.0 | 9.0 |
| Sacramento | 5410 | 10.0 | 2.7 | 13.9 | 13.2 |
| San Bernardino | 6986 | 10.7 | 2.6 | 15.3 | 17.0 |
| San Diego | 5243 | 10.0 | 2.0 | 14.8 | 12.8 |
| San Francisco | 1508 | 13.1 | 3.1 | 16.7 | 12.3 |
| San Joaquin | 2009 | 10.3 | 2.5 | 14.0 | 21.8 |
| San Mateo | 599 | 13.1 | 2.2 | 14.9 | *** |
| Santa Clara | 1011 | 10.2 | 2.4 | 12.6 | 9.2 |
| Solano | 1916 | 8.7 | 1.8 | 12.6 | 8.7 |

Source: MCAH analysis, 2002-2005 Birth Statistical Master File
Definitions: Low birth weight = less than 2500 grams; very low birth weight = less than 1500 grams; preterm = less than 37 weeks of age. Infant mortality rate = deaths before the first year of life per 1,000 live births.
***** Includes all births (singletons and multiples) in city or county.
****** Includes singleton births only.
*** Percents or rates are not shown for outcomes with less than 10 events.

Notes:
Infant Mortality Rate is based on births to women of all ages. All other outcomes are restricted to adults (18 years of age and older).
Analysis excludes foreign-born African-American women, women of Hispanic ethnicity, and women identifying themselves as mixed race.
Analysis excludes births with unknown or improbable birth outcome information.
City-specific numbers for Berkeley, Long Beach, and Pasadena have been subtracted from the overall numbers for their respective counties.

## Funding

The current allocation for the BIH Program totals $13.7 million. BIH Program funding sources include the federal Title V Maternal and Child Health Block Grant funds ($5 million), the State General Fund ($3.9 million), and federal Title XIX Medi-Cal funds (currently at $4.8 million – may fluctuate from year to year). Each of the seventeen local health jurisdiction receives an annual budget allocation to implement the Program. Local health jurisdictions may also utilize other sources of funding, including in-kind contributions, local funds, or outside sources (e.g., First Five or corporate donations).

## BIH Program Participants

The BIH Program targets adult African-American pregnant and parenting women at risk for adverse birth outcomes, including women who have:

- a previous history of infant or fetal death,
- a previous history of low birth weight and/or preterm delivery,
- significant barriers to accessing appropriate health care and other support,
- significant barriers to receiving Medi-Cal and other support services, or
- little or no support system in place.

### *BIH Enrollment*

The BIH Program enrolled 21,548 women between 1997 and 2005; 2,781 women were enrolled in 2005 alone (Figure 9). Los Angeles County, the largest local BIH program, enrolled 538 women in 2005. The smallest site, in the City of Berkeley, enrolled 32 women. Figure 9 presents the number of women enrolled in BIH during 2005 along with county data on all births to African-Americans. Although one current BIH priority is to serve 25% of all African-American women giving birth in the local county or city, the BIH Program currently serves between 8 and 12% of African-American women giving birth statewide, based on enrollment figures and birth outcome reports.[*]

[*] BIH MIS Pregnancy Outcome Reports 2005; BIH Current Pregnancy Reports 2005.

**FIGURE 9. Enrollment at BIH Sites during (a) 1997-2005 overall and (b) 2005 alone, along with (c) total number of African-American women giving birth in 2005 in the respective counties or cities.**

| | Client Enrollment (1997-2005) | Client Enrollment (2005) | Total number of women giving birth in County/City* (2005) |
|---|---|---|---|
| Alameda | 722 | 108 | 1932 |
| Berkeley** | 192 | 32 | 84 |
| Contra Costa | 1303 | 246 | 977 |
| Fresno | 834 | 106 | 678 |
| Kern | 1460 | 151 | 659 |
| Los Angeles | 5032 | 538 | 8313 |
| Long Beach | 830 | 67 | 909 |
| Pasadena | 833 | 67 | 164 |
| Riverside | 821 | 70 | 1290 |
| Sacramento | 1030 | 214 | 1809 |
| San Bernardino | 2138 | 347 | 2324 |
| San Diego | 1997 | 200 | 1675 |
| San Francisco | 676 | 183 | 439 |
| San Joaquin | 1488 | 145 | 690 |
| San Mateo | 541 | 54 | 194 |
| Santa Clara | 614 | 66 | 331 |
| Solano | 1037 | 187 | 586 |
| TOTAL | 21548 | 2781 | 23054 |

Source: BIH MIS Current Pregnancy Report (1997-2005); MCAH analysis, Birth Statistical Master File 2005

* County/City birth totals are given for non-Hispanic African-American adults (18 years of age and older) only.

** Berkeley's BIH program was established in 2001.

*Demographics*

Figure 10 shows socio-demographic data for all women enrolled at BIH sites from 1997-2005 compared with statewide averages for all African-American women giving birth from 2000-2004. Women enrolled in the BIH Program tend to be younger, to be unmarried, and to have fewer years of education than African-American childbearing women overall in California. Women enrolled in the BIH Program are also less likely to have had first-trimester prenatal care and more likely to be receiving Medi-Cal benefits. This information confirms that the BIH Program is serving a particularly vulnerable segment of African-American women.

**FIGURE 10. Selected demographic characteristics of (a) BIH Program participants and (b) all African-American women with live births in California.**

| BIH PROGRAM PARTICIPANTS (1997-2005)* | |
|---|---|
| | |
| AVERAGE AGE (years) | 24.3 |
| | % |
| MARITAL STATUS | |
| Unmarried | 83.9 |
| Married | 15.4 |
| Unknown | 0.6 |
| (Missing) | (5.8) |
| EDUCATION | |
| Less than High School | 35.7 |
| High School Graduate | 34.5 |
| Some College or higher | 25.8 |
| Vocational Training | 2.9 |
| Unknown | 1.2 |
| (Missing) | (6.4) |
| PRENATAL CARE PAY STATUS | |
| Medi-Cal | 81.4 |
| Other | 18.6 |
| (Missing) | (7.6) |
| TRIMESTER OF PRENATAL CARE INITIATION*** | |
| 1st | 67.2 |
| 2nd | 22.7 |
| 3rd | 10.1 |
| (Missing) | (15.3) |

| AFRICAN-AMERICAN WOMEN STATEWIDE (2000-2004)** | |
|---|---|
| | |
| AVERAGE AGE (years) | 26.3 |
| | % |
| MARITAL STATUS | |
| Unmarried | 66.2 |
| Married | 33.7 |
| (Missing) | (0.1) |
| EDUCATION‡ | |
| Less than High School | 17.0 |
| High School Graduate | 41.8 |
| Some College or higher | 41.2 |
| (Missing) | (2.0) |
| PRENATAL CARE PAY STATUS | |
| Medi-Cal | 49.4 |
| Other | 50.6 |
| (Missing) | (0.3) |
| TRIMESTER OF PRENATAL CARE INITIATION | |
| 1st | 82.8 |
| 2nd | 13.7 |
| 3rd | 2.4 |
| No prenatal care | 1.1 |
| (Missing) | (2.3) |

* Source: BIH MIS Demographic Report, 1997-2005; BIH MIS Current Pregnancy Report, 1997-2005; Trimester of PNC & BIH Entry 1997-2005. Note on percent calculation: Data coded as "unknown" are included in the denominator and "missing" data values are excluded from the denominator. Percent missing refers to data for which no coded information is available divided by the total number of program participants x 100.

** Source: UCSF analysis, Birth Statistical Master File 2000-2004. Note on percent calculation: "Missing" data values are excluded from the denominator.

*** Data on timing of prenatal care initiation are missing for 15% of BIH-enrolled women, some of whom may have received no prenatal care, as opposed to those whose dates of initiation were unknown.

‡ Data on vocational training are not available in the Birth Certificate file.

**FIGURE 11. Additional demographic characteristics of BIH Program participants.**

| BIH PROGRAM PARTICIPANTS (1997-2005) | |
|---|---|
| | |
| PRIMARY INCOME SOURCE | |
| Employment | 21.4 |
| AFDC/TANF | 38.7 |
| Parent/Partner Support | 8.2 |
| Other/Unknown | 19.9 |
| None | 11.8 |
| (Missing) | (6.4) |
| TRIMESTER OF BIH PROGRAM ENTRY | |
| 1st | 21.7 |
| 2nd | 36.1 |
| 3rd | 28.5 |
| Postpartum | 13.7 |
| (Missing) | (6.5) |
| CHILD CARE NEEDS | |
| Required within 2 weeks | 8.1 |
| Required within 60 days | 5.1 |
| Required within 120 days | 9.9 |
| Not Required | 69.3 |
| Unknown | 7.5 |
| Missing | (7.0) |
| HOUSING NEEDS | |
| Required within 2 weeks | 16.8 |
| Required within 60 days | 6.6 |
| Required within 120 days | 9.8 |
| Not Required | 62.4 |
| Unknown | 4.3 |
| (Missing) | (6.1) |
| PREGNANCY PLANNED | |
| Yes | 16.0 |
| No | 84.0 |
| (Missing) | (14.5) |
| SUBSTANCE USE* | |
| Currently smoking cigarettes | 10.3 |
| Currently drinking alcohol | 1.5 |
| Currently using cocaine | 1.4 |
| Currently using marijuana | 5.3 |

Source: BIH MIS Demographic Report 1997-2005; BIH MIS Current Pregnancy Report, 1997-2005; BIH MIS Trimester of PNC & BIH Entry 1997-2005. Note on percent calculation: Data coded as "unknown" are included in the denominator and "missing" data values are excluded from the denominator. Percent missing refers to data for which no coded information is available divided by the total number of program participants x 100.

* Substance use data was gathered from multiple fields. Data are missing on 9-10% of enrollees.

As shown in Figure 11, over one-third of women participating in the BIH Program receive cash assistance (listed in Figure 11 as "AFDC/TANF"), and 23% report a need for housing within the next two months; 84% of women enrolled in the Program report that the current pregnancy is unplanned; 10% are current smokers; and 7% report using illegal drugs, primarily marijuana. (Comparison data on these characteristics are not available at the statewide level.)

One of the major aims of the BIH Program is helping women find and continue to use appropriate prenatal care services. As shown in Figures 10 and 11 above, while it appears that over half of participants in the Program begin prenatal care in the first trimester (Figure 10), only 22% of enrolled women entered BIH during the first trimester (Figure 11). Most women appear to have already begun receiving prenatal care before enrolling in the BIH Program, consistent with the fact that many local BIH programs rely heavily on referrals from prenatal care sites. This pattern suggests a need to reassess outreach approaches, seeking ways to increase early enrollment in prenatal care as well as in the BIH Program.

**BIH Local Activities**

As noted above, four core service/curriculum "models" are currently being used to provide services to clients in the BIH Program. Each model provides guidance on implementing activities for pregnant or parenting African-American women or for parenting men. These models include:

- Prenatal Care Outreach & Tracking
- Case Management
- Social Support & Empowerment
- Role of Men

The Prenatal Care Outreach & Tracking model follows women and provides service coordination to ensure that they receive appropriate medical care and support services throughout pregnancy and up to one year postpartum. The Case Management model uses public health nurses to track medically and/or socially high-risk women and provide more intensive support and education, largely through home visiting. The Social Support & Empowerment model involves a series of eight group sessions focused on health education, health promotion, and empowerment and life skills (e.g., balancing a budget and checkbook, nutrition, job skills and job-seeking strategies, relationships). The Role of

Men model provides an opportunity for African-American men to enhance their parenting and life skills while addressing some of their legal, vocational, and financial concerns. Programs have the flexibility to tailor these models to the needs of their communities.

**FIGURE 12. Models currently used by local BIH Programs**

| | | Prenatal Care Outreach & Tracking | Social Support & Empowerment | Case Management | Role of Men |
|---|---|---|---|---|---|
| **1 model** | San Bernardino | • | | | |
| | San Diego | • | | | |
| **2 models** | Berkeley | • | • | | |
| | Contra Costa | • | | | • |
| | Fresno | • | | • | |
| | Kern | • | • | | |
| | Los Angeles | • | • | | |
| | Pasadena | • | • | | |
| | Riverside | • | | | • |
| | Sacramento | • | | • | |
| | San Francisco | • | | • | |
| | San Joaquin | • | • | | |
| **3 models** | Long Beach | • | • | | • |
| **4 models** | Alameda | • | • | • | • |
| | San Mateo | • | • | • | • |
| | Santa Clara | • | • | • | • |
| | Solano | • | • | • | • |

Figure 12 describes the models currently used by each BIH Program. All 17 BIH Programs are required to implement the Prenatal Care Outreach & Tracking model. BIH Programs may voluntarily implement any of the three additional models. Discussions with local BIH Program staff during site visits indicate that local Programs choose to implement additional models based on the needs of their client population, the particular skill set of their staff, and available funding. Ten BIH Programs are implementing the Social Support & Empowerment model, seven Programs are implementing the Case Management model, and seven Programs are implementing the Role of Men model. Two of the 17 Programs are implementing only the Prenatal Care Outreach & Tracking model, and four are implementing all four models. As a result, BIH participants at different sites

may receive markedly different services depending on which models are implemented at a given site.

*Staffing*

BIH staff members are responsible for providing and tracking services to clients in the Program, as well as for collecting data and monitoring client progress. Depending on the specific focus of the Program at a particular site, staff may include public health nurses, health educators, lactation consultants, social workers, and other professionally-trained health practitioners. In addition, para-professional Community Health Outreach Workers (CHOW) are employed for outreach, tracking, and social support of clients. Staff at BIH sites are primarily (if not entirely) African-American and provide culturally-sensitive support to women enrolled in the program. The principal staff categories are: (1) BIH Coordinator, (2) Community Health Outreach Worker, and (3) Public Health Nurse.

The BIH Scope of Work requires a "culturally competent" BIH Coordinator. The BIH Coordinators implement BIH models and serve as the administrative leads for their respective Programs. Coordinators are responsible for establishing networks and building relationships with providers and community leaders. Some, but not all, Coordinators facilitate Social Support and Empowerment groups.

CHOWs are used by the programs in several different capacities. The CHOW is responsible for recruiting pregnant women into the Program as well as for providing social support, service coordination, and follow-up and tracking of women throughout their participation in the Program. Appropriate referrals are made for services such as Medi-Cal enrollment, family planning, WIC, HIV-testing, mental health, substance abuse, domestic violence, job training, and other social services. CHOWs at some sites facilitate social support groups.

Public Health Nurses (PHN) have been utilized in BIH for clinical management of high-risk women in the Case Management model. All but two of the local BIH Programs employ at least a part-time PHN, and 11 sites employ at least one full-time equivalent of a PHN. Although in some cases all or part of the funding for those positions comes from sources other than the BIH Program, information

was not available on the extent to which sources other than BIH contribute toward the PHN salaries. Only seven of the 17 local BIH Programs were implementing the Case Management model at the time of our site visits, and it is unclear what portion of the PHN time is being used for case management versus other activities.

*BIH Data System*

Each local BIH Program collects data on program participants in a standardized format, using the BIH "Green Book." The Green Book is a 53-page data booklet in which an individual client's information is kept. This information includes: (1) programmatic data such as referrals for services, contacts made with BIH staff, and enrollment in specific program modules/models; (2) data on the client's social and medical background, including a psychosocial screening, previous reproductive history, and assessment of her social network; and (3) infant data, including birth weight and gestational age, breastfeeding initiation, immunizations and well-baby visits. The Green Book data are uploaded into a central BIH Management Information System (MIS), which provides standardized reports on the following topics:

- Outreach Status
- Enrollment
- Screening Instrument
- Demographics
- Current pregnancy
- Current pregnancy problems
- Contact Service Delivery
- Case Management Service Delivery
- Social Support and Empowerment Service Delivery
- Social Support and Empowerment Graduation
- Referral Summary
- Referral Results
- Pregnancy outcome – singleton births
- Pregnancy outcome – multiple births
- Mother follow-up
- Index infant follow-up
- Breastfeeding initiation
- Breastfeeding six month follow-up
- Breastfeeding twelve month follow-up
- Breastfeeding eighteen month follow-up
- Breastfeeding twenty-four month follow-up
- Client List
- Client Telephone List
- Case closure
- Role Of Men Service Delivery
- Current Active Client (caseload)
- Caseload during specified time period
- Mailing Labels
- List of Active Clients with EDC approaching in two months
- Zip Code Summary of Enrolled Clients
- Trimester of enrollment/prenatal care initiation
- Current Immunization Status Active Clients
- Immunization Status for Clients Served During A Specified Time Period
- Outreach Worker Caseload
- Case Manager Caseload
- Client retention through delivery
- Client retention through one year postpartum

In addition to the psychosocial and health data collected in the Green Book on BIH clients and their infants, extensive notes may be kept on variables not included in the MIS data system.

Birth outcomes described in BIH Program data include live births, deaths, birth weight, and gestational age. During the period from 1997 to 2005, pregnancy outcome information was collected on 15,898 outcome events for approximately 74% of the BIH-enrolled women enrolled; 24% of women with expected dates of confinement (EDC) are lost to follow-up, with their cases closed before they gave birth.[*] Given the often transient nature of a high-risk population, this loss-to-follow-up is not surprising, and the fact that 74% of clients have outcome information probably reflects well on BIH staff efforts. The large number of records with missing data nevertheless makes assessing the BIH Program's impact difficult, and it would be important to systematically seek ways to increase the completeness of records in the future.

[*] BIH MIS Retention Through Delivery Report, 1997-2005. Two percent of women with an EDC have a case that is still active with no pregnancy outcome reported.

## Perspectives from Local BIH Program Staff, Key Informants, and the State BIH Community Advisory Committee

This section presents comments and suggestions from local BIH Program staff, MCAH Directors, key informants, and State BIH Community Advisory Committee members during the assessment process, collected through site visits, teleconferences and meetings with the Assessment team. The Assessment team considered it important to relate the full range of comments and suggestions, recognizing that some—and particularly those that require additional funding--may not be feasible in the near future.

### Site Visits with Local BIH Programs

The Assessment team visited 16 of the 17 local BIH Programs to gather information on local implementation and elicit recommendations from the local staff on ways to enhance BIH in the future. A detailed report on those visits was included in the Assessment team's December 31, 2006 report to the MCAH Program. The Assessment team's general impression from the site visits is that the approaches and implementation of BIH Program activities vary greatly from one local program to another. As seen in Figure 12, there are differences in the number and type of models being utilized at each local program. Other local implementation differences include variation in:

- The modifications made to existing BIH models to make them more responsive to local population needs.
- The numbers and types of additional classes and workshops provided by local programs to supplement the standard models.
- The degree to which programs have created strategic partnerships with service agencies and community organizations.
- The intensity and scope of activities related to increasing community awareness and engagement, including use of the media.

Suggestions from the local BIH staff, elicited during site visits, repeatedly focused on the following areas:

- **A need for expanding the eligibility window:** Staff suggested increasing the enrollment period for BIH to include up to 24 months (2 years) postpartum. Staff commented that many women need continued support after the first postpartum year, and express a desire to continue receiving BIH services.

- **Provision of incentives:** Availability of material incentives (e.g., blankets, bags) for women enrolled in the program would be helpful in promoting participation in health education/promotion activities.

- **A need to review and revise the program models:** Staff expressed a desire to review and update curricula in each of the models.

- **Desire for support for more work with mass media**: There is a widespread perception that it would be valuable to increase statewide and local media and social marketing campaigns to publicize BIH. There is a desire for local input in developing materials that could be used statewide, and for reasonable local autonomy in implementing media campaigns based on materials supplied by the State.

- **Need for increased visibility within county/city agencies**: Staff feel that the BIH Program may not be as visible to other agencies as it should be; for example, limited awareness of BIH Programs means that BIH Program staff must continually re-establish relationships with new staff at public hospitals/clinics and social services agencies. Increased awareness of the BIH Program would facilitate cross-referrals and enhance collaboration among multiple agencies serving BIH clients.

- **Need for additional evaluation measures:** Staff want BIH evaluations to include both intermediate outcomes, such as increased social support or improved life skills, and measures of services provided to women, infants, and their families.

### Teleconferences with Local BIH Coordinators and MCAH Directors

Monthly teleconferences with the BIH Coordinators and MCAH Directors were held to discuss key issues and to allow local BIH Program staff the opportunity to highlight important local and statewide BIH issues not covered in the Assessment team site visits. Additional recommendations repeatedly brought up by the BIH Coordinators and/or MCAH Directors during the series of 6 teleconferences include:

- **Reducing the burden of data collection**: Significant amounts of data currently collected in the BIH MIS system are not being utilized at the local sites and perhaps not at the statewide level.

- **Increasing opportunities to share information and experiences:** Increased opportunities for meetings of staff from different local programs could facilitate strategizing and collaboration among the local programs.

- **Increasing focus on the "social" aspects of BIH:** Local staff feel that helping women enrolled in the program to meet both immediate and long-term social goals (e.g., getting a job; leaving an abusive relationship) is one of BIH's most important and effective functions.

A summary of additional comments made in roundtable discussions by MCAH Directors, BIH Coordinators and local staff at the October, 2007, BIH Statewide meeting is found in Appendix 2.

## Key Informant Interviews*

Sixteen interviews were conducted with management and data staff from various national and local programs that had initiatives aimed at reducing infant mortality. Interviews with key informants focused on lessons learned and on the specific elements that the informants felt resulted in successful programs. Seven of these interviews were with staff at initiatives focused on low-income African-American women. Key themes that emerged from these interviews include:

- **Community engagement**: Several informants attributed success in program implementation to successful collaboration with and engagement of their target communities. Informants underscored the importance of having community representation and engagement in both defining the problems and implementing services to address infant mortality. As one example, the Magnolia Project, which serves African-American women of childbearing age in Jacksonville, Florida, is staffed with a community development coordinator.

- **Strong government and community leadership**: Successful implementation of programs was also attributed to having strong leaders to advocate on the program's behalf. Interviewees spoke about the need for leadership within government (mayor, director of County Health Department) and the community to promote use of the program's services by community residents.

- **Adequate and stable funding base:** Informants stressed the importance of having sufficient and stable funding for programs; in their view, this often explained why some programs were successful and others not. Programs perpetually struggling to maintain minimal funding had little time for other crucial tasks.

- **Flexibility:** Programs need to tailor their strategies to the changing communities in which they work.

- **Creating a clear evaluation framework from the beginning of program implementation:** Informants noted the importance of understanding up front, before implementation, the measures to be evaluated and the planned timeframe for assessing "results" of current work.

* A list of key informants interviewed and their program affiliations can be found in Appendix I.

## Meetings/Teleconferences with the State BIH Community Advisory Committee*

A series of 13 meetings was held with the State BIH Community Advisory Committee. Members of the Advisory Committee—including obstetricians, social workers, nurses, and community health education leaders--met with local BIH Program staff during an annual BIH meeting in Sacramento, and the Assessment team provided additional information about the BIH Program to the Advisory Committee based on site visits and teleconferences with local BIH staff. One Advisory Committee member is an MCAH Director in a city with a BIH program, and two other Advisory Committee members have extensive prior experience with BIH. Below we highlight a few of the many issues raised by members of the Advisory Committee during these meetings. These issues were raised repeatedly and reflect apparent consensus among those participating in meetings/teleconferences:

- **Increasing the number of women served.**
- **Strengthening partnerships and linkages:** Increasing the number and breadth of partnerships between the BIH Program and other organizations that provide related services (both community and governmental), to make BIH resources go further.
- **Exploring the Centering Pregnancy model:** Considering the adoption of a Centering Pregnancy approach, which would combine group-based prenatal care with group-based social support, health education, health promotion, and empowerment services.
- **Acknowledging BIH staff and increasing program visibility**: Advisory Committee members felt that outstanding local BIH programs and staff need special recognition. Further, it was noted that events recognizing BIH sites/staff could serve a dual purpose: Invitations to local leaders could potentially provide opportunities both to showcase the BIH Program in the community and to increase or strengthen inter-agency collaborations.
- **Utilizing media:** Standardized media campaigns (statewide and/or local) could increase enrollment into BIH, increase awareness of the Program among the general community, and be a vehicle for community-wide health education and promotion

* The members of the BIH Community Advisory Committee are listed at the beginning of this document.

- **Engaging and mobilizing the community:** Increasing community buy-in through strategic activities with community leaders and organizations that can advocate on behalf of the BIH program.

- **Making data collection more useful:** Collecting data to reflect the services that are being provided by BIH staff, and eliminating unnecessary data elements that are not being utilized by the local sites or MCAH. Collected data should include intermediate outcomes.

## Literature Review

As background for assessing the BIH program, an extensive review of the literature was conducted during the spring and summer of 2006* and recently updated. This section summarizes the findings most relevant to the recommendations stated in this report.

Because infant health has been the primary focus of the BIH Program, we focused primarily on infant health, and only secondarily on maternal health**.** The review addressed the following central questions: **What is known about how to improve Black infant health and to decrease Black-White disparities in infant health?**

We studied two major aspects of that question:

I. **What current knowledge about the risk factors, causal pathways and mechanisms leading to adverse infant health outcomes could suggest the most promising directions to pursue to improve health and reduce disparities?**

II. **What is known about the effectiveness of existing interventions to improve Black infant health and reduce Black-White disparities? What are the remaining gaps in knowledge?**

* The summary here builds upon and updates work completed in June, 2006, by a team including Paula Braveman, MD, MPH, Kim Coleman-Phox, MPH, Sara Donahue, MPH student, Kristen Marchi, MPH, Gina Nicholson, MPH, and Tabashir Sadegh-Nobari, MPH, at the Center on Social Disparities in Health and Department of Family and Community Medicine, University of California, San Francisco

## Risk Factors, Causal Pathways, and Mechanisms Leading to Birth Outcomes

There is not clear evidence about how best to intervene to improve African-American birth outcomes. It is therefore worthwhile to consider the literature about risk factors, causal pathways, and mechanisms that could be involved. In the absence of definitive evidence of the effectiveness of an intervention, the strength of the evidence regarding plausible pathways and mechanisms is particularly relevant.

Current knowledge strongly supports the importance of addressing the following well-established risk factors for adverse birth outcomes in the general population as well as among African-American women. Here we summarize highlights regarding risk factors, pathways and mechanisms; a more complete review of the literature on these issues was conducted in 2006:

- **Nutrition before and during pregnancy.** [12-15] Prepregnancy underweight and/or inadequate weight gain during pregnancy have repeatedly been associated with adverse pregnancy outcomes, and the federal Special Supplemental Nutrition Program for Women, Infants and Children Program (WIC) has been associated with improved birth outcomes.[16-20] Special diets and nutritional supplementation have not been as successful in improving birth outcomes in affluent countries as in developing countries.[21] Prepregnancy overweight and obesity have been associated with complications of pregnancy, including gestational diabetes, maternal hypertension, preeclampsia, as well as complications of delivery, including cesarean delivery, small-/large-for-gestational-age, preterm birth, stillbirth, and neonatal death. [22-25]
- **Smoking** during pregnancy is associated with poor birth outcomes.[4, 26] Preventing and reducing smoking during pregnancy requires targeting women of childbearing age who are not pregnant as well as those who are pregnant. [27, 28] There also is accumulating evidence for a role of exposure to second-hand smoke in adverse birth outcomes.[4]
- **Alcohol** consumption during pregnancy can affect birth outcomes.[4]
- **Inter-pregnancy interval** refers to the space between delivery of one birth and the beginning of the next subsequent pregnancy. Inter-pregnancy interval shorter than 18 months is associated with adverse birth outcomes. [29]

- **Older maternal age** (> 35 years of age or older) is associated with adverse birth outcomes [30, 31]

- **Stress during pregnancy.** Many experts believe that stress is likely to be an important contributor to adverse birth outcomes and particularly to the Black-White disparity in birth outcomes.[4, 32, 33]. There are mixed findings in the literature, but according to the Institute of Medicine's (IOM) comprehensive 2007 report, more recent and better designed studies appear to provide a more consistent picture and suggest that stress can play an important role. Biologically plausible pathways have been elucidated; stress could act through neuroendocrine, sympathetic, vascular, and immune/inflammatory mechanisms which could directly affect length of gestation as well as growth retardation.[34-36] Stress also could have indirect adverse effects by leading to or exacerbating adverse health behaviors, such as excessive alcohol use, drug use, and smoking [33, 37]

- **Chronic stress prior to pregnancy**. Current knowledge of stress physiology suggests that chronic stress experienced by a woman during her life before becoming pregnant may also be an important contributor to adverse birth outcomes, independent of experiences during pregnancy itself.[4, 38] Chronic stress before as well as during pregnancy could be especially relevant to African-American women, given their greater levels of exposure to stress related to poverty/low income as well as experiences related to racial discrimination.[4, 36, 38]

- **Stress due to experiences of racial bias/discrimination.** A number of researchers have hypothesized –with some supporting empirical evidence—that, apart from how racial discrimination may lead to and perpetuate poverty and unhealthy neighborhood environments, experiences of racism itself could contribute to adverse birth outcomes among African-American women through pathways involving stress.[4, 39-41]

- **Socioeconomic factors.** There is considerable evidence of the significant role of socioeconomic factors in adverse birth outcomes among both Blacks and non-Hispanic Whites; a number of pathways are likely to be involved, [14, 42, 43], including stress. African-Americans disproportionately experience adverse socioeconomic conditions at multiple levels throughout life [44-50]. Although typical birth outcomes research has measured very few socioeconomic factors and has not considered experiences before pregnancy, a range of socioeconomic

experiences throughout a woman's life before --as well as during-- pregnancy may be a missing piece of the puzzle regarding Black-White disparities in birth outcomes. In the long run, therefore, interventions that improve community economic development may be crucial for improving birth outcomes, although these benefits would not to be realized for a generation.

Here we summarize the literature on interventions in the *preconception, prenatal, neonatal, and postneonatal periods, and mass media campaigns that cover all time periods.*

### *A. Preconception/interconception interventions.*

Preconception/interconception medical care

Currently, there is considerable interest in the potential for preconception/interconception care to improve birth outcomes and reduce disparities, primarily based on the biological plausibility of such effects. There has been little rigorous evidence of the impact of preconception care on health outcomes, however, and authors have noted that preconception medical care by itself is unlikely to have a sufficient impact, in the face of unfavorable social environments;[51, 52] however, the Centers for Disease Control and Prevention (CDC) has recommended and promoted preconception care based on knowledge of physiology and modifiable risk factors for birth outcomes and maternal health.[53] For example, preconception care provides opportunities to promote and support abstention from alcohol,[54] smoking, and other hazardous exposures, and to promote use of multivitamins with folate to reduce multiple congenital anomalies.[55] Moos [56] has underscored the need for public education and media messages promoting awareness of the importance of preconception care, in addition to education of providers.

### *B. Prenatal interventions*

Prenatal care and birth outcomes

Prenatal care is important for women's health.[57, 58] Unfortunately, findings from multiple studies (with rare exceptions),[59] have consistently failed to link prenatal care—as we currently provide it—with improved birth outcomes for women in industrialized countries.[4] This has raised questions about the potential role of psychosocial factors not addressed by prenatal care, and about the role of a woman's preconception health, including her own health during childhood. Our earlier review included studies examining effects of prenatal care overall in relation to birth outcomes as well as studies examining the individual standard clinical components of prenatal care, but failed to find evidence of reductions in adverse birth outcomes.

Prenatal care enhanced with nurse home visiting and/or case management

While prenatal care enhanced with home visiting and/or case management has generally not been shown to lead to improved birth outcomes, it has had other beneficial effects. A recent Cochrane review* conducted a meta-analysis of 11 randomized trials on preterm birth and 13 randomized trials on low birth weight. [60] It consistently found that prenatal care enhanced with additional time with providers and nurse home visiting was not associated with reduced low birth weight or preterm birth.[60] However, the Cochrane review did find that enhanced prenatal care had beneficial effects on other outcomes, including maternal "anxiety, awareness and knowledge of risk conditions, perceived mastery, and health-promoting behaviors." [60] Prenatal care enhanced by case management by social workers or nurses was not shown to improve birth outcomes of low-income Black and White women in a study in Tennessee.[61] Earlier experiences with highly intensive (30 to 70 visits) nurse home visiting begun prenatally and continued for two years postpartum were found to lead to improvements in several very important social and developmental outcomes, but generally not improved birth outcomes (apart from improvements among White adolescents and White smokers).[62] Reichman & Florio [63] found a small improvement in birth weight among Black women receiving prenatal care augmented by additional provider visits, case coordination with other agencies, and community health worker outreach. Brooten et al. [64] reported improved preterm birth rates in a largely African-American intervention group of women receiving half of their prenatal care from nurses at home compared with a largely African-American control group of women receiving standard prenatal care; that study was too small to report significant differences, however. (See section below on home visiting)

Aspects of prenatal care likely to have beneficial effects on birth outcomes

Despite the findings that neither standard nor enhanced prenatal care have been shown to improve low birth weight or preterm birth, there are several areas in which there is consensus about ***likely***

* Cochrane Reviews are based on the best available information about healthcare interventions. They explore the evidence for and against the effectiveness and appropriateness of treatments (medications, surgery, education, etc) in specific circumstances. The complete reviews are published in *The Cochrane Library* four times a year by Wiley InterScience. Each issue contains all existing reviews, plus an increasing range of new and updated reviews.

***beneficial effects of different aspects of prenatal care on birth outcomes*** (in addition to good evidence of beneficial effects of prenatal care on maternal health):

- Marked benefit from ***antenatal steroids for preterm labor.*** Antenatal steroids do not reduce prematurity, but they reduce neonatal morbidity and mortality by facilitating fetal lung maturation.[65]
- Promising results have been observed with use of ***progesterone for women with prior preterm births***. Progesterone treatment for women with a prior preterm birth has been shown to reduce the incidence of a second preterm birth.[66, 67]
- ***Prenatal care as a point of entry to other services, e.g., WIC.*** For many pregnant women, prenatal care is the point of entry to a range of social services, including Medi-Cal coverage for their existing children and WIC. Participation in WIC has been associated with improved birth outcomes, although evidence is mixed and some researchers still question the role of selection bias.[16-20] Goldenberg and Culhane, however, have noted that nutritional interventions involving special diets and/or special supplements had minimal and inconsistent effects on birth outcomes.[21]
- ***Prenatal care as a source of health education/promotion***. Pregnancy is a time when many women are highly motivated to change unhealthy behaviors, such as smoking and alcohol use, and are particularly receptive to health promotion messages.[68] Kogan, et al.,[69] showed that women who received all of the health behavior advice recommended by the Expert Panel on the Content of Prenatal Care were less likely than those who did not to have a low birth weight infant. Health education/promotion delivered via prenatal care has been effective when informed by well supported theories of behavior change,[51] particularly when complemented by community-wide education. [68, 70]

Pregnancy thus presents a window of opportunity for health promotion, with potential beneficial effects for women's and children's health. Unfortunately, African-American women may be less likely to receive appropriate health advice from providers during pregnancy than White women;[71] findings which could reflect Black women being cared for by less proficient obstetric providers, or judgments—potentially unconscious—that some providers make about who will adopt health advice. Two comprehensive reviews published in 2003 by the IOM and by the Department of Health and Human Services Agency for Healthcare Research and Quality (AHRQ) have supported these findings. The reviews examined a large body of evidence and found significant racial disparities in patient care that were judged very likely to reflect discriminatory treatment (in most cases probably

unconscious).[72, 73] Raising awareness about discrimination and/or culturally competent interventions may reduce such unconscious bias; however, there have not been studies of treatment outcomes of such interventions.[74] Nevertheless, based on its review, the IOM[73] recommended:

- increasing providers' (and public) awareness of disparities;
- use of evidence-based guidelines to improve equity in quality of care;
- integrating cross-cultural education into continuing education for current physicians and into medical education of future physicians;
- patient education and empowerment programs to increase patients' knowledge of how to best access care and participate in treatment decisions; and
- use of community health workers as a bridge between care providers and communities.

AHRQ also recommended:

- "directed public education campaigns" about important health risk factors, to enable patients to advocate for their own receipt of high-quality care.[72]

Other promising prenatal intervention areas

There is widespread consensus about the potential contribution to improved birth outcomes of the interventions noted above. In addition, despite the current mixed results/lack of conclusive evidence, many experts believe that the following areas should be actively pursued because they are promising, based on at least some evidence and consistent with knowledge of plausible biological mechanisms:

- ***Treating periodontal and reproductive tract infections.*** Current knowledge is inconsistent, but some evidence supports a possible role for infections (genital, periodontal) during pregnancy as a contributor to adverse birth outcomes and specifically to racial disparities in birth outcomes [75-78]. African-American women have been observed to have higher rates of genital and periodontal infections; however, treatment of infections has not consistently resulted in improved birth outcomes.[4, 79] If infections play a role in the etiology of adverse birth outcomes, this would support the need for prenatal care; it may also suggest the need for

preconception dental and medical care and health promotion to prevent infections and treat them before pregnancy.

- ***Prenatal care combined with peer group psychosocial interventions emphasizing education, social support, and empowerment***: Klerman et al. [80] studied an intervention that augmented prenatal care with "educationally oriented peer groups" and additional time with clinicians. Though the intervention was not observed to have an impact on birth outcomes, it did show significant improvements in important maternal health-related indicators including perceived mastery, knowledge, and health-related behaviors. The group-based Centering Pregnancy model (paired with the similarly structured Centering Parenting model during the postpartum period) has attracted considerable favorable attention because it addresses both medical and psychological needs and uses a conceptually sound model emphasizing group-based education, social support, and empowerment.[81] However, this model has not been studied adequately, and there have been no well designed evaluations demonstrating significant improvements in birth outcomes.[82, 83]

<u>Prenatal psychosocial interventions not integrated with prenatal care.</u>

The following psychosocial interventions have not been integrated into prenatal care (vs. those reviewed above which were integrated with prenatal care); however, in each case the psychosocial interventions encouraged and/or facilitated women's use of prenatal care:

- ***Home visiting***. Home visiting during pregnancy and the postpartum period is designed to improve multiple pregnancy, maternal, and child development outcomes among women with few resources. During the 1980s, David Olds pioneered an intensive approach to home visiting that involved around 30-70 home visits by highly trained nurses throughout pregnancy and continuing postpartum. [62] The results of research by Olds and others over the past 10-12 years on the effects of home visiting on birth outcomes, child development, and maternal outcomes have been mixed:

  Studies on prenatal home visiting using nurses have not generally found improved birth outcomes in association with the intervention, with few exceptions. Olds et al. found improvements in birth outcomes among adolescents and smokers [62] in a rural study with a

predominately White population. A follow-up Olds study with a predominately African-American population did not show improved birth outcomes. [62, 84, 85] While comprehensive reviews of nurse home visiting literature have reported that studies have not had an impact on pregnancy outcomes, [86, 87] one study has shown improved outcomes among medically high-risk African-Americans.[64] Brooten's randomized trial of in-home prenatal care with specialized nurses reported fewer preterm births and lower infant mortality rates among the intervention group but did not have sufficient statistical power to draw conclusions. [64] Her model of in-home prenatal care should be distinguished from more usual approaches which have supplemented rather than replaced clinic-based care with nurse home visiting. Watson et al. reported that women with recurrent preterm labor who received intensive home uterine activity monitoring (using a device to monitor uterine contractions) along with in-home nursing support had lower risk of preterm birth. [88]

Results of studies examining the effects of home visiting on child development have been more positive. The Olds model – intensive home visiting begun prenatally and continuing for 2 years postpartum – has shown reductions in child abuse and injuries in a predominately White population,[62], as well as an increase in supportive home environments for child development [89] in a racially diverse population (15% African-American, 35% White, 45% Mexican-American). A review by Kendrick et al.[90] also found a significant increase in supportive home environments (e.g., parental responsivity, acceptance of child, parent-child interaction) for families receiving home visiting. A recent meta-analysis of home visiting and child development outcomes found that home visiting was successful in preventing potential child abuse (e.g., number of emergency room visits, number of injuries or ingestions treated, number of accidents requiring medical attention) among low-income families.[91] Other evaluations of home visiting have been more skeptical of effects on child abuse. [92, 93]

The findings on the effects of home visiting on child health outcomes have been inconsistent across studies. Studies have been conducted in varied settings, with varied populations, and using varied interventions; experience with African American adults is limited. One review concluded that beneficial effects of home visiting were primarily on maternal outcomes and parenting, not on child health or use of child health services.[94] Another review by Gomby,[86]

however, found no improvements in child immunizations or well-baby visits, and "…revealed few health-related benefits for children from home visiting programs." [86] Unfortunately, one is left without definitive conclusions regarding the potential of nurse home visiting for improving maternal and infant health in general, particularly for African American adult women; furthermore, the literature overall would make it unrealistic to expect effects on birth outcomes among adult African American women. One generalization that can be made is that the successful models have been highly intensive (30-70 visits) and of long duration, beginning prenatally and continuing through 2 years postpartum.

There are also home visiting programs that have used paraprofessionals instead of nurses to provide home visits. Substitution of paraprofessionals for nurses has generally been less effective in the Olds model of home visiting, although Olds showed that women visited by paraprofessionals were employed longer and reported a greater sense of mastery and better mental health than women without such home visiting.[89, 95] Some other paraprofessional home visit programs, especially those targeting at-risk mothers and children, have been shown to have some important effects. Improved outcomes have included earlier initiation of prenatal care; [96, 97] improved birth outcomes in adolescents [97, 98]; lower post-neonatal mortality; [98, 99] higher immunization rates; [99, 100] improved maternal-child interaction; [89, 101] and improved maternal psychological health.[89, 102] One study found improved birth weight among low-income women receiving home visits from paraprofessionals, compared with a matched comparison group.[96] Recently, however, a review of paraprofessional home visiting for pregnant and parenting women concluded that the empirical evidence was insufficient for ascertaining the effectiveness of such programs.[103] Interventions delivered through home visiting, as well as settings and target populations, can vary widely from program to program, making it difficult to generalize findings from any one program to other home visiting models.

It is repeatedly noted in the literature that more data are needed to adequately determine which home visit programs have the best long-term outcomes for specific populations.

- ***Social support.*** Stress has repeatedly been associated with poor birth outcomes, acting through neuroendocrine, immune, and/or vascular mechanisms. There is some evidence in the literature indicating specifically that social support during pregnancy can act directly as a protective factor

and/or buffer the effects of stress on a woman's health and birth outcomes.[4, 37, 104, 105] There are plausible scientific explanations as to how this would occur physiologically, lending further weight to the findings from some studies.[106] Other studies have not shown any effects of social support on birth outcomes; the interventions, samples, and settings in those studies varied greatly. [60, 107] Some trials have demonstrated that, although social support did not improve birth outcomes, it was associated with improvements in several important intermediate indicators such as maternal anxiety, knowledge, perceived mastery, and health-related behaviors. [60, 80]

Although evidence is mixed regarding effects of social support on birth outcomes, it has been shown to have significant effects on a wide range of other health outcomes, including pregnancy wantedness and improved health behaviors [4, 108-110, 111] Social support is widely viewed as playing a protective role in health, buffering adverse health effects of stress. [112, 113] The large body of evidence demonstrating the importance of social support for a wide range of health outcomes across the life course suggests the need to address social support during pregnancy, despite limited evidence from pregnancy-specific research. As noted in the IOM review on preterm birth, social support at any level provided only during pregnancy may not be powerful enough to improve birth outcomes for a woman who has experienced long-standing social deprivation.[4]

- ***Group-based social support*** has been shown to lead to reduced alcohol consumption among pregnant women.[114] There is growing interest among clinicians and public health experts in the potential benefits of group-based prenatal, postpartum, and chronic disease care, as represented by the Centering Pregnancy model. The rationale is that the group setting not only permits increased provider time for education and health promotion but also may facilitate learning and provide an important source of social support. The group format may be more conducive to empowerment as well.[81, 115]

- ***Empowerment.*** At the individual level, empowerment refers to capacity-building and assisting an individual to discover and mobilize her own capacities, including problem-solving, pursuing healthy behaviors, and achieving life goals. Service models focusing on empowerment are contrasted with models that tend to create or perpetuate dependency. A large body of literature links empowerment with a wide range of health-related outcomes, including health-related

behaviors, use of medical care, and health status itself.[108, 116-122] The role of empowerment in improving health at the individual and community levels has been demonstrated repeatedly and strongly in studies internationally, including in the United States.[123] where empowerment of individuals has been measured and/or labeled in various ways – e.g., as self-efficacy, mastery, sense of control, or locus of control. The literature has not shown any effects of empowerment with birth outcomes specifically. Empowerment (along with social support) is, however, a core component of the nurse home visiting model developed by Olds.

- ***Community engagement (also called community involvement or participation).*** Community engagement or involvement refers to communities taking initiative and shaping actions taken within their communities, as opposed to passive compliance with prescriptions given by others. Community involvement has become a standard principle for public health and development work domestically[124], e.g., as part of the Fetal and Infant Mortality Review (FIMR) process,[125] and internationally.[126] Community engagement or involvement reflects social cohesion and trust, which have been linked to a wide range of health outcomes through different hypothesized pathways.[119, 126-128]

  Several articles focusing specifically on the role of community involvement in the federal Healthy Start Program are of particular relevance to the BIH assessment. The Healthy Start Program interventions were mandated to include community involvement. Employing community residents to deliver services was one of many approaches taken to community involvement. An. evaluation of the Healthy Start Program by Mathematica Policy Research Inc. found statistically significant reductions in the infant mortality rate, preterm birth rate, low birth weight rate, and very low birth weight rate at several sites. The evaluators concluded that, among programs with strong program administration, community involvement was one of the factors likely to have contributed to success.[129]

  Other researchers who evaluated Healthy Start judged that community involvement had contributed to community empowerment.[130] However, Howell, Devaney and others[131] wrote a thoughtful and sobering discussion based on early Healthy Start experience, warning that pursuing community involvement is not only exceedingly difficult and labor-intensive but may slow program development.

- ***The need to intervene across a woman's lifecourse.*** Extensive evidence has accumulated demonstrating that health at a given point in time – e.g., during pregnancy – is a product not only of one's health status immediately preceding that time but often of one's health status throughout life, from birth (or even gestation) onward.[38] For a wide range of health conditions, earlier
  - experiences in life have been shown to have lasting effects that are independent of later experiences/health status..[38, 132-151]

  Biological mechanisms have been identified that would explain how chronic stress during childhood could adversely affect a woman's health and lead to an adverse birth outcome, even if her experiences and health status during adulthood were not adverse. Chronic stress in childhood could cause neuroendocrine (hypothalamic-pituitary-adrenal axis) dysregulation that could cause a woman to secrete excess cortisol during pregnancy (a stress-related hormone linked to preterm birth) even if she were not confronted with particularly stressful conditions during that time period.[38] A number of public health experts have concluded that the failure of prenatal care to impact birth outcomes could be a manifestation of this phenomenon.[4, 38] Furthermore, it is possible that psychosocial interventions during pregnancy alone, even when accompanied by appropriate medical care, may also be too little and too late.[4, 38] For this reason, many experts now believe that it is important for any strategy focusing on improving Black infant health to examine the issue with a focus on the long-term health of women and children. It will be necessary to consider how to combine efforts focused on pregnant and parenting women with efforts to strengthen communities in ways that represent investments in children who will later become parents.

### *C. Neonatal Interventions*.

Congenital anomalies, low birth weight (LBW) and preterm birth (PTB) are the major determinants of neonatal health and survival. Preconception care could prevent multiple congenital anomalies by promoting use of multivitamins and folate, abstention from alcohol, and avoidance of other known teratogens during the preconception and first trimester periods. There is relatively strong scientific consensus regarding effective interventions to prevent neonatal mortality among babies born at low birth weight or prematurely. These clinical interventions include:

- antenatal steroids for preterm labor to reduce neonatal morbidity by fostering lung maturation, along with tocolytics to delay delivery until steroids have been administered,
- progesterone for women with prior preterm birth, and
- care for high-risk pregnant women and newborns in hospitals with specialized neonatal intensive care facilities. Women with high-risk pregnancies should deliver in hospitals with intensive care nurseries; and sick newborns, if born in facilities without appropriately intensive neotnatal care, should be transported quickly to those facilities.

There is widespread consensus that continued improvements in neonatal mortality among Blacks and Whites have reflected better hospital care rather than improvements in LBW or PTB.

### *D. Postneonatal Interventions*

SIDS prevention

***SIDS*** is the leading cause of mortality in the postneonatal period overall and among African-Americans nationally,[*] and is one of the top three causes of death among African-Americans in California.[†] Marked recent reductions in SIDS overall and among African-Americans have been attributed to campaigns to educate parents and other infant caregivers about sleep position.[152, 153] Successful campaigns have been conducted at the community-level using mass media and other approaches as well as through provider education of parents. Some studies have found that parents were more likely to hear about infant sleep position via mass media than from their providers. Nationally, Black-White disparities in SIDS widened initially with implementation of the Back-to-Sleep campaign,[154]; this finding was attributed to insufficient tailoring of messages for African-Americans. A range of approaches, including mass media, other community-wide approaches, and provider-based interventions, has been found to be successful in changing infant sleeping patterns associated with SIDS among African-Americans.[155] Moon et al. [156] concluded that a 15-minute small group-based educational intervention at WIC sites increased African-American parents' use of the supine sleep position, whereas media efforts had not been effective.

[*] CDC/NCHS, National Vital Statistics System, 2004
[†] MCAH analysis, California Death Statistical Master File, 2004

Injury prevention

***Injuries*** are another leading cause of postneonatal death overall and among African-Americans. Marked reductions in postneonatal mortality due to injuries have been achieved overall and among African-Americans. Strategies have included legislation (mandating use of infant car seats), providing car seats or smoke alarms at no/low cost to low-income families, public awareness campaigns and other community-wide approaches, and intensive nurse home visiting (2-4 visits per month) begun prenatally and continuing in infancy,[84] as well as provider-based strategies.[157]

### *E. Mass Media/Public Awareness Campaigns*

The use of mass media and public awareness campaigns for health education and promotion applies across all of the time periods (preconception, prenatal, neonatal, postneonatal) discussed above. Mass media and public awareness campaigns may be the only way to reach populations who are not using health services frequently or at all (e.g., young men, pregnant women who are not receiving prenatal care), or they may be seen as adjuncts to provider-based health education and promotion. The Community Guide to Preventive Services conducted systematic reviews and concluded that studies supported the use of mass media in campaigns to reduce tobacco use[158] and alcohol-impaired driving,[159] but there were too few studies of effects on physical activity to draw conclusions.[160] Mass media campaigns regarding SIDS were successful in lowering rates of SIDS overall, but appear to have widened disparities between African-Americans and Whites,[154] highlighting the need to tailor messages and approaches when appropriate. We were unable to locate well-designed studies examining the impact of mass media specifically on African-American infant health. There is, however, substantial evidence in the general health literature regarding the importance of augmenting provider-based approaches with well-designed community-wide public awareness strategies.[161-165] As part of its recommendations on how to reduce disparities in medical care, AHRQ recommended "directed public education campaigns" about important health risk factors to enable patients to advocate for their own receipt of high-quality care.[72]

**Highlighted Conclusions from the Literature Review of Particular Relevance for the Recommendations for BIH**

- **No certainty about how to decrease disparities in birth outcomes**. Little is known about racial disparities in birth outcomes; the known risk factors do not adequately explain the gaps, and there is little evidence of successful interventions. Treating genital or periodontal infections has not consistently improved outcomes. More biomedical and psychosocial research is needed. In the absence of certainty, the MCAH Program must rely on the best available knowledge about likely mechanisms and the most promising interventions to improve birth outcomes. Uncertain but plausible positive benefits for birth outcomes should be weighed along with well documented beneficial effects on other important maternal and infant health indicators. All program recommendations in this report reflect this reasoning – plausible effects on birth outcomes combined with evidence of favorable effects on maternal health and/or other infant health indicators

- **Considerable knowledge about how to decrease disparities in maternal and infant health.** In contrast to the dearth of evidence about how to decrease disparities in birth outcomes, there are many opportunities --supported by strong evidence-- to improve important indicators of maternal and infant health through health education, health promotion, social support and empowerment efforts in the preconception, prenatal, and infant periods. Public awareness campaigns and other community-wide approaches, provider-based health education efforts in the preconception, prenatal, and infant periods, and nurse and paraprofessional home visiting interventions have shown success when carefully planned in a knowledge-based manner. Poorly planned efforts can waste resources.

- **The role of preconception/interconception care**. There is now a strong consensus among the scientific community about the importance of preconception/interconception medical care for maternal health. This consensus appears to be based on knowledge of maternal risk factors and their modifiability, rather than empiric evidence that a specific preconception intervention leads to improved birth outcomes. Nevertheless, the CDC has judged the evidence sufficient to strongly recommend preconception/interconception care. The CDC also recommends

preconception health promotion focusing on "a general awareness among men and women regarding reproductive health and risks to childbearing."[53]

- **The role of interconception care addressing family planning**. The association of short inter-pregnancy interval (i.e., shorter than 18 months) with adverse birth outcomes and adverse social consequences for mothers and children in itself justifies preconception/interconception care efforts focused on family planning.

- **The role of prenatal care**. Prenatal care is important for women's health, as a point of entry to other services (e.g., WIC, social services) and, if care is of high quality, a potential source of health education/promotion. Efforts to decrease disparities in the quality of prenatal care (e.g., related to providers' cultural competence) thus seem important. The BIH Program should continue to promote and facilitate prenatal care, but it is unrealistic, given findings in the literature, to expect that an emphasis on prenatal care –with or without nurse home visiting—will lead to improved birth outcomes.

- **The role of home visiting**. The literature has shown that home visiting by nurses or paraprofessionals has not generally been effective in improving birth outcomes, except among White adolescents and White smokers. Home visiting programs have had favorable effects on reducing child abuse (although recent findings are mixed), improving child learning/development, and prolonging inter-pregnancy intervals. There may be more long-term positive effects of intensive nurse home visiting as well. Where positive outcomes have been shown, they have been observed as results of very intensive home visiting interventions beginning in pregnancy and continuing at least 2 years postpartum.

- **The role of paraprofessional home visiting**. Some paraprofessional home visit programs, especially those targeting at-risk mothers and children, have been shown to have some important intervention effects. It is important to find model programs and program components that address the needs of the targeted population, risk factors, and desired outcomes.

- **The role of social support**. Social support has been observed to reduce stress and/or to buffer the health-damaging effects of stress; biologically plausible pathways have been traced that would explain how social support would have favorable effects on many health outcomes

including birth outcomes. Conclusive proof of the direct effect of social support specifically on birth outcomes is lacking; however, the considerable body of evidence of positive effects, along with a rich body of literature documenting the contribution of social support to a range of important health outcomes across the life course, makes inclusion of social support one of the most promising directions to pursue in efforts to improve Black infant health. This reflects a wide consensus among public health experts.

- **The role of empowerment of individuals--self-efficacy, mastery, sense of control.** Although we did not find specific evidence on the effects of empowerment in relation to birth outcomes, there is a consensus in the literature supporting the importance of empowerment of individuals--measured as self-efficacy, mastery, sense of control, or locus of control--in a range of health outcomes and health behaviors across the life course, including family planning, avoiding harmful substances, and other health-related behaviors . As with social support, the weight of the general literature –rather than conclusive pregnancy-specific literature – supports inclusion of strategies focusing on empowerment for improving the health of pregnant and parenting women.

- **The role of engagement or involvement of communities**. We could not identify evidence of health effects of community engagement from rigorously designed studies; furthermore, the Healthy Start evaluation raised questions about potential conflicts between program goals and community involvement that should be heeded. An approach supporting engagement of communities is nevertheless consistent with a large U.S. and international literature on health promotion and community development. It would be unrealistic to expect community engagement activities to provide short-term improvements in health; however, an investment in communities can be thought of as an investment in improving maternal and child health in the future, based on the strong links between social and economic conditions and maternal and infant health.

- **The role of media/public awareness campaigns**. There is a large body of theory and empirical evidence regarding the need for culturally-appropriate mass media/public awareness campaigns, in addition to provider-based approaches, to achieve change in many health behaviors, including smoking and alcohol use. Messages and approaches need to be tailored to specific populations and communities.

**Unmet Needs of the BIH Population**

Childbearing African-American women in California face multiple challenges to their own and their infants' health, which markedly increase their needs for medical and social services. This report documents large and persistent Black-White disparities in the key indicators of maternal and infant health. Our review of the literature notes the large body of research linking ill health, including maternal and infant health, to poverty or low income among families and communities. A large literature also links racial residential segregation to ill health, and a small but growing literature links experiences of discrimination to ill health through pathways involving stress. Disproportionate rates of poverty/low income and persistent residential segregation substantially increase the need for both medical and social services targeting African Americans in general.

The Maternal and Infant Health Assessment (MIHA), a statewide annual postpartum survey (of English- or Spanish-speaking women over age 14 who have recently give birth in California) conducted by the MCAH Program in collaboration with UCSF to provide vital information for policy and programs, paints a more detailed – and concerning-- picture of the unmet needs of African American women who give birth, than is available in many other states. Among African American women who had recently given birth in California and were surveyed in the 2004-2006 MIHA:

- 63% had low incomes (200% of the federal poverty level or less) during pregnancy.
- 43% were poor (100% of the federal poverty level or less) during pregnancy
- 5% were homeless at some point during pregnancy
- 61% reported that the birth had resulted from an unintended pregnancy; births resulting from unintended pregnancy are at elevated risk of a range of adverse social outcomes for mothers and children
- 54% were overweight or obese before pregnancy.
- 12% rated their pre-pregnancy health as only "good" or "fair", rather than "very good" or excellent".
- 22% had no regular source of medical care before pregnancy.
- 37% had not received dental care during pregnancy, even though they had a dental problem.

- 10% had no insurance coverage for themselves following the 6-week postpartum check-up.

These survey findings document that the African-American delivery population faces many obstacles that could seriously impact maternal and infant health. Data from BIH Program participants (see pages 26-27 in this report) have documented even greater needs among this population than the general African-American delivery population. For example, 84% of BIH participants reported unplanned pregnancies, 17% reported a need for housing within the next two weeks, and 39% reported receiving public assistance benefits. The BIH Program is intended to provide assistance to pregnant and parenting women by removing some of the barriers to achieving a healthy pregnancy and birth, but many obstacles for women enrolled in the program remain. Local BIH staff note that lack of transportation, child care, and food are widespread major hurdles for their clients to overcome. Finding affordable housing and/or shelters for women, including those involved in domestic violence situations, and their children continues to be another, frequently encountered, major challenge for local BIH staff. Some local BIH sites have noted a need to have a trained mental health professional on staff, not only because of limited mental health and substance abuse services in their communities, but also because on-site services would reach many women who trust their local BIH staff but will not comply with a referral to another agency. Coordination with other agencies and programs providing health and social services is essential, and cuts in these services may have large adverse repercussions for BIH.

It is clear that the vital task of addressing the health of California's African-American women and infants presents a complex undertaking. Utilizing the most effective evidence-based model, the BIH Program will continue to have a finite reach in breadth and depth within existing resources, making it a challenge to address the overwhelming unmet health needs of its target population and consequently restricting the ability to affect long-term outcomes. The charge to move forward demands a public health systems approach, building on existing BIH expertise, in order to begin influencing the health of our current African-American population and ultimately impacting the health of future generations.

# Moving forward: Recommendations

**This report makes two general recommendations:**

**<u>Recommendation I.</u> Develop and implement a single core model for all local BIH Program sites that:**

- Addresses health promotion, social support, empowerment, and health education throughout a woman's pregnancy and early parenting.
- Builds upon promising models such as the BIH Social Support and Empowerment model, the Centering Pregnancy and Centering Parenting approach, other models developed by BIH sites, and materials developed and tested elsewhere, adapting and synthesizing them in ways tailored to BIH's target population.
- Increases the number of pregnant or postpartum women served by using creative and efficient approaches to outreach, inter-agency linkages, group-based services, and targeted one-on-one support.
- Identify a set of specified, measurable outcomes reflecting the health of African-American women and infants.
- Is standardized across all sites.

**<u>Recommendation II.</u> Support effective implementation of the core BIH Program model and enhance its impact on Black maternal and infant health by:**

- **Strengthening partnerships and linkages with other relevant agencies.**
- **Strengthening community engagement.**
- **Strengthening the use of media for community-wide outreach, health promotion and education.**
- **Ensuring adequate training, technical assistance and staff development.**

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**Criteria for Developing the Recommendations**

The following criteria guided development of these recommendations:

- The recommended approach is likely to maximize BIH's impact on the health of African-

American women and children.

- The approach is supported by the best available knowledge, including both published and unpublished literature and practical experience.
- The approach can be implemented across all BIH sites.
- The approach is likely to be sustainable at existing funding levels (although additional sources should be explored in the future).
- The approach builds on existing Federal, State, and local initiatives, including existing MCAH Program priorities for 2006-2010. (See the end of the Introduction for a complete list of the priorities.)
- The approach contributes to strengthening communities as well as individuals.
- The approach has measurable outcomes that can be evaluated, with results that have meaning for policy-makers.

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**Recommendation I. Develop and implement a single core model for all local BIH Program sites that:**

- Addresses health promotion, social support, empowerment, and health education throughout a woman's pregnancy and early parenting.
- Builds upon promising models such as the BIH Social Support and Empowerment model, the Centering Pregnancy and Centering Parenting approach, other models developed by BIH sites, and materials developed and tested elsewhere, adapting and synthesizing them in ways tailored to BIH's target population.
- Increases the number of pregnant or postpartum women served by using creative and efficient approaches to outreach, inter-agency linkages, group-based services, and targeted one-on-one support.
- Identify a set of specified, measurable outcomes reflecting the health of African-American women and infants.
- Is standardized across all sites.

**Overall goal:** To improve the health of African-American women and children by providing intensive social support, empowerment, health education, and health promotion during pregnancy and early parenting.

**Overall objectives**

- Create a knowledge-based, standardized core BIH Program model for use by all sites that integrates social support, empowerment, health education, and health promotion in a group-based approach.
- Achieve measurable improvements in several specified outcomes among African-American women and children.
- Design and implement a scientifically sound evaluation plan, yielding data that will inform policy-makers and guide program managers and staff in efforts for ongoing quality improvement.

**Rationale**

*A single core BIH Program model that is standardized across all sites will be crucial to the successful implementation and evaluation of the Program.* Currently each BIH Program is required to implement one specific program model – Prenatal Care Outreach and Tracking—out of four total possible program models; while many sites do include other models as well, choosing to do so is voluntary and depends largely on whether a local site can support the costs and staff time of implementing models in addition to Prenatal Care Outreach and Tracking. The current set of models has not been updated recently and sites have justifiably adapted the model curricula to their local populations and experiences. The resulting differences in implementation, however, have made evaluating the impact of BIH across multiple sites impossible.

Like other public programs, the BIH Program is dependent on policy-maker support for ongoing funding. Because no single BIH site or even cluster of sites serves sufficient numbers of participants to have statistically significant results on its own, outcome information must be pooled across sites—a process that requires a shared set of core activities with consistent implementation at all sites. Without this fundamental standardization, BIH outcomes cannot be measured and reported in

ways that can be meaningful for policymakers. While different staff, populations, and settings at each BIH site will inevitably introduce variability, local staff must understand that variability makes it more difficult to demonstrate overall BIH Program impact in a convincing fashion; staff development activities must periodically reinforce the importance of minimizing variability. Activities that are not feasible at every site should not be included in the core BIH Program model, because their inclusion will inevitably lead to significant inter-site variability. Local sites may choose to implement supplemental activities with other sources of funding, as long as BIH funds are used exclusively to implement the core model in a standardized manner.

*Greater emphasis on group activities is recommended* because group-based activities can be more effective for health promotion and social support than individual-focused activities. By building ties among group participants rather than fostering dependence on a service-provider, an emphasis on group activities is also more consistent with an empowerment model. The current program's emphasis on one-on-one outreach and on one-on-one services for all enrolled women may limit program impact by limiting the number of women who may be served with BIH resources, and also by limiting the emphasis on fostering social support and empowerment among women. Emphasizing group-based activities, such as in the Social Support and Empowerment model, may increase the impact of the Program given the resources. A balance must be struck between individual and group activities, recognizing that some women will not participate in groups and/or may require one-on-one support; eligibility for Title XIX (Medi-Cal matching funds) must also be considered in determining the balance between individual and group activities. There are a number of obstacles to holding ongoing groups, but some BIH sites have found ways to overcome these obstacles and their expertise should be shared with others.

*Addressing social support, empowerment, health education, and health promotion throughout a woman's pregnancy and early parenting is a promising approach to improving maternal and infant health.* Although definitive knowledge of how to improve birth outcomes (low birth weight [LBW] and preterm birth [PTB]) is lacking, many experts believe that *addressing psychosocial issues* is important for improving birth outcomes, especially among African-Americans. Furthermore, there is a sound basis in the literature and a wide consensus among public health experts for focusing on these elements to improve many other important indicators of maternal and infant health, apart from

LBW and PTB. For example, by buffering against the adverse health consequences of stress, social support and empowerment services would make women generally more able to make healthy choices* for themselves and their children.

Current funding levels may restrict postpartum participation in the BIH Program to one year or less. Ideally, an *18-24 month participation period postpartum* would be implemented based on knowledge that an inter-pregnancy interval of 18 months or more is associated with improved birth outcomes and better maternal health. In addition, the inter-conception period is an opportunity for important health promotion and education interventions (e.g., promoting preconception multivitamin and folate use and abstention from alcohol and smoking; addressing diet and exercise; supporting parenting skills and promoting breastfeeding and well child care) aimed not only at subsequent birth outcomes but also at women's and children's health. Success of the Olds model of nurse home visiting with some populations (principally unmarried White teens) has been attributed in part to its continuation from pregnancy through 2 years postpartum.

The ultimate intended outcomes of the core intervention are *improved African American maternal and infant health*. Infant mortality and maternal mortality are rare events and hence difficult to measure, and should be seen as endpoints on a continuum with opportunities to intervene earlier. The literature suggests that no intervention – particularly an intervention with the BIH Program's relatively limited resources and time frame – is likely *by itself* to have measurable impact on birth outcomes without opportunities for synergistic effects with other efforts. The BIH Program should thus measure other important outcomes with well-established connections to mortality or to other important health outcomes. The recommended program model should lead to measurable improvements in a number *of other intermediate outcomes which, based on the literature, are both important in their own right and likely to be influenced by the recommended intervention*. A number of such measures are listed under Implementation below.

* It is worth noting that, although the evidence does not support a key role for smoking or drinking in the Black-White disparity in birth outcomes, it is well established that *smoking cessation and abstaining from alcohol* will improve birth outcomes among pregnant women and BIH health promotion efforts should include these issues.

# Implementation

**Designing the structure of the core model**

- *The core model should rely as much as possible on small-group activities to provide services*. Group-based activities with small groups including the same women could enhance social support, empowerment, health education, and health promotion by building on the combined strengths of all group members and their interactions with each other. A group-based structure would be ideal because health education/promotion and empowerment activities are more effective in groups; furthermore, group members can give each other social support. Also, it could be possible to serve more women with a group-based approach than are currently being served. The BIH program's core Prenatal Care Outreach & Tracking model (PCOT) provides individual case coordination services. The BIH Social Support and Empowerment (SSE) model currently serves fewer women than the Prenatal Care Outreach & Tracking model, reflecting the fact that PCOT is required while SSE is optional; it may also reflect the fact that greater skills are required to run groups than to provide one-on-one support. An expansion of the Social Support and Empowerment model (making it longitudinal throughout pregnancy and early parenting, and greatly expanding the activities), coupled with innovative outreach efforts, could potentially serve more women –and have a greater impact--than are currently being served through PCOT. The group-based approach is likely to be feasible for women enrolled in the BIH Program. Based on our review of the MIS data about sociodemographic and psychosocial characteristics of current BIH enrollees, it appears that relatively few enrollees are so marginalized socially that they would be unlikely to participate in groups.

- *When particular individuals require additional social support (practical and/or emotional), group activities should be supplemented, as needed, by one-on-one support from CHOWs*. Such support can include logistical help (e.g., transportation or child care assistance so that a woman can attend prenatal/postpartum/infant medical care or BIH groups) as well as facilitation or coordination of social services from other agencies. Elements of the Prenatal Care Outreach and Tracking model provide guidance for providing this kind of additional support to individual women; however, our recommendation is that this intensive individual support be reserved for

particular individuals, rather than provided routinely to all BIH enrollees. Criteria for identifying women who require more intensive services will have to be developed. The rationale is trying to have maximal impact with BIH's limited resources. Nurse consultation must be available to the CHOWs as needed; this should be explored with MCAH Directors.

- *The basic structure of the recommended group-based intervention could be visualized in concrete terms as an expansion of the BIH Social Support and Empowerment model, with additional non-clinical elements of the Centering Pregnancy framework.* The Social Support and Empowerment model provides 8 group sessions focused on health education, health promotion, social support, empowerment and life skills education, led by a dynamic facilitator (professional or paraprofessional). Social Support and Empowerment has been used by many BIH sites for years to engage African-American women in group format. Centering Pregnancy involves a series of 10 structured small-group visits integrating prenatal care with social support, empowerment, health education, and health promotion activities in a model that emphasizes empowerment. Groups are led by nurse-midwives or nurse practitioners with assistance from health educators, social workers, nutritionists, and other health professionals. (A logical extension of Centering Pregnancy, Centering Parenting, extends the Centering Pregnancy model into the postpartum and infancy periods.) The structure of the recommended intervention would expand the Social Support and Empowerment model to ongoing groups throughout pregnancy and the postpartum/early parenting period. Elements of the Centering Pregnancy model, including use of nurse-midwives and other health professionals, could be added to the current Social Support and Empowerment model. It should be emphasized that the current Centering Pregnancy and Centering Parenting curricula would require very extensive revision to be suitable for BIH; furthermore, there are many logistical obstacles that would need to be overcome, that require intensive consideration by MCAH, local MCAH Directors, and local BIH staff.

- *The group approach presents challenges*. While small groups including women at similar stages of pregnancy are ideal, only the largest BIH sites will have sufficient numbers of women for stage-specific groups. Because women enroll in the BIH Program at different times during their pregnancies, groups at most sites will need to include women at different stages of

pregnancy/parenting. *Accommodating this practical reality would require building flexibility into the curriculum*, permitting different groups to tailor the focus of their meetings by selecting relevant topics in varied order from a standard topic 'menu.'

- *Maintaining participation in groups over time is another challenge*, considered particularly daunting by some BIH sites. A number of BIH sites have been successful, however, in maintaining good participation in ongoing support groups. Local BIH sites have attributed the success to scheduling sessions on evenings and Saturdays and/or having CalWORKS, CalLEARN, and in some cases Probation Officers agree to credit participation in BIH groups toward their own requirements. Some BIH Programs have observed that material incentives such as infant car seats, diapers, diaper bags, and items for the women themselves can have a substantial impact on participation, and the domestic and international literature supports the use of incentives in this manner. State funds have not been adequate to purchase incentives for some time; use of incentives should be reconsidered in light of the literature.

- *Bringing women into groups is yet another challenge.* The current core model, Prenatal Care Outreach & Tracking, focuses on identifying pregnant women in their communities with the help of Community Health Outreach Workers. A more effective approach to outreach would utilize media and a system of linkages and affiliations with other programs to ensure a stream of women entering into the new BIH model. The capability to do limited highly targeted outreach in special cases should be retained, but unless funding requirements mandate continuation of intensive effort on one-on-one outreach, use of media and strengthened linkages are likely to have higher yields, freeing up staff time for increased health promotion, health education, social support and empowerment activities.

- The *essential personnel* to implement the small groups would include a *health educator* (or social worker with strong group facilitation skills) to lead the group, and ideally a *family (or maternal-infant) care nurse with up-to-date clinical expertise* to address clinical topics and to be a resource as questions arise at all group sessions. Group leaders must be African-American. The health educator/social worker may be a paraprofessional in certain cases, where a skilled paraprofessional is known to BIH staff; paraprofessionals (or social workers, for that matter)

should be taking the lead only on non-clinical topics. If an African-American nurse is unavailable, another African-American health professional should be co-leader; a non-African-American nurse could be utilized as a resource on an as-needed basis, but she would not participate in sessions unless specifically needed. The intention will be, to the extent possible, to retain current BIH staff who are willing and able to be retrained.

**Developing the content of the core model**

- Promoting the *use of recommended prenatal, infant, postpartum, and women's health care* should *be part of the core model's content* for all BIH-enrolled women. As is done currently, appropriate referrals should continue to be made for services such as Medi-Cal enrollment, family planning, WIC, HIV-testing, mental health, substance abuse, domestic violence, job training, and other social services. Material support (transportation, child care, patient advocacy) should be provided on an as-needed basis to individuals who would not otherwise obtain recommended care. Health education topics should cover common physical health and psychosocial issues during pregnancy and the postpartum period, as well as topics regarding infant health and women's health and well-being more generally, all tailored to the specific needs of African-American women.

- To *develop the social support, empowerment, health education and health promotion model,* the new model's curriculum should build upon the current Social Support and Empowerment model, with additional added elements extracted from the Centering Pregnancy framework, from innovative models developed by individual local BIH sites, and from curricula of well-established programs developed elsewhere. Adopted elements should be supported at least theoretically by the literature, especially where sound evaluation indicates their practical effectiveness.

    - *Consider relevant material in all of the existing BIH models* that could be incorporated with appropriate adaptations.
        - The *Social Support and Empowerment* model in particular embodies a desirable fundamental approach. The topics it covers seem essential. It is unrealistic, however,

to expect an impact on the desired outcomes with such a short timeframe (SSE is designed as an 8-week intervention.)

- The *Behavioral Modification* model also should be assessed as a potential source of material.
- The *Prenatal Care Outreach/Tracking* model contains valuable lesson plans for training paraprofessional CHOWs and guidance for recruiting appropriate trainers. It seems inefficient, however, for CHOWs to routinely perform intensive one-on-one follow-up with all enrollees; we recommend reserving this for those who clearly need the more intensive services. It also seems inefficient for CHOWs to spend time combing the streets, laundromats, and elsewhere looking for pregnant women. Strategic use of media and links with other agencies are more efficient approaches to recruitment and should free up CHOW time. (See Recommendation II below)
- The *Role of Men* model includes helpful ideas about how to engage men as supportive fathers and partners, and explains clearly how doing so contributes to the health of women and children. Without additional resources, however, sites may not be able to provide the services to men that this model recommends and that appear desirable. Adding these elements to the BIH core model should be among the priorities to consider if additional funding were available in the future, and linkages should be explored with other programs addressing the needs of men.
- The *Comprehensive Case Management* model lists important health education topics to cover with pregnant/postpartum women that should be covered by the new core model. As it is currently constructed, however, this appears to be the weakest of the BIH models, providing little concrete guidance or skills-building techniques. There is no clear specification of the required background for case managers (at different places in the model documentation, nurses, social workers and health educators are listed as appropriate case managers), and most of the case manager's listed duties require primarily psychosocial skills and ability to coordinate social services.
- The *supplementary model for Care Coordination by paraprofessionals*, developed for use where PHNs are unavailable, contains useful material for training CHOWs to assist with service coordination. Particularly given the State's severe nursing shortage, and the salary levels of nurses, it appears more rational to train (and

appropriately supervise) well-qualified CHOWs to perform one-on-one service coordination when needed, and to provide practical and emotional support to ensure high-risk women obtain needed prenatal/infant care, with a nurse available for consultation as needed.

Note: None of the above-mentioned models refers to *current literature.* The new model should have up-to-date references, relying on literature review conducted by the Assessment team last year and updated with references on specific curricular models identified during the development phase.

- The final content of the core BIH Program *model will be developed with significant input* from local BIH Program staff, MCAH Directors, State BIH Community Advisory Committee members, State MCAH staff, additional expert consultants and the Assessment team.

    - *Create a Program Development Working Group consisting of:* 3-5 interested local BIH Program staff; 1-2 interested MCAH Directors; 1-2 volunteers from the State BIH Community Advisory Committee; State MCAH staff; and the Assessment team (supplemented with expert program development consultants as needed).

    - *Local BIH staff must be closely involved in developing the guide* from the beginning. A number of local BIH Program staff have considerable expertise and creativity and are passionately committed to the BIH Program. On many issues, they alone will know whether a given approach supported by the resources that can realistically be expected will work with the BIH target population. Their substantive input is crucial from the very beginning of developing a new model to avoid wasted resources. Without this involvement, their buy-in will be at risk. A limited number (3-5) of BIH Coordinators (or other relevant local staff designated by Coordinators) should be designated to work closely with the rest of the Working Group on developing the detailed curricular/program guides. A workable structure should be sought to allow for wide input without creating an unwieldy process. Diverse local conditions should be represented on the Working Group, so that the materials developed will be appropriate at diverse BIH sites.

- *MCAH Directors also have relevant expertise*; their perspective is particularly needed on feasibility, linkages and opportunities to draw on other resources. They also must be involved from the outset; 1-2 MCAH Directors should participate in the Working Group.

- *The work of amassing the relevant experiences from BIH sites and elsewhere can be done by the UCSF Assessment team* (if desired and if our Year 2 Scope of Work, now focused on designing the evaluation, were modified), who would seek advice from individual colleagues (local and national), the MCAH Program, and national MCH networks including CityMATCH, AMCHP, MCHB/HRSA, and MCH-Epi (CDC), in searching for curricula developed elsewhere.

- One to two *highly experienced program development consultants (at least one of whom preferably would have specific expertise relevant to the health of African American women/children)* should be identified to provide guidance from the beginning and to carry out the final stages of synthesizing the diverse materials into an effective, polished program guide/curriculum. Costs can be minimized by using the expert consultant judiciously, relying on the Assessment team to carry out research and organizational tasks with the consultant's guidance. The *guide should be reviewed by outside experts* with background in social support and health promotion in the African-American population, as well as individuals with a wide range of expertise in maternal and infant health (e.g., nurses, social scientists, etc.)

- At frequent intervals, *drafts (in brief installments) should be circulated via e-mail to all BIH staff, MCAH Directors, members of the State BIH Community Advisory Committee, State MCAH staff, and experts (as needed) for comments*. Comments should be requested via e-mail or individual telephone calls but teleconferences also should be scheduled to permit exchange *among* local staff; such communication has been helpful during the Assessment process.

- It may be possible to *complete this process of curriculum development over a 12-month period*,

depending on the time needed to (a) collect relevant materials from other programs and (b) achieve consensus. *Pilot-testing* will be essential, but is unlikely to be feasible during the 12-month development process. Individual components of the guide may be pilot-tested as drafts are completed.

**Training and staff development**

- The intention is for local BIH staff to continue, re-training them in the implementation of the core model. For example, current BIH staff could play an important role in linkages with other agencies, in supporting group activities, and in providing one-on-one assistance to a limited number of BIH clients who will not participate in group-based activities.
- *Initial training for BIH staff in the use of the core model is likely to require several days*, potentially distributed across more than one initial workshop. Training workshops should be followed soon thereafter by *site visits* by an experienced trainer, to reinforce the trainings, support, and trouble-shoot. Training costs may be lessened by: relying as much as possible on BIH staff with the appropriate skills to be trainers, supplemented by 1-2 professional trainers; and using 2-3 regional workshops --rather than a single statewide workshop for the initial and/or follow-up trainings –could reduce costs of transportation and hotels. Having more than one workshop will increase the time needed from the professional trainers, and this must be balanced against savings in travel costs for BIH staff. It also would be advisable for all BIH staff to be together for at least some training workshops.

- Resources also need to be allotted *for two forms of ongoing staff development*. *One-day regional workshops* will serve as refresher trainings and opportunities for local staff to share experiences and techniques (successful and unsuccessful) to improve implementation as well as to recommend changes needed. BIH personnel from local sites can probably provide most of the trainers for these ongoing education/staff development workshops. *Site visits by trainers* to provide continuing support to staff in implementing the core model, to continually assess how the model is working, and to advise regarding the need for revisions in the core model. While some outside expertise may be advisable for this purpose, a few BIH Coordinators also should be considered for the role of site visitor(s). It should be assumed that in the first couple of years (at

least) after implementation, *modifications in the core model will need to be made based on experience in the field.*

**Developing the evaluation plan**

- A *scientifically sound evaluation plan* is needed both to inform policy-makers (thereby promoting financial sustainability) and to guide program managers and staff in efforts for ongoing quality improvement. Outcome data should be periodically shared at regional workshops, as the basis for discussions among staff regarding quality improvement, including needs for program modifications.

- *Potential outcome measures:* The officially stated goals of the BIH Program should be amended to include not only decreased infant and maternal mortality, but improved "maternal and infant health" considered more broadly. Described below are examples of the range of potential outcomes that could be impacted and measured by the BIH Program.

    - *Outcomes related to use of clinical services*
        - *Utilization of recommended preventive medical services* including prenatal care, well-baby care, postpartum care and family planning, and women's health care.
        - Use of *postpartum family planning*.
        - Receipt of *appropriate referral services* such as WIC, HIV, mental health, substance abuse, domestic violence, job training, other social services.

    - *Outcomes reflecting strengthening of women's fundamental capabilities to promote their own and their children's health*:
        - *Mastery/self-efficacy* and *self-esteem.*
        - *Social support* – material (instrumental/practical) and emotional.
        - *Life skills*.
        - *Skills in relationships* with partners and family.
        - *Knowledge of important health issues* during pregnancy (danger signs, avoiding harmful exposures), postpartum (need for family planning), for infants (e.g., sleep

position, breastfeeding), and regarding women's health (nutrition, preventing/controlling chronic disease).

- *Outcomes that depend on strengthened capabilities and the intermediate outcomes above:*
  - *Maternal mental health* (fewer depressive symptoms, functional status).
  - *Parenting skills.*
  - *Child abuse/neglect.*
  - *Educational and occupational outcomes* for the women.
  - *Use of harmful substances* including alcohol during pregnancy, binge drinking at any time, tobacco use.
  - Maternal and infant *nutrition* (general nutrition, breastfeeding).
  - *Maternal physical health* (control of hypertension, diabetes, obesity)/risk factors (leisure physical activity).
  - *Inter-pregnancy intervals* (Note: this can only be assessed if women are followed for a sufficient time period postpartum). This reflects both maternal and infant health.

- Impact on *birth outcomes* also should be measured, with the understanding that an intervention as limited as that possible with current BIH resources may not have a measurable impact at this level:
  - *Low birth weight*, *very low birth weight* (VLBW), and *preterm birth* rates (will require focused attention to improve percent of enrollees with birth outcome information).

- For each outcome that is selected for measurement in the BIH Program, existing (and, when possible, validated) instruments should be sought for measuring the specified outcomes among low-income African-American women. Validated instruments should be given high priority, but considerations of complexity and burden on staff time also are important in selecting appropriate measures for the BIH Program. The goal when selecting measures will be to build an ongoing data base for many key outcomes while at the same time streamlining the data collection requirements for local BIH staff.

**<u>Recommendation II.</u> Support effective implementation of the core BIH program model and enhance its impact on Black maternal and infant health by:**

- **Strengthening partnerships and linkages with other relevant agencies.**
- **Strengthening community engagement.**
- **Strengthening the use of media for community-wide outreach, health promotion and education.**
- **Ensuring adequate training, technical assistance and staff development.**

***<u>Strengthening partnerships and linkages with other relevant agencies.</u>***

**Goal:** To improve Black maternal and infant health through identifying and partnering with other statewide and local agencies with overlapping goals and missions.

**Objectives**

- Increase the numbers of women served by the BIH Program through increasing referral relationships with partner agencies.
- Negotiate agreements with CalWORKS and Cal-Learn that would facilitate women's participation in ongoing support/health promotion groups.
- Identify several promising potential partnerships/linkages that would expand the services BIH participants receive and identify strategies to strengthen/develop the links.

**Rationale**

Improving Black infant and maternal health will require coordinated efforts by multiple agencies, as well as policy changes at many levels and in many sectors beyond health care. The BIH Program should facilitate and build on linkages with programs that offer related or complementary services; such linkages can greatly increase the impact of the BIH Program, either through increasing referrals into BIH or augmenting services received by BIH participants. Some BIH sites have been highly successful in building linkages across a range of other local programs (including county Public Health Nursing activities, other clinical and social service referral resources, First Five, and a range of community development efforts), and these sites can provide guidance and technical assistance for others. Unfortunately, local arrangements have at times been informal and are vulnerable to staff turnover in the other local agencies. When the relevant agencies operate in all counties, negotiating partnering arrangements at the statewide level would be more efficient and effective.

**Implementation**

- The MCAH Program has already formed partnerships with some of the following agencies, but should explore expanding those linkages *for the express purpose of strengthening the BIH Program*, and identify others that would be appropriate as well:
  - First Five: Explore whether First Five could potentially fund implementation of one or more of the proposed recommendations that are beyond the reach of BIH's resources – e.g., community engagement, media, extension of support/health promotion groups to 18 months and ideally longer.
  - CalWORKS and Cal-Learn: Explore linkages that would allow work and/or educational requirements to be met with BIH activities.
  - Title XIX (Medi-Cal FFP): Explore whether Title XIX funds could be extended to promoting women's health and use of prenatal care through support/education groups as well as for one-on-one tracking activities.
  - Other appropriate agencies (Probation, Child Protective Services, etc.)

- Hold discussions among BIH Coordinators/MCAH Directors about local-level strategies to establish and maintain linkages with partners who can augment or strengthen BIH services. A number of current BIH Coordinators have been successful at creating and maintaining successful partnerships and can suggest promising opportunities and strategies to their colleagues.

    - Beginning as soon as possible and periodically (at least every 5 years) thereafter, conduct an inventory of relevant programs and services and systematically consider opportunities for linkages. BIH Program staff should regularly assess its own program content in the context of all relevant programs.

    - Consider the need for activities designed to increase cultural competence of staff serving African-American women at other agencies, including clinical and social service staff in key agencies serving pregnant/parenting African-American women. This could greatly increase the ability of other agencies to serve African-American women effectively, thereby reducing some of the burden on BIH staff. This will, however, probably require the identification of additional sources of funding.

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***Strengthening efforts to engage communities.***

**Goal:** To improve Black infant health by increasing community mobilization and involvement in actions to improve Black maternal and infant health.

**Objectives**

- Increase the skills of BIH staff in promoting community engagement.
- Strengthen local Community Advisory Boards by incorporating additional key stakeholders.
- Increase community awareness of the BIH Program and its services.
- Increase community-level activities to promote Black maternal and infant health.

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**Rationale**

The literature supports engagement or involvement of communities as a strategy that can lead to improved health of communities. In addition, community engagement can mobilize a range of resources that would not be available with a more traditional "top-down" approach. Involving the community is a required component of the BIH Program; local sites sponsor at least two community events every year and must convene a Community Advisory Board with community members, leaders and providers. However, the degree of success, particularly with Community Advisory Boards, currently varies among the sites.

**Implementation**

- A half-day session at an upcoming statewide meeting should be devoted to community engagement strategies; if possible, outside experts should be brought in to lead the session, and some BIH Coordinators with experience in this areas should be enlisted to assist in leading discussion groups.
- All sites—and in particular those that currently are involved in few community engagement activities--need adequate training and ongoing technical assistance.
- The staff of sites that are already involved in promoting community engagement can share their expertise on strengthening engagement activities with other sites by assisting in training and ongoing technical assistance.
- Ongoing guidance should be provided on utilizing local BIH Community Advisory Boards to incorporate key stakeholders and leaders who are likely to be effective in building community engagement; again, some BIH sites have already done this effectively, and can advise others.

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***Strengthen the use of local media for community-wide outreach, health promotion and education. Explore the feasibility of statewide support for use of mass media.***

**Goal*:*** To contribute toward improvements in Black maternal and infant health by using mass media as a means to community-wide dissemination of health education/promotion messages and to heighten awareness of the BIH Program among local policy-makers and the public.

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**Objectives**

- Increase knowledge among the African-American community of important health education/health promotion messages relevant to Black maternal and infant health.
- Increase awareness of the BIH Program among (a) African-American women of reproductive age and the African-American community in general, (b) other relevant service providers and agencies, and (c) policy-makers.
- Increase the numbers of pregnant/parenting African-American women enrolled in BIH through self-referral and referrals from the community, thereby reducing BIH staff time spent in one-on-one outreach.
- Decrease the proportion of African-American women who smoke and drink alcohol prior to conception and during pregnancy.

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**Rationale**

Media campaigns can increase public awareness of Black maternal and infant health concerns and also can increase support for and use of BIH services. Although data on many services provided by BIH are not collected as part of the current data system, it appears that a small proportion (e.g., no more than 12% during 2005) of Black women who give birth in the BIH counties and cities with a BIH Program are actually enrolled in the Program. Currently, BIH local sites are utilizing local media (including flyers, bus placards, newspaper, radio, etc.) with varying degrees of success. A significant portion of staff time is spent on neighborhood outreach to find women who may be pregnant or parenting or who know someone who is. While potentially useful, this "word of mouth" advertising may limit the extent to which BIH can substantially increase the number of eligible women enrolled in the Program. Community-wide media efforts are essential to reach larger numbers of African-American women and their families, including women who will not or cannot participate in individual- or group-focused activities. Although priority should be given to economically disadvantaged African-American women, large Black-White disparities in birth outcomes are seen among women across the socioeconomic spectrum; BIH needs to reach out to Black women at all socioeconomic levels, and the most efficient way to do this is via public media.

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The potential impact of increased media efforts could be substantial. There is a strong consensus among the Advisory Group regarding the need for intensified efforts with media. Local BIH Coordinators have also been supportive, but they note that their local resources are generally insufficient to create their own media campaigns; therefore it would be helpful to have standardized statewide materials that all sites could use and adapt to their local needs. It is recommended that MCAH develop a coordinated media strategy, with assistance from media professionals. At a minimum, the BIH sites with more media experience can help other sites to move forward. These discussions could lead to greater clarity about the level of needed support at the State level; for example, less funding would be needed if attractive materials are already available from work at individual sites.

**Implementation**

- Media campaigns need to be strategic, with the multiple goals of (1) outreach for potential BIH clients; (2) community education about important health messages (e.g., importance of preconception care, importance of men's role in parenting, importance of inter-pregnancy interval) and (3) making policy-makers and the public more aware and supportive of BIH.
- Media outreach should target men as well as women (e.g., with messages about men's role in parenting), and should increase community awareness of a range of relevant services –not only BIH services --for African-American families that are likely to promote maternal and infant health.
- As with other aspects of the BIH Program, there should be an attempt to standardize as much as possible; however, the local sites need reasonable autonomy in how they adapt and use the materials.
- Members of the State BIH Community Advisory Committee have suggested combining efforts focused on gaining media attention with efforts to periodically recognize outstanding performance by local BIH staff. For example, celebrations of the Program's successes, including special recognition of high-performing staff, could bring in local politicians and thus draw media coverage.
- State MCAH should explore the possibility of statewide support for mass media activities at statewide and local levels. Ideally, the State would produce template media materials for local

adaptation and implementation. The materials should consider drawing on elements from materials that some sites have already developed on their own. A few BIH Coordinators could play a lead role in working with State MCAH on this, with input obtained periodically from all sites, e.g., by soliciting e-mail comments on drafts and through teleconference discussions.

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***Ensure adequate training, technical assistance, and staff development.***

**Goal:** To improve Black maternal and infant health by ensuring the capabilities of local BIH staff to implement the core intervention. This requires ongoing staff development, technical assistance, and efforts to sustain staff morale.

**Objectives**

- Skilled and knowledgeable local staff (as assessed by expert trainer based on staff development workshops, site visits).
- Improved morale of local staff who should feel supported in enhancing their abilities to serve BIH Program participants (assessed by anonymous questionnaires, staff discussion at workshops, and site visits).

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**Rationale**

A transition to a single, core BIH Program will present new challenges for many BIH staff, particularly in the areas of facilitating groups, sustaining participation in groups, engaging communities, increasing use of media, and strengthening partnerships/linkages with other agencies. The current wide range of expertise and experience among the BIH Coordinators could inform ongoing staff development and program improvement activities. Opportunities for sharing expertise and maintaining morale could improve skills and increase program productivity and impact. To ensure that changes in the program are reasonable and feasible, representatives of local program staff should be actively involved in crafting concrete changes in the program. Local staff input should be ongoing, so that the program changes appropriately in relation to changing circumstances and emerging evidence of both program impact and obstacles to implementation.

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**Implementation**

- Hold regional meetings of BIH Coordinators/MCAH Directors at least once a year, in addition to the current annual statewide meeting. The regional meetings should include all staff, while the statewide meeting includes only BIH Coordinators and MCAH Directors. Local staff should be consulted as continuing education topics are selected for the regional and statewide meetings. Locations of the regional meetings should be selected to minimize costs and travel time.
- Hold regular (at least quarterly) teleconferences of BIH Coordinators and MCAH Directors, facilitated by MCAH but with substantial involvement of local staff in setting agendas. These teleconferences should provide an opportunity to respond to emerging concerns raised by both State and local staff. The atmosphere should be informal and open and encourage frank exchange of ideas; the goal should be collaborative problem-solving.
- Considerable time at teleconferences and at regional and statewide meetings should be allotted for open discussion of challenges and sharing approaches to overcoming them; meetings should include time for discussions in small groups. Lecture format should be kept to a minimum.
- Statewide and regional meetings should routinely include recognition of BIH sites or particular staff who have made outstanding contributions, based on criteria developed by the Advisory Group. This assessment process has revealed that local BIH staff deserve praise for their efforts on behalf of African-American infant health. Working under challenging circumstances, staff members routinely go above and beyond their job duties in attempting to meet clients' needs. Many staff members have shown creativity in developing innovative approaches and stretching limited resources.
- Staff morale could also be enhanced through recognition of sites and/or staff at public events; these events would also provide opportunities for showcasing BIH to local politicians, community leaders, and agencies; see Recommendation regarding media.

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## Appendix 1

**List of Key Informant Interviews**

Mildred Thompson, MSW
Executive Director
Healthy Start, Oakland, CA

Deborah Roebuck, RN, MSN
Project Director
Healthy Start, Philadelphia, PA

Carol Brady, MA
Executive Director
Magolia Project, Jacksonville, FL

Pam Hansen, MPH
Maternal and Child Health Director
New Haven Health Department, New Haven, CT

Diane Cox, PhD, MSN, RD
Program Administrator, Office of Family Health
Maricopa County Public Health Department, Phoenix, AZ

Linda Hook, RN, MSHP
Nursing Program Manager
San Antonio Metropolitan Health District, San Antonio, TX

Jane Bambace, M.Ed
Home Visiting Services Director
Healthy Start Coalition of Pinellas, Clearwater, FL

Helen Jackson, PhD, MSRD
Director, Division of Community Nutrition Services
Duval County Health Department, Jacksonville, FL

Carolyn Slack, MS, RN
Director, Maternal Child Health Division
Columbus Health Department, Columbus, OH

Kathy Carson, RN
MCH Coordinator
Seattle-King County Department of Public Health, Seattle, WA

Zenobia Harris, MPH, BSN
Patient Care Leader, Central Region
Arkansas Department of Health, Little Rock, AR

Meena Abraham, MPH
Director of MCH Programs
Baltimore City Health Department, Baltimore, MD

Cynthia Harding, MPH
Program Director, Maternal Child & Adolescent Health Program
Los Angeles County Department of Health Services, Los Angeles, CA

Virginia Smyly, MPH
Deputy Director, Community Health Prevention Branch
San Francisco Department of Public Health, San Francisco, CA

Kimberlee Wyche-Etheridge, MD, MPH
Director, Bureau of Maternal and Child Health
Metro Public Health Department, Nashville, TN

## Appendix 2

Roundtable discussions were held during the second day of the October, 2007 BIH Statewide Meeting. Listed below is a summary by MCAH staff of comments obtained from MCAH Directors, BIH Coordinators and local BIH staff during those roundtable discussions.

**"What BIH Needs…."**

- Stronger collaboration with the social service system (housing, mental health, medicine, client needs and how they are served by providers)
- Reinstate serving clients for two years instead of one year
- Provide comprehensive services for clients
- Increase political voice & involvement
- Increase Pre-Conception education & help
- Train BIH Personnel to give up-to-date information
- Teach clients to teach their children & families
- See racism as a health issue, not just a social issue
- Provide mental health education for clients
- Increase access to quality food
- Train providers on health impact of racism
- Peer-to-peer client involvement & teaching (empowerment)
- Continue to collect data that will help the program to continue
- Take information received and provide the information to the clients & staff
- Do not "wait" for state to change policy to "allow" us to take action
- Less "Red Tape" & more attention to addressing the needs of the Program
- Positive approach to racism (understanding & coping)
- Practice stress reduction techniques
- Examine how to capture and implement positive attributes and activities so they are not lost when people move on