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Factors Associated with Bed-Sharing Within Racial Groups in a Sample of Mothers and Young Infants in Wisconsin

Trina C. Salm Ward
University of Wisconsin-Milwaukee

FACTORS ASSOCIATED WITH BED-SHARING WITHIN RACIAL GROUPS IN A SAMPLE OF MOTHERS AND YOUNG INFANTS IN WISCONSIN

by

Trina C. Salm Ward

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ABSTRACT

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The University of Wisconsin-Milwaukee, 2012
Under the Supervision of Professor Mary K. Madsen, Ph.D., R.N., FAAIDD

Since 2005, the American Academy of Pediatrics has recommended a separate but proximate sleep surface for infants (AAP, 2005). However, racial differences in the prevalence of bed-sharing and infant mortality (especially as a result of SIDS or unsafe sleep) continue. Limited research has examined predictors of bed-sharing by racial group, especially the AAP's 2005 policy statement against it. The purpose of this study was to explore maternal-infant bed-sharing and infant sleep position for African-Americans and Whites in a sample of 2,530 respondents (822 African-American and 1,708 Whites) to the Wisconsin Pregnancy Risk Assessment and Monitoring System (PRAMS), a stratified sample of linked survey and birth certificate data between 2007 and 2010. Significantly more African-Americans (70.5%) reported bed-sharing than Whites (53.5%), $z = 56.67$, SEM = 0.005, $p < .001$ (one-tailed). Factors associated with bed-sharing varied by race. In the final models, for African-Americans, a higher likelihood of bed-sharing was associated with ≥ 16 years of education (Odds Ratio[OR]: 2.540, 95% CI: 1.098-5.875), 13-15 years of education (OR: 1.924, 95% CI: 1.129-3.278), partner-related stress (OR: 1.859, 95% CI: 1.272-2.715), currently breastfeeding (OR: 1.598, 95% CI: 1.012-2.522), non-supine infant sleep (OR: 1.573, 95% CI: 1.077-2.297), and maternal age (OR: 0.963, 95% CI: 0.931-0.995). When Medicaid as method of payment was included, it reduced the likelihood of bed-sharing (OR: 0.550, 95% CI: 0.372-0.814). For Whites, bed-sharing was associated with currently breastfeeding (OR:

2.444, 95% CI: 1.939-3.081), income of $10,000-$14,999 (OR: 1.833, 95% CI: 1.004-3.344), income of $35,000-$49,999 (OR: 1.704, 95% CI: 1.234-2.351), being unmarried (OR: 1.667, 95% CI: 1.184-2.346), non-supine infant sleep (OR: 1.407, 95% CI: 1.069-1.852), and partner-related stress (OR: 1.381, 95% CI: 1.058-1.802). Needing money for food was also associated with bed-sharing (OR: 1.575, 95% CI: 1.158-2.143). Overall, subtle differences in the factors at play for African-American and White families who bed-share were demonstrated. Practice implications include culturally-relevant discussions and interventions. In-depth investigation of the family level context of bed-sharing, the ecology of infant sleep, and information received by families is suggested. These results help inform development of a targeted, culturally sensitive approach to educating families on sleep-related infant safety.

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LIST OF ABBREVIATIONS

AAP……American Academy of Pediatrics

CDC……...…….Centers for Disease Control and Prevention

CI…….……..Confidence Intervals

DHHS……...……..Department of Health and Human Services

DPH……...……Department of Public Health

DSM-IV……...…….Diagnostic Statistical Manual IV

FIMR……...….Fetal Infant Mortality Review

FPL…….……..Federal Poverty Level

HMO…….Health Maintenance Organization

IFPS II…….....Infant Feeding Practices Study II

IMR……...…….Infant Mortality Rate

MHD……..…….City of Milwaukee Health Department

NCHS……...…..National Center for Health Statistics

NICHD……..…….National Institute for Child Health and Human Development

NICU……...……..Neonatal Intensive Care Unit

NISP……..National Infant Sleep Position Study

OR……..…….Odds Ratios

PRAMS…….……..Pregnancy Risk Assessment and Monitoring System

SES……...…….Socioeconomic Status

SEM……..……Standard Error of Measurement

SIDS……..…….Sudden Infant Death Syndrome

SPSS……..……..Statistical Package for the Social Sciences

TANF……..……..Temporary Assistance for Needy Families

U.S……..……United States

WDHS……..…….Wisconsin Department of Health Services

WIC……..…..…..……..Women, Infants and Children Services

χ^2……...…….Chi Square

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CHAPTER 1

INTRODUCTION

Bed-sharing between an infant and mother has been a common practice for centuries among many different cultures (McKenna, Ball & Gettler, 2007; Jenni & O'Connor, 2005; Baddock, 2000). However, an ongoing debate on the benefits and risks of bed-sharing has been brewing, with some linking bed-sharing to an increased risk of infant death due to unsafe sleep situations and Sudden Infant Death Syndrome (SIDS) (Schnitzer, Covington & Dysktra, 2012; Venneman, Hense, Bajanowski, Blair, Complojer, Moon & Kiechl-Kohlendorfer, 2011; Ball, Blair & Ward-Platt, 2004). On the other side of the debate, bed-sharing benefits both infant and mother, leading to more sleep for both, improved breastfeeding rates, increased milk supply, more stable infant heart rates and breathing patterns, and increased maternal response rates (Ball & Volpe, 2012; McKenna & McDade, 2005; Baddock, Galland, Bolton, Williams & Taylor, 2006; Gettler & McKenna, 2011; Morgan, Horn & Bergman, 2011; Gettler & McKenna, 2010). Since 2005, the American Academy of Pediatrics' (AAP) Taskforce on SIDS has recommended a separate but proximate sleep surface for infants, and as result, many health care providers and public health officials have recommended against bed-sharing (AAP, 2005; 2011).

Juxtaposed with this debate is the significantly higher prevalence of bed-sharing among African-Americans. Among nineteen states reporting bed-sharing through the Pregnancy Risk Assessment and Monitoring System (PRAMS), African-Americans had a higher prevalence of bed-sharing than Whites, with rates as high as three times the rate for Whites (Centers for Disease Control [CDC], 2012). Racial differences in the prevalence of bed-sharing have been confirmed by others as well (Broussard, Sappenfield & Goodman, 2012; Blair, Heron & Fleming, 2010; Fu, Moon & Hauck, 2010; Fu, Colson, Corwin &

Moon, 2008; Hauck, Signore, Fein & Raju, 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, Hunsaker, Mudloon, Corey & Spivak, 2005; McCoy, Hunt, Lesko, Vezina, Corwin, Willinger, Hoffman & Mitchell, 2004; Brenner, Simons-Morton, Bhaskar, Revenis, Das & Clemens, 2003; Willinger, Ko, Hoffman, Kessler & Corwin, 2003). These findings are especially concerning in light of racial disparities in infant mortality rates (IMR) between African-Americans and Whites – with African-American infants being at twice the risk of death in their first year of life than Whites or Hispanics (with IMRs of 13.3 per 1,000 live births, 5.6, and 5.5, respectively) (Murphy, Xu & Kochanek, 2012). Further, African-Americans accounted for a disproportionate number of infant deaths caused by SIDS and unintentional injuries (including unsafe sleep situations) compared to Whites, whereas Hispanic rates for SIDS were similar to or below the White rates in 2007 (at rates of 107.9, 58.0, and 29.2 deaths per 100,000 live births for SIDS, respectively, and 60.7, 29.9, and 13.4 deaths per 100,000 live births for unintentional injuries, respectively) (Mathews & MacDorman, 2011).

The burden of racial disparities is even higher for some states. Between 2008 and 2010, African-American infants in Wisconsin were almost three times as likely to die in their first year of life compared to Whites or Hispanics (with IMRs of 14.0, 5.2, and 5.7 deaths per 1,000 live births, respectively) (Wisconsin Department of Health Services Department of Public Health [WDHS DPH], 2012). This long-standing racial disparity puts Wisconsin among the top five states with the highest racial disparities among all states (WDHS DPH, 2012; Mathews & MacDorman, 2011). African-American infants in Wisconsin die due to SIDS and unintentional injuries (including unsafe sleep) at twice the rate of Whites and Hispanics (with IMRs of 1.1, 0.4, and 0.5 deaths per 1,000 live births, respectively, for SIDS,

and 1.0, 0.3, and 0.2 deaths per 1,000 live births, respectively, for unintentional injuries) (WDHS DPH, 2012).

In an effort to target interventions to lower the risk of unsafe sleep-related infant deaths, extensive research has been conducted in the past decade to identify factors associated with bed-sharing. Mothers who bed-share with their infants are more likely to be African-American (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; Hauck, et al., 2008, Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2008; McCoy, et al., 2004; Willinger, et al., 2003; Brenner, et al., 2003), unmarried (Broussard, Sappenfield & Goodman, 2012; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004; Brenner, et al., 2003; Weimer, et al., 2002), younger (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; McCoy, et al., 2004; Willinger, et al., 2003), breastfeeding (Broussard, Sappenfield & Goodman, 2012; Norton & Grellner, 2011; Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004), with a lower socioeconomic status (SES) or income level (Norton & Grellner, 2011; Hauck, et al., 2008; Glenn & Quillin, 2007; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004; Willinger, et al., 2003; Morgan & Johnson, 2001) and of lower maternal education (Brenner, et al., 2003; Weimer, et al., 2002). Bed-sharing has also been associated with partner-related stress (Broussard, Sappenfield & Goodman, 2012), not attending the recommended number of well-child visits (Norton & Grellner, 2011), an infant less than 8 weeks old, infants covered by quilts (Willinger, et al., 2003), moving since birth of the infant, having depression, being born in the U.S. (Brenner, et al., 2003), and having two or fewer rooms used for sleeping (Weimer, et al., 2002).

When examining differences in bed-sharing across racial groups, one study found significant contributors to racial differences to include maternal age, marital status, being U.S. born, partner-associated stress, timing of first prenatal care visit, breastfeeding, and

depression (Broussard, Sappenfield & Goodman, 2012). The leading determinants of bed-sharing for African-Americans were depression and breastfeeding, while for Whites they were breastfeeding and late or no prenatal care (Broussard, Sappenfield & Goodman, 2012). Another study found that the leading factors associated with bed-sharing for Whites (in order of importance) were breastfeeding, young maternal age, and household income less than $35,000, while for African-Americans they were young maternal age, being unmarried, and breastfeeding (McCoy, et al., 2004). A study also found that when examining income as a predictor among racial groups, lower income Whites were more likely to bed-share than higher income Whites, while lower income African-Americans were just as likely as higher income African-Americans to bed-share (Lahr, Rosenberg & Lapidus, 2007).

Three gaps remain in the current body of literature on bed-sharing. First, only two of twelve U.S. studies in the past ten years examined determinants of bed-sharing by race (Broussard, Sappenfield & Goodman, 2012; McCoy, et al., 2004), despite findings of significant differences in prevalence of bed-sharing between Whites and African-Americans (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; McCoy, et al., 2004; Brenner, et al., 2003; Willinger, et al., 2003). Another eight studies examined race as a predictor of bed-sharing within the entire sample versus within each racial group (Fu, et al., 2008; Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; Willinger, et al., 2003; Brenner, et al., 2003; Weimer, et al., 2002; Morgan & Johnson, 2001). Two additional studies did not have sufficient sample size to examine race (Norton & Grellner, 2011; Glenn & Quillin, 2007). Whereas these studies provide helpful information about disparities in the prevalence of bed-sharing by race, they shed limited light on the different factors associated with bed-sharing within each racial group.

Second, all but two of the studies published in the past decade collected data on bed-sharing prior to the AAP's explicit recommendations against bed-sharing (November 2005). The two studies examining data post-2005 were not representative racially (Norton & Grellner, 2011) or socioeconomically (Hauck, et al., 2008). Norton & Grellner (2011) did not have a large enough sample size to examine race, while Hauck and colleagues' (2008) sample underrepresented ethnic minorities and mothers of low SES. The next most recent studies collected data from the entire year of 2005, including the ten months prior to release of the AAP recommendations (Broussard, et al., 2012; Fu, et al., 2008; AAP, 2005).

Third, while several studies have determined the predictors of infant sleep position and bed-sharing as separate outcomes, findings have been mixed regarding whether and how bed-sharing may be related to adherence to the AAP's recommendation to place infants supine (on their back) to sleep (AAP, 1992; AAP, 1997; AAP, 2000; AAP, 2005; AAP, 2011). While several studies found no significant relationship between bed-sharing and infant sleep position (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Brenner, et al., 2003), two studies found that bed-sharing infants were *less* likely to be placed non-supine (Willinger, et al., 2003; Mollborg, Wennergren, Norvenius & Alm, 2011; Morgan & Johnson, 2001), while another found bed-sharing infants were *more* likely to be placed non-supine when bed-sharing (Shields, et al., 2005). Two studies examined both bed-sharing and infant sleep position as outcome variables, but did not explore the relationship between the two (von Kohorn, Corwin, Rybin, Heeren, Lister & Colson, 2010; Hauck, et al., 2008). One study found that among African-American infants, bed-sharing infants were twice as likely to be placed non-supine as infants who slept alone (Flick, White, Vemulapalli, Stulac & Kemp, 2001).

Study Purpose

The purpose of this study was to explore maternal-infant bed-sharing and infant sleep position for African-Americans and Whites in a sample of mothers and young infants. This study will utilize the Wisconsin PRAMS dataset, a stratified sample of linked survey and birth certificate data from mothers with young infants.

Specific Aims

The potential factors associated with bed-sharing were examined within a socioecological framework, paying attention to the different levels of influence represented by such a framework, as well as the potential interactions across levels that may affect bed-sharing behaviors. The specific aims and hypotheses were:

Specific Aim 1: Determine the relationship between race and bed-sharing.

Hypothesis 1: Consistent with other findings, African-American mothers will report higher rates of bed-sharing compared to White mothers.

Specific Aim 2: Examine the determinants of bed-sharing for African-Americans and Whites.

Hypothesis 2: African-American mothers will have different factors associated with bed-sharing than White mothers will when examined separately, with the factors for African-Americans being related to marital status, stress, and personally-mediated racism and for Whites being related to currently breastfeeding, lower SES, and less education.

Specific Aim 3: Determine the relationship between bed-sharing and sleep position in African-Americans and Whites.

Hypothesis 3: Bed-sharing will be associated with infants sleeping non-supine for African-Americans, but not for Whites.

Specific Aim 4: Explore the impact of using different SES proxies to address the previous specific aims.

Hypothesis 4: Significant factors associated with bed-sharing will be similar across all SES proxies.

Significance/Implications

As a result of the AAP's 2005 recommendations, the many health care providers and public health officials have discouraged maternal-infant bed-sharing, often without describing ways that bed-sharing could be made less risky for parents who do choose to bed-share (Ball & Volpe, 2012; Gettler & McKenna, 2010; Gurbutt & Gurbutt, 2007; see Ibarra & Goodstein, 2011; National Sudden & Unexpected Infant/Child Death & Pregnancy Loss Resource Center, 2009; and NICHD, 2006 for examples). Such an approach withholds information about ways to reduce the risks around bed-sharing, and further, limits individuals' abilities to make an informed decision based on their own unique situation (Ball & Volpe, 2012; Gettler & McKenna, 2010; Cowan & Bennett, 2009; Johnston & Johnston, 2008). When health care providers and public health officials focus only on discouraging caregivers from bed-sharing, they are in danger of alienating and stigmatizing caregivers who do choose to bed-share (Ball & Volpe, 2012; Gurbutt & Gurbutt, 2007). For example, in Ajao and colleagues' (2011) study, they discovered that many parents used pillows and other items for propping their infant while sleeping on an adult bed. Further, Cowan and Bennett (2009) express concern that if breastfeeding women (who are likely to fall asleep during feeding) are discouraged from bed-sharing, they may feed their babies in other places such as armchairs and couches, increasing the risk of them falling asleep in even more dangerous places than an adult bed. Indeed, one study found that 25% of survey respondents reported falling asleep with their infants on chairs, sofas, or recliners, while another study found that

breastfeeding mothers were significantly more likely to have ever shared a sofa than non-breastfeeding mothers (Kendall-Tackett, Cong & Hale, 2010; Ball, et al., 2012). While it has been hypothesized that bed-sharing is primarily due to poverty (such as not being able to afford a crib), several studies have found that poverty was *not* a significant predictor of bed-sharing (Ball, et al., 2012; Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; Blair & Ball, 2004). Successful educational interventions would need to incorporate and address the unique needs and influences of the target population while educating them on the known risk factors for sleep-related infant deaths, such as bed-sharing on soft surfaces, with individuals other than the caregivers, with smoking in the household, or after using alcohol or drugs (Volpe, Ball & McKenna, 2012; Gettler & McKenna, 2010; Johnston & Johnston, 2008; McKenna & Gettler, 2008; Horsley, et al., 2007; Baddock, et al., 2006; McKenna & McDade, 2005).

Researchers have called for a more comprehensive examination of the characteristics of bed-sharing in specific populations, taking into account the family and environmental context as well as the cultural beliefs within which decisions about bed-sharing are made (Ball & Volpe, 2012; Ball, Moya, Fairley, Westman, Oddie & Wright, 2012; Chianese, Ploof, Trovato & Chang, 2009; McKenna & Gettler, 2008; Blanchard & Vermilya, 2007; Dahl & El-Sheikh, 2007; Horsley, et al., 2007; McKenna & McDade, 2005; Chianese, et al., 2009; Shields, et al., 2005; McCoy, et al., 2004; Brenner, et al., 2003; Weimer, et al., 2002; Morgan & Johnson, 2001). Once these factors are identified, targeted interventions can be developed that incorporate and address the unique needs and influences of the target population (Johnston & Johnston, 2008; McKenna & Gettler, 2008; Horsley, et al., 2007; Baddock, et al., 2006; McKenna & McDade, 2005).

Resnicow and colleagues define a *culturally sensitive* approach as taking into account the "ethnic/cultural characteristics, experiences, norms, values, behavioral patterns and beliefs of a target population as well as relevant historical, environmental and social forces," (Resnicow, et al., 1999, p. 11). Two domains exist within cultural sensitivity – *surface structure* and *deep structure*. In the context of safe infant sleep, an example of surface structure could be educational materials and messages that superficially match the race/ethnicity of the target audience, such as a brochure depicting African-American infants in a crib (Resnicow, et al., 1999). Deep structure, on the other hand, moves further along the continuum to "convey salience" to target audiences, and requires "understanding the cultural, social, historical, environmental and psychological forces" influencing bed-sharing within a target population (Resnicow, et al., 1999, p. 12). Culturally sensitive safe sleep interventions with deep structure, for example, would take into account the target population's beliefs and understandings about the risk and benefits of bed-sharing, including examining core cultural values, the magnitude and type of stressors faced by the target population, and their racial/ethnic identity (Resnicow, et al., 1999).

A first step in designing a culturally sensitive intervention is to determine the characteristics of the target population (Ball, et al., 2012; Ball & Volpe, 2012; Resnicow, Baranowski, Ahluwalia & Braithwaite, 1999). Contrasting responses between the majority culture and racial/ethnic populations can help further clarify the extent of cultural tailoring required for an intervention (Resnicow, et al., 1999). This study is the first step in identifying race-specific factors associated with bed-sharing among African-American and White mothers with young infants in Wisconsin. These study results have potential to inform development of a targeted, culturally sensitive approach to educating families on sleep-related infant safety in Wisconsin.

CHAPTER 2

REVIEW OF THE LITERATURE

Definition of Bed-Sharing

Bed-sharing has been defined in several ways, with most authors defining it as the baby sharing a sleep surface with another person (Blanchard & Vermilya, 2007; Goldberg & Keller, 2007; Mesich, 2005). While some have used the terms *bed-sharing* and *co-sleeping* interchangeably (Blair, Sidebotham, Evason-Coombe, Edmonds, Heckstall-Smith, & Fleming, 2009; Buswell & Spatz, 2007; Thoman, 2006; Owens, 2002; Hunsley & Thoman, 2002), others have specified that *co-sleeping* refers to any sleeping arrangements in which the infant is in the same room as the parent (including bed-sharing arrangements) (Sears & Sears, 2011; Goldberg & Keller, 2007; Morgan, Groer & Smith, 2006). McKenna and McDade define co-sleeping as:

> infants who sleep on a different surface from the parents, yet remain close enough (ideally within arm's reach) to permit the mutual monitoring and exchange of caregiver-infant sensory signals and cues (McKenna & McDade, 2005, p. 141).

For the purposes of this analysis, the term "bed-sharing" will be used to denote a sleep surface that is shared between an infant and caregiver. Because of the varying definitions of bed-sharing used across studies, this review includes as much detail as possible regarding the definition of infant sleeping arrangements used in each study. These varying definitions have caused confusion for both researchers and parents, and thus have contributed to a long-standing controversy surrounding bed-sharing.

Controversy Surrounding Bed-Sharing

A vigorous debate has been brewing over the past few decades on the benefits and dangers of maternal-infant bed-sharing (Venneman, et al., 2011; Thoman, 2006). Bed-

sharing has demonstrated benefits to both infant and mother, including more sleep for both, improved breastfeeding rates, increased milk supply, more stable infant heart rates and breathing patterns, and increased maternal response to infant cues (Ball & Volpe, 2012; McKenna & McDade, 2005; Baddock, et al., 2006; Gettler & McKenna, 2011; Morgan, Horn & Bergman, 2011). Long-term positive effects of bed-sharing include more social activities, less fearfulness, and less tantrums during childhood, and higher self-esteem, less guilt and anxiety, higher feelings of satisfaction with life, and better neuroaffective responses to stress during adulthood (McKenna & McDade, 2005; Morgan, Horn & Bergman, 2011).

Others have argued that bed-sharing increases the risk of infant death (Schnitzer, et al., 2012; Scheers, Rutherford & Kemp, 2003; Unger, et al., 2003; Kemp, et al., 2000; Drago & Dannenberg, 1999; Carpenter, et al., 2004; Tappin, Ecob, Stat & Brooke, 2005; Blair & Fleming, 2002; Blair, et al., 1999). Criticisms of these studies include lack of a control group to determine relative risk, limited or no data on other risk factors (such as parental alcohol or drug use or smoking), or combining cases with various risk factors into one sample (such as combining bed-sharing on a firm surface with incidents of couch sleeping, or including parental bed-sharing with incidents of infants sleeping with other siblings) (Gettler & McKenna, 2011; Blanchard & Vermilya, 2007; McKenna & McDade, 2005; McKenna & Gettler, 2008; Weimer, et al., 2002). Others have argued that there is no increased risk of infant death during bed-sharing when other risk factors (such as soft bedding, smoking, or bed-sharing with other than the caregiver) are not present (Blabey & Gessner, 2009; Gessner & Porter, 2006; McKenna & McDade, 2005; Hauck, Herman, Donovan, Iyasu, Merrick Moore, Donoghue, Kirschner & Willinger, 2003; Fleming, et al., 1996). Further, two studies examining the frequency of bed-sharing and infant death found a two-fold increase for non-routine bed-sharing infants who shared a bed with a caregiver the previous night, suggesting

that non-routine bed-sharing can be more dangerous than routine bed-sharing (Venneman, et al., 2011; Venneman, Bajanowski, Brinkmann, Jorch, Sauerland & Mitchell, 2009; Scragg, et al., 1993).

Professional organizations have also weighed in on the bed-sharing debate – the Academy of Breastfeeding Medicine (2008) supports bed-sharing to facilitate breastfeeding, while the World Health Organization (2009) recommends sharing the benefits and contraindications of bed-sharing with mothers. The Alaska Department of Public Health recommended "infants sleep in an infant crib or with a nonsmoking unimpaired caregiver on a standard, adult, non-water mattress," (Blabey & Gessner, 2009, p. 533) while the City of Milwaukee Health Department launched a shocking ad campaign depicting the dangers of bed-sharing (see Figure 1), garnering heated criticism from bed-sharing proponents and community leaders (Kendall-Tackett, Cong & Hale, 2010; Sears & Sears, 2011; McManus, 2010; MHD, 2011). Further, the media provides confusing messages around bed-sharing, with magazine pictures depicting sleeping environments inconsistent with AAP recommendations (Joyner, Gill-Bailey & Moon, 2009); parenting books that advocate or endorse bed-sharing (Ramos & Youngclarke, 2006); and varied advice regarding the risks and safety of bed-sharing on the internet (Chung, Oden, Joyner, Sims & Moon, 2012).

Figure 1: Examples of City of Milwaukee Health Department's Safe Sleep Ads

Source: Milwaukee Health Department

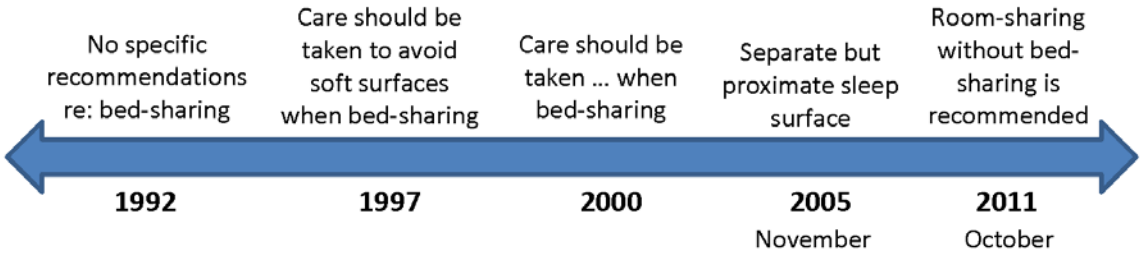
Source: Serve Marketing

Source: Milwaukee Health Department

Recommendations Regarding Bed-Sharing

The American Academy of Pediatrics (AAP, www.aap.org), a professional membership organization dedicated to the health of infants, publishes a professional journal including guidelines and policy statements on clinical best practices in pediatrics. The AAP's Task Force on SIDS has paid particular attention to the issue of bed-sharing and how it relates to infant death, thoroughly reviewing the most recent research literature and releasing policy statements on the topic (see Figure 2 for a timeline of AAP recommendations).

Figure 2: Timeline of AAP Recommendations Regarding Bed-Sharing (AAP, 1992; 1997; 2000; 2005; 2011)



In 1992, the AAP Task Force on Infant Sleep Position and SIDS mentioned bed-sharing briefly, however, it made no recommendations regarding bed-sharing, focusing more on recommending back or side infant sleep position (versus prone) (AAP, 1992). In 1997, while the AAP drew no conclusions on the relationship between bed-sharing and SIDS, they suggested, "…if mothers choose to sleep in the same bed with their infants, care should be taken to avoid using soft sleep surfaces," (AAP, 1997, p. 272). In 2000, the AAP task force commented:

> bed-sharing or co-sleeping may be hazardous under certain conditions…if a mother chooses to bed-share…care should be taken to observe recommendations (non-prone sleep position, avoidance of soft surfaces/loose covers, and avoidance of entrapment by moving bed away from wall and other furniture and avoiding beds that present entrapment possibilities), (AAP, 2000, p. 654).

This message has grown progressively stronger with every policy update after this one. The November 2005 policy statement noted,

> a separate but proximate sleeping environment is recommended… evidence is growing that bed-sharing… is more hazardous than the infant sleeping on a separate sleep surface, and therefore, recommends that infants not bed-share during sleep.... Because it is very dangerous to sleep with an infant on a couch or armchair, no one should sleep with an infant on any of these surfaces," (AAP, 2005, p.1252).

In 2011, the AAP reviewed their 2005 policy statement, and again concluded:

> room-sharing without bed-sharing is recommended… AAP does not recommend any specific bed-sharing situations as safe…specific circumstances…substantially increase the risk of SIDS or suffocation while bed-sharing. In particular:
>
> i. when the infant is younger than 3 months…
> ii. with a current smoker…or the mother smoked during pregnancy…
> iii. with someone who is excessively tired
> iv. with someone who has used medications… or substances that could impair alterness…
> v. with anyone not a parent…
> vi. with multiple persons
> vii. on a soft surface…
> viii. on a surface with soft bedding… (AAP, 2011, p. 1033).

The Prevalence of Bed-Sharing

Bed-sharing has been a common practice for centuries among many different cultures (Gettler & McKenna, 2011; McKenna, Ball & Gettler, 2007; Jenni & O'Connor, 2005). Despite recommendations against it, many families have continued to bed-share with their infants. Several states have monitored the prevalence of bed-sharing using the PRAMS survey, a surveillance project carried out by the CDC and state health departments (CDC, 2012a). In 2008, among the nineteen states reporting data on this question, the prevalence of an infant usually bed-sharing with an adult ranged from 16.2% (Nebraska) to 47.8% (Alaska), with about 19.5% of Wisconsin mothers reporting that their infant usually bed-shared (CDC, 2012a).

Other studies have demonstrated varying rates of bed-sharing as well. For example, in a sample of 214 families in Dallas, 44% of infants bed-shared for an average of four and a half hours per night (Nie, Bailey, Istre & Anderson, 2010). An online survey of 4,789 mothers in the U.S. found that 44% of mothers reported their babies were in their beds most of the night, while 59% ended the night bed-sharing (Kendall-Tackett, Cong & Hale, 2010). Of 2,300 respondents from the Infant Feeding Practices Study II (IFPS II), 42% of families reported bed-sharing at two weeks post-partum, with prevalence declining to 34% at three months and 27% at twelve months post-partum (Hauck, et al., 2008). Among 10,860 Alaska PRAMS survey respondents between 2003 and 2004, 38% reported bed-sharing frequently with their infants (Blabey & Gessner, 2009). A survey of 275 predominantly U.S. and Canadian mothers via a popular attachment parenting magazine found that 79.3% of the mothers reported bed-sharing during the first six months of their infant's lives (Green & Groves, 2008). A telephone survey of 165 parents in Michigan found that 33% reported bed-sharing with their infants (Morgan & Johnson, 2001).

Variance in Prevalence by Race/Ethnicity

Significant differences in bed-sharing rates among different racial and ethnic groups have been demonstrated, with studies finding African-American bed-sharing rates to be two to six times higher than White bed-sharing rates. For example, of 2,791 Florida PRAMS respondents, 66.9% of African-Americans reported frequently bed-sharing compared to 37.5% of Whites (Broussard, Sappenfield & Goodman, 2012). Among the 2,300 respondents in the IFPS II, compared to Whites, African-American infants were twice as likely to bed-share (Hauck, et al., 2008). The Oregon PRAMS survey of 1,867 families revealed that African-Americans were three times more likely to bed-share than Whites (Lahr, Rosenberg & Lapidus, 2007). Among 185 Kentucky women, African-Americans were almost six times more likely to bed-share than Whites (Shields, et al., 2005). In a sample of 10,355 Massachusetts and Ohio infants, African-Americans were four times as likely to bed-share (McCoy, et al., 2004). Brenner and colleagues (2003) found that among 394 mothers in the District of Columbia, African-American bed-sharing rates were twice as high as Whites. In a telephone survey of 8,453 infant caregivers, African-Americans were four times more likely to bed-share (Willinger, et al., 2003). State survey data from the CDC's PRAMS also revealed wide gaps among racial and ethnic groups (Table 1) (CDC, 2012a).

Table 1: Summary of PRAMS Results for Participating States by Race/Ethnicity on the Prevalence of "Usually" Bed-Sharing (CDC, 2012a)

		White	Black	Hispanic
		% (CI)	% (CI)	% (CI)
State	**Year[1]**	n	N	N
Alaska	2008	39.8 (34.9-45.0) 185	52.5 (32.4-71.8) 23	46.9 (31.3-63.2) 29
Delaware	2008	13.9 (11.5-16.8) 89	28.4 (23.2-34.3) 74	24.2 (19.0-30.4) 53
Florida	2005	19.9 (16.4-24.0) 127	45.8 (40.7-50.9) 269	18.7 (14.7-23.5) 90
Georgia	2008	13.9 (9.8-19.3) 57	46.1 (36.8-55.7) 141	35.5 (25.3-47.2) 40
Louisiana	2004	22.2 (19.4-25.3) 185	56.3 (51.5-61.1) 294	28.8 (16.7-44.9) 12
Michigan	2008	12.8 (10.6-15.4) 109	31.8 (27.8-36.0) 196	29.4 (18.0-44.1) 14
Minnesota	2008	15.1 (12.9-17.6) 131	49.0 (41.2-56.9) 121	30.7 (22.4-40.4) 34
Missouri	2007	18.9 (16.2-21.9) 190	45.3 (35.6-55.4) 59	24.3 (12.1-42.8) 12
Nebraska	2008	12.5 (10.1-15.3) 76	28.8 (23.9-34.4) 70	28.1 (23.7-32.9) 94
New Jersey	2008	10.1 (7.7-13.1) 54	34.5 (28.3-41.3) 85	19.9 (15.9-24.8) 67
New York City	2007	20.5 (16.0-26.0) 64	25.2 (19.7-31.6) 90	18.5 (14.5-23.1) 85
Ohio	2008	14.4 (11.7-17.7) 109	37.8 (32.9-43.1) 181	17.4 (7.1-36.8) 6
Oregon	2008	36.5 (31.2-42.0) 115	59.4 (52.1-66.3) 90	53.9 (49.0-58.8) 206
Pennsylvania	2008	10.8 (8.7-13.4) 89	31.6 (22.6-42.2) 33	26.1 (17.0-37.9) 20
South Carolina	2007	13.5 (10.2-17.6) 78	41.7 (33.9-49.8) 165	27.1 (17.3-39.7) 26
Tennessee	2008	21.5 (17.4-26.3) 113	51.5 (40.1-62.6) 74	39.5 (22.6-59.4) 13
Washington	2008	29.7 (25.4-34.4) 119	55.7 (48.9-62.4) 111	48.8 (43.6-54.1) 177
West Virginia	2008	20.7 (18.3-23.3) 309	35.0 (21.5-51.3) 26	*
Wisconsin	2008	14.0 (11.0-17.6) 61	40.1 (33.7-46.9) 85	28.4 (22.9-34.7) 63

Source: CDC (2012)
[1]Most recent year of data available
*=Not available if unweighted sample size was less than 30.

As is evident in the table, African-Americans in every participating state had a higher prevalence of reported bed-sharing – some with rates as high as three times higher than the White rate. And in a little more than half of the reporting states, African-Americans had the highest prevalence of bed-sharing among all racial groups.

Review of the Literature on Factors Associated with Bed-Sharing

Over the past ten years, several studies have examined factors associated with bed-sharing. PubMed, POPLINE, ERIC, and PsychInfo were searched using the terms "bed share," "bed sharing," "co sleep," "co sleeping," and "infant sleep" in the past ten years. Reference lists of the articles were also reviewed to identify articles not initially found in the first round of searching.

Broussard, Sappenfield, and Goodman (2012)

Most recently, Broussard and colleagues (2012) explored the relationship between bed-sharing and supine (back sleep position) in a sample of 2,791 records from the Florida PRAMS survey, using the item, "How often does your new baby sleep in the same bed with you or anyone else?" with the response set including: "always," "often," "sometimes," "rarely," and "never." Bed-sharing was coded into two categories: infrequent bed-sharing (never or rarely) and occasional/frequent bed-sharing (always, often, or sometimes) (Broussard, Sappenfield & Goodman, 2012). Significant contributors to racial differences in bed-sharing included maternal age, marital status, U.S. born, partner-associated stress, timing of first prenatal care visit, breastfeeding, and depression (Broussard, Sappenfield & Goodman, 2012). The leading determinants of bed-sharing for African-Americans were depression (AOR 7.50), breastfeeding for greater than four weeks (AOR 5.84), and breastfeeding for four weeks or less (AOR 4.02) (Broussard, Sappenfield & Goodman,

2012). For Whites, the leading determinants were breastfeeding greater than four weeks (AOR 2.65), late or no prenatal care (AOR 1.56), and breastfeeding for four weeks or less (AOR 1.22) (Broussard, Sappenfield & Goodman, 2012).

Broussard and colleagues (2012) concluded that behavior-specific and race-specific messaging may be a key public health strategy to reduce risky infant sleep. The study was limited in that due to missing data and the resulting issues of limited power, an overt measure of poverty could not be included in their model which could have affected their results (Broussard, Sappenfield & Goodman, 2012). Secondly, PRAMS surveys were conducted from 2004 to 2005, prior to or near the November 2005 AAP policy statement advising *against* bed-sharing (AAP, 2005).

Norton and Grellner (2011)

Norton and Grellner (2011) determined the prevalence of bed-sharing and its associations in a large family practice residency program in Missouri by conducting retrospective chart reviews for 2,405 patients attending well-child visits between 2002 and 2008. Bed-sharing was defined using the health care provider's check boxes under "sleeping": "crib," "bassinet," or "w/parent(s)," collected at each of four well-child visits (Norton & Grellner, 2011). Bed-sharing was significantly associated with less than the recommended number of well-child visits; breastfeeding longer than 6 months; and low SES (defined by Medicaid, state insurance or no insurance) (Norton & Grellner, 2011). Decreased bed-sharing was significantly associated with a stay in the Neonatal Intensive Care Unit (NICU) and a poor social environment (defined as a history of drug use, domestic violence, or involvement with the department of family services) (Norton & Grellner, 2011). The authors concluded that safe sleep education should begin during pregnancy and be continued throughout well-child visits (Norton & Grellner, 2011). The main study limitation

was a sample size that was too small to analyze race or ethnicity, parity, maternal age, educational background, or place of residence by zip code (Norton & Grellner, 2011).

Fu, Colson, Corwin, and Moon (2008)

Fu and colleagues (2008) interviewed 708 women at WIC centers in Texas and Georgia to identify factors associated with infant sleep location. Bed-sharing was assessed by inquiring about the infant's sleeping arrangements the night prior: bed-sharing, room-sharing without bed-sharing, or solitary sleeping (Fu, et al., 2008). Mothers aged nineteen or younger were significantly more likely to bed-share, as were African-Americans (Fu, et al., 2008). The authors concluded that being of African-American race and being a teen mother was associated with bed-sharing in this population, which are also risk factors for SIDS. They also called for future studies to investigate parental reasons for bed-sharing in these sub-groups to inform effective safe sleep interventions (Fu, et al., 2008). One limitation of this study is that it can only be generalized to low-income families who participated in WIC (Fu, et al., 2008). It also collected data in 2005 – the same year that the AAP began explicitly advising against bed-sharing (November 2005).

Hauck, Signore, Fein, and Raju (2008)

As part of the Infant Feeding Practices Study II (IFPS II), sleeping arrangements of 2,300 infants across the U.S. were examined to assess the association between sleeping arrangements and maternal characteristics (Hauck, et al., 2008). Data were collected between 2005 and 2007, and included a question about whether or not women "ever lie down or sleep with [the] baby at night," with "yes" response choices of "with the baby in a co-sleeper," "in a bed (standard mattress)," "in a waterbed," "on a mattress on the floor," "on a couch or other place that is not a bed," and "no," with multiple choices allowed (Hauck, et

al., 2008, p. S114; Fein, Labiner-Wolfe, Shealy, Li, Chen & Grummer-Strawn, 2008). Bed-sharing was associated with higher poverty (<185% of the poverty level), breastfeeding, and being African-American (Hauck, et al., 2008). Maternal age, education, and postnatal smoking were not significantly associated with bed-sharing (Hauck, et al., 2008). The authors called for further research to evaluate safe sleep and breastfeeding promotion interventions, including evaluation of reductions in SIDS rates and other infant deaths attributed to unsafe sleep situations (Hauck, et al., 2008). One study limitation was that the sample underrepresented ethnic minorities and low SES mothers – groups that have demonstrated higher rates of bed-sharing (Hauck, et al., 2008). The timing of the data collection – 2005 to 2007 – coincided with the release of the AAP's (2005) updated recommendations against bed-sharing, however, the authors note that physicians may still not have been familiar with the updated recommendations (Hauck, et al, 2008).

Glenn and Quillin (2007)

Glenn and Quillin (2007) conducted a study to compare the influence of SES of mothers and fathers on bed-sharing and infant feeding in thirty-three Tennessee families. Study participants completed daily logs about their own sleep, the infant's sleep, and infant care (Glenn & Quillin, 2007). SES was based on education level and occupation and was calculated using the Hollingshead Index of Social Position. Bed-sharing was defined as the infant sleeping in the mother's bed either some or all of the time (Glenn & Quillin, 2007). Father's SES (more so than the mother's) affected whether or not an infant breastfed, and mother's SES (more so than the father's) impacted bed-sharing (Glenn & Quillin, 2007). Mothers who both bed-shared and bottle-fed tended to be lower SES (Glenn & Quillin, 2007). Glenn and Quillin (2007) concluded that education should be focused on mothers of lower SES and that breastfeeding education should be primarily addressed to the father. The

major limitation in this study was that inclusion criteria required an educational level of tenth grade or higher (in order to be able to complete the sleep logs), thus the sample may not accurately reflect a population with lower levels of education or lower SES (Glenn & Quillin, 2007). Further, the sample was drawn from a primarily White population, which, the authors note, had "slight economic and health disparities" compared to the national population, and as a result, race was not examined (Glenn & Quillin, 2007). The article does not provide information on what year(s) the data were collected, making it difficult to determine the timing of data collection with respect to the AAP's safe sleep recommendations.

Lahr, Rosenberg, and Lapidus (2007)

Lahr and colleagues (2007) explored the prevalence and determinants of bed-sharing in Oregon using data from 1,867 PRAMS survey respondents with the question, "How often does your new baby sleep in the same bed with you," with choices of "always," "almost always," "sometimes," and "never." Responses were re-coded into a dichotomous outcome for purposes of using multivariate logistic regression – "frequent bed-sharing" (always/almost always) and "infrequent bed-sharing" (sometimes/never) (Lahr, Rosenberg & Lapidus, 2007). More frequent bed-sharing was significantly associated with being African American or Hispanic, single or divorced, earning less than $50,000 annually, and breastfeeding for greater than four weeks (Lahr, Rosenberg & Lapidus, 2007). Frequent bed-sharing was also examined by race/ethnicity and annual family income; lower income White women were more likely to bed-share than higher income White women, however, a significant income gradient was not observed for African-American and Hispanic women (Lahr, Rosenberg & Lapidus, 2007). The authors concluded that "apparently, economic factors operate differently in different racial/ethnic groups," (Lahr, Rosenberg & Lapidus,

2007, p. 281). Their overall conclusion was that bed-sharing is affected by more than just economic factors, thus, providing cribs for families may not be completely effective in reducing bed-sharing (Lahr, Rosenberg & Lapidus, 2007). One study limitation was the inability to explore reasons why women chose to bed-share, and whether or not a crib was available (Lahr, Rosenberg & Lapidus, 2007). Data were collected between 1998 and 1999, prior to the AAP's revised policy statement recommending against bed-sharing (AAP, 2005).

Shields, Hunsaker, Mudloon, Corey, and Spivack (2005)

In a prospective cohort study of 189 Kentucky women, Shields and colleagues (2005) examined the prevalence of "modifiable" risk factors associated with sudden unexplained infant death – prone sleeping position, bed-sharing, and maternal smoking. Bed-sharing included a question about whether or not the infant "bed-shared for nap/overnight," and whether the bedding was "crib/bassinet only," "parent's bed only," "combinations," or "other" (Shields, et al., 2005). African-American mothers were significantly more likely to bed-share and significantly more likely to place their infants prone than White mothers (Shields, et al, 2005). Despite higher rates of bed-sharing among African-Americans, breastfeeding rates were similar across races, and thus the authors concluded that "McKenna's promotion of bed-sharing as a tool to both encourage and lengthen the duration of breastfeeding may be ineffective in the high-risk African-American population," (Shields, et al., 2005). Of important note is that these data were collected in 2002, prior to release of the AAP's recommendation for a separate but proximate sleep surface for infants (AAP, 2005).

McCoy, Hunt, Lesko, Vezina, Corwin, Willinger, Hoffman, and Mitchell (2004)

McCoy and colleagues (2004) aimed to determine the prevalence of bed-sharing and its association with infant and maternal characteristics in a sample of 10,335 families in Eastern Massachusetts and Northwestern Ohio. As part of the Infant Care Practices Study, bed-sharing was measured using the following question, "for most of the night last night, did your baby sleep in a bed alone or share a bed with someone else?" with one choice allowed among the following: "slept alone," "slept with parent(s)," "slept with other adult(s)," "slept with other child(ren)," and "other (specify__)" (McCoy, et al., 2004, p. 142). Bed-sharing was significantly associated with being African-American, Hispanic, or Asian; breastfeeding, young maternal age (age fourteen to seventeen), being unmarried, and lower household income (McCoy, et al., 2004). Parity, language spoken at home, country of origin, birth weight, and occupancy (number of persons per bedroom) were not significant (McCoy, et al., 2004).

When examined by racial group, the leading predictor for Whites was breastfeeding, followed by maternal age fourteen to seventeen years, and household income less than $35,000. For African-Americans, the leading predictor was maternal age fourteen to seventeen years, followed by being unmarried, and breastfeeding. McCoy and colleagues (2004) concluded that bed-sharing is influenced by a variety of factors that can change over time, and that all of these factors should be incorporated into an analysis of overall risks and benefits of bed-sharing, with particular attention paid to breastfeeding practices. However, well-educated White families were overrepresented in the final sample, which could have biased the results (McCoy, et al., 2004). Data were also collected between 1995 and 1998 – several years prior to the AAP's recommendations that infants should sleep separately (AAP, 2005; McCoy, et al., 2004).

Willinger, Ko, Hoffman, Kessler, and Corwin (2003)

The National Infant Sleep Position Study (NISP), a telephone survey of 8,453 infant caregivers, examined trends in bed-sharing and the factors that influenced it (Willinger, et al., 2003). The NISP included the following sleep location choices: crib, bassinet, cradle, carry cot or traveling bed, adult bed or mattress, sofa, playpen, car or infant seat, or someplace else (Willinger, et al., 2003, p. 44). An increased probability of routine bed-sharing was associated with maternal age less than eighteen years, African-American or Asian race, household income less than $20,000, living in the Southern states (compared to the Midwest), and infants less than eight weeks old (Willinger, et al., 2003). A decreased probability of routine bed-sharing was associated with living in the mid-Atlantic and being born low birthweight and preterm (Willinger, et al., 2003). A trend of increased prevalence of bed-sharing was also seen from 1993 to 2000 (Willinger, et al., 2003). The authors concluded that "the adult bed is a common location for infants to sleep at night, bed-sharing as a routine practice is growing in the U.S., and cultural factors play an important role in bed-sharing," (Willinger, et al., 2003, p. 48). However, because the sample was derived from a list of households with telephones (which under-represents individuals with lower incomes), the authors suggest that bed-sharing prevalence may have been under-estimated (Willinger, et al., 2003). Also noteworthy is the timing of data collection – between 1993 and 2000 – prior to the AAP's 2005 policy statement advising against such behaviors.

Brenner, Simons-Morton, Bhaskar, Revenis, Das, and Clemens (2003)

Brenner and colleagues conducted a prospective birth cohort study in the District of Columbia to describe sleep practices, examine sleep practices over time, and identify factors associated with bed-sharing in a sample of 394 mothers from predominantly low-income inner city areas (Brenner, et al., 2003). Bed-sharing was assessed via the question, "Where

does [baby's name] usually sleep?" and "Where did [baby's name] sleep last night?" with response choices of "alone," "in a bed with a parent," "in a bed with another child," "in a bed with another adult," and "other [specify]," (Brenner, et al., 2003, p. 34). Further, parents were asked about infant sleep location with choices of crib, bassinet, cradle, carry cot or travel bed, adult bed or mattress, sofa, playpen, car seat or infant seat, cot, drawer, box, and floor (Brenner, et al., 2003, p. 34).

Single marital status and one or more moves since the baby's birth were significantly associated with bed-sharing at both the first (three to seven month) and second (seven to twelve month) interviews (Brenner, et al., 2003). Variables that were not significant included household income, maternal employment, parity, birth weight, infant gender, household crowding, smoking, drug and alcohol use during pregnancy, timing of initiation of prenatal care, stressful life experiences, breastfeeding, infant sleep position, smokers in the home, and drug or alcohol use in the home (Brenner, et al., 2003). The authors concluded that "sleep practices were relatively stable between the two follow-up interviews, suggesting that in this population, these practices become established early in infancy," (Brenner, et al., 2003, p. 38). Study limitations included that the sampling scheme was focused on inner-city residents of lower SES (not population-based) (Brenner, et al., 2003). Also, the data were collected between 1995 and 1997, prior to the AAP's recommendations against bed-sharing (AAP, 2005; Brenner, et al., 2003).

Weimer, Dise, Evers, Ortiz, Welldaregay, and Steinman (2002)

In a survey of 101 caregivers in New Orleans to assess knowledge, attitudes and prevalence of bed-sharing, bed-sharing was defined as "the presence of a child sleeping on the same mattress as an adult, within touching distance, for any length of time," (Weimer, et al., 2002, p. 434). Bed-sharing was significantly associated with single parenthood, high

school or less education, and two or fewer rooms used for sleeping (Weimer, et al., 2002). The majority (88%) of respondents reported their child "ever slept with an adult," and 65% reported that it was acceptable to share a bed with children (Weimer, et al., 2002). Weimer and colleagues concluded, "perhaps clinicians should counsel these groups about safe [bed-sharing] practices," (2002, p. 437). Further, they recommended more bed-sharing studies "to evaluate the prevalence, attitudes, and practices of wider socioeconomic and cultural groups," (Weimer, et al., 2002, p. 437). Study limitations included a small sample size, a limited population of predominantly low-income African-Americans, and that pediatrician-administered surveys may have affected participant responses (Weimer, et al., 2002). The data in this study were collected in 2000, prior to the AAP's recommendations against bed-sharing (AAP, 2005; Weimer, et al., 2002).

Morgan and Johnson (2001)

Morgan and Johnson (2001) surveyed twenty-seven family practice residents about their recommendations about infant sleep and 165 parents about their infant's sleep position and location from two family practice centers in Michigan (Morgan & Johnson, 2001). A significant difference in bed-sharing between SES groups was found, with the lower SES group having a higher prevalence (40%) of bed-sharing compared to the higher SES group (15%) (Morgan & Johnson, 2001). The authors concluded that more research is needed about how physician recommendations are related to parents' practices regarding sleep position and location (Morgan & Johnson, 2001). Limitations included using insurance type as a proxy for SES, which could have been an inaccurate way to measure SES (Morgan & Johnson, 2001). Moreover, there were significant differences between SES groups by race; therefore, it is not clear whether bed-sharing behaviors were predicted by race/ethnicity or SES (Morgan & Johnson, 2001). Data for this study were collected between 1995 and 1996,

prior to the AAP's recommendations against bed-sharing (AAP, 2005; Morgan & Johnson, 2001).

Gaps in the Literature on Bed-Sharing

Despite a plethora of research over the years on factors associated with bed-sharing, three gaps remain in the current literature: (1) examination of the determinants of bed-sharing by race, (2) timing of the data collection, and (3) mixed findings on the relationship between bed-sharing and infant sleep position, especially among different racial groups. These gaps are described in greater detail below.

Examination of Bed-Sharing by Race/Ethnicity

One gap in the literature is the limited number of studies that examined predictors by racial/ethnic identity. Of the twelve U.S. studies published in the past ten years, nine examined race and ethnicity (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; McCoy, et al., 2004; Willinger, et al., 2003; Brenner, et al., 2003; Weimer, et al., 2002; Morgan & Johnson, 2001), however only two examined differences in determinants of bed-sharing by race (Broussard, Sappenfield & Goodman, 2012; McCoy, et al., 2004). The other three studies did not examine race/ethnicity, or noted that African-Americans may have been under-represented in their sample (Norton & Grellner, 2011; Hauck, et al., 2008; Glenn & Quillin, 2007). Lahr and colleagues (2007) examined differences among racial and ethnic groups in bed-sharing, but only by income level. They found that lower income Whites were more likely to bed-share than higher income White women, however, this income gradient did not hold true for African-Americans – higher income African-American women were *as likely* to bed-share as lower income African-American women (Lahr, Rosenberg & Lapidus, 2007).

In the two studies that examined determinants by race/ethnicity, predictor variables did vary by racial/ethnic group. Broussard and colleagues (2012) found that the leading determinants of bed-sharing for Whites were breastfeeding greater than four weeks, late or no prenatal care, and breastfeeding four or less weeks, whereas the leading determinants for African-Americans were depression, breastfeeding greater than four weeks, and breastfeeding four or less weeks (Broussard, Sappenfield & Goodman, 2012). McCoy and colleagues (2004) found that the leading determinants for Whites were breastfeeding, maternal age fourteen to seventeen years, and household income less than $35,000, and for African-Americans they were maternal age fourteen to seventeen years, being unmarried, and breastfeeding. There is a need for replicating these approaches to determine if the results are consistent across other populations.

Timing of Data Collection

Another gap in the current body of literature on the determinants of bed-sharing is regarding the timing of data collection in relation to the AAP's policy recommendations regarding bed-sharing. In 2005, the AAP made a monumental shift in recommendations surrounding bed-sharing, moving from neutral to recommending *against* bed-sharing (AAP, 2005). Since this change, many health care and public health providers have discouraged patients from bed-sharing, and thus, one might expect the prevalence of bed-sharing to have decreased. Indeed, some research has demonstrated that physician advice plays at least a small role in mothers' decisions around whether or not to bed-share (Ajao, Oden, Joyner & Moon, 2011; Oden, Joyner, Ajao & Moon, 2010; Smith, Colson, Rybin, Margolis, Colton, Lister & Corwin, 2010; von Kohorn, et al., 2010; Flick, Vemulapalli, Stulac & Kemp, 2001).

Within the current body of literature, the most recent published data was through 2008 (Norton & Grellner), however, the main limitation of Norton and Grellner's study was

that race was not examined. The next most recent data were collected between 2005 and 2007 (Hauck, et al., 2008), however, Hauck and colleagues noted that ethnic minorities and mothers with low income/SES were underrepresented in their sample. Two studies examined data from 2005 (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008), the year the AAP released its recommendations against bed-sharing, however, the AAP recommendation came out in November 2005 (AAP, 2005). Thus, it is possible that both health care practitioners and study participants were still unfamiliar with the recommendations. The next most recent data was collected between 2002 and 2003 (Shields, et al., 2005), with the remaining study data being collected prior to 2000 (Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004; Willinger, et al., 2003; Brenner, et al., 2003; Morgan & Johnson, 2001), during which time the AAP remained neutral regarding recommendations around bed-sharing (AAP, 2000). Even among the international studies of the determinants of bed-sharing, the most recent published data was from 2004 (Santos, Mota, Matijasevich, Barros & Barros, 2009) or 2003 (Mollborg, et al., 2011). Thus, one gap in the literature is that there are a limited number of studies using data collected after the AAP 2005 recommendations against bed-sharing were made, especially studies that were representative of both race and SES.

Examination of Infant Sleep Position in Relation to Bed-Sharing by Racial Group

Prone (face-down) sleep position has been linked to an increased risk of infant death (AAP, 2000; AAP, 2005; AAP, 2011). There have been mixed findings regarding the relationship of bed-sharing and infant sleep position – several studies have found no significant relationship between bed-sharing and infant sleep position (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Brenner, et al., 2003). Two studies found that bed-sharing infants were *less* likely to be placed on their

sides or prone (Willinger, et al., 2003; Mollborg, et al., 2011; Morgan & Johnson, 2001), while another study found that bed-sharing infants were *more* likely to be placed side or prone when bed-sharing (Shields, et al., 2005). However, Mollborg and colleagues (2011) noted a higher likelihood of varying side/back position and varying side/prone position in bed-sharing infants. Three studies examined both bed-sharing and infant sleep position as outcome variables, but did not explore the relationship between the two (von Kohorn, et al., 2010; Hauck, et al., 2008). One study found that among African-American infants, bed-sharing infants were twice as likely to be placed prone to sleep than infants who always slept alone (Flick, White, Vemulapalli, Stulac & Kemp, 2001). Another recent study examined infant sleep position (but not bed-sharing), and found that between 1996 to 2007, White infants experienced an increase in back sleep positioning while African-American infants had smaller increases in back sleep positioning (Smith, Liu, Helms & Wilkerson, 2012).

A Focus on Wisconsin

Wisconsin provides an environment conducive to examining racial differences in bed-sharing behaviors. In 2010, Wisconsin's overall IMR met the Department of Health and Human Services' (DHHS) *Healthy People 2020* (a set of objectives for improving the health of all Americans) goal of 6.0 infant deaths per 1,000 live births with an IMR of 5.7 (WDHS DPH, 2012; DHHS, 2012). However, that number masks wide racial disparities – while the White IMR was 4.9 and the Hispanic rate was 4.4, the African-American IMR was 13.9 (WDHS DPH, 2012). With a disparity ratio of 2.93, Wisconsin has one of the highest racial disparities in IMR, tying for fifth place among all states (Mathews & MacDorman, 2011). African-American infants in Wisconsin die due to SIDS and unintentional injuries (including roll-overs, etc.) at twice the rate of Whites and Hispanics (WDHS DPH, 2012). Racial disparities in birth outcomes have been a strong focus for the state, most recently

through their Statewide Advisory Committee on Eliminating Racial and Ethnic Disparities in Birth Outcomes (WDHS SAC, 2011). According to the Wisconsin PRAMS, in 2008, the rate of bed-sharing among Wisconsin African-Americans was nearly three times the rate of Whites (40.1% and 14.0%, respectively) (CDC, 2012a). The City of Milwaukee's recent media campaign aimed at reducing bed-sharing rates received national attention, including strong criticism from community members and bed-sharing advocates (Kendall-Tackett, Cong & Hale, 2010; Sears & Sears, 2011; McManus, 2010; MHD, 2012).

In Wisconsin, the theme of racial disparities is not unique to infant mortality. Large racial disparities have also been observed in wages earned, poverty rates, high school graduation rates, incarceration rates, and unemployment rates (U.S. Dept. of Labor, 2012; WOJA, 2008; Center on Wisconsin Strategy, 2007). Milwaukee received national attention in the documentary *Unnatural Causes* (California Newsreel, 2008) for a study of 350 Milwaukee employers that found White males *with* criminal records received more job call-backs than African-American males with*out* criminal records (Pager, 2003). The City of Milwaukee, home for over half (66%) of the African-American population in Wisconsin, is also one of the most highly segregated cities among large U.S. cities (U.S. Census, 2012). Thus, it seems appropriate to examine bed-sharing by racial group using the Wisconsin PRAMS survey.

CHAPTER 3

THEORETICAL FRAMEWORK

Making a Case for the Socioecological Model

Several researchers have called for a more comprehensive examination of the characteristics of bed-sharing in specific populations (McKenna & Gettler, 2008; Blanchard & Vermilya, 2007; McKenna & McDade, 2005; Chianese, et al., 2009; Shields, et al., 2005; McCoy, et al., 2004; Brenner, et al., 2003; Weimer, et al., 2002; Morgan & Johnson, 2001). Such an approach can help identify the myriad of factors that may affect bed-sharing behaviors. Once these factors are identified, targeted interventions can be used to improve the safety of infant sleep situations. In their review of the literature, Alio and colleagues identified the socioecological framework as a model for examining birth outcomes, especially in relation to racial disparities affecting African-American women (Alio, Richman, Clayton, Jeffers, Wathington & Salihu, 2010).

The socioecological framework has been steadily growing in popularity, particularly with public health issues, because it helps address the complexity of problems that cannot "be understood adequately from single levels of analysis and, instead, require more comprehensive approaches that integrate psychologic, organizational, cultural, community planning, and regulatory perspectives," (Stokols, 1996, p. 283). The DHHS' *Healthy People 2020* endorses a socioecological approach, as does the Institute of Medicine (DHHS, 2012; Thomas, Quinn, Butler, Fryer, & Garza, 2011; Smedley & Syme, 2000). The socioecological model has also been applied to answer multiple complex research questions such as father involvement with children (Gavin, Black, Minor, Abel, Papas & Bentley, 2002), the impact of long-term hospitalization of infants (Miles, Holditch-Davis, Schwartz, & Scher, 2007), child growth, adolescent maternal-fetal attachment, child wellness (Reifsnider, Gallagher &

Forgione, 2005), physical activity in children with autism spectrum disorders (Obrusnikova & Miccinello, 2012), and in tobacco use in adolescent girls (DiNapoli, 2009).

Further, the socioecological model can be used to guide design and implementation of health promotion activities (Stokols, 1996). It has been used to guide development of interventions such as preventing sexual assault in adolescents (Smothers & Smothers, 2011), modifying chronic disease risk factors in school children (Naylor, Macdonald, Reed & McKay, 2006), and improving mammography rates (English, Fairbanks, Finster, Rafelito, Luna & Kennedy, 2008). For these reasons, the socioecological framework model works well for conceptualizing the combination of factors that affect maternal-infant bed-sharing.

Overview of the Socioecological Model

The socioecolological framework has been attributed to several researchers, including Bronfenbrenner's Ecological Systems Theory in which he describes different layers of influence on a human's development, as the macro-, exo-, meso- and micro- levels (Bronfenbrenner, 1977; Bronfenbrenner, 1986). Lewin's (1936) formula also stated:

$$B = f(P \backslash E)$$

Behavior is a function of **P**erson and **E**nvironment

In the socioecological perspective, individuals dynamically interact with their environment across time and space, with individuals actively shaping, and being shaped by, their environments (Lounsbury & Mitchell, 2009; Glass & McAtee, 2006). Thus, behavioral interventions that simply focus on changing the behavior are doomed to failure unless they take into account the social context in which the individual is behaving (Gettler & McKenna, 2010; Glass & McAtee, 2006).

In terms of a research application of the socioecological framework, it allows for rigorous assessment of human behavior at any ecological level (Lounsbury & Mitchell, 2009). Lounsbury and Mitchell note:

> Good ecological research is explicit in selecting its units of interest. A valid ecological unit is: (1) self-generated (i.e., occurring naturally without involvement of the investigator), (2) given a specific time-space locus, and (3) internally constrained (i.e., has internal forces that impose patterns on their own internal components) (Lounsbury & Mitchell, 2009, p. 214).

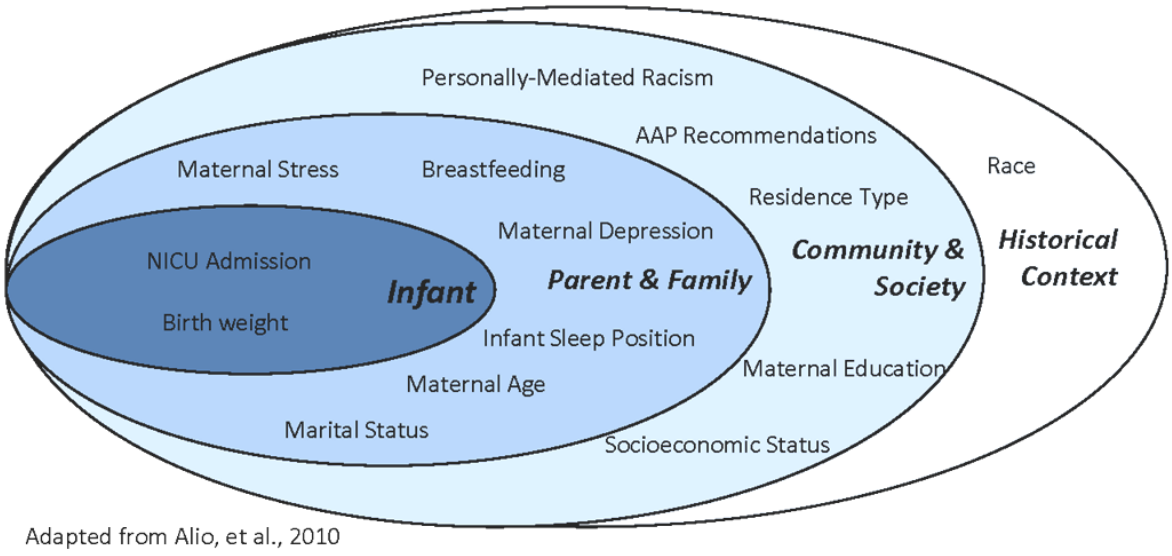
When applying the socioecological model in research, it is important to note that causal hypotheses are not always clear-cut (Glass & McAtee, 2006). For example, an individual attribute such as race/ethnicity does not necessarily "cause" an outcome, but instead can serve as a proxy for exposure to social processes (such as the social process of racial discrimination and its practices and history) (Glass & McAtee, 2006). Thus, in this analysis, many of the attributes such as age, income level, and race/ethnicity are not hypothesized as *causes* of bed-sharing, but are proxies for the social processes that lead individuals with these attributes to be more likely to engage in bed-sharing.

Application of the Socioecological Model to Bed-Sharing

The socioecological framework lends itself to examining complex issues such as bed-sharing for four important reasons: (1) contextual factors are important to explore in relation to bed-sharing (McKenna & McDade, 2005; Horsley, et al., 2007, Chianese, et al., 2009; Dahl & El-Sheikh, 2007; van Wouwe & HiraSing, 2006; Aslam, Kemp, Harris & Gilbert, 2009); (2) racial-ethnic disparities exist in bed-sharing behaviors, with African-Americans engaging in these behaviors at a higher frequency than other races (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields,

et al., 2005; McCoy, et al., 2004; Brenner, et al., 2003; Willinger, et al., 2003); (3) African-American infants are at increased risk of death related to unsafe sleep (CDC, 2012a; Mathews & MacDorman, 2011); and (4) the model allows for examination of the interactions among the different levels of influence on a family's infant sleep practices (Lounsbury & Mitchell, 2009; Glass & McAtee, 2006). Using such a framework to examine bed-sharing can help illustrate the interactions among the different levels of influence and help identify the level with the most potential for successful interventions to address unsafe sleep situations (Campbell & Quintiliani, 2006). Thus, this current study seeks to help fill gaps in knowledge around infant bed-sharing guided by a socioecological framework (Figure 3 illustrates the proposed framework applied to bed-sharing).

Figure 3: Proposed Socioecological Framework for Examining Bed-Sharing Behaviors



Infant

Within the context of bed-sharing, this level relates directly to characteristics of the infant that have been linked to bed-sharing. Several studies have identified significant factors affecting the prevalence of bed-sharing in this level of confluence, with the strongest factors including age and health status of the infant.

Infant Age. Two studies have found a higher occurrence of bed-sharing for younger infants (under four months old) (Fu, et al., 2008; Willinger, et al., 2003).

Infant Health. Bed-sharing has been used by parents as a strategy to more closely monitor and respond to their infants (Ajao, et al., 2011; Lee & Gay, 2011; Moon, et al., 2010; Chianese, et al., 2009; Ateah & Hamelin, 2008; Baddock, et al., 2006; Ball, 2002; Weimer, et al., 2002; Hooker, Ball & Kelly, 2001). Higher heart rates and decreased quiet sleep duration (both indicators of distress) have been demonstrated in very young infants who were removed from skin-to-skin contact with their mothers (Morgan, Horn, & Bergman, 2011). One study found a decreased likelihood of bed-sharing among infants who were admitted to the NICU at birth (Norton & Grellner, 2011). Some studies found that bed-sharing was associated with lower birth weights (Galler, Harrison & Ramsey, 2006), while others found a lower likelihood of bed-sharing for low birth weight infants (Willinger, et al., 2003). Other studies demonstrated no significant association between birth weight and bed-sharing (Norton & Grellner, 2011; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al, 2004; Brenner, et al., 2003).

Parent and Family

This level of confluence includes maternal, paternal, and familial factors that affect the infant, including infant-rearing practices as well as maternal and paternal behaviors linked to bed-sharing. The majority of studies identified at least one or more significant factors affecting bed-sharing in this level, with the strongest factors being breastfeeding, marital status, maternal depressive symptoms, the position the infant was placed in for sleep, maternal age, parity/birth order, smoking in the house, and maternal experiences of stress.

Breastfeeding. Breastfeeding predicts bed-sharing (Ball, 2012; Broussard, Sappenfield & Goodman, 2012; Gettler & McKenna, 2011; Norton & Grellner, 2011;

Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004; Willinger, et al., 2003; Mollborg et al., 2011; Blair, Heron & Fleming, 2010; Galler, et al., 2009; Santos, et al., 2009; Ball, Ward-Platt, Heslop, Leech & Brown, 2006; Blair & Ball, 2004; Ball, 2003; Hooker, Ball & Kelly, 2001). Breastfeeding is also one of the main reasons caregivers give for bed-sharing when they are asked (Ateah & Hamelin, 2008; Hauck, et al., 2008; Baddock, et al., 2006; Weimer, et al., 2002). However, two studies found no significant differences in bed-sharing by breastfeeding (Fu, et al., 2008; Brenner, et al., 2003).

Marital Status. Being a single mother has been associated with a higher likelihood of bed-sharing in most studies (Broussard, Sappenfield & Goodman, 2012; Mollborg, et al., 2011; Blair, Heron & Fleming, 2010; Hauck, et al., 2008; McCoy, et al., 2004; Brenner, et al., 2003; Weimer, et al., 2002). A handful of studies did not observe a greater likelihood for single mothers to bed-share compared to married mothers (Ateah & Hamelin, 2008; Blair & Ball, 2004).

Depression. In the few studies that examined depression as predictors of bed-sharing, findings were mixed. For example, Brenner and colleagues (2003) found that depression predicted bed-sharing for younger infants (ages three to seven months), but not for older infants. Others have not found significant associations with bed-sharing (Galler, et al., 2006; Broussard, Sappenfield & Goodman, 2012). Though findings regarding bed-sharing and depression have been mixed, depression has been linked with not using the recommended back-to-sleep position (NICHD, 1994; Zajicek-Farber, 2009; Chung, McCollum, Elo, et al., 2004). If depressed mothers have difficulty complying with back-to-sleep recommendations (NICHD, 1994), it could be possible that they may also have difficulty following the separate-but-proximate (AAP, 2005; AAP, 2011) recommendations as well. Maternal depressive symptoms have also been linked to reports of more

problematic infant sleep and more infant health concerns, both of which have been identified as reasons for maternal-infant bed-sharing (Gress-Smith, Luecken, Lemery-Chalfant & Howe, 2012; Lee & Gay, 2011; Chianese, Ploof, Trovato & Chang, 2009; Weimer, et al., 2002).

Infant Sleep Position. Most studies have not found a significant relationship between bed-sharing and infant sleep position (Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Brenner, et al., 2003). Two studies found that bed-sharing infants were *less* likely to be placed non-supine (Willinger, et al., 2003; Mollborg, et al., 2011; Morgan & Johnson, 2001), however another study found that bed-sharing infants were *more* likely to be placed non-supine when bed-sharing (Shields, et al., 2005). A higher likelihood of varying side/back position and side/prone position in bed-sharing infants has also been found (Mollborg, et al., 2011). In one study, African-American bed-sharing infants were twice as likely to be placed prone than African-American infants who always slept alone (Flick, et al., 2001).

Maternal Age. Younger mothers have been found to be more likely to bed-share (Broussard, Sappenfield & Goodman, 2012; Blair, et al., 2010; Galler, et al., 2009; McCoy, et al., 2004) whereas others have found that maternal age did not predict bed-sharing (Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; Blair & Ball, 2004). However, in a sample of WIC participants, younger mothers were *less* likely to bed-share (Fu, et al., 2008).

Parity/Birth Order. Parity/birth order of the infant has not been found to be a significant predictor of bed-sharing in several studies (Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Willinger, et al., 2003), nor has a larger family with more than three children (Shields, et al., 2005; Blair & Ball, 2004).

Smoking. Although one study found that exposure to tobacco smoke was predictive of bed-sharing (Hauck, et al., 2008), the majority of studies have not found significant associations between the two (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; McCoy, et al., 2004).

Stress. In the past ten years, a limited number of studies have examined the relationship between stress and bed-sharing. Broussard and colleagues (2012) found that partner-associated stress significantly predicted bed-sharing, however, traumatic, financial, and emotional stress did not, except when examined by race. Significantly lower bed-sharing rates were associated with a "poor social environment" that included documentation of drug usage, domestic violence, or involvement with the department of family services (Norton & Grellner, 2011).

Community and Society

This level of confluence includes factors beyond the infant and family that have demonstrated an impact on bed-sharing. Though SES and poverty many times are interpreted as individual factors, they are set within a broader context of the community and society – for example, policies affecting the minimum wage. Because of differential access to opportunities such as high quality and affordable education, maternal education is also included in this level of confluence. Access to/utilization of prenatal care and place of well-child care are included as well, as they can be affected by societal factors such as SES or type of insurance.

AAP Recommendations. As previously noted, the AAP has been monitoring risk factors for infant death through its Task Force on SIDS, and releases recommendations for avoiding these additional risks. From 1992 to 2000, the AAP recommended that if a mother chose to bed-share, she should avoid non-prone sleep position, soft surfaces/loose covers,

and entrapment potential (AAP, 1997; AAP, 2000). In 2005 and 2011, the AAP recommended that mothers not bed-share with their infants due to a potential increased risk of infant death (AAP, 2005; AAP, 2011).

Residence Type. In the two studies that examined this variable, an urban (versus non-urban) neighborhood setting did not have any significant effect on bed-sharing rates (Norton & Grellner, 2011; Lahr, Rosenberg & Lapidus, 2007).

Racism. None of the current bed-sharing literature has explored the impact that experiences of racism may have on bed-sharing. However, several researchers have argued that experiences of racism should be considered as a social determinant of race-based disparities, especially in light of the stress-induced physiologic pathways (such as by elevated blood pressure and heart rate, and hypervigilance) by which racism may negatively affect pregnancy and health in general (Dominguez, 2011; Ford & Airhihenbuwa, 2010; Mays, Cochran & Barnes, 2007; Smedley, Stith & Nelson, 2003; Harrell, 2000). Further, a lower quality of healthcare has been observed for minorities compared to non-minorities, "even when access-related factors, such as patients' insurance status and income, are controlled," (Smedley, Stith & Nelson, 2003, p. 1; Mays, Cochran & Barnes, 2007). The link between racism as a stressor that affects health outcomes has been well-documented (Mays, Cochranj & Barnes, 2007; Harrell, 2000; Clark, Anderson, Clark & Williams, 1999; Carty, Kruger, Turner, Campbell, DeLoney & Lewis, 2011). For example, in one study, African-Americans reported experiencing more daily types of racial discrimination while emotional responses to racism slightly increased their odds of a low birth weight infant (Carty, et al., 2011). Further, racial discrimination and stress predicted smoking and lower perceived physical health (Carty, et al., 2011). Based on this research, experiences of racism could suggest another

level of stress for African-American mothers that may affect her decisions around infant sleep location.

Socioeconomic Status (SES). The majority of studies demonstrated higher rates of bed-sharing in families of lower SES (Lee & Gay, 2011; Blair, Heron & Fleming, 2010; Galler, Harrison & Ramsey, 2009; Hauck, et al., 2008; Glenn & Quillin, 2007; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004; Willinger, et al., 2003; Ramos, 2002). Families have also cited lack of space for or availability of a crib (which could be associated with lower SES), as a reason for bed-sharing (Joyner, Oden, Ajao & Moon, 2010; Jenni & O'Connor, 2005; Ball, 2002; Weimer, et al., 2002). One study documented an increased concern among low-SES mothers for safety from environmental dangers as a reason for bed-sharing (Joyner, et al., 2010). Two studies did not demonstrate significant differences in bed-sharing among different SES levels (Fu, et al., 2008; Shields, et al., 2005), and one study found that higher SES predicted bed-sharing (Blair & Ball, 2004).

In the bed-sharing literature, SES has been defined in several ways, including the following variables (either singly or in combination): family income; education level; type of insurance; use of Women, Infants and Children (WIC) services; occupation; federal poverty level (FPL); or number of home conveniences (Broussard, Sappenfield & Goodman, 2012; Lee & Gay, 2011; Norton & Grellner, 2011; Blair, et al., 2010; Galler, Harrison & Ramsey, 2009; Hauck, et al., 2008; Glenn & Quillin, 2007; McCoy, et al., 2004; Willinger, et al., 2003; Ramos, 2002; Weimer, et al., 2002; Braveman, Cubbin, Marchi, Egerter & Chavez, 2001; Morgan & Johnson, 2001). In a comparison of multiple SES measures, Braveman and colleagues (2001) found that the unadjusted (for race) SES were dependent not on the SES measure but on the health indicator and racial/ethnic group of interest. For example, education has been found *not* to be an acceptable proxy for racially or ethnically diverse

populations of childbearing women (Braveman, et al., 2001). They recommend that SES measures be "based on the considerations of the potential causal pathways through which SES factors may affect a specific outcome in a given population," and that researchers test multiple dimensions of SES that could be relevant and multiple ways of specifying them (Braveman, et al., 2001, p. 461). Particularly relevant to this current study, employment status may not be a good proxy for SES in a sample of women who have recently given birth, as it is possible that many of them may have had to end employment during pregnancy or after the birth of the infant.

Broussard and colleagues (2011) utilized three SES-related variables: maternal education, use of WIC during pregnancy, and method of payment for delivery. For use of WIC during pregnancy, Broussard and colleagues (2011) found significant racial differences, with 69.2% of African-Americans using WIC during pregnancy compared to 34.2% of Whites (Broussard, Sappenfield & Goodman, 2001). Significant differences were also found for method of payment for delivery, with the majority (64.3%) of African-Americans using Medicaid/public funding to pay for delivery compared to 34% of Whites using this method (Broussard, Sappenfield & Goodman, 2012). The authors did attempt to utilize family income and family size to calculate percent of the federal poverty level, however, due to missing data, they were unable to calculate it for a portion of the sample, with that portion being predominantly African-American, unmarried, high school or less education, and using WIC and Medicaid (all factors associated with lower SES) (Broussard, Sappenfield & Goodman, 2012). In regards to income level, McCoy and colleagues (2004) found that for families with an annual income between $35,000 - $55,000, Whites were slightly more likely to bed-share, but African-Americans were slightly *less* likely to bed-share (McCoy, et al., 2004).

Maternal Education. Though education has been included within the definition of SES above, maternal education has also been examined as a separate variable. Most of those studies found that lower maternal education was associated with higher rates of bed-sharing (Blair, et al., 2010; Fu, et al., 2008; Glenn & Quillin, 2007; McCoy, et al., 2004; Brenner, et al., 2003; Willinger, et al., 2003; Ramos, 2002; Weimer, et al., 2002). Two studies found no significant association between maternal education and bed-sharing (Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007).

Prenatal Care. One study examining timing of prenatal care in relation to bed-sharing found that it significantly predicted bed-sharing for African-Americans only (Broussard, Sappenfield & Goodman, 2012). Another study found that it was not significantly associated with bed-sharing (Lahr, Rosenberg & Lapidus, 2007). However, prenatal care visits have been found to be less reliable on the birth certificate, especially in minority and limited English-language populations (Northam & Knapp, 2006; Reichman & Schwartz-Soicher, 2007).

Place of Well-Child Care. Neither of the two studies that examined place of well-child care in relation to bed-sharing found that it significantly predicted bed-sharing (Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007).

Historical Context

Alio and colleagues (2010) describe the historical context as taking into account the impact that racism has had on the African-American race in the U.S. From a developmental context, African-Americans were not allowed to vote or own land until much later in U.S. history than Whites. As a result, their historical accumulation of wealth and privilege has occurred over a shorter trajectory than has occurred for Whites. Alio and colleagues describe how racism "permeates and is embedded in every aspect of the lives of African-

American women," (Alio, et al., 2010). These historical influences still impact African-Americans today, even for high-achieving, high SES African-Americans. For example, many high SES African-Americans still come from more "humble" beginnings (parents were less likely to have graduated from college or owned a home, for example) than their White counterparts (Alio, et al., 2010).

Race. Race has often been referred to as a social construct, meaning that its basis is not biological, but that it creates a hierarchy within the social world between inherited disadvantage among African-Americans and "unearned advantages" among others, such as Whites (Ford & Airhihenbuwa, 2010a, p. 1395; Dominguez, 2008; David & Collins, 2007). Dominguez notes, "race operates as a social stratifier, resulting in racial group hierarchies and marked inequalities in resources, power, opportunity, and social status," (Dominguez, 2008, p. 360). Indeed, several studies have demonstrated better health outcomes for African-born African immigrants compared to U.S.-born African-Americans, with immigrants' health outcomes growing progressively worse the longer they stay in the U.S. (Dominguez, 2008; Collins, Wu & David, 2002). Dominguez concludes, "given African-Americans' unique sociopolitical history in the U.S., their poorer health status may be a 'biologic expression of race relations.'" (Dominguez, 2008, p. 363). For these reasons, race is included as a factor within this level. Within this historical context, race is linked with factors among the different levels of confluence, and thus, these findings will be briefly touched upon again here.

In the bed-sharing literature, race has been identified as a significant predictor, with most studies reporting that African-Americans had a higher rate of bed-sharing than Whites as well as Hispanics (Fu, et al., 2008; Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; McCoy, et al., 2004; Brenner, et al., 2003; Willinger, et al., 2003; Ramos,

2002). However, only two studies in the past ten years have examined differences in predictors for bed-sharing *among* racial groups (Broussard, Sappenfield & Goodman, 2012; McCoy, et al., 2004). These results are summarized below.

Breastfeeding. In one study, breastfeeding for greater than four weeks predicted bed-sharing at a higher level for African-Americans than for Whites (Broussard, Sappenfield & Goodman, 2012), however another study found that breastfeeding predicted bed-sharing for Whites at a much higher rate than for African-Americans (McCoy, et al., 2004).

Marital Status. White single mothers were only slightly more likely to bed-share than married White mothers, however single African-American mothers were almost twice as likely to bed-share than their married counterparts (McCoy, et al., 2004).

Depression. Though these findings were not statistically significant, Broussard and colleagues (2012) found that African-Americans who experienced depression during or after pregnancy were seven times more likely to bed-share than Whites who had experienced depression.

Smoking. Smoking predicted bed-sharing for African-American families (McCoy, et al. 2004).

Stress. Among African-American families reporting frequent bed-sharing, a significantly higher percentage of them reported experiencing several different types of stress: 73.6% reported partner-associated stress, 73.8% reported traumatic stress, 69.6% reported financial stress, and 71.7% reported emotional stress (Broussard, Sappenfield & Goodman, 2012).

As previously noted, the socioecological framework posits that individuals shape and respond to their environments. When examining the behavior of bed-sharing, variables within each of the levels of confluence can interact with each other to shape behaviors. For

example, the historical context of racism and other forms of stress may interact to make it more difficult for a mother to follow the AAP recommendations to not bed-share. Community and society factors such as education level and experiences of personally-mediated racism may make it difficult for a mother to trust her provider's recommendations around infant sleep, or to understand the recommendations being made. Parent and family factors such as a mother's marital status or depression may affect the level of support she needs in caring for an infant, thus putting her at higher risk of not following the AAP's recommendations. Infant issues such as low birth weight may lead a mother to be more likely to place her infant to sleep with her so she can better monitor the infant's breathing. The interactions of these factors may affect bed-sharing as well. For example, a mother with post-partum depressive symptoms, with a lower education level may have a very supportive husband who encourages her to follow the AAP recommendations around not bed-sharing. Or, a single mother with a higher education level may know what the AAP recommendations are, but because of a high level of stress and lack of support, may choose to bed-share in an effort to get more sleep. Thus, this study will examine bed-sharing within a socioecological framework, focusing specifically on determinants of bed-sharing and factors by race.

CHAPTER 4

METHODS

The purpose of this study was to explore maternal-infant bed-sharing and infant sleep position for African-Americans and Whites in a sample of mothers and young infants. This study utilized the Wisconsin PRAMS dataset, which is a stratified sample of linked survey and birth certificate data from mothers with infants born between 2007 and 2010.

Specific Aims

The potential factors associated with bed-sharing were examined within a socioecological framework, paying attention to the different levels of influence represented by such a framework, as well as the potential interactions across levels that may affect bed-sharing behaviors. The specific aims and hypotheses were:

Specific Aim 1: Determine the relationship between race and bed-sharing.

Hypothesis 1: Consistent with other findings, African-American mothers will report higher rates of bed-sharing compared to White mothers.

Specific Aim 2: Examine the determinants of bed-sharing for African-Americans and Whites.

Hypothesis 2: African-American mothers will have different factors associated with bed-sharing than White mothers will when examined separately, with the factors for African-Americans being related to marital status, stress, and personally-mediated racism and for Whites being related to currently breastfeeding, lower SES, and less education.

Specific Aim 3: Determine the relationship between bed-sharing and sleep position in African-Americans and Whites.

Hypothesis 3: Bed-sharing will be associated with infants sleeping non-supine for African-Americans, but not for Whites.

Specific Aim 4: Explore the impact of using different SES proxies to address the previous specific aims.

Hypothesis 4: Significant factors associated with bed-sharing will be similar across all SES proxies.

Design

This study utilized a population-based stratified surveillance dataset, the Wisconsin PRAMS, a multi-mode survey conducted since 2007. The Wisconsin PRAMS is a collaborative project between the CDC and the Wisconsin Department of Health Services (WDHS) as part of the CDC's nation-wide PRAMS (CDC, 2011). The strengths of this dataset include: (1) it utilizes a randomized stratified sample, (2) PRAMS questions are standardized across states, allowing for comparisons with other participating states, (3) it is a pre-existing dataset, and (4) it is the only available dataset representative of Wisconsin that includes a question regarding bed-sharing (WDHS, 2011). The ecological unit of study in this analysis is the family and how it interacts with the social context within which it is positioned. All data management and analyses were conducted using the Statistical Package for the Social Sciences 20.0 Complex Samples Module® (SPSS, www.IBM.com).

Sample/Setting

The WDHS, in collaboration with the CDC, began conducting the Wisconsin PRAMS survey in 2007 (WDHS, 2011). Each month, a random sample of women is selected from birth certificates of infants born two to three months earlier (WDHS, 2011). The Wisconsin sampling scheme includes sampling independently from three strata: White,

non-Hispanic mothers, African-American non-Hispanic mothers, and all others (WDHS, 2011). Sampling rates differ by stratum: 1 of 83 White, non-Hispanic mothers, 1 of 11 Black non-Hispanic mothers, and 2 of 35 other mothers (WDHS, 2011). Approximately 50-55 mothers are selected from each stratum each month, for a total sample of about 1,870 mothers annually (WDHS, 2011). The sampling scheme "excludes adoptive mothers, surrogates, Act 2 or safe haven infants, and multiple births of 4 or more," out-of-state residents who gave birth in Wisconsin, or Wisconsin residents who gave birth in another state (WDHS, 2011, p. 2).

Data Sources

The Wisconsin PRAMS consists of linked birth certificate and PRAMS survey data; both sources will be utilized in this study (WDHS, 2011).

Birth Certificate

Every U.S. infant birth is documented using the National Center for Health Statistic's birth certificate form (NCHS, 2003, Appendix A). In Wisconsin, birth certificate data are completed by the hospitals using self-report data from the mother and hospital records, and then transferred to the WDHS. Several studies have examined the reliability and validity of birth certificate data (Reichman & Schwartz-Soicher, 2007; Northam & Knapp, 2006; Schoendorf & Branum, 2006; DiGiuseppe, Aron, Ranbom, Harper & Rosenthal, 2002). Insurance, birthweight, Apgar score, delivery method, maternal demographic data, and basic infant characteristics (such as birth weight and infant gender) have been demonstrated reliable (Northam & Knapp, 2006; Schoendorf & Branum, 2006; DiGiuseppe, et al., 2002). The number of prenatal visits and maternal complications have been found to be less reliable, especially in minority and limited English-language

populations (Northam & Knapp, 2006; Reichman & Schwartz-Soicher, 2007). Tobacco and alcohol use, obstetric procedures, complications of labor and delivery, maternal and infant medical conditions, and gestational age have been found to be unreliable, with missing data complicating analyses further (Northam & Knapp, 2006; Schoendorf & Branum, 2006; DiGiuseppe, et al., 2002).

Reichman and Schwartz-Soicher (2007) found more accurate reporting of maternal conditions (such as diabetes) for low birth weight births (versus normal weight births), suggesting that accuracy of birth certificate data may vary by infant outcomes (Reichman & Schwartz-Soicher, 2007). Despite these limitations, a major strength of birth certificate data is that they represent all births occurring in a given population, and thus provide much less risk of selection bias, allowing generalizability to the population the sample is drawn from (Schoendorf & Branum, 2006). This study limited birth certificate variables to those that have shown good reliability, including maternal demographic data and infant birth weight.

PRAMS Survey

Since the CDC began collaborating with states to conduct the PRAMS survey in 1988, several iterations (phases) of questionnaires have evolved, each based on extensive research and testing of the questions (CDC, 2012a). The questionnaire consists of two parts – core questions that are standard across all states, and state-added questions that can be chosen either from a bank of standard questions tested by the CDC, or created by the state (CDC, 2012a). Appendix B contains Phase 5 (2007-2008) and Phase 6 (2009-2010) of the Wisconsin PRAMS surveys which were used for this analysis.

Two studies have explored the effectiveness of the PRAMS methodology in obtaining a representative sample (Shulman, Gilbert & Lansky, 2006; Gilbert, Shulman, Fischer, & Rogers, 1999). When examining response rates from eleven states in 1996, the

authors concluded that, overall, PRAMS was effective in reaching most women, with ten states achieving response rates of 70% or greater (Gilbert, et al., 1999). The following characteristics were most significantly associated with higher response rates: first-time mothers, with twelve or more years of education, married, and White (Gilbert, et al., 1999). The second study examined response rates in 2001 among twenty-three states, and again concluded that PRAMS was effective in reaching most mothers (Shulman, et al., 2006). As was found in the earlier study, higher response rates were predicted by higher maternal education, married, White women (Shulman, et al., 2006). Thus, there is a concern that PRAMS may not completely reflect certain sub-groups, such as minority women with lower education, who are single, and who have had a previous child (Gilbert, et al., 1999; Shulman, et al., 2006).

Despite these potential drawbacks, PRAMS data continue to be a common source (and in some states, the only source) of data for studies examining infant and maternal outcomes. Table 2 summarizes the studies published in just the past year utilizing PRAMS data. As noted in the review of the literature, a few studies have used PRAMS to explore bed-sharing behaviors (Broussard, Sappenfield & Goodman, 2011; Blabey & Gessner, 2009; Lahr, Rosenberg & Lapidus, 2007).

Table 2. Studies Published Using the PRAMS Data Set, 2011-2012

Topic Area	States Covered	Citation
Chronic disease	7 states (excluding Wisconsin)	Bombard, Dietz, Galavotti, England, Tong, Hayes & Morrow, 2012
Bed-sharing by racial group	Florida	Broussard, Sappenfield & Goodman, 2012
Breastfeeding	Ohio, Michigan, Arkansas	Colaizy, Saftlas & Morriss, 2012
Contraceptive use	Florida	Hernandez, Sappenfield, Goodman & Pooler, 2012
Infant sleep position	South Carolina	Smith, Liu, Helms & Wilkerson, 2012
Hospital-based maternity care practices & breastfeeding	11 states and New York (excluding Wisconsin)	Ahluwalia, Morrow, D'Angelo & Li, 2011
Influenza vaccination	10 states, including Wisconsin	Ahluwalia, Singleton, Jamieson, Rasmussen & Harrison, 2011
Intimate partner violence & gestational weight gain	Oklahoma	Beydoun, Tamim, Lincoln, Dooley & Beydoun, 2011
As a jumping off point for follow-back surveys	Oregon	CDC, 2011b
Effect of policies on direct access to ob/gyn on outcomes	All participating states (excluding Wisconsin)	Durrance & Hankins, 2011
Social network size	Utah	Dyer, Hunter & Murphy, 2011
Mood, substance use & birth outcomes	Minnesota	Gyllstrom, Hellerstedt & McGovern, 2011
Oral health & birth outcomes	10 states (excluding Wisconsin)	Hwang, Smith, McCormick & Barfield, 2011
Perinatal mood	New York City	Liu & Tronick, 2011
Alcohol/smoking & birth outcomes	Nine states (excluding Wisconsin)	Mateja, Nelson, Kroelinger, Ruzek & Segal, 2011
Intimate partner violence	Massachusetts	Mitra, Manning & Lu, 2011
Risk factors for child maltreatment	Alaska	Parrish, Young, Perham-Hester & Gessner, 2011
Infertility treatment	Seven states (excluding Wisconsin)	Simonsen, Baksh & Stanford, 2012
Obesity & postpartum depression	15 states	Sundaram, Harman, Peoples-Sheps, Hall & Simpson, 2011
Racial disparities & smoking	All states, including Wisconsin	Tong, Dietz, England, Farr, Kim, D'Angelo & Bombard, 2011
To supplement mixed methods research, such as infant feeding experiences	North Carolina	Tucker, Wilson & Samandari, 2011
Prenatal counseling on seatbelt use & crash-related medical care	31 states (excluding Wisconsin)	Whitehead, 2011

Only a few studies have included Wisconsin PRAMS data within multi-state datasets, and one study explored the impact of various incentives on response rates for African-

Americans (Ahluwalia, et al., 2011; Tong, et al., 2011; Dykema, Stevenson, Kniss, Kvale, Gonzalez & Cautley, 2012). Between 2009 and 2010, African-American mothers were randomly assigned to one of three groups – a cash incentive ($5), a diaper voucher ($6), or no incentive – with the cash incentive being most effective in increasing survey response rates (Dykema, et al., 2012). No other studies have exclusively examined Wisconsin data at this time.

Procedures

Survey Procedures

Each month, the WDHS draws a stratified sample from certificates of recent births (WDHS, 2011). Selected women are mailed an introductory letter within the first two to four months after their infants are born (WDHS, 2011). A few days later, the initial PRAMS survey packet is mailed, along with a small incentive and information materials for new mothers (WDHS, 2011). Non-responders are sent a second and third survey packet, along with a reminder letter (WDHS, 2011). If the survey is not returned within about seven weeks, telephone numbers are obtained through Medicaid or WIC records or internet sites, and trained female telephone interviewers attempt to contact the women to complete the survey via telephone (WDHS, 2011). Women identified as Hispanic on their baby's birth certificate receive materials in both English and Spanish, and all interviewers are bi-lingual (WDHS, 2011). When a survey is completed, a children's music CD is mailed as a thank you for participating (WDHS, 2011). Survey data are entered into PRAMS data management software and submitted monthly to the CDC (WDHS, 2011). CDC statisticians prepare an annual weighted data set, with the weights adjusting "for the disproportionate sampling rates, stratum non-response rates, and how well the sample reflects the population of Wisconsin birth mothers in the given year," (WDHS, 2011).

Procedures to Obtain the Data

To obtain the Wisconsin PRAMS data set, a data application was completed (Appendix C) and submitted to the WDHS, and two separate Data Use Agreements (one for each phase of the data) were signed by all research team members who had access to the data set (Appendix D). This project was submitted to the University of Wisconsin-Milwaukee Institutional Review Board and was determined exempt (Appendix E). The Data Use Agreement stipulates that researchers must adhere to "the survey researchers' code of ethics which prohibits any attempt to identify individual persons in the data set, and which prohibits releasing any data or results that are not in aggregate form," (WDHS, 2011, p. 4). Researchers may not further distribute the data set, must destroy or securely archive the data set when analysis is complete, and comply with reporting requirements (WDHS, 2011).

Variables

Predictor Variables

Predictor variables were chosen based on the preceding literature review, and are described in greater detail below (Kleinbaum & Klein, 2010). A summary of variables is provided in Table 3.

Table 3: Characteristics, Definitions, and Response Sets by Socioecological Level

Predictor	Definition	Response Set/Coding
Infant		
Birthweight	Normal (≥2,500 grams); low (<2,500 grams)	Normal; Low
NICU Admission	After your baby was born, was he or she put in an intensive care unit?	No; Yes
Parent and Family		
Abuse	Abuse by partner/husband before or during pregnancy?	No; Yes
Breastfeeding	Are you still breastfeeding or feeding pumped milk to your new baby?	No; Yes
Marital Status	Married at conception, at birth, or anytime in between	1 = married; 0 = other
Maternal Age	Maternal age at time of delivery	Interval
Depressive Symptoms	Experience of one or more depressive symptoms "Always" or "Often" post-partum.	No; Yes
Infant Sleep Position	How do you *most often* lay your baby down to sleep now?	Non-supine; Supine
Partner stress	Experience of any of the following: divorce; arguing a lot with partner; husband/partner not wanting pregnancy	No; Yes
Traumatic stress	Experience of: homelessness; physical fights; husband/partner in jail; others using drugs	No; Yes
Financial stress	Experience of: moving; husband/partner job loss; mom lost job; couldn't pay bills	No; Yes
Emotional stress	Experience of: family member illness; others dying	No; Yes
Community and Society		
Residence Type	Maternal residence urban (25 counties) or rural (47 counties)	Urban; Rural
Maternal Education	Education level at time of delivery	Less than high school; 12 yrs; 13-15 yrs; ≥ 16 yrs
Racism	During the *12 months before* your new baby was born, did you feel emotionally upset (for example angry, sad, or frustrated) as a result of how you were treated *based on your race*?	No; Yes
Income	Income in the past 12 months	< $10,000; $10,000-$14,999; $15,000-$19,999; $20,000-$24,999; $25,000-$34,999; $35,000-$49,999; ≥$50,000
Delivery-Medicaid	Medicaid/BadgerCare as method of payment for delivery	No; Yes
Need Food $	During most recent pregnancy, needing food stamps, WIC vouchers or money to buy food	No; Yes
Historical Context		
Race	Mother's race as recorded on birth certificate	White, non-Hispanic; Black, non-Hispanic

Infant

Birth Weight. Taken from the birth certificate, birth weight was originally recorded in grams. Previous studies coded birth weight dichotomously, as: Normal (≥2,500 grams) or Low (<2,500 grams) (Norton & Grellner, 2011; Lahr, et al., 2007; McCoy, et al, 2004; Brenner, et al., 2003; Willinger, et al., 2003). Based on the previous literature, this analysis will utilize the same coding scheme.

NICU Admission. NICU Admission was measured by the PRAMS question, "After your baby was born, was he or she put in an intensive care unit?" with response choices of No; Yes; or I don't know.

Parent and Family

Breastfeeding. Breastfeeding was measured in multiple ways across the research literature, but for this analysis, the question, "Are you still breastfeeding or feeding pumped milk to your new baby?" (No/Yes) was utilized, which is in-line with other studies (Glenn & Quillin, 2007; Shields, et al., 2005; McCoy, et al., 2004). This question seems most appropriate to address the specific aims of this project because of the large number of studies citing currently breastfeeding as a reason for bed-sharing (Ateah & Hamelin, 2008; Hauck, et al., 2008; Baddock, et al., 2006; Weimer, et al., 2002).

Infant Sleep Position. Infant sleep position was measured using the question, "How do you *most often* lay your baby down to sleep now?" (On his or her: side; back; stomach; side/back; side/stomach; or back/stomach). For the purposes of this analysis, the question was coded into two responses: Supine (back) and Non-Supine (all others). These categories reflect the AAP's recommendations that the safest infant sleep position is supine, and are in line with how other researchers have coded this variable (AAP, 1997; 2000; 2005; 2011; Broussard, Sappenfield & Goodman, 2012).

Marital Status. Marital status was measured using the birth certificate field "Mother married? (At birth, conception, or anytime time in between)" (No; Yes).

Maternal Age. Maternal age at time of delivery was obtained from the birth certificate as a continuous variable.

Maternal Depression. In the 2007-2008 Wisconsin PRAMS Survey, two questions focused on depressive symptoms: "Since your new baby was born, how often have you felt down, depressed, or hopeless?" and "Since your new baby was born, how often have you had little pleasure in doing things?" These two questions assess depressed mood and anhedonia, which are required diagnostic criteria for a diagnosis of Major Depressive Disorder based upon the *Diagnostic Statistical Manual IV (DSM-IV)* (First, Frances, & Pincus, 2002). Both questions contained the response set: Always; Often; Sometimes; Rarely; or Never. In the 2009-2010 Wisconsin PRAMS Survey, the question was changed to "Since your new baby was born, how often have you: (a) felt down, depressed, or sad; (b) felt hopeless; and (c) felt slowed down" with the same response choices (Always; Often; Sometimes; Rarely; and Never) for each of the three areas.

In the two bed-sharing studies that included depression, one defined it as "depression during or after pregnancy" (Yes; No) (Broussard, Sappenfield & Goodman, 2012), while the other used a 6-item scale to measure depression (Brenner, et al., 2003). Because the Wisconsin PRAMS was limited in the number of questions regarding depression, the variable "Depressive Symptoms Present," was created and coded with "Yes" if one or more of the responses were checked as "Always" or "Often," and "No" for all other responses.

Maternal Education. Maternal education was taken from the birth certificate and was coded into the following choices: less than high school (< 12 years); 12 years; 13 to 15

years; or 16 or more years, which has been used in previous studies (Broussard, Sappenfield & Goodman, 2012).

Maternal Stress. Maternal stress was measured utilizing thirteen stressful events that were described in the PRAMS survey, each of which required a response of Yes; No regarding "things that may have happened during the past 12 months before your new baby was born," including (1) a close family member sick and hospitalized, (2) separation or divorce, (3) moved, (4) homeless, (5) husband/partner lost job, (6) lost job, (7) argued with husband/partner more than usual, (8) husband/partner did not want pregnancy, (9) a lot of bills I couldn't pay, (10) physical fight, (11) husband/partner in jail, (12) someone close having problem with drinking or drugs, and (13) someone close died. This analysis utilized the four constructions of stress used in previous studies based on results of factor analysis: Partner-Associated, Traumatic, Emotional, and Financial Stress (Broussard, Sappenfield & Goodman, 2012; Ahluwalia, Merritt, Beck & Rogers, 2001). Stress variables were coded in the following manner: (1) Partner-Associated Stress (partner did not want pregnancy, arguing with partner more than usual during pregnancy, and separation or divorce from a partner); (2) Traumatic Stress (woman or partner went to jail, woman was involved in a physical fight, woman became homeless, and someone close to the woman had a problem with alcohol or illicit drug use); (3) Financial Stress (woman lost her job despite wanting to work, woman had a lot of unpaid bills, husband or partner lost job, and woman moved to a new address); and (4) Emotional Stress (family member ill or hospitalized, and someone close died) (Broussard, Sappenfield & Goodman, 2012; Ahluwalia, Merritt, Beck & Rogers, 2001). Each category was coded "Yes" if one or more of the variables making up that category were endorsed, and "No" if none of them were endorsed.

Community and Society

Racism. The PRAMS question, "During the 12 months before your new baby was born, did you feel emotionally upset (for example angry, sad, or frustrated) as a result of how you were treated based on your race?" (Yes; No) was utilized.

Socioeconomic Status (SES). In this analysis, the primary SES measure was income level which was collected via the PRAMS questionnaire with the following question: "During the 12 months before your new baby was born, what was your yearly total household income before taxes? Include your income, your husband's or partner's income, and any other income you may have received. (All information will be kept private and will not affect any services you are now getting.) with response choices of < $10,000; $10,000 - $14,999; $15,000 - $19,999; $20,000 – $24,999; $25,000 – $34,999; $35,000 - $49,999; and ≥ $50,000. In addition, Medicaid as a source of payment for delivery was used from the PRAMS Survey question, "How was your delivery paid for?" (Delivery paid – Medicaid) (No; Yes). This measure was used in previous studies (Broussard, Sappenfield & Goodman, 2012; Norton & Grellner, 2011; Morgan & Johnson, 2001). A third variable, needing money for food, was assessed with the question, "During your most recent pregnancy, did you feel you needed any of the following services? Money to buy food, food stamps, or WIC vouchers" (No; Yes).

Residence Type. The birth certificate variable of "Maternal Residence Urban or Rural," with coding as Mother lived in an urban (metropolitan) county (25 counties); and Mother lived in a rural (non-metropolitan) county (47 counties) was used.

Historical Context

Race. Maternal race was measured using the birth certificate field, "Mother's Race and Hispanic Ethnicity," including the following choices: White, non-Hispanic; Black, non-

Hispanic; American Indian, non-Hispanic; Hispanic; Laotian, Hmong, non-Hispanic; Other, non-Hispanic. This analysis focused on the racial groups of non-Hispanic African-American and non-Hispanic White, given the extensive literature on racial disparities in prevalence of bed-sharing rates (Broussard, Sappenfield & Goodman, 2012; Blair, Heron & Fleming, 2010; Fu, et al., 2008; Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; McCoy, et al., 2004; Brenner, et al., 2003; Willinger, et al., 2003), and in sleep-related infant mortality (CDC, 2012a; WDHS DPH, 2012).

Outcome Variable

The outcome variable, frequency of bed-sharing, was collected with the survey question, "How often does your new baby sleep in the same bed as you or anyone else?" with accompanying response choices of "Always;" "Often;" "Sometimes;" "Rarely;" and "Never." A differential risk of SIDS has been found for infants who routinely sleep with their parents versus those who do not. Two studies have found that non-routine bed-sharing infants were twice as likely to die when they shared a bed with a caregiver the previous night (Vennemann, Hense, Bajanowski, Blair, Complojer, Moon & Kiechl-Kohlendorfer, 2012; Vennemann, Bajanowski, Brinkmann, Jorch, Sauerland & Mitchell, 2009; Scragg, Mitchell, Taylor, Stewart, Ford, Thompson, et al., 1993).

Crosstabs by race, each of the five categories, and the variables of interest revealed several variables (abuse, income, infant in the ICU, maternal age, and upset regarding treatment based on race) in which cells contained frequencies of less than five unweighted occurrences, one of the assumptions of logistic regression (Warner, 2008). When categories were collapsed into Frequent (Always; Sometimes); Infrequent (Sometimes; Rarely); and Never, only the "race bias" variable contained a frequency of less than five; only four Whites reported "yes" to the question regarding feeling upset regarding treatment based on race.

Thus, to preserve the maximum number of variables of interest in the model, the collapsed version of bed-sharing frequency (Frequent; Infrequent; and Never) was used.

Data Set Preparation

Two separate data files were delivered to the researcher; the first file contained linked birth certificate and PRAMS data from the 2007-2008 version (Phase 5) of the PRAMS survey and the second file contained data from the 2009-2010 version (Phase 6). Data files (which were initially received in SAS® format) were imported into SPSS® and saved as SPSS data files. A data codebook was created to identify data elements, their name in the original SAS documentation, name in the SPSS file, type of variable, and variable values. As new variables were created through re-coding of current variables and through calculations between two or more variables, they were also added to the data codebook (Appendix F).

To prepare the datasets for analysis, several steps were taken to create one combined file. First, the CDC instructions were followed to combine the two separate datasets, which included combining the state stratification scheme and the sample year variables into one variable and merging the data sets (CDC, 2012a). Second, the merged dataset was examined to ensure that all files and variables merged properly. Third, per CDC instructions, a statistical plan file was created in SPSS Complex Samples® to describe the PRAMS sample design, which included details about the design variables, estimation method, size, and plan summary (CDC, 2012a). This analysis plan file was used with all future analyses. Fourth, re-coding was done to facilitate use of variables across both phases of the surveys, and those new variables were added to the codebook. Fifth, because this analysis focused only on comparisons between non-Hispanic African-American and non-Hispanic White individuals, all cases with Hispanic ethnicity or other racial categories were excluded from the final data set for analysis.

Sample Size and Response Rates

Per WDHS documentation, the sample sizes for each phase (Phase 5: 2007-2008; Phase 6: 2009-2010) are described in Table 4 below. This table reflects the number of mothers who were sent PRAMS surveys in each year.

Table 4. Wisconsin PRAMS Sample Sizes, 2007-2010

Survey Year	White,non-Hispanic	Black, non-Hispanic	Other	Total
2007	619	639	616	1,874
2008	612	641	625	1,878
2009	598	644	621	1,863
2010	580	606	592	1,778
Total Sampled	2,409	2,507	2,454	7,393

Source: Wisconsin PRAMS 2007-2010. Data file provided by Wisconsin Department of Health Services.

Of the 7,393 women who were invited to participate in Wisconsin PRAMS, 3,921 completed surveys. Respondent numbers are summarized in Table 5 below. The unweighted response rates were 55% in both 2007 and 2008, 53% in 2009, and 49% in 2010 (WDHS, 2011). The overall unweighted response rate between 2007 and 2010 for Whites was 72.2% compared to 34.6% for African-Americans.

Table 5. Wisconsin PRAMS Respondents, 2007-2010

Survey Year	White, non-Hispanic	Black, non-Hispanic	Other	Total
2007	472	234	328	1,034
2008	443	227	355	1,025
2009	438	226	324	988
2010	387	181	306	874
Total Respondents	1,740	868	1,313	3,921

Source: Wisconsin PRAMS 2007-2010. Data file provided by Wisconsin Department of Health Services.

The weighted response rates (adjusted for the disproportionate sampling strata) are summarized in Table 6, and the weighted counts by stratum are summarized in Table 7.

Table 6. Wisconsin PRAMS Weighted Response Rates, 2007-2010

Survey Years	White, non-Hispanic	Black, non-Hispanic	Other	Total
2007	76.3%	36.6%	53.2%	68.7%
2008	62.4%	35.4%	56.8%	66.1%
2009	73.2%	35.1%	52.2%	65.9%
2010	66.6%	29.9%	51.7%	60.5%

Source: Wisconsin PRAMS 2007-2010. Data file provided by Wisconsin Department of Health Services.

Table 7. Wisconsin PRAMS Weighted Results by Stratum, 2007-2010

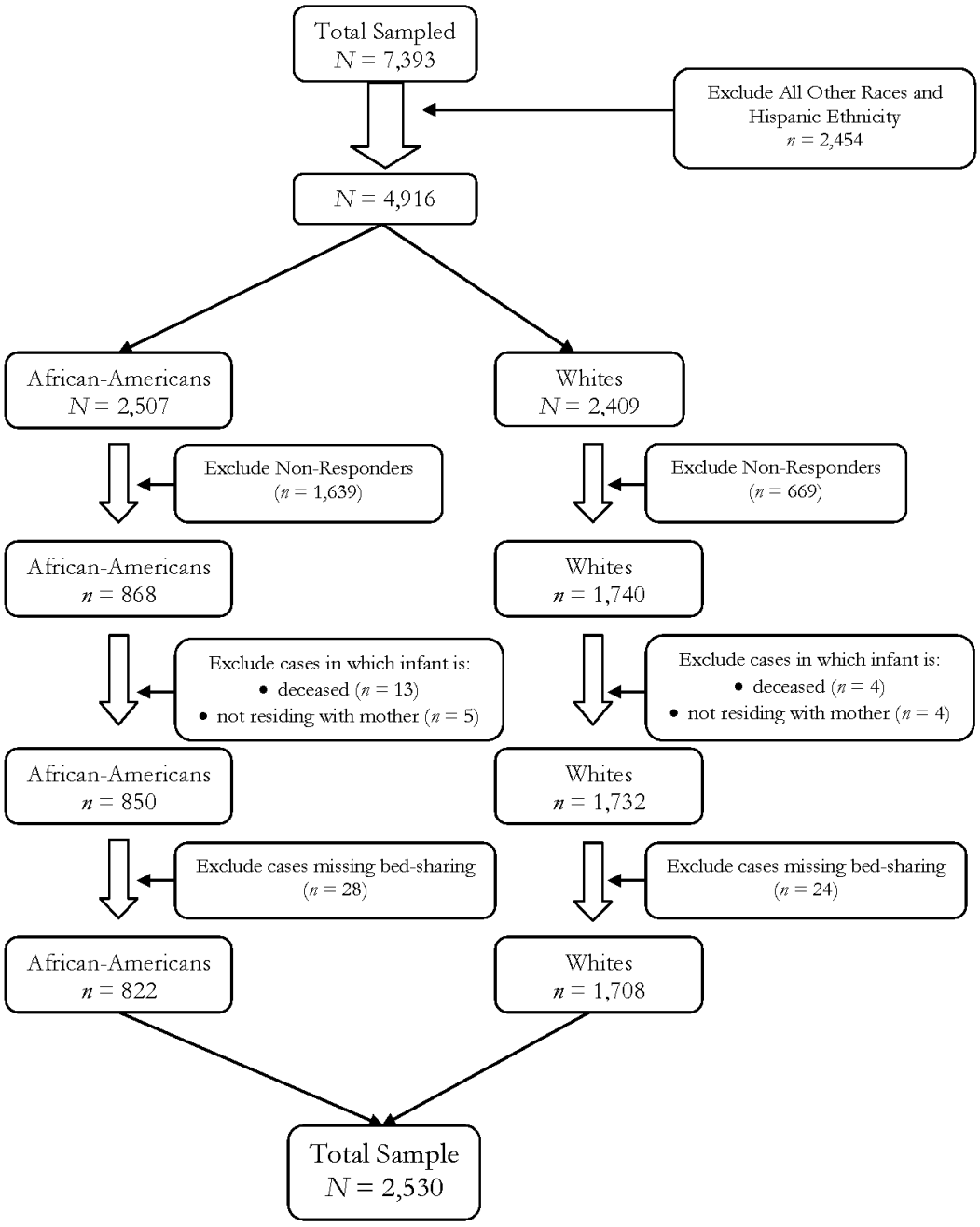
Survey Years	White, non-Hispanic	Black, non-Hispanic	Other	Total
2007	51,308	7,024	10,728	69,060
2008	50,650	7,037	10,935	68,622
2009	49,439	7,066	10,797	67,327
2010	48,179	6,663	10,333	65,210
Total	199,576	27,790	42,793	270,219

Source: Wisconsin PRAMS 2007-2010. Data file provided by Wisconsin Department of Health Services.

Pre-Analysis Data Screening

All variables of interest were screened for missing data and outliers by reviewing frequency tables and bivariate cross tables (Kleinbaum & Klein, 2010; Warner, 2008b). See Figure 4 for a flow chart of the study sample. The original 2007-2008 data file contained 3,752 records with 1,693 (45.1%) non-responders and 2,059 (54.9%) responders. The original 2009-2010 data file contained 3,641 records with 1,779 (48.9%) non-responders and 1,862 (51.1%) responders. A total of 2,608 non-Hispanic African-American and White women responded to the 2007-2010 Wisconsin PRAMS surveys. Respondents were excluded from the sample if their infant was deceased or did not reside with the mother at the time of completion of the survey, and if they contained missing data on bed-sharing. A total of 822 African-American women and 1,708 White women (N = 2,530) remained available for the analysis. Mother's residence type (urban versus rural) was dropped from the analysis because only 1.3% (n = 10) of African-American women lived in a rural county.

Figure 4: Study Sample Flow Chart



Missing data were handled by examining the characteristics of the missing data, including determining if there were any patterns that might indicate a possible bias in non-response (Warner, 2008b). When examining missing values by race for the variables of interest, all variables contained less than 2% of missing values, except income level (Table 8).

Table 8: Missing Values by Race for Variables of Interest

Variable	Non-Hispanic African-American *n* = 822 # Missing	(%)	Non-Hispanic White *n* = 1708 # Missing	(%)
Abuse before/during pregnancy	6	(0.7%)	6	(0.4%)
Birthweight	0	(0%)	0	(0%)
Currently Breastfeeding	7	(0.9%)	4	(0.2%)
Depressive symptoms	13	(1.6%)	4	(0.2%)
Intensive Care Unit at birth	3	(0.4%)	4	(0.2%)
Marital status	0	(0%)	0	(0%)
Maternal age	0	(0%)	0	(0%)
Maternal education	11	(1.3%)	4	(0.2%)
Medicaid for delivery	2	(0.2%)	1	(<0.1%)
Emotional stress	4	(0.5%)	7	(0.4%)
Financial stress	6	(0.7%)	9	(0.5%)
Partner stress	5	(0.6%)	9	(0.5%)
Traumatic stress	12	(1.5%)	11	(0.6%)
Upset re: treatment based on race	8	(1.0%)	14	(0.8%)
Needed money for food	9	(1.1%)	6	(0.4%)
Income level	43	(5.2%)	42	(2.5%)
Residence type	0	(0%)	0	(0%)

Source: Wisconsin PRAMS 2007-2010. Data file provided by Wisconsin Department of Health Services.

When the distribution of birth weight (in grams) was examined separately for African-Americans, and Whites, the data were negatively skewed, and were therefore converted to a categorical variable based on the naturally-occurring breaks in the data.

Analysis of Responders versus Non-Responders

To check the representativeness of the sample, differences between responders and non-responders by maternal race (non-Hispanic African-American versus non-Hispanic White) were examined for variables from the birth certificate. First, an unweighted cross-tabulation and two-sided Pearson χ^2 tests were conducted to determine whether significant differences existed between non-responders and responders for marital status and maternal education by race. Independent sample *t*-tests were conducted to compare means of maternal age between non-responders and responders for non-Hispanic African-Americans and non-Hispanic Whites.

For African-Americans, significant differences between responders and non-responders existed for maternal education and marital status, but not for birthweight, residence type, or maternal age (Tables 9 & 10). African-American non-responders tended to have slightly less education and be unmarried compared to responders. For Whites, significant differences existed between responders and non-responders for maternal education, marital status, and maternal age, but not for birthweight or residence type (Tables 9 & 10). White non-responders tended to have lower education levels, be unmarried, and were slightly younger than responders.

Table 9. Unweighted Cross-Tabulation of Response Status by Race for Non-Hispanic African-Americans and Whites, Wisconsin PRAMS Survey

	African-Americans					Whites				
	Non-Responders		Responders		*p*	Non-Responders		Responders		*p*
Variable	*n*	%	*n*	%	value[i]	*n*	%	*n*	%	value[i]
Birthweight										
Normal	714	(84.7%)	361	(88.7%)	.056	336	(95.2%)	768	(93.1%)	.192
Low	129	(15.3%)	46	(11.3%)		17	(4.8%)	57	(6.9%)	
Education										
< HS	265	(31.7%)	111	(27.4%)		184	(26.2%)	210	(17.3%)	
12 years	322	(38.5%)	154	(38.0%)	<.05	263	(37.5%)	275	(22.7%)	<.001
13-15 years	203	(24.2%)	97	(24.0%)		154	(21.9%)	309	(25.5%)	
≥ 16 years	47	(5.6%)	43	(10.6%)		101	(14.4%)	417	(34.4%)	
Marital status										
Married	104	(12.2%)	71	(17.2%)	<.05	345	(48.8%)	832	(68.3%)	<.001
Other	750	(87.8%)	342	(82.8%)		362	(51.2%)	386	(31.7%)	
Residence										
Urban	830	(98.5%)	402	(98.8%)	.803	227	(64.3%)	575	(69.7%)	.076
Rural	13	(1.5%)	5	(1.2%)		126	(35.7%)	250	(30.3%)	

Notes: Values shown are unweighted percentages of women within each level of response.
[i]Results of Pearson χ^2 two-tailed tests.
Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

Table 10: Group Differences for Non-Hispanic African-Americans and Whites by Response Status, Wisconsin PRAMS Survey

	Non-Responders			Responders					*p*
Characteristic	*M*	Range	SD	*M*	Range	SD	*T*	df	value
African-Americans									
Maternal age (years)	24.6	13-44	5.65	25.1	13-42	5.7	-1.469	746.2	.142
Whites									
Maternal age (years)	27.4	14-41	5.9	29.2	14-47	5.3	-5.107	1176	.000

Notes: Values shown are unweighted means for women within each level of response.
Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

Data Analysis Plan

All analyses took into account the analytical weight variable, and WDHS standards for reporting PRAMS results were followed (WDHS, 2011). To test hypothesis 1, crosstabs were conducted by race and a test of proportion (z test) was conducted. To test hypothesis 2, crosstabs were conducted to examine the distribution of characteristics, χ^2 tests were conducted to assess differences in associations, and logistic regression was conducted to calculate odds ratios (OR) and 95% Confidence Intervals (CI). To preserve the ordinal nature of the bed-sharing frequency variable, ordinal logistic regression was also conducted and cumulative ORs were calculated (Kleinbaum & Klein 2010; Heeringa, West & Berglund, 2010; Warner, 2008a). To test hypothesis 3, χ^2 tests were conducted to assess associations and differences in those associations, and logistic regression was conducted to calculate ORs and 95% CIs. To test hypothesis 4, three separate logistic regression models were run using each SES variable. Per Braveman and colleagues' recommendations, findings using each of the SES measures were compared, and all results are reported (Braveman, et al., 2001). For all hypotheses, separate but identical methods were used to examine differences by race in potential predictor variables. Goodness of fit tests included Wald's test statistic, the Cox and Snell's R^2, and Nagelkerke's R^2 (Warner, 2008b; Peng & So, 2002).

CHAPTER 5

RESULTS

The purpose of this study was to explore maternal-infant bed-sharing and infant sleep position for African-Americans and Whites in a stratified sample of mothers and young infants.

Study Sample

After data cleaning was completed, 2,530 cases (822 African-American and 1,708 White women) remained available for the analysis. Overall, the weighted distribution revealed that 55.6% of respondents reported bed-sharing, with 14.7% reporting frequently (always, often), 40.9% infrequently (sometimes, rarely), and 44.4% reporting never bed-sharing. Of these respondents, 20.2% reported placing their infants non-supine (or mixed) to sleep. Characteristics of the sample are described by race in Table 11. The weighted distributions of all variables differed for both African-American and White women ($p < .001$) with the distributions for African-American women being generally more adverse than those for White women. Group differences also existed for maternal age: African-American women in the sample ranged from age thirteen to forty-five years and were younger ($M = 25.3$, SD = 6.09) compared to White women ($M = 28.8$, SD = 5.3), ranging in age from fourteen to forty-seven years, and these differences were significant, $t(2522) = 233.76$, $p < 0.001$.

Table 11. Distribution of Characteristics for Non-Hispanic African-American and Non-Hispanic White Wisconsin PRAMS Respondents

Characteristic	African-American *n* = 822 % (95% CI)		White *n* = 1,708 % (95% CI)		*p* value[i]
Bed-Sharing					
Frequent	30.2	(27.2-33.4)	12.6	(11.0-14.2)	<.001
Infrequent	40.3	(36.9-43.7)	40.9	(38.6-43.3)	
Never	29.5	(26.5-32.7)	46.5	(44.1-48.9)	
Birth weight					
Normal	89.0	(86.6-91.0)	93.8	(92.5-94.9)	<.001
Low	11.0	(9.0-13.4)	6.2	(5.1-7.5)	
Abuse before/during pregnancy					
No	85.0	(82.3-87.3)	96.1	(95.0-97.0)	<.001
Yes	15.0	(12.7-17.7)	3.9	(3.0-5.0)	
Breastfeeding					
No	78.3	(75.4-81.0)	48.3	(45.9-50.7)	<.001
Yes	21.7	(19.0-24.6)	51.7	(49.3-54.1)	
Depressive symptoms					
No	71.2	(67.9-74.3)	82.9	(81.0-84.6)	<.001
Yes	28.8	(25.7-32.1)	17.1	(15.4-19.0)	
Income level					
<$10,000	51.1	(47.6-54.7)	10.0	(8.5-11.7)	
$10,000-$14,999	13.2	(11.0-15.9)	5.5	(4.5-6.8)	
$15,000-$19,999	6.9	(5.3-9.0)	4.3	(3.4-5.5)	<.001
$20,000-$24,999	5.9	(4.5-7.8)	6.4	(5.3-7.8)	
$25,000-$34,999	10.3	(8.3-12.6)	9.5	(8.2-11.1)	
$35,000-$49,999	5.8	(4.3-7.6)	13.5	(11.9-15.3)	
≥$50,000	6.8	(5.4-8.5)	50.7	(48.3-53.1)	
Intensive Care Unit at birth					
No	85.6	(83.0-87.9)	90.7	(89.2-92.0)	<.001
Yes	14.4	(12.1-17.0)	9.3	(8.0-10.8)	
Marital status					
Married	17.2	(14.9-19.8)	74.3	(72.0-76.4)	<.001
Other	82.8	(80.2-85.1)	25.7	(23.6-28.0)	
Maternal education					
< high school	28.9	(25.8-32.2)	6.1	(5.0-7.5)	
12 years	38.6	(35.3-42.0)	27.0	(24.8-29.3)	<.001
13-15 years	24.0	(21.2-27.1)	27.4	(25.3-29.5)	
≥ 16 years	8.5	(6.9-10.5)	39.4	(37.2-41.8)	
Method of payment for delivery					
Other	30.5	(27.5-33.7)	69.4	(67.1-71.6)	<.001
Medicaid	69.5	(66.3-72.5)	30.6	(28.4-32.9)	
Emotional stress					
No	57.6	(54.1-60.9)	70.6	(68.3-72.7)	<.001
Yes	42.4	(39.1-45.9)	29.4	(27.3-31.7)	
Financial stress					
No	30.1	(27.1-33.4)	54.5	(52.0-56.8)	<.001
Yes	69.9	(66.6-72.9)	45.5	(43.2-48.0)	
Partner stress					
No	47.7	(44.2-51.1)	73.2	(71.0-75.3)	<.001
Yes	52.3	(48.9-55.8)	26.8	(24.7-29.0)	
Traumatic stress					
No	64.1	(60.7-67.3)	83.7	(81.8-85.5)	
Yes	35.9	(32.7-39.3)	16.3	(14.5-18.2)	<.001

Upset re: treatment based on race					
No	80.2	(77.2-82.8)	96.8	(95.8-97.6)	<.001
Yes	19.8	(17.2-22.8)	3.2	(2.4-4.2)	
Needed money for food					
No	29.9	(26.9-33.1)	70.2	(67.9-72.4)	<.001
Yes	70.1	(66.9-73.1)	29.8	(27.6-32.1)	

Notes: Values shown are weighted percentages of women within each level of response by race.
[i]Results of Pearson χ^2 two-sided tests.
Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

Results Related to Specific Aims

Specific Aim 1: Determine the relationship between race and bed-sharing.

Hypothesis 1: Consistent with other findings, African-American mothers will report higher rates of bed-sharing compared to White mothers. When examined by race, 70.5% of African-American women reported bed-sharing at some point while 53.5% of Whites reported bed-sharing. A test for proportion resulted in the null hypothesis of equal proportions being rejected, meaning that significantly more African-American women bed-shared than White women, $z = 56.67$, SEM = 0.01, $p < .001$ (one-tailed).

Specific Aim 2: Examine the determinants of bed-sharing for African-Americans and Whites.

Hypothesis 2: African American mothers will have different factors associated with bed-sharing than White mothers will when examined separately, with the factors for African-Americans being related to marital status, stress, and personally-mediated racism and for Whites being related to currently breastfeeding, lower SES, and less education. Results of the logistic regression using bed-sharing (yes/no) for both races combined are displayed in Table 12 below. The overall corrected model was significant, Adjusted Wald $F(21.46,50588.75) = 6.71$, $p < .001$. Bed-sharing was significantly associated with being African-American, currently breastfeeding, income level, being unmarried, and experiencing partner-related stress. In order of importance, significant

factors associated with bed-sharing included: (1) currently breastfeeding (OR: 2.378; 95% CI: 1.917-2.950); (2) earning between $35,000 and $49,999 annually (OR: 1.753; 95% CI: 1.283-2.396), but not significant for earning less than $35,000 annually; (3) being unmarried (OR: 1.701; 95% CI: 1.249-2.316); (4) being African-American (OR: 1.512; 95% CI: 1.166-1.961); and (5) experiencing partner-related stress (OR: 1.468; 95% CI: 1.162-1.856) being more likely to bed-share. However, with a Cox and Snell's $R^2 = 0.081$ and Nagelkerke's $R^2 = 0.108$, only approximately ten percent of the phenomenon of bed-sharing was accounted for by this model.

Table 12: Logistic Regression Results for Bed-Sharing Among Non-Hispanic African-American and Non-Hispanic White Wisconsin PRAMS Respondents

Characteristics	ß	SE	OR	95% CI	Adjusted Wald	*p* value[i]
Race						
African-American			**1.512**	**1.166-1.961**	**9.749**	**.002**
White	-.414	.132	Referent			
Abuse						
No	-.161	.238	Referent		.455	.500
Yes			1.174	0.736-1.873		
Birth weight						
Normal	-.039	.208	Referent			.850
Low			1.040	0.692-1.564	.036	
Currently Breastfeeding						
No	-.866	.110	Referent		**62.126**	**.000**
Yes			**2.378**	**1.917-2.950**		
Depressive symptoms						
No	.041	.125	Referent		.108	.743
Yes			.960	0.751-1.226		
Income level						
<$10,000	.087	.227	1.090	0.698-1.703		
$10,000-$14,999	.416	.259	1.516	0.913-2.518	**2.622**	**.003**
$15,000-$19,999	.464	.284	1.590	0.912-2.772		
$20,000-$24,999	.315	.234	1.370	0.865-2.169		
$25,000-$34,999	.228	.181	1.256	0.881-1.791		
$35,000-$49,999	.562	.159	**1.753**	**1.283-2.396**		
≥$50,000			Referent			
Intensive Care Unit at birth						
No	.082	.171	Referent		.228	.633
Yes			0.921	0.658-1.289		
Marital status						
Married	-.531	.157	Referent		**11.376**	**.001**
Other			**1.701**	**1.249-2.316**		
Maternal age	-.007	.011	0.993	0.973-1.014	.406	.524
Maternal education						
< high school			Referent			
12 years	.181	.224	1.055	0.713-1.560	.425	.333
13-15 years	.234	.153	0.984	0.650-1.489		
≥ 16 years	.164	.126	0.834	0.538-1.295		
Upset re: treatment based on race						
No	-.108	.222	Referent		.236	.627
Yes			1.114	0.720-1.723		
Emotional stress						
No	-.148	.105	Referent		.161	.169
Yes			1.159	0.943-1.426		
Financial stress						
No	-.049	.106	Referent		.214	.644
Yes			1.050	0.853-1.294		
Partner stress						
No	-.384	.119	Referent		**10.341**	**.001**
Yes			**1.468**	**1.162-1.856**		
Traumatic stress						
No	-.036	.144	Referent		.064	.800
Yes			1.037	0.782-1.376		

[i]Results of Pearson χ^2 two-sided tests.

Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

Separate logistic regression models run by race revealed differences in factors associated with bed-sharing. When examining African-Americans separately (Table 13), the overall corrected model was significant, $F(20.81,49052.95) = 2.12$, $p = .002$. For African-Americans in this sample, bed-sharing was significantly associated with breastfeeding, being unmarried, younger maternal age, and experiencing partner-related stress. Significant predictors in order of size were: (1) experiencing partner-related stress (OR: 1.931; 95% CI: 1.326-2.812); (2) being unmarried (OR: 1.790; 95% CI: 1.018-3.150); and (3) currently breastfeeding (OR: 1.621; 95% CI: 1.029-2.555) being more likely to bed-share. Although maternal age was significant (OR: 0.958; 95% CI: 0.928-0.990), the small OR suggests a very small change in the likelihood of bed-sharing by year of age. The model was relatively weak, however, with a Cox and Snell's $R^2 = 0.068$ and Nagelkerke's $R^2 = 0.096$, meaning that approximately ten percent of the phenomenon of bed-sharing was accounted for by this model.

Table 13: Logistic Regression Results for Non-Hispanic African-American Bed-Sharing Wisconsin PRAMS Respondents

Characteristics	ß	SE	OR	95% CI	Adjusted Wald	*p* value
Abuse						
No	.413	.266	Referent		2.405	.121
Yes			0.662	0.393-1.115		
Birth weight						
Normal	.256	.268	Referent			
Low			0.774	0.457-1.310	.911	.340
Currently Breastfeeding						
No	-.483	.232	Referent		**4.338**	**.037**
Yes			**1.621**	**1.029-2.555**		
Depressive symptoms						
No	-.045	.199	Referent		.051	.821
Yes			1.046	0.708-1.544		
Income level						
<$10,000	-.573	.457	0.564	0.230-1.382		
$10,000-$14,999	-.897	.474	0.408	0.161-1.033		
$15,000-$19,999	-.914	.520	0.401	0.144-1.112	1.012	.303
$20,000-$24,999	-.696	.526	0.499	0.178-1.399		
$25,000-$34,999	-.509	.468	0.601	0.240-1.506		
$35,000-$49,999	-.011	.528	0.989	0.352-2.784		
≥$50,000			Referent			
Intensive Care Unit at birth						
No	.284	.243	Referent		1.363	.243
Yes			0.753	0.468-1.213		
Marital status						
Married	-.582	.288	Referent		**4.085**	**.043**
Other			**1.790**	**1.018-3.150**		
Maternal age	-.043	.017	**0.958**	**0.928-0.990**	**6.525**	**.011**
Upset re: treatment based on race						
No	-.123	.238	Referent		.266	.606
Yes			1.131	0.709-1.805		
Emotional stress						
No	.087	.182	Referent		.227	.634
Yes			.0917	0.641-1.311		
Financial stress						
No	-.307	.195	Referent		2.473	.116
Yes			1.360	0.927-1.994		
Partner stress						
No	-.658	.192	Referent		**11.766**	**.001**
Yes			**1.931**	**1.326-2.812**		
Traumatic stress						
No	.113	.203	Referent		.307	.579
Yes			0.893	0.600-1.331		

[i]Results of Pearson χ^2 two-sided tests.
Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

For Whites, the overall corrected model was significant, $F(20.89,49239.95) = 5.26$, $p < .001$ (Table 14). Bed-sharing was significantly associated with currently breastfeeding,

income level, being unmarried, and experiencing partner-related stress. Significant predictors in order of size were: (1) currently breastfeeding (OR: 2.458; 95% CI: 21.952-3.096); (2) earning between $35,000 to $49,999 annually (OR: 1.758; 95% CI: 1.274-2.425); (3) being unmarried (OR: 1.703; 95% CI: 1.212-2.393); and (4) experiencing partner-related stress (OR: 1.394; 95% CI: 1.069-1.818). Maternal age was not significantly associated with bed-sharing. The model was relatively weak, with a Cox and Snell's $R^2 = 0.080$ and Nagelkerke's $R^2 = 0.107$, meaning that approximately ten percent of the phenomenon of bed-sharing was accounted for by this model.

Table 14: Logistic Regression Results for Non-Hispanic White Bed-Sharing Wisconsin PRAMS Respondents

Characteristics	ß	SE	OR	95% CI	Adjusted Wald	*p* value
Abuse						
No	-.353	.325	Referent		1.180	.277
Yes			1.424	0.753-2.693		
Birth weight						
Normal	-.103	.246	Referent			
Low			1.109	.685-1.795	.176	.675
Currently Breastfeeding						
No	-.899	.118	Referent		**58.441**	**.000**
Yes			**2.458**	**1.952-3.096**		
Depressive symptoms						
No	.057	.143	Referent		.158	.691
Yes			0.945	0.713-1.251		
Income level						
<$10,000	.032	.271	1.032	0.606-1.757		
$10,000-$14,999	.599	.307	1.820	0.996-3.324		
$15,000-$19,999	.539	.320	1.714	0.915-3.213	**2.618**	**.016**
$20,000-$24,999	.358	.253	1.430	0.871-2.350		
$25,000-$34,999	.216	.196	1.241	0.845-1.821		
$35,000-$49,999	.564	.164	**1.758**	**1.274-2.425**		
≥$50,000			Referent			
Intensive Care Unit at birth						
No	.038	.197	Referent		.037	.848
Yes			0.963	0.655-1.461		
Marital status						
Married	-.532	.173	Referent		**9.422**	**.002**
Other			**1.703**	**1.212-2.393**		
Maternal age	-.003	.012	0.997	0.974-1.020	.068	.794
Maternal education						
< high school			Referent			
12 years	.391	.287	0.917	0.537-1.564	1.342	.259
13-15 years	.304	.164	0.809	0.467-1.399		
≥ 16 years	.178	.133	0.677	0.385-1.188		
Upset re: treatment based on race						
No	-.059	.319	Referent		.034	.854
Yes			1.060	0.567-1.982		
Emotional stress						
No	-.174	.117	Referent		2.208	.137
Yes			1.190	0.946-1.498		
Financial stress						
No	-.018	.117	Referent		.024	.876
Yes			1.018	0.810-1.281		
Partner stress						
No	-.333	.135	Referent		**6.033**	**.014**
Yes			**1.394**	**1.069-1.818**		
Traumatic stress						
No	-.077	.169	Referent		.209	.647
Yes			1.080	0.776-1.504		

[i]Results of Pearson χ^2 two-sided tests.
Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

In summary, significant factors for bed-sharing (yes/no) differed by race, most notably, maternal age were significantly associated with bed-sharing only for African-Americans, and income level was significantly associated with bed-sharing only for Whites (Table 15). The strengths of the associations in the models also varied by race. For African-Americans, the strongest associations were for partner-related stress, marital status, and breastfeeding, while the strongest associations for Whites were breastfeeding, income level, and marital status. These factors were different than what was originally hypothesized.

Table 15: Summary of Differing Factors by Race in their Associations with Bed-Sharing for Non-Hispanic African-American and Non-Hispanic White Wisconsin PRAMS Respondents

Characteristics	Both Races *n* = 2,530 OR (95% CI)	African-American *n* = 822 OR (95% CI)	White *n* = 1,708 OR (95% CI)
Maternal race			
African-American	**1.125 (1.166-1.961)****		
White	Referent		
Currently Breastfeeding			
No	Referent	Referent	Referent
Yes	**2.378 (1.917-2.950)*****	**1.621 (1.029-2.555)***	**2.438 (1.952-3.096)*****
Income level			
<$10,000	1.090 (0.698-1.703)	0.564 (0.230-1.382)	1.032 (0.606-1.757)
$10,000-$14,999	1.516 (0.913-2.518)	0.408 (0.161-1.033)	1.820 (0.996-3.324)
$15,000-$19,999	1.590 (0.912-2.772)	0.401 (0.144-1.112)	1.714 (0.915-3.213)
$20,000-$24,999	1.370 (0.865-2.169)	0.499 (0.178-1.399)	1.430 (0.871-2.350)
$25,000-$34,999	1.256 (0.881-1.791)	0.601 (0.240-1.506)	1.241 (0.845-1.821)
$35,000-$49,999	**1.753 (1.283-2.396)****	0.989 (0.352-2.784)	**1.758 (1.274-2.425)***
≥$50,000	Referent	Referent	Referent
Marital status			
Married	Referent	Referent	Referent
Other	**1.701 (1.249-2.316)****	**1.790 (1.018-3.150)***	**1.703 (1.212-2.393)****
Maternal age	0.993 (0.973-1.014)	**0.958 (0.928-0.990)***	0.997 (0.974-1.020)
Partner stress			
No	Referent	Referent	Referent
Yes	**1.468 (1.162-1.856)****	**1.931 (1.326-2.812)****	**1.394 (1.069-1.818)***

*$p < .05$; **$p < .01$; ***$p<.001$

Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

When examining bed-sharing in its original ordinal format (versus dichotomous – yes/no), data screening revealed that some cells had less than five occurrences (Warner, 2008). Therefore, the five categories of bed-sharing (Always, Often, Sometimes, Rarely,

Never) were collapsed into three categories: Frequent (Always, Often), Infrequent (Sometimes, Rarely), and Never. Frequencies of these three categories revealed that approximately 40% of the respondents were represented in the Never and Infrequent categories, with the remaining approximate 20% represented in the Frequent category; thus the distribution appeared appropriate to examine using an ordinal logistic regression model (Heeringa, West, & Berlund, 2010). The distribution of characteristics were examined by bed-sharing frequency for each race separately (Table 16). For African-Americans, significant differences by bed-sharing frequency existed only for partner-related stress, while for Whites, significant differences by bed-sharing frequency existed for abuse, currently breastfeeding, income level, marital status, maternal education, financial stress, partner-related stress, and traumatic stress.

For African-Americans, the only characteristic demonstrating significant differences by frequency of bed-sharing was partner-related stress, with a higher percentage among those experiencing partner-related stress bed-sharing infrequently (43.7%) compared to those reporting bed-sharing frequently (32.5%) or never (23.9%). African-Americans reporting frequently bed-sharing were slighter younger (M = 24.1, Range = 15-42, SD = 6.04) compared to those reporting infrequently bed-sharing (M = 25, Range = 13-45, SD = 6.34), and to those who never bed-shared (M = 24.9, Range = 13-40, SD = 5.74).

For Whites, several characteristics differed significantly by bed-sharing frequency, including abuse, breastfeeding, income level, marital status, maternal education, financial stress, partner stress, and traumatic stress. A higher percentage of White mothers reporting abuse reported infrequently bed-sharing (48.5%) compared to frequent (21.7%) or never (29.8%). For breastfeeding White mothers, a lower percentage reported frequently bed-sharing (17.6%) than infrequently (42.2%) or never (40.1%) bed-sharing. When examining

income levels by bed-sharing frequency, almost half of White mothers between the income ranges of $10,000 - $49,999 reported infrequently bed-sharing, while about half of those with income levels under $10,000 (42.7%) or income levels at $50,000 or more (54.5%) reported never bed-sharing. A higher percentage of unmarried mothers (49%) reported infrequently bed-sharing compared to frequent (17.2%) and never (33.8%) bed-sharing. When examining education level, a higher percentage of White mothers with less than high school education (16.2%) reported frequently bed-sharing compared to other education levels, while 52.4% of those with sixteen or more years of education reported never bed-sharing. Across financial, partner-related and traumatic stress, a higher percentage of those endorsing these experiences of stress reported infrequently bed-sharing. Further, those reporting never bed-sharing tended to be older (M = 29, Range = 14-47, SD = 5.11) than those who frequently bed-shared (M = 28.4, Range = 15-44, SD = 5.86) or who infrequently bed-shared (M = 28, Range = 15-47, SD = 5.42). In general for Whites, infrequent bed-sharing seemed to be more common among those mothers experiencing adverse experiences.

Table 16. Distribution of Characteristics by Bed-Sharing Frequency for Non-Hispanic African-American and Non-Hispanic White PRAMS Respondents

	African-American									White						
	Frequent		Infrequent		Never			Frequent		Infrequent		Never			
	n **= 253**		***n*** **= 337**		***n*** **= 232**		***p***	***n*** **= 211**		***n*** **= 691**		***n*** **= 806**		***p***	
Characteristics	**% (95% CI)**		**% (95% CI)**		**% (95% CI)**		**value[i]**	**% (95% CI)**		**% (95% CI)**		**% (95% CI)**		**value[i]**	
Abuse															
No	28.8	(25.6-32.2)	41.8	(38.2-45.6)	29.4	(26.1-32.9)	.068	**12.2**	**(10.6-13.9)**	**40.5**	**(38.2-43.0)**	**47.3**	**(44.9-49.7)**		
Yes	37.8	(29.5-46.8)	31.5	(23.7-40.5)	30.8	(23.0-39.8)		**21.7**	**(13.0-33.9)**	**48.5**	**(36.1-61.1)**	**29.8**	**(19.6-42.5)**	**<.05**	
Birth weight															
Normal	30.8	(27.6-34.1)	40.8	(37.2-44.4)	28.5	(25.3-31.9)	.179	12.9	(11.3-14.6)	40.4	(38.0-42.9)	46.7	(44.3-49.2)	.167	
Low	25.8	(17.8-35.9)	36.2	(26.9-46.7)	38.0	(28.4-48.6)		8.1	(4.1-15.5)	48.9	(39.3-58.5)	43.0	(33.7-52.8)		
Breastfeeding															
No	30.3	(26.9-34.0)	38.7	(34.9-42.6)	31.0	(27.5-34.7)	.104	**6.9**	**(5.2-9.0)**	**39.4**	**(36.0-42.9)**	**53.8**	**(50.2-57.3)**	**<.001**	
Yes	29.3	(23.3-36.2)	46.5	(39.5-53.7)	24.1	(18.5-30.9)		**17.6**	**(15.3-20.3)**	**42.2**	**(39.0-45.5)**	**40.1**	**(37.0-43.4)**		
Depressive symptoms															
No	27.6	(24.2-31.4)	42.3	(38.3-46.3)	30.1	(26.5-34.0)	.081	12.2	(10.5-14.0)	41.0	(38.5-43.7)	46.8	(44.2-49.4)	.499	
Yes	35.6	(29.7-42.0)	36.3	(30.3-42.8)	28.1	(22.5-34.4)		14.7	(11.0-19.4)	40.2	(34.6-46.1)	45.0	(39.3-50.9)		
Income level															
< $10,000	31.9	(27.5-36.7)	38.5	(33.7-43.5)	29.5	(25.1-34.4)		**17.4**	**(12.0-24.5)**	**39.9**	**(32.2-48.2)**	**42.7**	**(34.8-51.0)**		
$10,000-$14,999	22.1	(15.2-31.0)	41.3	(32.0-51.2)	36.6	(27.7-46.5)		**18.0**	**(10.9-28.1)**	**51.9**	**(41.0-62.7)**	**30.1**	**(21.0-41.1)**		
$15,000-$19,999	34.7	(22.9-48.7)	34.0	(22.4-47.9)	31.3	(20.1-45.3)	.415	**13.5**	**(6.9-24.8)**	**52.5**	**(40.3-64.5)**	**33.9**	**(23.4-46.4)**	**<.001**	
$20,000-$24,999	32.4	(20.6-47.0)	35.8	(23.4-50.4)	31.8	(20.0-46.7)		**16.4**	**(10.1-25.5)**	**47.3**	**(37.4-57.3)**	**36.3**	**(27.3-46.4)**		
$25,000-$34,999	33.4	(24.1-44.3)	38.4	(28.5-49.4)	28.2	(19.2-39.3)		**11.1**	**(7.1-17.1)**	**44.4**	**(36.6-52.4)**	**44.5**	**(36.8-52.5)**		
$35,000-$49,999	22.6	(12.8-36.6)	56.0	(41.7-69.4)	21.4	(12.0-35.3)		**13.0**	**(9.2-18.1)**	**48.2**	**(41.7-54.8)**	**38.7**	**(32.5-45.3)**		
≥ $50,000	35.6	(25.0-47.9)	41.3	(30.3-53.2)	23.1	(14.5-34.6)		**10.4**	**(8.6-12.6)**	**35.1**	**(32.0-38.2)**	**54.5**	**(51.3-57.8)**		
Intensive Care Unit															
No	31.0	(27.7-34.4)	40.6	(37.0-44.3)	28.5	(25.2-31.9)	.147	12.8	(11.2-14.6)	40.6	(38.1-43.1)	46.6	(44.1-49.1)	.659	
Yes	24.1	(17.2-32.7)	39.3	(30.9-48.5)	36.6	(28.3-45.8)		10.3	(6.3-16.5)	42.8	(35.2-50.7)	46.9	(39.2-54.8)		
Marital status															
Married	26.9	(20.8-34.1)	42.4	(35.1-50.1)	30.6	(23.9-38.2)	.612	**11.0**	**(9.4-12.8)**	**38.1**	**(35.6-40.8)**	**50.9**	**(48.2-53.6)**	**<.001**	
Other	30.9	(27.6-34.5)	39.8	(36.1-43.6)	29.3	(25.9-32.9)		**17.2**	**(13.7-21.3)**	**49.0**	**(43.9-54.1)**	**33.8**	**(29.2-38.8)**		
Maternal education															
< high school	27.6	(22.2-33.7)	37.4	(31.3-44.0)	35.0	(29.0-41.5)		**16.2**	**(10.0-25.2)**	**49.7**	**(39.4-60.0)**	**34.0**	**(24.9-44.6)**		
12 years	29.6	(24.7-34.9)	39.9	(34.5-45.6)	30.5	(25.6-36.0)	.119	**12.7**	**(9.7-16.4)**	**44.9**	**(40.0-49.9)**	**42.4**	**(37.5-47.4)**	**<.01**	
13-15 years	35.1	(28.8-42.0)	40.3	(33.6-47.3)	24.6	(19.0-31.3)		**11.9**	**(92-15.1)**	**43.2**	**(38.9-47.7)**	**44.9**	**(40.6-49.4)**		
≥ 16 years	30.4	(21.4-41.2)	49.1	(38.5-59.8)	20.5	(13.2-30.4)		**12.3**	**(10.1-14.8)**	**35.4**	**(32.0-38.9)**	**52.4**	**(48.8-55.9)**		

Upset re: treatment based on race														
No	30.1	(26.7-33.7)	38.9	(35.2-42.8)	31.0	(27.5-34.6)	.344	12.8	(11.3-14.5)	40.5	(38.2-43.0)	46.6	(44.2-49.1)	.188
Yes	31.8	(25.2-39.3)	43.1	(35.6-50.9)	25.1	(18.8-32.6)		8.3	(3.1-20.5)	53.7	(39.4-67.4)	38.0	(25.2-52.6)	
Emotional stress														
No	31.0	(27.0-35.3)	39.2	(34.9-43.7)	29.8	(25.8-34.1)	.792	12.5	(10.7-14.5)	39.5	(36.7-42.3)	48.1	(45.2-50.9)	.124
Yes	29.3	(24.8-34.2)	41.5	(36.4-46.8)	29.2	(24.6-34.3)		13.0	(10.2-16.3)	44.4	(40.0-48.8)	42.7	(38.3-47.1)	
Financial stress														
No	29.5	(24.3-35.4)	36.5	(30.8-42.7)	33.9	(28.3-40.1)	.178	**11.6**	**(9.7-13.8)**	**38.4**	**(35.3-41.6)**	**50.0**	**(46.8-53.2)**	**<.01**
Yes	30.5	(26.9-34.4)	41.8	(37.7-45.9)	27.7	(24.1-31.6)		**13.7**	**(11.4-16.4)**	**43.9**	**(40.4-47.6)**	**42.4**	**(38.8-46.0)**	
Partner stress														
No	**27.9**	**(23.8-32.5)**	**36.2**	**(31.6-41.1)**	**35.8**	**(31.2-40.7)**	**<.01**	**10.9**	**(9.3-12.78)**	**38.4**	**(35.8-41.2)**	**50.7**	**(47.9-53.5)**	**<.001**
Yes	**32.5**	**(28.2-37.1)**	**43.7**	**(38.9-48.5)**	**23.9**	**(20.0-28.3)**		**17.1**	**(13.8-21.1)**	**47.6**	**(42.9-52.4)**	**35.2**	**(30.8-39.9)**	
Traumatic stress														
No	27.7	(24.1-31.6)	42.1	(37.9-46.4)	30.3	(26.4-34.4)	.154	**11.8**	**(10.2-13.5)**	**39.8**	**(37.2-42.3)**	**48.5**	**(45.9-51.1)**	**<.01**
Yes	34.0	(28.8-39.7)	36.9	(31.5-42.6)	29.1	(24.1-34.7)		**16.4**	**(12.3-21.6)**	**46.6**	**(40.5-52.8)**	**37.0**	**(31.3-43.2)**	

Notes: Values shown are weighted percentages of women within each level of response by race, and Pearson .

[1]Results of Pearson χ^2 two-sided tests.

Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

An ordinal logistic regression was conducted examining both races combined, however, the Test of Parallel Lines was significant, $F(22.38,52738.21) = 1.948$, $p = .005$, indicating a rejection of the null hypothesis of equal slopes, suggesting that the data do not fit this model (Heeringa, West & Berlund, 2010). Thus, no further analysis was conducted. These findings could indicate a limited sample size in relation to each frequency category, despite attempts to screen for such issues and to address them by collapsing categories.

Specific Aim 3:

Determine the relationship between bed-sharing and sleep position in African-Americans and Whites.

First, the distribution of characteristics by race and infant sleep position were examined (Table 17). For African-Americans, bed-sharing frequency varied significantly between non-supine and supine sleeping infants, with the majority of those placing infants supine to sleep reporting infrequent bed-sharing (41.5%) compared to frequent (25.4%) or never (33.1%), while the majority of non-supine sleepers tended to be frequent (38.9%) or infrequent (38.1%) bed-sharers, compared to never (22.9%), $\chi^2(1.998) = 18.13$, $p < .000$. African-American mothers who placed their infants supine to sleep were significantly older ($M = 25.7$ years, SD = 6.2) than those who placed their infants non-supine ($M = 24.5$ years, SD = 5.7), $t = 2.766$ (599), $p = .006$.

For Whites, bed-sharing frequency, income level, and maternal education varied significantly between non-supine and supine sleeping infants. The majority of White mothers placing their infants supine to sleep reported never bed-sharing (48.3%) compared to infrequent (40.2%) or frequent (11.6%) bed-sharing, while the majority of non-supine sleepers tended to be infrequent (44.9%) or never (38.6%) bed-sharers, compared to frequent (16.5%), $\chi^2(2) = 11.47$, $p = .004$. White mothers who placed their infants supine to

sleep were older (M = 29 years, SD = 5.3) than those who placed their infants non-supine (M = 28.3 years, SD = 5.6), though this difference was not significant, $t = 1.840(438.1)$, $p = .066$.

Table 17. Distribution of Characteristics by Sleep Position for PRAMS Respondents

	African-American				White			
	Supine	Non-Supine			Supine	Non-Supine		
	n = 538	*n* = 277	*p*		*n* = 1395	*n* = 309	*p*	
Characteristic	% (95% CI)	% (95% CI)	value		% (95% CI)	% (95% CI)	value	
Bed-Sharing								
Frequent	**25.4 (21-9-29.2)**	**38.9 (33.4-44.8)**			**11.6 (10.0-13.4)**	**16.5 (12.7-21.1)**		**.004**
Infrequent	**41.5 (37.4-45.8)**	**38.1 (32.6-44.0)**	**.000**		**40.2 (37.6-42.8)**	**44.9 (39.4-50.6)**		
Never	**33.1 (29.2-37.2)**	**22.9 (18.2-28.4)**			**48.3 (45.6-50.9)**	**38.6 (33.3-44.2)**		
Abuse								
No	86.2 (83.0-89.0)	82.2 (77.1-86.4)	.137		96.3 (95.1-97.2)	95.1 (91.8-97.1)		.326
Yes	13.8 (11.0-17.0)	17.8 (13.6-22.9)			3.7 (2.8-4.9)	4.9 (2.9-8.2)		
Birth weight								
Normal	89.5 (86.5-91.8)	87.8 (83.4-91.2)			**92.9 (91.4-94.2)**	**97.6 (95.2-98.8)**		**.002**
Low	10.5 (8.2-13.5)	12.2 (8.8-16.6)	.478		**7.1 (5.8-8.6)**	**2.4 (1.2-4.8)**		
Breastfeeding								
No	78.1 (74.4-81.4)	78.7 (73.6-83.1)	.849		49.0 (46.3-51.6)	45.3 (39.7-51.0)		.254
Yes	21.9 (18.6-25.6)	21.3 (16.9-26.4)			51.0 (48.4-53.7)	54.7 (49.0-60.3)		
Depressive symptoms								
No	71.7 (67.6-75.4)	69.9 (64.1-75.1)	.604		83.6 (81.6-85.5)	79.8 (74.8-84.0)		.117
Yes	28.3 (24.6-32.4)	30.1 (24.9-35.9)			16.4 (14.5-18.4)	20.2 (16.0-25.2)		
Income level								
< $10,000	50.9 (46.5-55.3)	51.2 (45.1-57.2)			**9.9 (8.3-11.7)**	**10.7 (7.4-15.1)**		
$10,000-$14,999	12.9 (10.2-16.1)	14.2 (10.4-19.2)			**5.6 (4.4-7.0)**	**5.5 (3.3-9.1)**		
$15,000-$19,999	7.4 (5.3-10.1)	6.1 (3.7-9.8)			**4.3 (3.3-5.6)**	**4.3 (2.5-7.5)**		
$20,000-$24,999	5.7 (4.0-8.0)	6.1 (3.7-9.9)	.970		**6.0 (4.8-7.4)**	**7.9 (5.2-11.8)**		**.038**
$25,000-$34,999	9.9 (7.6-12.8)	10.8 (7.6-15.2)			**9.2 (7.7-10.9)**	**10.9 (7.8-15.0)**		
$35,000-$49,999	6.0 (4.2-8.5)	5.4 (3.3-8.6)			**12.4 (10.7-14.3)**	**18.6 (14.5-23.4)**		
≥ $50,000	7.2 (5.4-9.5)	6.1 (4.0-9.3)			**52.7 (50.0-55.4)**	**42.1 (36.6-47.8)**		
Intensive Care Unit								
No	84.2 (80.9-87.1)	87.9 (83.4-91.3)	.168		90.2 (88.5-91.7)	92.9 (89.3-95.3)		.153
Yes	15.8 (12.9-19.1)	12.1 (8.7-16.6)			9.8 (8.3-11.5)	7.1 (4.7-10.7)		
Marital status								
Married	16.9 (14.1-20.1)	17.2 (13.4-21.8)	.901		75.1 (72.6-77.4)	70.4 (64.8-75.4)		.102
Other	83.1 (79.9-85.9)	82.8 (78.2-86.6)			24.9 (22.6-27.4)	29.6 (24.6-35.2)		
Maternal education								
< high school	30.8 (26.9-35.0)	25.5 (20.6-31.1)			**4.7 (3.7-6.1)**	**12.1 (8.7-16.6)**		
12 years	38.2 (34.1-42.5)	39.2 (33.5-45.2)			**26.5 (24.1-29.1)**	**28.9 (23.8-34.5)**		**.000**
13-15 years	22.1 (18.7-25.8)	27.6 (22.6-33.3)	.205		**27.5 (25.3-29.9)**	**27.1 (22.5-32.2)**		
≥ 16 years	9.0 (6.9-11.5)	7.6 (5.2-11.2)			**41.2 (38.7-43.8)**	**31.9 (27.1-37.2)**		
Upset re: treatment based on race								
No	82.2 (78.7-85.2)	76.5 (71.0-81.2)	.059		97.0 (95.9-97.9)	95.9 (92.7-97.7)		.335
Yes	17.8 (14.8-21.3)	23.5 (18.8-29.0)			3.0 (2.1-4.1)	4.1 (2.3-7.3)		
Emotional stress								
No	59.8 (55.5-63.9)	53.2 (47.3-59.1)	.075		70.9 (68.4-73.2)	69.5 (64.0-74.4)		.629
Yes	40.2 (36.1-44.5)	46.8 (40.9-52.7)			29.1 (26.8-31.6)	30.5 (25.6-36.0)		
Financial stress								
No	32.3 (28.5-36.4)	25.9 (21.0-31.4)	.060		54.2 (51.5-56.9)	56.0 (50.4-61.5)		.569
Yes	67.7 (63.6-71.5)	74.1 (68.6-79.0)			45.8 (43.1-48.5)	44.0 (38.5-49.6)		
Partner stress								
No	49.3 (45.0-53.5)	45.1 (39.2-51.0)	.263		74.0 (71.6-76.3)	69.5 (64.0-74.5)		.119
Yes	50.7 (46.5-55.0)	54.9 (49.0-60.8)			26.0 (23.7-28.4)	30.5 (25.5-36.0)		
Traumatic stress								
No	65.2 (61.0-69.1)	61.7 (55.7-67.4).	.335		84.4(82.3-86.3)	80.9 (75.9-85.1)		.159
Yes	34.8 (30.9-39.0)	38.3 (32.6-44.3)			15.6(13.7-17.7)	19.1 (14.9-24.1)		

Notes: Values shown are weighted percentages of women within each level of response by race.
[i]Results of Pearson χ^2 two-sided tests.
Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

Hypothesis 3: Bed-sharing will be associated with infants sleeping non-supine for African-Americans, but not for Whites. Of African-Americans who bed-shared, 77% placed their infants non-supine to sleep compared to only 22.9% of African-Americans who did not bed-share, $\chi^2(2,1634.29) = 18.13$, $p = 0.000$. For Whites who bed-shared, 61.4% of mothers placed their infants non-supine compared to 38.6% of Whites who did not bed-share, $\chi^2(2,3407.92) = 11.47$, $p = 0.004$.

When adding infant sleep position to the logistic regression model explored in Specific Aim 2, for African-Americans, the overall corrected model was significant, Adjusted Wald $F(21.79,51149.82) = 2.05$, $p = .003$. The Cox and Snell's R^2 increased from 0.068 to 0.073 and the Nagelkerke's R^2 increased from 0.096 to 0.103. African-Americans who placed their infants non-supine were more likely to bed-share than those who placed their infants supine to sleep. Currently breastfeeding, maternal age, and partner stress remained significantly associated with bed-sharing for African-Americans, with the ORs remaining about the same as the previous model. Maternal education gained significance while marital status lost significance in this model (Table 18).

For Whites, the overall corrected model was significant, Adjusted Wald $F(21.89,51367.91) = 5.27$, $p < .001$. The Cox and Snell's R^2 increased slightly from 0.080 to 0.084 and the Nagelkerke's R^2 also slightly increased from 0.107 to 0.111. Whites who placed their infants non-supine were more likely to bed-share compared to Whites who placed their infants supine to sleep. Currently breastfeeding, income level, marital status, and partner status remained significant for Whites, and the OR stayed about the same. Having an income level of $10,000 - $14,999 gained significance, with White mothers in this bracket being 1.8 times more likely to bed-share (Table 18).

Table 18: Summary of Significant Factors in their Associations with Bed-Sharing and Sleep Position for Non-Hispanic Wisconsin PRAMS Respondents

Characteristics	African-American *n* = 822 OR (95% CI)	White *n* = 1,708 OR (95% CI)
Sleep position		
Supine	Referent	Referent
Non-Supine	**1.573 (1.077-2.297)***	**1.407 (1.069-1.852)***
Currently Breastfeeding		
No	Referent	Referent
Yes	**1.598 (1.012-2.522)***	**2.444 (1.939-3.081)*****
Income level		
<$10,000	0.561 (0.226-1.390)	1.040 (0.611-1.770)
$10,000-$14,999	0.401 (0.157-1.024)	**1.833 (1.004-3.344)****
$15,000-$19,999	0.415 (0.148-1.165)	1.707(0.915-3.185)
$20,000-$24,999	0.534 (0.186-1.533)	1.407 (0.850-2.327)
$25,000-$34,999	0.585 (0.231-1.486)	1.248 (0.847-1.838)
$35,000-$49,999	1.004 (0.353-2.855)	**1.704 (1.234-2.351)****
≥$50,000	Referent	Referent
Marital status		
Married	Referent	Referent
Other	1.745 (0.988-3.079)	**1.667 (1.184-2.346)****
Maternal age	**0.963 (0.931-0.995)***	0.996 (0.973-1.020)
Maternal education		
< high school	Referent	Referent
12 years	1.249 (0.815-1.916)	0.938 (0.542-1.622)
13-15 years	**1.924 (1.129-3.278)***	0.826 (0.471-1.448)
≥ 16 years	**2.540 (1.098-5.875)***	0.695 (0.391-1.236)
Partner stress		
No	Referent	Referent
Yes	**1.859 (1.272-2.715)****	**1.381 (1.058-1.802)***

*$p < .05$; **$p < .01$; ***$p<.001$

Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

Specific Aim 4: Explore the impact of using different SES proxies to address the previous specific aims.

Hypothesis 4: Significant predictors of bed-sharing will be similar across all SES proxies. As noted earlier, for the purposes of this analysis, the main measure used as a proxy for SES was income level. Analyses for hypotheses 2 and 3 were re-run to examine differences among the following additional SES proxies: Model 2: using Medicaid as payment for delivery, and Model 3: needing money for food.

When performing logistic regression separately by race, for African-Americans, bed-sharing was significantly associated with maternal education, partner-related stress, and placing infant non-supine to sleep across all SES measures (Table 19). However, the

strength of these predictors, as well as the significance of other predictors, varied depending on the SES measure used.

For African-Americans, in Model 1 (using income level as the SES measure), the overall corrected model was significant, Adjusted Wald $F(21.79,51149.82) = 2.05$, $p = .003$. Factors associated with bed-sharing, in order of strength, included: (1) education level of sixteen or more years (OR: 2.540; 95% CI: 1.098-5.875) or thirteen to fifteen years of education (OR: 1.924; 95% CI: 1.129-3.278); (2) experiencing partner-related stress (OR: 1.859; 95% CI: 1.272-2.715); (3) breastfeeding (OR: 1.598; 95% CI: 1.012-2.522); and (4) placing infant non-supine to sleep (OR: 1.573; 95% CI: 1.077-2.297) being more likely to bed-share (Table 19).

In Model 2 (delivery paid for by Medicaid as the SES measure), the overall corrected model was significant, Adjusted Wald $F(16.89,40814.81) = 2.82$, $p = .000$. The strongest associations with bed-sharing for African-Americans were: (1) sixteen or more years of education (OR: 2.590; 95% CI: 1.225-5.477) or thirteen to fifteen years (OR: 1.925; 95% CI: 1.170-3.169); (2) endorsing partner-related stress (OR: 1.916; 95% CI: 1.325-2.771); and (3) placing infants non-supine to sleep (OR: 1.567; 95% CI: 1.086-2.261) being more likely to bed-share. African-Americans who reported using Medicaid to pay for their delivery were less likely to bed-share than those used another method to pay for delivery (OR: 0.550; 95% CI: 0.372-.0814). Breastfeeding was no longer significant in this model (Table 19).

In Model 3 (using needing money for food as the SES measure), the overall corrected model was significant, Adjusted Wald $F(16.90,40776.37) = 2.32$, $p = .002$. The strongest factors associated with bed-sharing among African-Americans were: (1) sixteen or more years of education (OR: 3.247; 95% CI: 1.515-6.956) or thirteen to fifteen years of education (OR: 1.965; 95% CI: 1.190-3.245); (2) partner-related stress (OR: 1.912; 95% CI:

1.325-2.759); and (3) placing infant non-supine (OR: 1.541; 95% CI: 1.065-2.228) were more likely to bed-share. Breastfeeding was not significant in this model, either (Table 19).

In summary, when utilizing different proxies for SES for African-Americans, the results of the logistic regression models varied. While maternal education, partner-related stress, and non-supine sleep position were significant across all three models, their strength differed slightly, depending on which SES proxy was used. Breastfeeding was only significant in the first model (using income level), while in the second model, using Medicaid for delivery was significantly protective against bed-sharing. Despite these differences, the Cox and Snell's R^2 were similar across the income level, Medicaid, and food models, equaling 0.084, 0.072, and 0.062, respectively; and Nagelkerke's R^2 were also similar across all models, equaling 0.111, 0.102, and 0.087, respectively. These findings demonstrate that even though the findings were different, they still only accounted for ten percent or less of the phenomenon of bed-sharing.

Table 19: Significant Factors across SES Measures for Bed-Sharing Among Non-Hispanic African-American Wisconsin PRAMS Respondents

Characteristic	Odds Ratios and 95% Confidence Intervals Model 1: Income Level	 Model 2: Medicaid for delivery	 Model 3: Money for food
Currently Breastfeeding			
No	Referent	Referent	Referent
Yes	**1.598 (1.012-2.522)***	1.434 (0.928-2.216)	1.515 (0.980-2.341)
Marital status			
Married	Referent	Referent	Referent
Other	1.745 (0.988-3.079)	1.627 (0.983-2.694)	1.497 (0.905-2.476)
Maternal education			
< high school	Referent	Referent	Referent
12 years	1.249 (0.815-1.916)	1.242 (0.821-1.879)	1.217 (0.807-1.836)
13-15 years	**1.924 (1.129-3.278)***	**1.944 (1.182-3.197)***	**1.965 (1.190-3.245)****
≥ 16 years	**2.540 (1.098-5.875)***	**2.636 (1.245-5.582)***	**3.247 (1.515-6.956)****
Partner stress			
No	Referent	Referent	Referent
Yes	**1.859 (1.272-2.715)****	**1.938 (1.340-2.803)*****	**1.912 (1.325-2.759)****
Sleeping position			
Supine	Referent	Referent	Referent
Non-supine/mixed	**1.573 (1.077-2.297)***	**1.578 (1.092-2.281)***	**1.541 (1.065-2.228)***
Income level			
<$10,000	0.561 (0.226-1.390)		
$10,000-$14,999	0.401 (0.157-1.024)		
$15,000-$19,999	0.415 (0.148-1.165)		
$20,000-$24,999	0.534 (0.186-1.533)		
$25,000-$34,999	0.585 (0.231-1.486)		
$35,000-$49,999	1.004 (0.353-2.855)		
≥$50,000	Referent		
Payment for delivery			
Other		Referent	
Medicaid		**0.550 (0.372-0.814)****	
Needed money for food			
No			Referent
Yes			1.031 (0.707-1.504)

*$p < .05$; **$p < .01$; ***$p<.001$

Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

For Whites, when examining the logistic regression results by SES proxy, currently breastfeeding, being unmarried, placing the infant non-supine to sleep, and experiencing partner-related stress were significantly associated with bed-sharing across all measures of SES (Table 20). Income level and needing money for food were significantly associated with bed-sharing in those models that used them as SES proxies.

In Model 1 (using income level as the SES measure), the overall corrected model was significant, Adjusted Wald $F(21.89,51367.91) = 5.27$, $p < .001$. Bed-sharing was significantly

associated with the following factors, in order of size: (1) currently breastfeeding (OR: 2.444; 95% CI: 1.939-3.081); (2) earning $10,000-$14,999 (OR: 1.833; 95% CI: 1.004-3.344) or earning $35,000-$49,999 (OR: 1.704; 95% CI: 1.234-2.351); (3) being unmarried (OR: 1.667; 95% CI: 1.184-2.346); (4) placing infant non-supine to sleep (OR: 1.407; 95% CI: 1.069-1.852); and (5) reporting partner-related stress (OR: 1.381; 95% CI: 1.058-1.802) being more likely to bed-share (Table 20).

In Model 2 (using delivery being paid for by Medicaid as the SES measure), the overall corrected model was significant, Adjusted Wald $F(16.924,40887.85) = 6.67$, $p < .001$. Factors significantly associated with bed-sharing in this model included: (1) currently breastfeeding (OR: 2.452; 95% CI: 1.957-3.072); (2) unmarried (OR: 1.666; 95% CI: 1.208-2.298; (3) partner-associated stress (OR: 1.403; 95% CI: 1.079-1.824); and (4) non-supine sleep position (OR: 1.387; 95% CI: 1.057-1.819) being more likely to bed-share (Table 20).

In Model 3 (using needing money for food as the SES measure), the overall adjusted model was significant, Adjusted Wald $F(16.92,40837.38) = 6.86$, $p < .001$. The strongest factors associated with bed-sharing were: (1) currently breastfeeding (OR: 2.512; 95% CI: 1.999-3.156); (2) unmarried (OR: 1.561; 95% CI: 1.136-2.146); (3) needing money for food (OR: 1.575; 95% CI: 1.158-2.143); (4) placing infants non-supine (OR: 1.373; 95% CI: 1.046-1.802); and (5) experiencing partner-related stress (OR: 1.363; 95% CI: 1.048-1.772) being more likely to bed-share (Table 20).

In summary, when utilizing different proxies for SES for Whites, the results of the logistic regression models varied. Currently breastfeeding, being unmarried, non-supine sleep position, and partner-related stress were significant across the models with similar strengths across each SES proxy used. SES level as measured by income level was significantly associated with bed-sharing, as was the need for money for food. The Cox and

Snell's R^2 were similar across income level, Medicaid, and food models, equaling 0.085, 0.078, and 0.082, respectively; Nagelkerke's R^2 were also similar, equaling 0.113, 0.104, and 0.109, respectively. These findings demonstrate that even though the findings were different, they still only accounted for ten percent or less of the phenomenon of bed-sharing.

Table 20: Differing Factors by SES Measure for Bed-Sharing Among Non-Hispanic White Wisconsin PRAMS Respondents

	Odds Ratios and 95% Confidence Intervals		
Characteristic	**Model 1: Income Level**	**Model 2: Medicaid for delivery**	**Model 3: Money for food**
Currently Breastfeeding			
No	Referent	Referent	Referent
Yes	**2.444 (1.939-3.081)*** **	**2.452 (1.957-3.072)*** **	**2.512 (1.999-3.156)*** **
Marital status			
Married	Referent	Referent	Referent
Other	**1.667 (1.184-2.346)** **	**1.666 (1.208-2.298** **	**1.561 (1.136-2.146)** **
Partner stress			
No	Referent	Referent	Referent
Yes	**1.381 (1.058-1.802)***	**1.403 (1.079-1.824)***	**1.363 (1.048-1.772)***
Sleeping position			
Supine	Referent	Referent	Referent
Non-supine/mixed	**1.407 (1.069-1.852)***	**1.387 (1.057-1.819)***	**1.373 (1.046-1.802)***
Income level			
<$10,000	1.407 (1.069-1.772)		
$10,000-$14,999	**1.833 (1.004-3.344)** **		
$15,000-$19,999	1.707 (0.915-3.185)		
$20,000-$24,999	1.407 (0.850-2.327)		
$25,000-$34,999	1.248 (0.847-1.838)		
$35,000-$49,999	**1.704 (1.234-2.351)** **		
≥$50,000	Referent		
Payment for delivery			
Other		Referent	
Medicaid		0.804 (0.595-1.087)	
Needed money for food			
No			Referent
Yes			**1.575 (1.158-2.143)** **

*$p < .05$; **$p < .01$; ***$p<.001$
Source: Wisconsin PRAMS 2007-2010. Data file provided by WDHS.

When comparing the models between African-Americans and Whites, for both races, partner-related stress and infant sleep position were significant across all SES proxies. However, the strength of the associations were different between races, with African-American mothers experiencing partner-related stress being more likely to bed-share (OR: 1.9) across the models compared to White mothers (OR: 1.4). African-American infants

sleeping non-supine were more likely to bed-share (OR: 1.6) across all three SES models compared to White infants sleeping non-supine being more likely to bed-share (OR: 1.4). Further, for African-Americans, maternal education was significantly related to bed-sharing across all SES models. Using Medicaid for delivery lowered the likelihood of bed-sharing by half for African-Americans. Breastfeeding and marital status were associated with bed-sharing only for Whites across all three SES models. Income level and needing money for food were also significantly associated with bed-sharing for Whites in the models that used those SES proxies, while using Medicaid for delivery was *not* a significant factor associated with bed-sharing for Whites.

CHAPTER 6

DISCUSSION

The purpose of this study was to explore maternal-infant bed-sharing and infant sleep position for African-Americans and Whites in a sample of Wisconsin mothers and young infants. The first specific aim sought to determine the relationship between race and bed-sharing. The first hypothesis stated that consistent with other findings, African-American mothers will report higher rates of bed-sharing compared to White mothers. In this sample of mothers, significantly more African-American mothers (70.5%) reported ever bed-sharing than White mothers (53.5%). These findings are consistent with previous literature that has examined differences by race. Broussard and colleagues (2012) found that 66.9% of African-Americans frequently bed-shared compared to 37.5% of Whites, while Lahr and colleagues (2007) found that 91% of African-Americans ever bed-shared compared to 73.7% of Whites.

Of important note is that these previous studies collected data prior to 2005, when the AAP began clearly discouraging bed-sharing (AAP, 2005). Interestingly, despite the Wisconsin PRAMS data (2007-2010) being collected several years after the AAP's policy statement (and a consequent shift in health care provider and health department recommendations), the rates remain high for both African-Americans and Whites. These findings may indicate that: (1) Wisconsin health care and public health providers may not have changed their messaging around safe infant sleep, despite AAP recommendations against it, (2) African-American and White families are still bed-sharing – at least rarely, if not more often – despite AAP recommendations against it, and/or (3) the bed-sharing prevalence in Wisconsin *does* reflect a decrease in prevalence since the AAP's 2005

recommendations, however, without a baseline to compare to, it is not possible to determine whether this is true.

In this analysis, the significantly higher prevalence of bed-sharing by African-American mothers versus White mothers in Wisconsin may also indicate a variance in the "uptake" of messaging aimed at reducing bed-sharing. These findings are even more concerning given the higher rates of African-American infant deaths due to SIDS and unintentional injuries in Wisconsin (WDHS DPH, 2012).

The second specific aim in this analysis sought to examine the determinants of bed-sharing for African-Americans and Whites separately, with the hypothesis that African-American mothers will have different factors (marital status, stress, and personally-mediated racism) associated with bed-sharing than White mothers (currently breastfeeding, lower SES, and less education). Separate logistic regression models by race revealed differing factors associated with bed-sharing between African-Americans versus Whites. A logistic regression model was first run using both races combined. The results of that model revealed that bed-sharing was significantly associated with being African-American, currently breastfeeding, income level, being unmarried, and experiencing partner-related stress. Previous literature has also demonstrated the significant factors of being African-American (versus White) (Fu, et al., 2008; Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Shields, et al., 2005; McCoy, et al., 2004; Brenner, et al., 2003; Willinger, et al., 2003; Ramos, 2002); breastfeeding (Ball, 2012; Broussard, Sappenfield & Goodman, 2012; Gettler & McKenna, 2011; Norton & Grellner, 2011; Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004; Willinger, et al., 2003; Mollborg, et al., 2011; Blair, Heron & Fleming, 2010; Galler, et al., 2009; Santos, et al., 2009; Ball, et al., 2006; Blair & Ball, 2004; Ball, 2003; Hooker, Ball & Kelly, 2001); income level (Lee & Gay, 2011; Blair, Heron & Fleming, 2010; Galler, Harrison

& Ramsey, 2009; Hauck, et al., 2008; Glenn & Quillin, 2007; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004; Willinger, et al., 2003; Ramos, 2002), being unmarried (Broussard, Sappenfield & Goodman, 2012; Mollborg, et al., 2011; Blair, Heron & Fleming, 2010; Hauck, et al., 2008; McCoy, et al., 2004; Brenner, et al., 2003; Weimer, et al., 2002), and experiencing partner-related stress (Broussard, Sappenfield & Goodman, 2012).

This discussion will first focus on the common significant factors associated with bed-sharing for both races, and then explore the differing factors further. In the final models (including non-supine sleep), for both the African-American and White models, non-supine sleep position, currently breastfeeding, and partner-related stress were significantly associated with bed-sharing for both African-Americans and Whites, and these findings are similar to previous studies (Broussard, Sappenfield & Goodman, 2012; McCoy, et al., 2004). Within these factors, the size of the ORs varied between races. For example, non-supine sleep position played a larger role for African-Americans (OR: 1.6) compared to Whites (1.4), and experiencing partner-related stress also played a larger role for African-Americans (OR: 1.9) compared to Whites (OR: 1.4).

Currently breastfeeding played a larger role for Whites (2.4) compared to African-Americans (OR: 1.6). In the two previous studies that explored race separately, breastfeeding was significantly associated with bed-sharing for both African-Americans and Whites. Broussard and colleagues (2012) found that breastfeeding for greater than four weeks predicted bed-sharing at a higher level for *African-Americans* than for Whites, while McCoy and colleagues' (2004) found that breastfeeding predicted bed-sharing for Whites at a much higher rate than for African-Americans. These findings may also reflect the significantly smaller proportion in this current analysis of African-Americans who reported currently breastfeeding (21.7%) compared to Whites (51.7%). The findings of differential

rates of currently breastfeeding for African-Americans versus Whites are consistent with previous research that has demonstrated lower breastfeeding rates for African-Americans (CDC, 2011d; Lewallen & Street, 2010; Scanlon, Grummer-Strawn, Li, Chen, Molinari & Perrine, 2010; Kogan, Singh, Dee, Belanoff & Grummer-Strawn, 2008).

When models were run separately for each racial group, the significant findings changed. For African-Americans, income level was no longer a significant factor associated with bed-sharing. Factors that gained significance for African-Americans included maternal age and higher levels of education, however the OR was very small for maternal age. Some studies have found that younger age has been associated with bed-sharing (Broussard, Sappenfield & Goodman, 2012; Blair, et al., 2010; Galler, et al., 2009; McCoy, et al., 2004). African-Americans in this sample who had a higher level of maternal education were more likely to bed-share than African-Americans with less than a high school education, however, these findings should be interpreted with caution given the small number of African-American women with higher levels of education (n = 88) in this sample. In previous studies, higher maternal education has been associated with a *lower* likelihood of bed-sharing across most studies examining bed-sharing in multi-racial samples (Blair, et al., 2010; Fu, et al., 2008; Glenn & Quillin, 2007; McCoy, et al., 2004; Brenner, et al., 2003; Willinger, et al., 2003; Ramos, 2002; Weimer, et al., 2002) though some did not find a significant association (Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007).

For Whites, in addition to the common significant factors of marital status, partner-related stress, and breastfeeding, income level was also significantly associated with bed-sharing. In this analysis, in comparison to mothers earning $50,000 or more annually, White mothers earning $35,000-$49,999 were more likely to bed-share (OR: 1.8). While the other income levels pointed in the direction of a higher likelihood of bed-sharing for lower-income

individuals, they lacked significance. McCoy and colleagues (2004) found similar results – for Whites in their sample, lower income level was significantly associated with a higher likelihood of bed-sharing, but income level was not a significant predictor for African-Americans. Broussard and colleagues (2012) were not able to examine income level in their sample of data.

This analysis is one of the first to examine the experience of racism as a potential factor related to bed-sharing, with the hypothesis that racism is a type of stress experienced, and thus, may be linked to decisions and behaviors such as bed-sharing. Though having an experience of racism was not a significant factor in the model, a significantly higher percentage (19.8%) of African-Americans reported being upset regarding their treatment based on race compared to Whites (3.2%). These experiences may still play a strong role within an African-American woman's brain functioning and physiologic response, potentially affecting other aspects of her life and health, even if not directly linked to bed-sharing behaviors (Mays, Cochran & Barnes, 2007). This finding still sheds light on the different contexts within which African-Americans and Whites live, which reinforces the notion that different cultural factors are at play for African-Americans and Whites regarding the context within which they make decisions about infant sleep (Resnicow, et al., 1999; Ball, et al., 2012; Ball & Volpe, 2012; Sobralske & Gruber, 2009; Aslam, et al., 2009; Fu, et al., 2008; Johnston & Johnston, 2008; Horsley, et al., 2007; Blanchard & Vermilya, 2007; van Wouwe & HiraSing, 2006).

Despite significant associations in each of the regression models, the R^2 values remained very small – about ten percent – meaning that only about ten percent of the phenomenon of bed-sharing was accounted for by these variables. This finding suggests that the variables chosen for this analysis are not adequate to explain the phenomenon of

bed-sharing. The variables for this model were chosen based on previous literature (Kleinbaum & Klein, 2010) regarding bed-sharing and the availability of variables in the Wisconsin PRAMS dataset. Additional factors play a role in the phenomenon of bed-sharing. For example, one potential factor that was not examined in this analysis is each family's reasons for bed-sharing (Ball, et al., 2012; Volpe, Ball & McKenna, 2012; Aslam, et al., 2009; Chianese, et al., 2009; Blanchard & Vermilya, 2007; Van Wouwe & HiraSing; 2006).

Racial differences by frequency of bed-sharing were also explored. Although an ordinal logistic regression found that the data did not fit the model, and this may be due to the small *n* in each frequency category. In future years, as the sample size increases, it may be valuable to re-examine bed-sharing frequency within each racial group to determine if there are significant differences across frequency. These findings could also suggest different factors (not included in the present model) are at play regarding the frequency, for example, infant temperament or sleep difficulties. Further, the terms "often," "sometimes," and "rarely" could have different meanings for different people. Other studies have used number of hours per night and number of nights per week to measure frequency as a potentially more objective measure (Sadeh, Mindell, Luedtke & Wiegand, 2009).

Regardless, the chi-square tests by bed-sharing frequency revealed significant differences for African-Americans for partner-related stress only, with a higher percentage of mothers endorsing partner-related stress reporting bed-sharing infrequently compared to frequently or never bed-sharing. For Whites, significant differences across bed-sharing frequency were found for abuse, breastfeeding, income level, marital status, maternal education, financial stress, partner-related stress, and traumatic stress. In general, White mothers endorsing more adverse experiences tended to have a higher percentage of infrequent bed-sharing. These findings are particularly concerning given some findings

supporting an increased risk of infant death for infants who did not routinely sleep with their parents, but had done so the previous night (Vennemann, et al., 2012; Vennemann, et al., 2009; Scragg, et al., 1993).

The third specific aim sought to determine the relationship between bed-sharing and infant sleep position in African-Americans and Whites, with the hypothesis that bed-sharing will be associated with infants sleeping non-supine for African-Americans, but not for Whites. In this sample, bed-sharing was significantly associated with sleeping non-supine for both African-American and White infants, which differs from previous findings that did not find a significant relationship between bed-sharing and infant sleep position (Broussard, Sappenfield & Goodman, 2012; Fu, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Brenner, et al., 2003). Similar to results in this analysis, Shields and colleagues (2005) also found that bed-sharing infants were more likely to be placed non-supine, and Mollborg and colleagues (2011) found a higher likelihood of bed-sharing infants being placed in mixed positions (supine/non-supine). Flick and colleagues also found that among African-American infants, bed-sharing infants were twice as likely to be placed non-supine as infants who slept alone (Flick, White, Vemulapalli, Stulac & Kemp, 2001).

The findings from this analysis regarding this factor is particularly troubling given that sleeping non-supine has been associated with an increased risk of infant death, and that the "Back to Sleep" (BTS) campaign has been ongoing since 1994 (AAP, 1992; AAP, 1997; AAP, 2002; AAP, 2012; NICHD, 1994). The finding that sleep position is associated with bed-sharing in Wisconsin could potentially reflect two ideas: (1) by the nature of bed-sharing, parents are willing to place their infant in several different positions to sleep, including non-supine positions, despite the strong BTS campaign; or (2) it could be possible that this sub-group of individuals has not received any formal safe sleep education on either

BTS or bed-sharing, and thus, are at an even higher risk of infant death. To answer these questions, future studies could examine in greater detail the positioning of infants who are bed-sharing with their mothers and could also explore whether or not, and the extent to which, safe sleep training was received by families. One potential opportunity for exploring this information could be to add an additional question to the PRAMS survey asking whether or not a health care practitioner had talked to the mother about safe sleep.

The fourth specific aim sought to explore the impact of using different SES proxies to address the previous specific aims, with the hypothesis that significant predictors of bed-sharing will be similar across all SES proxies. Contrary to this hypothesis, the significance and strength of the effect of the variables differed when using the different SES proxies. Interestingly, for African-American mothers reporting using Medicaid to pay for delivery, the likelihood of bed-sharing was half of that of those who used other methods to pay for delivery. Thus, use of Medicaid for delivery appeared to be protective against bed-sharing for African-Americans. When using needing money for food as the SES proxy, maternal education, partner-related stress, and sleep position remained significant, with the OR for maternal education of sixteen years or more increasing. For Whites, significant factors remained the same across all SES proxy models, except that income level was significantly associated with bed-sharing in the model that utilized income as an SES proxy, and needing money for food was a significant predictor in the model that used food money as an SES proxy.

In previous studies, SES level was not found to be a significant predictor for African-Americans or Whites when examined separately (Broussard, Sappenfield & Goodman, 2012; McCoy, et al., 2004). In studies where all races were examined as a whole, most studies have found SES level to be a significant predictor of bed-sharing (Lee & Gay,

2011; Blair, et al., 2010; Galler, Harrison & Ramsey, 2009; Hauck, et al., 2008; Glenn & Quillin, 2007; Lahr, Rosenberg & Lapidus, 2007; McCoy, et al., 2004; Willinger, et al., 2003; Ramos, 2002), while others have not found it to be a significant predictor (Fu, et al., 2008; Shields, et al., 2005), and one study found that higher SES predicted bed-sharing (Blair & Ball, 2004).

The differential findings regarding SES proxy used fit with the differential findings by SES measure observed by Braveman and colleagues (2001) when examining maternal and infant health factors. These findings reinforce the importance of examining multiple dimensions of SES as recommended by Braveman and colleagues' (2001), especially when trying to differentiate significant factors between racial groups. The differential findings also reinforce the importance of examining the socioecological context in which different groups of individuals engage in particular behaviors. Specifically related to this analysis, while Medicaid for delivery was a significant protective factor for African-Americans, it was not for Whites; however, income level and needing money for food were significant predictors of bed-sharing for Whites but not for African-Americans.

To further elucidate the findings regarding Medicaid, important questions to answer could include: in Wisconsin, what additional services do Medicaid recipients receive, and do any of them provide safe sleep education (or alternative places for an infant to sleep such as a crib). Further, it may be useful to explore which hospitals accept Medicaid for delivery, and whether or not their safe sleep trainings are different than other non-Medicaid hospitals. One study attempted to examine the type of prenatal care received and infant sleep position, and found that compared to women receiving prenatal care from private physicians or HMOs, women receiving prenatal care from health department prenatal clinics were more likely to place their infants supine (Lahr, Rosenberg & Lapidus, 2005). A similar analysis

could be conducted with the Wisconsin PRAMS dataset with bed-sharing as the outcome (versus sleep position).

Revisiting the Socioecological Framework

When re-visiting the socioecological framework in light of these findings, for both African-Americans and Whites, the parent and family-level of the framework seemed to have the largest impact on bed-sharing, including partner-related stress, breastfeeding, marital status (for Whites), and sleep position. In particular, the findings of bed-sharing being more likely for those experiencing partner-related stress (for both African-Americans and Whites) and being unmarried (for Whites) may point to an influence of partners (potentially fathers) on bed-sharing, regardless of race. Involvement and engagement of partners and/or fathers may affect the stress level of these families, and further, have an important influence on bed-sharing. These findings may additionally allude to partner-related stress directly linked to bed-sharing; for example, if bed-sharing behaviors interfere with the couples' level of sexual or emotional intimacy (Joyner, et al., 2010; Ateah & Hamelin, 2008; Ramos, 2002). In two studies, families reported *not* bed-sharing because of wanting privacy or their own space for the couple (Joyner, et al., 2010; Ateah & Hamelin, 2008). In a survey of 215 mothers of young children in two California cities, 67% of mothers reported that bed-sharing interfered with their relationship with their partners (Ramos, 2002).

In the infant level of the framework, no significant association between bed-sharing and NICU admission or birthweight were found, which may indicate that this level of confluence does not play as significant of a role as other levels, or it could indicate that this model did not include factors that were significant in this level of the framework. For example, though younger infant age (less than four months) has been associated with higher rates of bed-sharing (Fu, et al., 2008; Willinger, et al., 2003), because of the nature of data

collection of this data set (with surveys being mailed out several months after the birth of the infant) and the limitation of the dataset as provided to the researcher, infant age was not included in this analysis. In the community and society level, maternal education played a role for African-Americans, with those with higher education levels appearing to be more likely to bed-share than those with lower education levels. Income level played a role for Whites, with those earning less than $50,000 being more likely to bed-share. The differential findings regarding SES proxy reinforce the differential effects of community and society level factors on African-Americans and Whites, with income level and needing money for food being important factors for Whites, while use of Medicaid for delivery was an important protective factor for African-Americans.

Limitations

This analysis poses several potential limitations. First, only two infant-level factors (NICU admission and birth weight) were examined in this analysis. Infant age and gender were not included in this analysis due to limited previous research demonstrating the significance of these characteristics. However, when examining the literature on reasons for bed-sharing, infant-level factors such as illness and infant's emotional needs or comfort have been identified as reasons for parents choosing to bed-share (Lee & Gay, 2011; Moon, et al., 2010; Chianese, et al., 2009; Ateah & Hamelin, 2008; Hauck, et al., 2008; Baddock, et al., 2006; Jenni & O'Connor, 2005; Ball, 2002; Ramos, 2002; Weimer, et al., 2002; Hooker, Ball & Kelly, 2001). It is possible that this analysis missed the important effect of infant-level factors in this model, however, given the limited questions on the Wisconsin PRAMS questionnaire, these characteristics may be best explored through in-depth individual data collection.

Second, this analysis was not able to explore the individual reasons for choosing to (or not to) bed-share. Information on reasons for bed-sharing would be extremely useful in providing information on what points must be addressed when delivering educational interventions. Several of the studies on determinants of bed-sharing suggested further research on the reasons that particular populations of families choose to bed-share, in order to tailor interventions to address those reasons (Volpe, Ball & McKenna, 2012; Fu, et al., 2008; Hauck, et al., 2008; Lahr, Rosenberg & Lapidus, 2007; Weimer, et al., 2002; Morgan & Johnson, 2001). For example, if the main reasons for bed-sharing were lack of resources to purchase a crib, a program such as Cribs for Kids® (cribsforkids.org) in which families are provided a portable crib along with safe infant sleep education should be sufficient in reducing the prevalence of bed-sharing. To help elucidate the reasons for bed-sharing, additional questions could be added to the Wisconsin PRAMS questionnaire regarding why families might choose to bed-share. Despite this limitation, this analysis remains useful as a first step in identifying sub-populations that may have a higher likelihood of bed-sharing, and thus, help to identify target groups for future interventions.

Third, the Wisconsin PRAMS survey question on bed-sharing specifically refers to a "bed" (versus other potential sleep surfaces). Therefore, it is possible that mothers sleeping with infants on other sleep surfaces (such as couches) may not have endorsed this question (Lahr, Rosenberg & Lapidus, 2007). To help clarify this information, the CDC PRAMS bank of questions includes questions referring to "sleep surface," with a note stating this can "include a bed, crib, futon, couch, recliner, or any other surface used for sleeping," (CDC, 2011c, p. 129). It may be useful to revise the Wisconsin PRAMS question to clarify it for families who are completing the questionnaire.

Fourth, it is possible that mothers under-reported their bed-sharing behaviors because of the stigma associated with bed-sharing (Ball & Volpe, 2012; Gurbutt & Gurbutt, 2007). This potential limitation has been identified in other studies as well (Broussard, Sappenfield & Goodman, 2012; Weimer, et al., 2002). However, given that the PRAMS is an anonymous survey, it remains one of the best opportunities to collect this information without mothers' fears of recrimination.

Fifth, caution should be used when interpreting the findings for African-Americans, especially when considering the overall unweighted response rate for African-Americans (34.6%) compared to Whites (72.2%). Further, significant differences were found between responders and non-responders for both races, with African-American non-responders tending to be slightly (but significantly) less educated and unmarried compared to responders, while White non-responders tended to be slightly (but significantly) less educated, unmarried, and younger. Thus, these findings may not be completely representative of the population of Wisconsin mothers with young infants.

This study also has several strengths. First, it is one of a handful of studies that have examined bed-sharing after the AAP's 2005 release of recommendations against bed-sharing and one of the only studies that is representative of both race and SES. Third, because this analysis is based on the PRAMS standardized data collection procedures, there is an opportunity to compare results with other participating PRAMS states and for replication of the methods (CDC, 2011). Fourth, the PRAMS data set contains data including bed-sharing and multiple socioecological factors that are not available from any other source in Wisconsin, and thus, is the only one at the present time that provides information about the nature of bed-sharing among African-Americans and Whites in Wisconsin (WDHS, 2011).

Therefore, this analysis serves as a first step in building a foundation of knowledge about bed-sharing behaviors in Wisconsin.

CHAPTER 7

IMPLICATIONS

As a result of the AAP's 2005 recommendations, many health care providers and public health officials have discouraged against maternal-infant bed-sharing, often without describing ways that bed-sharing could be made less risky for parents who do choose to bed-share (Ball & Volpe, 2012; Gettler & McKenna, 2010; Gurbutt & Gurbutt, 2007; see Ibarra & Goodstein, 2011; National Sudden & Unexpected Infant/Child Death & Pregnancy Loss Resource Center, 2009; and NICHD, 2006 for examples). Such an approach withholds information about ways to reduce the risks around bed-sharing, and further, limits individuals' abilities to make an informed decision based on their own unique situation (Ball & Volpe, 2012; Gettler & McKenna, 2010; Cowan & Bennett, 2009; Sobralske & Gruber, 2009; Johnston & Johnston, 2008). When the focus is only on discouraging caregivers from bed-sharing, there is a danger of alienating and stigmatizing caregivers who do choose to bed-share (Ball & Volpe, 2012; Gurbutt & Gurbutt, 2007).

Many have called for culturally sensitive education on infant sleep location addresses the underlying cultural beliefs, environmental situations, and personal reasons that families consider when choosing to bed-share (Ball, et al., 2012; Ball & Volpe, 2012; Gettler & McKenna, 2010; Chianese, Ploof, Trovato & Chang, 2009; Cowan & Bennett, 2009; Sobralske & Gruber, 2009; Aslam, et al., 2009; Fu, et al., 2008; Johnston & Johnston, 2008; Horsley, et al., 2007; Blanchard & Vermilya, 2007; van Wouwe & HiraSing, 2006; McKenna & McDade, 2005). Interventions that simply focus on changing the behavior are doomed to failure unless they take into account the social context in which the individual is behaving (Gettler & McKenna, 2010; Glass & McAtee, 2006). Successful interventions would incorporate and address the unique needs and influences of the target population while

educating them on the known risk factors for sleep-related infant deaths, such as bed-sharing on soft surfaces; with individuals other than the caregivers; with smoking in the household; after using alcohol, drugs or medications that would impair alertness; or when excessively tired (Volpe, Ball & McKenna, 2012; AAP, 2011; Gettler & McKenna, 2010; Johnston & Johnston, 2008; McKenna & Gettler, 2008; Horsley, et al., 2007; Baddock, et al., 2006; McKenna & McDade, 2005).

This study took a first step towards designing a culturally sensitive intervention by examining the characteristics of the target population (Ball, et al., 2012; Ball & Volpe, 2012; Resnicow, et al., 1999). Resnicow and colleagues (1999) recommend contrasting responses between the majority culture and racial/ethnic populations to help further clarify the extent of cultural tailoring required for an intervention (Resnicow, et al., 1999). This study attempted to accomplish this recommendation by contrasting the characteristics of African-Americans versus Whites around bed-sharing in Wisconsin. Ball and Volpe (2012) also suggest that such an approach can help to "engage communities in discussion about how bed-sharing can be conducted more safely, without alienating the target community by attacking a culturally-valued behavior," (p. 6).

Overall, these findings confirm previous studies that there are differing risk factors associated with bed-sharing for African-Americans and Whites (Broussard, Sappenfield & Goodman, 2012; McCoy, et al., 2004). Similarly, the results suggest that the use of behavior-specific and race-specific public health messaging may help address the differing risk factors observed in this study (Broussard, et al., 2012). One major implication for both practice and research is the importance of engaging parents on both and individual and community-level in the discussion around bed-sharing, including being involved in planning educational interventions that are salient for the target populations, as well as in planning and

interpreting research results regarding bed-sharing. In this way, future messaging around safe infant sleep can respond to the most pressing issues for families and has potential to be much more effective than previous interventions. Specifically, the differing risk factors have important implications for both practice and research, which are described in more detail below.

Implications for Practice

This study identified subtle differences in the factors associated with bed-sharing among African-American and White mothers with young infants in Wisconsin. For clinicians and providers who are working with individual families, it is imperative that open discussions about the nature of their sleep arrangements, along with the reasons and context for these sleep arrangements, are discussed in an open and genuine conversation. This conversation then provides an opportunity to address the issues most relevant to this particular family. For example, this study demonstrates that for African-Americans in Wisconsin, income level is not significantly associated with bed-sharing. Further, while an educational intervention around safe sleep is extremely important, a conversation about the family's unique circumstances, values, and beliefs around infant sleep is also important. Such a conversation opens the door to discuss the additional recommendations provided by the AAP (2011) regarding known risk factors for infant death associated with bed-sharing such as a young infant, current smoker, someone who is excessively tired, medications or substances impairing alertness, a non-parent, multiple persons, soft surfaces, or soft bedding. Future discussions and messaging must incorporate this additional information regarding modifiable risk factors if families do choose to bed-share.

As community-level educational campaigns and interventions are created, differences must be accounted for in a much deeper sense than, for example, reflecting different

racial/ethnic identity in the presentation of images outlined in a campaign. By examining these results through a socio-ecological model, clues as to the level with the most potential for successful interventions can be seen (Campbell & Quintiliani, 2006). Parent and family-level factors seemed to have the most potential for a successful impact in this analysis, including identifying factors associated with bed-sharing for African-Americans (unmarried, higher maternal education level, partner-related stress, placing infant non-supine to sleep) and for Whites (breastfeeding, lower income level, unmarried, partner-related stress, placing infant non-supine to sleep).

The findings regarding the important influence of a partner could suggest an opportunity to engage both mother and partner in a thoughtful discussion around the risks and benefits of bed-sharing. Engaging partners and fathers more in the postnatal period has been advocated by many due to their important role in improving infant outcomes (Lu, Jones, Bond, Wright, Pumpuang, Maidenberg, Jones, Garfield & Rowley, 2010; Carr & Springer, 2010; Alio, Salihu, Kornosky, Richman & Marty, 2010). In a review of the literature, Alio and colleagues (2010) found that paternal involvement had a positive impact on prenatal care usage, alcohol and smoking abstinence, and reduction in low birth weight and small for gestational age infants.

Further, it is important to recognize that there are differences among sub-populations who are bed-sharing, and that these differences need to be recognized and addressed. Thus, in Wisconsin, it may be necessary to craft messaging and education aimed at specific target audiences with higher rates of bed-sharing. For example, this study found White mothers who were currently breastfeeding were almost two and a half times more likely to bed-share than those who were not bed-sharing, suggesting a potential need for an intervention tailored to breastfeeding mothers. This population may be at particular risk of

receiving conflicting messages around bed-sharing, as many breastfeeding advocates also advocate bed-sharing to help facilitate breastfeeding (ABM, 2008; La Leche League, 2007; McKenna, Mosko & Richard, 1997).

Of utmost importance, however, is that these targeted interventions take into account the family and environmental context as well as the cultural beliefs within which decisions about bed-sharing are made (Ball, et al., 2012; Ball & Volpe, 2012; Sobralske & Gruber, 2009; Aslam, et al., 2009; Fu, et al., 2008; Johnston & Johnston, 2008; Dahl & El-Sheikh, 2007; Horsley, et al., 2007; Blanchard & Vermilya, 2007; van Wouwe & HiraSing, 2006; Resnicow, et al., 1999). Additionally, interventions must reflect deep structure, going beyond the color of the individuals' skin on a billboard sign, for example, to a more salient message to the target audience that takes into account the "cultural, social, historical, environmental and psychological forces" at play within their lives (Resnicow, et al., 1999, p. 12). This would include a clear understanding of the target audiences' beliefs and understandings about the risks and benefits of bed-sharing, including core cultural values, and the magnitude and type of stressors faced by them, and their racial and/or ethnic identity (Resnicow, et al., 1999). For example, Ajao and colleagues (2010), in their focus group study, identified several misperceptions by families regarding what a "firm surface" meant, as well as the misperception that pillows placed around an infant on an adult bed was a "safe" sleep surface. These kinds of misperceptions should be addressed in a culturally-sensitive intervention with deep structure while acknowledging in a respectful manner that families may have been utilizing these with good (but not well-informed) intentions of providing a safe place for their infant.

These findings also reinforce the importance of examining socioecological factors when infant deaths occur, especially during infant sleep. In addition to the CDC's

recommendations regarding infant death scene investigations (CDC, 2012b; Senter, Sackoff, Landi & Boyd, 2011; Corey, Hanzlick, Howard, Nelson & Krous, 2007; Bajanowski, Vege & Byard, 2007), the context of the infant's life should be conducted as well. The National Fetal and Infant Mortality Review (FIMR) suggests a perinatal systems intervention, "action-oriented community process that continually assesses, monitors, and works to improve service systems and community resources for women, infants, and families" (NFIMR, 2012). These reviews should review the socioecological factors as well. For example, in addition to reviewing infant-level factors (such as medical and genetic factors), the infant's family/household context, such as, who lived in the house with the infant, if and how the father or a partner was involved, who cared for the infant, was he/she breastfed, where did he/she usually sleep, and in what position, what stressors was the mother experiencing, maternal depressive symptoms, and maternal age. In the community and society level, exploration of the mother's understanding of "safe sleep messaging," the context of the neighborhood, maternal education level, and socioeconomic status factors (such as income, use of Medicaid or WIC, need for money for food). By reviewing these factors within the FIMR review process, it may be possible to identify factors that place families at higher risk for infant death.

Implications for Research

The findings from this study also suggest several opportunities for future research. For example, the findings reinforce a need to examine in-depth the phenomenon of maternal-infant bed-sharing and the factors that affect the behavior. Other researchers have called for a greater understanding of the context as well (Ball, et al., 2012; Ball & Volpe, 2012; Volpe, Ball & McKenna, 2012; Sobralske & Gruber, 2009; Aslam, et al., 2009; Fu, et al., 2008; Johnston & Johnston, 2008; Horsley, et al., 2007; Blanchard & Vermilya, 2007; van

Wouwe & HiraSing, 2006; Resnicow, et al., 1999). A better understanding of the socio-ecological factors at play in a family's decision to bed-share may be best accomplished using a qualitative approach with the individual family as a unit of analysis. A qualitative approach allows in-depth, descriptive information regarding the phenomenon of study, and can help explain complex social phenomenon such as bed-sharing, by including interactions, experiences, and perspectives (Giacomini & Cook, 2000). In particular, individual interviews with families would allow an in-depth focus on the family's perspective and context of bed-sharing, including reasons for bed-sharing, frequency of nights per week, number of hours per day, and the specific location of sleep, as well as details such as the caregiving structure and household make-up of the family (Ritchie & Lewis, 2008; Kendall-Tackett, Cong & Hale, 2010; Sadeh, et al., 2009; Ball, 2007). Sadeh and colleagues (2009) developed an Extended Brief Infant Sleep Questionnaire (BISQ) that not only collects data on the frequency and duration of bed-sharing, but also the routines and other details surrounding the infant's sleep ecology. In one laboratory-based case study report, Volpe and Ball (2012) found that mothers engaged in a variety of infant sleep strategies throughout the night, including crib-sleeping, bed-sharing on a couch, and bed-sharing on an adult bed. Thus, in-home interviews could allow for an even greater understanding and opportunity first-hand to observe the natural setting of infant sleep, such as location of sleep in the home, along with identification of other potential risk factors such as soft bedding, etc. Such an analysis could also help elucidate the exact factors at play for the increased risk of SIDS and unsafe sleep-related infant death in sub-populations.

The finding that the bed-sharing rates were higher despite data being collected after 2007 may warrant further examination of the education around bed-sharing in Wisconsin. Future studies may need to examine Wisconsin health care provider recommendations

around infant sleep. Indeed, several studies have demonstrated limited knowledge about the AAP's recommendations on infant sleep (AAP, 1992; 1997; 2000; 2005; 2011), as well as limited, contrary, or no advice about these recommendations by physicians, nurses, and pediatricians (Krouse, Craig, Watson, Matthews, Zolski & Isola, 2012; Smith, et al., 2010; Moon, Kington, Oden, Iglesias & Hauck, 2007; Moon, Gingras & Erwin, 2002; Morgan & Johnson, 2001). One approach to collect this information in Wisconsin could be to include additional questions in the Wisconsin PRAMS survey, including, "Did a doctor, nurse, or other health care worker talk with you about how to lay your new baby down to sleep?" (No/Yes) (CDC, 2011c, p. 126). Further, the State of Vermont developed a question that asks, "From whom or where did you get the information or advice that you received [re: sleep behaviors]?" with checkboxes that include: "My mother," "My grandmother," "Other family member or friend," "TV or Radio," "A home health visitor," "My hospital nurse," "My obstetrician or midwife," "My baby's doctor," or "Other – Please tell us:" (CDC, 2011c, p. 128). This question accomplishes two purposes – determining whether or not a health care provider or heath visitor has given recommendations about bed-sharing, and helping to identify what other advice was taken into account when making this decision. This second purpose may help elucidate whether or not White and African-American families are willing to follow advice helps provide information about what other sources of information may be affecting a family's decision about infant sleep. Some research has demonstrated that provider advice plays at least a small role in decisions to (or not to) bed-share (Oden, et al., 2010; Smith, et al., 2010; von Kohorn, et al., 2010; Flick, et al., 2001), while others demonstrate the importance of other sources of information, such as the internet (Chung, et al., 2012), parenting books (Ramos & Youngclarke, 2006), magazines (Joyner, Gill-Bailey & Moon, 2009), and family and friends (Oden, et al., 2010).

A third potential area for further exploration is regarding the characteristics associated with frequency of bed-sharing. It could be possible that varying frequencies of bed-sharing may reflect different approaches to bed-sharing – for example, those reporting "always" bed-sharing may take a more informed approach to bed-sharing, following precautions provided through multiple sources (such as Sears & Sears, 2011; Gettler & McKenna, 2010; Blabey & Gessner, 2009; Johnston & Johnston, 2008; McKenna & McDade, 2005; Sears & Sears, 2003; Mosko, Richard & McKenna, 1997). On the other hand, those reporting "sometimes" or "rarely" may reflect situations in which bed-sharing was accidental, versus a purposeful decision (Mosley, Dailey Stokes & Ulmer, 2007). In one survey, 25% of mothers reported falling asleep with their infants on chairs, sofas, or recliners (Kendall-Tackett, Cong & Hale, 2010). Some studies have differentiated between intentional versus reactive bed-sharing, with intentional bed-sharing being a pre-planned, purposeful decision while reactive is in response to problems getting the infant to sleep (Ramos, Youngclarke & Anderson, 2007; Goldberg & Keller, 2007; Keller & Goldberg, 2004; Ramos, 2003). Indeed, Ball and colleagues (2000) found that though the majority of parents planned *not* to bed-share while they were pregnant, a large number of them found themselves bed-sharing with their infants once they were born (Ball, Hooker & Kelly, 2000). Given the differential risk of SIDS based on routine versus non-routine bed-sharing (Vennemann, et al., 2012; Vennemann, et al., 2009; Scragg, et al., 1993), collecting as much detail as possible regarding bed-sharing is critical to understanding the nature of (and potential dangers around) bed-sharing (Volpe, Ball & McKenna, 2012; Goldberg & Keller, 2007; McKenna & McDade, 2005). In future years, as the sample size increases, it may be valuable to re-examine bed-sharing frequency within each racial group to determine if there are significant differences across frequency. In combination with the recommendation to collect more

detailed and objective frequency information, a more thorough understanding of the impact of frequency of bed-sharing could be explored.

One of the most significant findings of this analysis is that when data were "rolled together" for these two different racial groups (African-American versus White), the results seemed to mask some important differences between each racial group. This finding has also been demonstrated by others specific to bed-sharing (Broussard, Sappenfield & Goodman, 2012; McCoy, et al., 2004), but has also been demonstrated across other maternal and infant health factors (Braveman, et al., 2011; Alio, et al., 2010). These findings may have important implications for other research areas as well, especially ones that contain racial disparities. As researchers aim to close the gap in racial disparities, it may be important as a first step to examine differences among the racial groups. Though the level of differences between ORs may seem small when examined independently, the overall implications may suggest different contextual and process factors that are affecting the phenomenon in the racial groups.

One important point that warrants re-iteration is that the differences found in this analysis may not accurately represent actual differences between racial groups. The term "race" is used as a social construct, meaning that its basis is not biological, but that it creates an artificial hierarchy within the social world between inherited disadvantage among African-Americans and "unearned advantages" among Whites (Ford & Airhihenbuwa, 2010a, p.1395; Dominguez, 2008; David & Collins, 2008). As Dominguez notes, "race operates as a social stratifier, resulting in racial group hierarchies and marked inequalities in resources, power, opportunity, and social status," (Dominguez, 2008, p. 360). Thus, the findings of this study should be interpreted within this context – findings are not stating that African-Americans (or Whites, for that matter) behave differently as a whole. The artificial terms of

"race" hide a world of complexity complicated by cultural values, environmental factors, and other contextual issues.

In a highly-racialized society such as the U.S., racial differences point to different underlying processes that are affecting individuals' outcomes in this country (Dominguez, 2008). For example, as Alio and colleagues and others have indicated, despite the perception that we now live in a post-racial society, the historical, societal, and individual contexts of racism and previous discrimination still play major roles in the outcomes of individuals today (Alio, et al., 2010; Dominguez, 2008; Mays, Cochran & Barnes, 2007). Indeed, the finding in this sample that a significantly higher percentage (19.8%) of African-Americans reported being upset regarding their treatment based on race compared to Whites (3.2%) reinforces this issue. These findings can help remind researchers and clinicians alike that the *context* within which individuals exist is as important as broad population-level findings (Glass & McAtee, 2006). If these contextual factors are not taken into account in designing interventions, the interventions will not be effective (Glass & McAtee, 2006).

In summary, this study was a first step in identifying race-specific factors associated with bed-sharing among African-American and White mothers with young infants in Wisconsin. These findings demonstrate differences in the factors at play for African-American and White families who bed-share. Practice implications include, at the community-level, ensuring that community-level interventions incorporate the cultural and behavioral aspects specific to the target audience, and addressing the cultural relevance of the messaging by striving for salience with the target audience. At the family- or individual-level, discussions should remain open and non-judgmental regarding where and how the infant sleeps, by: (1) engaging the *family* (including partner) in discussions, (2) inviting the family to share the most relevant influences in their lives regarding their decisions for infant

sleep, (3) and providing additional information to support their decision, including precautions to take if they do choose to bed-share (as outlined in AAP, 2011). Areas for further investigation include: (1) exploring the context of bed-sharing at the family level through qualitative methods, (2) collecting detailed information on the ecology of infant sleep (such as objective data on bed-sharing activities and routines), and (3) exploring of the messages and information received and used by the family to make decisions around infant sleep. These results can help to inform development of a targeted, culturally sensitive approach to educating families on sleep-related infant safety.

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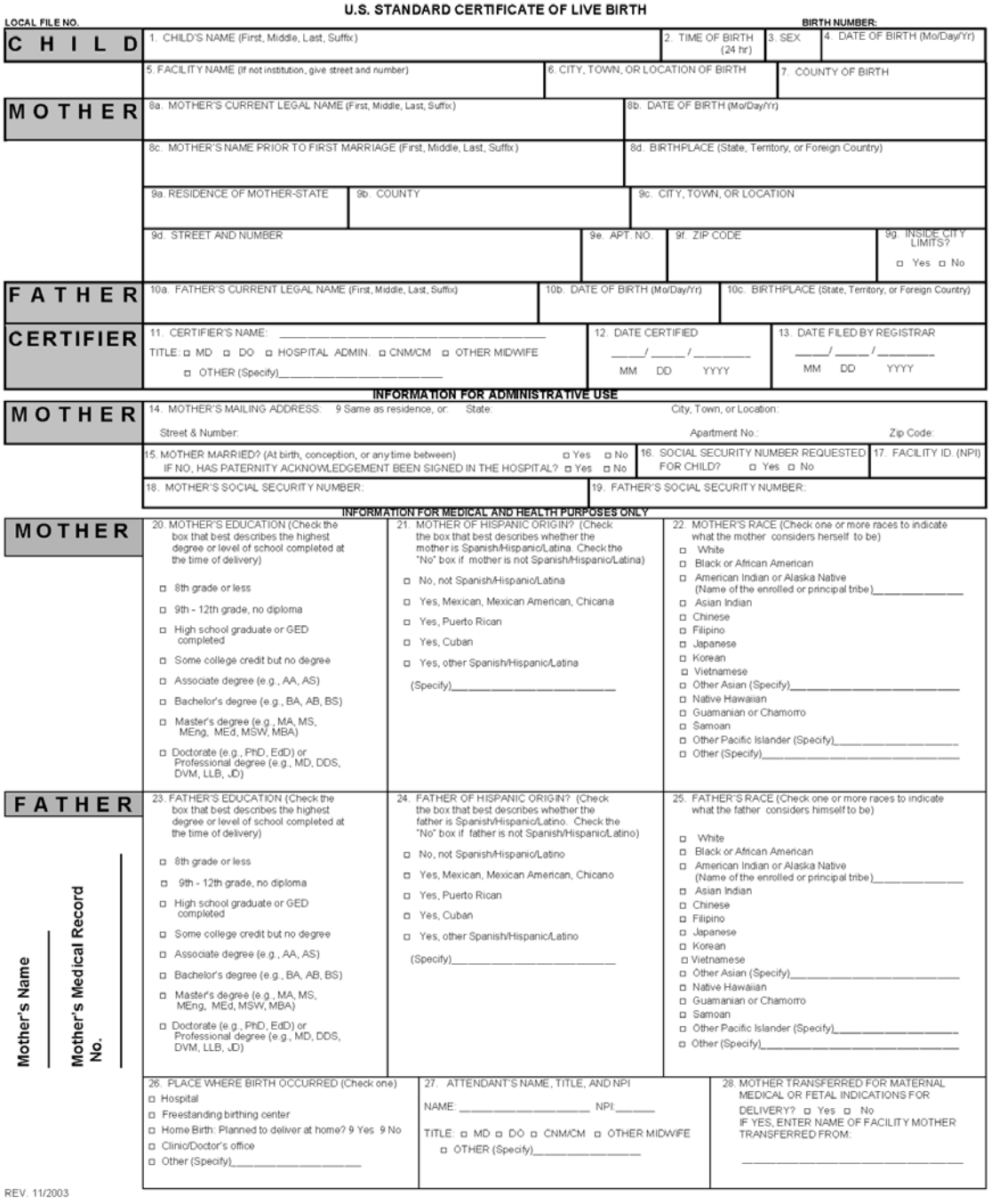
APPENDIX A: BIRTH CERTIFICATE WORKSHEET



U.S. STANDARD CERTIFICATE OF LIVE BIRTH

LOCAL FILE NO. BIRTH NUMBER:

CHILD

1. CHILD'S NAME (First, Middle, Last, Suffix)
2. TIME OF BIRTH (24 hr)
3. SEX
4. DATE OF BIRTH (Mo/Day/Yr)
5. FACILITY NAME (If not institution, give street and number)
6. CITY, TOWN, OR LOCATION OF BIRTH
7. COUNTY OF BIRTH

MOTHER

8a. MOTHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)
8b. DATE OF BIRTH (Mo/Day/Yr)
8c. MOTHER'S NAME PRIOR TO FIRST MARRIAGE (First, Middle, Last, Suffix)
8d. BIRTHPLACE (State, Territory, or Foreign Country)
9a. RESIDENCE OF MOTHER-STATE
9b. COUNTY
9c. CITY, TOWN, OR LOCATION
9d. STREET AND NUMBER
9e. APT. NO.
9f. ZIP CODE
9g. INSIDE CITY LIMITS? ☐ Yes ☐ No

FATHER

10a. FATHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)
10b. DATE OF BIRTH (Mo/Day/Yr)
10c. BIRTHPLACE (State, Territory, or Foreign Country)

CERTIFIER

11. CERTIFIER'S NAME: _____
TITLE: ☐ MD ☐ DO ☐ HOSPITAL ADMIN. ☐ CNM/CM ☐ OTHER MIDWIFE
☐ OTHER (Specify)_____
12. DATE CERTIFIED _____/_____/_____ MM DD YYYY
13. DATE FILED BY REGISTRAR _____/_____/_____ MM DD YYYY

INFORMATION FOR ADMINISTRATIVE USE

MOTHER

14. MOTHER'S MAILING ADDRESS: 9 Same as residence, or: State: City, Town, or Location:
Street & Number: Apartment No.: Zip Code:
15. MOTHER MARRIED? (At birth, conception, or any time between) ☐ Yes ☐ No
IF NO, HAS PATERNITY ACKNOWLEDGEMENT BEEN SIGNED IN THE HOSPITAL? ☐ Yes ☐ No
16. SOCIAL SECURITY NUMBER REQUESTED FOR CHILD? ☐ Yes ☐ No
17. FACILITY ID. (NPI)
18. MOTHER'S SOCIAL SECURITY NUMBER:
19. FATHER'S SOCIAL SECURITY NUMBER:

INFORMATION FOR MEDICAL AND HEALTH PURPOSES ONLY

MOTHER

20. MOTHER'S EDUCATION (Check the box that best describes the highest degree or level of school completed at the time of delivery)
☐ 8th grade or less
☐ 9th - 12th grade, no diploma
☐ High school graduate or GED completed
☐ Some college credit but no degree
☐ Associate degree (e.g., AA, AS)
☐ Bachelor's degree (e.g., BA, AB, BS)
☐ Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)
☐ Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)

21. MOTHER OF HISPANIC ORIGIN? (Check the box that best describes whether the mother is Spanish/Hispanic/Latina. Check the "No" box if mother is not Spanish/Hispanic/Latina)
☐ No, not Spanish/Hispanic/Latina
☐ Yes, Mexican, Mexican American, Chicana
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, other Spanish/Hispanic/Latina
(Specify)_____

22. MOTHER'S RACE (Check one or more races to indicate what the mother considers herself to be)
☐ White
☐ Black or African American
☐ American Indian or Alaska Native (Name of the enrolled or principal tribe)_____
☐ Asian Indian
☐ Chinese
☐ Filipino
☐ Japanese
☐ Korean
☐ Vietnamese
☐ Other Asian (Specify)_____
☐ Native Hawaiian
☐ Guamanian or Chamorro
☐ Samoan
☐ Other Pacific Islander (Specify)_____
☐ Other (Specify)_____

FATHER

23. FATHER'S EDUCATION (Check the box that best describes the highest degree or level of school completed at the time of delivery)
☐ 8th grade or less
☐ 9th - 12th grade, no diploma
☐ High school graduate or GED completed
☐ Some college credit but no degree
☐ Associate degree (e.g., AA, AS)
☐ Bachelor's degree (e.g., BA, AB, BS)
☐ Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)
☐ Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)

24. FATHER OF HISPANIC ORIGIN? (Check the box that best describes whether the father is Spanish/Hispanic/Latino. Check the "No" box if father is not Spanish/Hispanic/Latino)
☐ No, not Spanish/Hispanic/Latino
☐ Yes, Mexican, Mexican American, Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, other Spanish/Hispanic/Latino
(Specify)_____

25. FATHER'S RACE (Check one or more races to indicate what the father considers himself to be)
☐ White
☐ Black or African American
☐ American Indian or Alaska Native (Name of the enrolled or principal tribe)_____
☐ Asian Indian
☐ Chinese
☐ Filipino
☐ Japanese
☐ Korean
☐ Vietnamese
☐ Other Asian (Specify)_____
☐ Native Hawaiian
☐ Guamanian or Chamorro
☐ Samoan
☐ Other Pacific Islander (Specify)_____
☐ Other (Specify)_____

Mother's Name

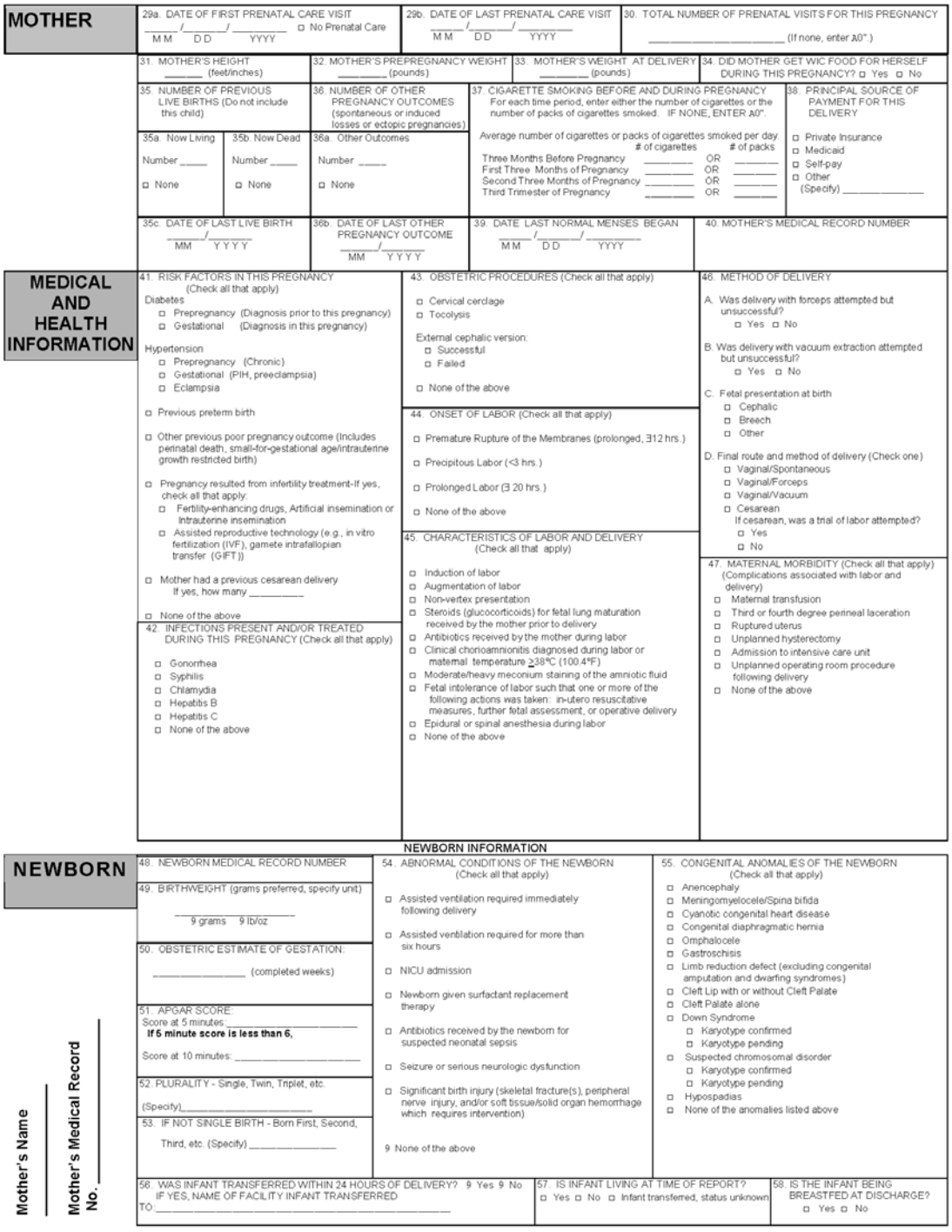
Mother's Medical Record No.

26. PLACE WHERE BIRTH OCCURRED (Check one)
☐ Hospital
☐ Freestanding birthing center
☐ Home Birth: Planned to deliver at home? 9 Yes 9 No
☐ Clinic/Doctor's office
☐ Other (Specify)_____

27. ATTENDANT'S NAME, TITLE, AND NPI
NAME: _____ NPI:_____
TITLE: ☐ MD ☐ DO ☐ CNM/CM ☐ OTHER MIDWIFE
☐ OTHER (Specify)_____

28. MOTHER TRANSFERRED FOR MATERNAL MEDICAL OR FETAL INDICATIONS FOR DELIVERY? ☐ Yes ☐ No
IF YES, ENTER NAME OF FACILITY MOTHER TRANSFERRED FROM:
_____

REV. 11/2003



MOTHER

29a. DATE OF FIRST PRENATAL CARE VISIT
_____/_____/_____ ☐ No Prenatal Care
M M D D YYYY

29b. DATE OF LAST PRENATAL CARE VISIT
_____/_____/_____
M M D D YYYY

30. TOTAL NUMBER OF PRENATAL VISITS FOR THIS PREGNANCY
_____ (If none, enter "0".)

31. MOTHER'S HEIGHT
_____ (feet/inches)

32. MOTHER'S PREPREGNANCY WEIGHT
_____ (pounds)

33. MOTHER'S WEIGHT AT DELIVERY
_____ (pounds)

34. DID MOTHER GET WIC FOOD FOR HERSELF DURING THIS PREGNANCY? ☐ Yes ☐ No

35. NUMBER OF PREVIOUS LIVE BIRTHS (Do not include this child)

35a. Now Living
Number _____
☐ None

35b. Now Dead
Number _____
☐ None

36. NUMBER OF OTHER PREGNANCY OUTCOMES (spontaneous or induced losses or ectopic pregnancies)

36a. Other Outcomes
Number _____
☐ None

37. CIGARETTE SMOKING BEFORE AND DURING PREGNANCY
For each time period, enter either the number of cigarettes or the number of packs of cigarettes smoked. IF NONE, ENTER "0".

Average number of cigarettes or packs of cigarettes smoked per day.

	# of cigarettes		# of packs
Three Months Before Pregnancy	_____	OR	_____
First Three Months of Pregnancy	_____	OR	_____
Second Three Months of Pregnancy	_____	OR	_____
Third Trimester of Pregnancy	_____	OR	_____

38. PRINCIPAL SOURCE OF PAYMENT FOR THIS DELIVERY
☐ Private Insurance
☐ Medicaid
☐ Self-pay
☐ Other
(Specify) _____

35c. DATE OF LAST LIVE BIRTH
_____/_____
MM Y Y Y Y

36b. DATE OF LAST OTHER PREGNANCY OUTCOME
_____/_____
MM Y Y Y Y

39. DATE LAST NORMAL MENSES BEGAN
_____/_____/_____
M M D D YYYY

40. MOTHER'S MEDICAL RECORD NUMBER

MEDICAL AND HEALTH INFORMATION

41. RISK FACTORS IN THIS PREGNANCY
(Check all that apply)

Diabetes
☐ Prepregnancy (Diagnosis prior to this pregnancy)
☐ Gestational (Diagnosis in this pregnancy)

Hypertension
☐ Prepregnancy (Chronic)
☐ Gestational (PIH, preeclampsia)
☐ Eclampsia

☐ Previous preterm birth

☐ Other previous poor pregnancy outcome (Includes perinatal death, small-for-gestational age/intrauterine growth restricted birth)

☐ Pregnancy resulted from infertility treatment-If yes, check all that apply:
☐ Fertility-enhancing drugs, Artificial insemination or Intrauterine insemination
☐ Assisted reproductive technology (e.g., in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT))

☐ Mother had a previous cesarean delivery
If yes, how many _____

☐ None of the above

42. INFECTIONS PRESENT AND/OR TREATED DURING THIS PREGNANCY (Check all that apply)
☐ Gonorrhea
☐ Syphilis
☐ Chlamydia
☐ Hepatitis B
☐ Hepatitis C
☐ None of the above

43. OBSTETRIC PROCEDURES (Check all that apply)
☐ Cervical cerclage
☐ Tocolysis

External cephalic version:
☐ Successful
☐ Failed

☐ None of the above

44. ONSET OF LABOR (Check all that apply)
☐ Premature Rupture of the Membranes (prolonged, ≥12 hrs.)
☐ Precipitous Labor (<3 hrs.)
☐ Prolonged Labor (≥ 20 hrs.)
☐ None of the above

45. CHARACTERISTICS OF LABOR AND DELIVERY
(Check all that apply)
☐ Induction of labor
☐ Augmentation of labor
☐ Non-vertex presentation
☐ Steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery
☐ Antibiotics received by the mother during labor
☐ Clinical chorioamnionitis diagnosed during labor or maternal temperature ≥38°C (100.4°F)
☐ Moderate/heavy meconium staining of the amniotic fluid
☐ Fetal intolerance of labor such that one or more of the following actions was taken: in-utero resuscitative measures, further fetal assessment, or operative delivery
☐ Epidural or spinal anesthesia during labor
☐ None of the above

46. METHOD OF DELIVERY
A. Was delivery with forceps attempted but unsuccessful?
☐ Yes ☐ No

B. Was delivery with vacuum extraction attempted but unsuccessful?
☐ Yes ☐ No

C. Fetal presentation at birth
☐ Cephalic
☐ Breech
☐ Other

D. Final route and method of delivery (Check one)
☐ Vaginal/Spontaneous
☐ Vaginal/Forceps
☐ Vaginal/Vacuum
☐ Cesarean
If cesarean, was a trial of labor attempted?
☐ Yes
☐ No

47. MATERNAL MORBIDITY (Check all that apply)
(Complications associated with labor and delivery)
☐ Maternal transfusion
☐ Third or fourth degree perineal laceration
☐ Ruptured uterus
☐ Unplanned hysterectomy
☐ Admission to intensive care unit
☐ Unplanned operating room procedure following delivery
☐ None of the above

NEWBORN

NEWBORN INFORMATION

48. NEWBORN MEDICAL RECORD NUMBER

49. BIRTHWEIGHT (grams preferred, specify unit)
_____
9 grams 9 lb/oz

50. OBSTETRIC ESTIMATE OF GESTATION:
_____ (completed weeks)

51. APGAR SCORE:
Score at 5 minutes: _____
If 5 minute score is less than 6,
Score at 10 minutes: _____

52. PLURALITY - Single, Twin, Triplet, etc.
(Specify)_____

53. IF NOT SINGLE BIRTH - Born First, Second, Third, etc. (Specify) _____

54. ABNORMAL CONDITIONS OF THE NEWBORN
(Check all that apply)
☐ Assisted ventilation required immediately following delivery
☐ Assisted ventilation required for more than six hours
☐ NICU admission
☐ Newborn given surfactant replacement therapy
☐ Antibiotics received by the newborn for suspected neonatal sepsis
☐ Seizure or serious neurologic dysfunction
☐ Significant birth injury (skeletal fracture(s), peripheral nerve injury, and/or soft tissue/solid organ hemorrhage which requires intervention)
9 None of the above

55. CONGENITAL ANOMALIES OF THE NEWBORN
(Check all that apply)
☐ Anencephaly
☐ Meningomyelocele/Spina bifida
☐ Cyanotic congenital heart disease
☐ Congenital diaphragmatic hernia
☐ Omphalocele
☐ Gastroschisis
☐ Limb reduction defect (excluding congenital amputation and dwarfing syndromes)
☐ Cleft Lip with or without Cleft Palate
☐ Cleft Palate alone
☐ Down Syndrome
☐ Karyotype confirmed
☐ Karyotype pending
☐ Suspected chromosomal disorder
☐ Karyotype confirmed
☐ Karyotype pending
☐ Hypospadias
☐ None of the anomalies listed above

56. WAS INFANT TRANSFERRED WITHIN 24 HOURS OF DELIVERY? 9 Yes 9 No
IF YES, NAME OF FACILITY INFANT TRANSFERRED TO:_____

57. IS INFANT LIVING AT TIME OF REPORT?
☐ Yes ☐ No ☐ Infant transferred, status unknown

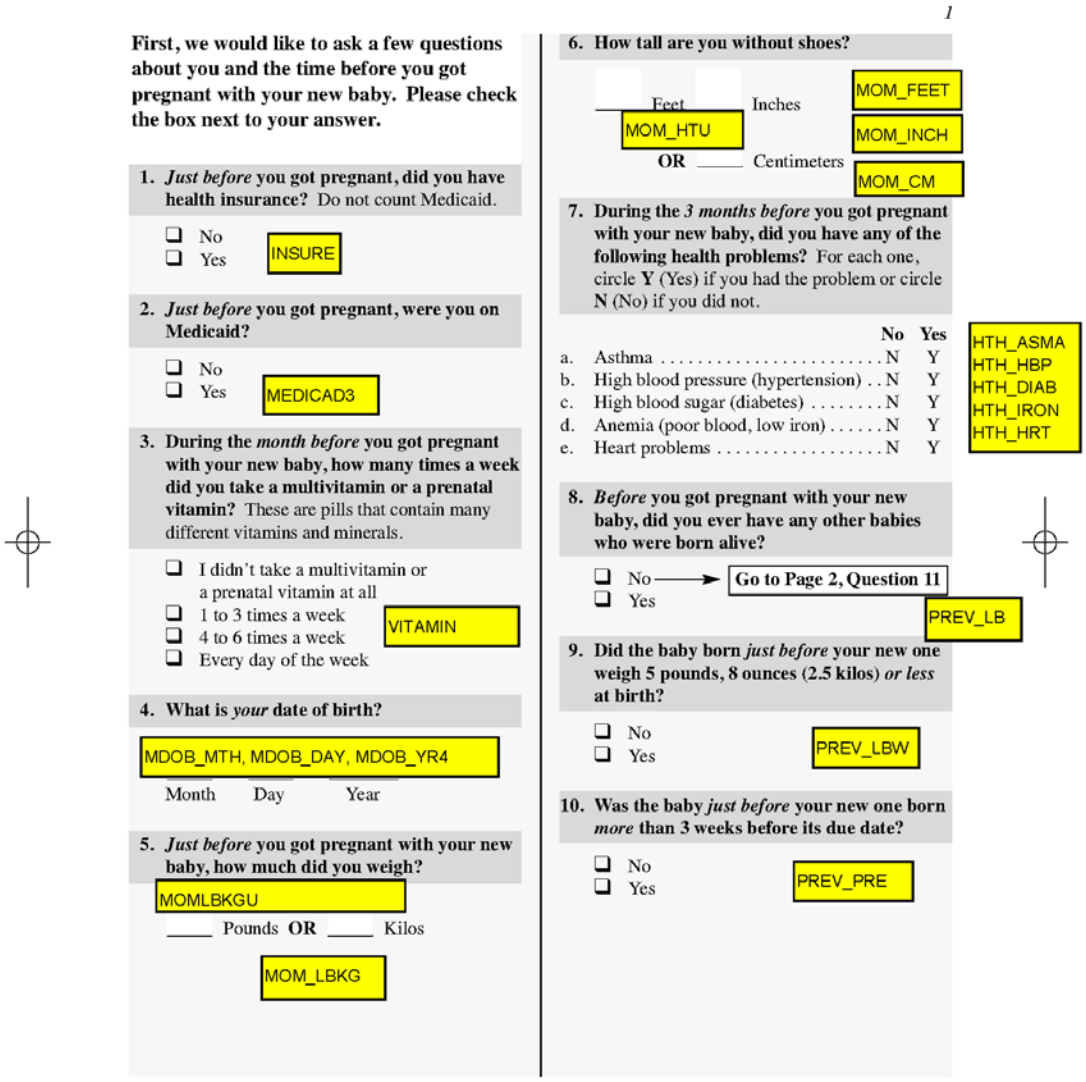
58. IS THE INFANT BEING BREASTFED AT DISCHARGE?
☐ Yes ☐ No

Mother's Name _____ Mother's Medical Record No. _____

Rev. 11/2003
NOTE: This recommended standard birth certificate is the result of an extensive evaluation process. Information on the process and resulting recommendations as well as plans for future activities is available on the Internet at: http://www.cdc.gov/nchs/vital_certs_rev.htm.

APPENDIX B: WISCONSIN PRAMS SURVEYS (PHASE 5 AND 6)

Phase 5: 2007 - 2008
PRAMS_WI_11-10_Eng_v1_vars.pdf
PRAMS_WI_11-10_Eng_v1.qxd 11/10/06 9:15 AM Page 1



1

First, we would like to ask a few questions about you and the time before you got pregnant with your new baby. Please check the box next to your answer.

1. *Just before* you got pregnant, did you have health insurance? Do not count Medicaid.

- ❑ No
- ❑ Yes

INSURE

2. *Just before* you got pregnant, were you on Medicaid?

- ❑ No
- ❑ Yes

MEDICAD3

3. During the *month before* you got pregnant with your new baby, how many times a week did you take a multivitamin or a prenatal vitamin? These are pills that contain many different vitamins and minerals.

- ❑ I didn't take a multivitamin or a prenatal vitamin at all
- ❑ 1 to 3 times a week
- ❑ 4 to 6 times a week
- ❑ Every day of the week

VITAMIN

4. What is *your* date of birth?

MDOB_MTH, MDOB_DAY, MDOB_YR4

Month Day Year

5. *Just before* you got pregnant with your new baby, how much did you weigh?

MOMLBKGU

____ Pounds **OR** ____ Kilos

MOM_LBKG

6. How tall are you without shoes?

____ Feet ____ Inches

MOM_HTU MOM_FEET MOM_INCH

OR ____ Centimeters

MOM_CM

7. During the *3 months before* you got pregnant with your new baby, did you have any of the following health problems? For each one, circle **Y** (Yes) if you had the problem or circle **N** (No) if you did not.

		No	Yes
a.	Asthma	N	Y
b.	High blood pressure (hypertension)	N	Y
c.	High blood sugar (diabetes)	N	Y
d.	Anemia (poor blood, low iron)	N	Y
e.	Heart problems	N	Y

HTH_ASMA
HTH_HBP
HTH_DIAB
HTH_IRON
HTH_HRT

8. *Before* you got pregnant with your new baby, did you ever have any other babies who were born alive?

- ❑ No → **Go to Page 2, Question 11**
- ❑ Yes

PREV_LB

9. Did the baby born *just before* your new one weigh 5 pounds, 8 ounces (2.5 kilos) *or less* at birth?

- ❑ No
- ❑ Yes

PREV_LBW

10. Was the baby *just before* your new one born *more* than 3 weeks before its due date?

- ❑ No
- ❑ Yes

PREV_PRE

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Phase 5: 2007 - 2008
PRAMS_WI_11-10_Eng_v1_vars.pdf
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The next questions are about the time when you got pregnant with your *new* baby.

11. Thinking back to *just before* you got pregnant with your *new* baby, how did you feel about becoming pregnant?

Check one answer

FEEL_PG

- ❑ I wanted to be pregnant sooner
- ❑ I wanted to be pregnant later
- ❑ I wanted to be pregnant then
- ❑ I didn't want to be pregnant then or at any time in the future

12. When you got pregnant with your new baby, were you trying to get pregnant?

PREG_TRY

- ❑ No
- ❑ Yes → **Go to Question 15**

13. When you got pregnant with your new baby, were you or your husband or partner doing anything to keep from getting pregnant? (Some things people do to keep from getting pregnant include not having sex at certain times [rhythm] or withdrawal, and using birth control methods such as the pill, condoms, cervical ring, IUD, having their tubes tied, or their partner having a vasectomy.)

BC_WHEN4

- ❑ No
- ❑ Yes → **Go to Question 15**

14. What were your or your husband's or partner's reasons for not doing anything to keep from getting pregnant?

Check all that apply

NBC_MIND
NBC_TIME
NBC_SIDE
NBC_GET
NBC_STER
NBC_HUSB
NBC_OTH
NBC_WHY

- ❑ I didn't mind if I got pregnant
- ❑ I thought I could not get pregnant at that time
- ❑ I had side effects from the birth control method I was using
- ❑ I had problems getting birth control when I needed it
- ❑ I thought my husband or partner or I was sterile (could not get pregnant at all)
- ❑ My husband or partner didn't want to use anything
- ❑ Other → Please tell us:

_____

The next questions are about the prenatal care you received during your most recent pregnancy. Prenatal care includes visits to a doctor, nurse, or other health care worker before your baby was born to get checkups and advice about pregnancy. (It may help to look at the calendar when you answer these questions.)

15. How many weeks or months pregnant were you when you were *sure* you were pregnant? (For example, you had a pregnancy test or a doctor or nurse said you were pregnant.)

SURE_PGU
SURE_PG

____ Weeks **OR** ____ Months

- ❑ I don't remember

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16. How many weeks or months pregnant were you when you had your first visit for prenatal care? Do not count a visit that was only for a pregnancy test or only for WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children).

PNC_1STU
PNC_1ST

_____ Weeks **OR** _____ Months

❑ I didn't go for prenatal care

17. Did you get prenatal care as early in your pregnancy as you wanted?

ERLY_PNC

❑ No
❑ Yes
❑ I didn't want prenatal care → **Go to Question 19**

18. Here is a list of problems some women can have getting prenatal care. For each item, circle **Y** (Yes) if it was a problem for you during your most recent pregnancy or circle **N** (No) if it was not a problem or did not apply to you.

EP5APPT
EP5MONY
EP5TRAN
EP5LEAVE
EP5START
EP5MEDI
EP5CHLD
EP5BUSY
EP5SECRT
EP5OTH
EP5REAS

		No	Yes
a.	I couldn't get an appointment when I wanted one	N	Y
b.	I didn't have enough money or insurance to pay for my visits	N	Y
c.	I had no way to get to the clinic or doctor's office	N	Y
d.	I couldn't take time off from work	N	Y
e.	The doctor or my health plan would not start care as early as I wanted	N	Y
f.	I didn't have my Medicaid card	N	Y
g.	I had no one to take care of my children	N	Y
h.	I had too many other things going on	N	Y
i.	I didn't want anyone to know I was pregnant	N	Y
j.	Other	N	Y

Please tell us: _____

If you did not go for prenatal care, go to Page 4, Question 21.

19. How was your prenatal care paid for?

Check all that apply

PP_MEDIC
PP_INCM
PP_IHMO
PP_OTH
PP_TYPE

❑ Medicaid
❑ Personal income (cash, check, or credit card)
❑ Health insurance or HMO (including insurance from your work or your husband's work)
❑ Other → Please tell us: _____

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20. During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about any of the things listed below? Please count only discussions, not reading materials or videos. For each item, circle **Y** (Yes) if someone talked with you about it or circle **N** (No) if no one talked with you about it.

TLK_SMK
TLK_BF
TLK_DRK
TLK_BELT
TLK_BC
TLK_MEDS
TLK_DRUG
TLK_BDEF
TLK_LABR
TLK_HIVT
TLK_ABUS

		No	Yes
a.	How smoking during pregnancy could affect my baby	N	Y
b.	Breastfeeding my baby	N	Y
c.	How drinking alcohol during pregnancy could affect my baby	N	Y
d.	Using a seat belt during my pregnancy	N	Y
e.	Birth control methods to use after my pregnancy	N	Y
f.	Medicines that are safe to take during my pregnancy	N	Y
g.	How using illegal drugs could affect my baby	N	Y
h.	Doing tests to screen for birth defects or diseases that run in my family	N	Y
i.	What to do if my labor starts early	N	Y
j.	Getting tested for HIV (the virus that causes AIDS)	N	Y
k.	Physical abuse to women by their husbands or partners	N	Y

21. At any time during your most recent pregnancy or delivery, did you have a test for HIV (the virus that causes AIDS)?

HIVTEST

- ❑ No
- ❑ Yes
- ❑ I don't know

The next questions are about your most recent pregnancy and things that might have happened during your pregnancy.

22. During your most recent pregnancy, were you on WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children)?

WIC_PREG

- ❑ No
- ❑ Yes

23. Did you have any of these problems during your most recent pregnancy? For each item, circle **Y** (Yes) if you had the problem or circle **N** (No) if you did not.

MORB_DIB
MORB_DID
MORB_BLD
MORB_KID
MORB_NAU
MORB_CRV
MORB5BP
MORB_PLA
MORB_LAB
MORB_PRM
MORB_TRN
MORB_CAR

		No	Yes
a.	High blood sugar (diabetes) that started *before* this pregnancy	N	Y
b.	High blood sugar (diabetes) that started *during* this pregnancy	N	Y
c.	Vaginal bleeding	N	Y
d.	Kidney or bladder (urinary tract) infection	N	Y
e.	Severe nausea, vomiting, or dehydration	N	Y
f.	Cervix had to be sewn shut (incompetent cervix)	N	Y
g.	High blood pressure, hypertension (including pregnancy-induced hypertension [PIH]), preeclampsia, or toxemia	N	Y
h.	Problems with the placenta (such as abruptio placentae or placenta previa)	N	Y
i.	Labor pains more than 3 weeks before my baby was due (preterm or early labor)	N	Y
j.	Water broke more than 3 weeks before my baby was due (premature rupture of membranes [PROM])	N	Y
k.	I had to have a blood transfusion	N	Y
l.	I was hurt in a car accident	N	Y

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If you did not have any of these problems, go to Question 25.

24. Did you do any of the following things because of these problems? For each item, circle **Y** (Yes) if you did that thing or circle **N** (No) if you did not.

MORB5LTI
MORB51_7
MORB5GT7
MORB5BED

		No	Yes
a.	I went to the hospital or emergency room and stayed less than 1 day	N	Y
b.	I went to the hospital and stayed 1 to 7 days	N	Y
c.	I went to the hospital and stayed more than 7 days	N	Y
d.	I stayed in bed at home more than 2 days because of my doctor's or nurse's advice	N	Y

The next questions are about smoking cigarettes and drinking alcohol.

25. Have you smoked at least 100 cigarettes in the *past 2 years*? (A pack has 20 cigarettes.)

SMK_2YRS

- ❑ No → **Go to Question 29**
- ❑ Yes

26. In the *3 months before* you got pregnant, how many cigarettes did you smoke on an average day? (A pack has 20 cigarettes.)

SMK5_3B

- ❑ 41 cigarettes or more
- ❑ 21 to 40 cigarettes
- ❑ 11 to 20 cigarettes
- ❑ 6 to 10 cigarettes
- ❑ 1 to 5 cigarettes
- ❑ Less than 1 cigarette
- ❑ None (0 cigarettes)

27. In the *last 3 months* of your pregnancy, how many cigarettes did you smoke on an average day? (A pack has 20 cigarettes.)

SMK5_3L

- ❑ 41 cigarettes or more
- ❑ 21 to 40 cigarettes
- ❑ 11 to 20 cigarettes
- ❑ 6 to 10 cigarettes
- ❑ 1 to 5 cigarettes
- ❑ Less than 1 cigarette
- ❑ None (0 cigarettes)

28. How many cigarettes do you smoke on an average day *now*? (A pack has 20 cigarettes.)

SMK5_3N

- ❑ 41 cigarettes or more
- ❑ 21 to 40 cigarettes
- ❑ 11 to 20 cigarettes
- ❑ 6 to 10 cigarettes
- ❑ 1 to 5 cigarettes
- ❑ Less than 1 cigarette
- ❑ None (0 cigarettes)

29. Does your husband or partner smoke inside your house?

SMK_HUSB

- ❑ No
- ❑ Yes

30. Not including yourself or your husband or partner, does anyone else smoke cigarettes inside your house?

SMK_OTH

- ❑ No
- ❑ Yes

31. Have you had any alcoholic drinks in the *past 2 years*? (A drink is 1 glass of wine, wine cooler, can or bottle of beer, shot of liquor, or mixed drink.)

- ❑ No → **Go to Page 6, Question 34**
- ❑ Yes

DRK_2YRS

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32a. During the *3 months before* you got pregnant, how many alcoholic drinks did you have in an average week?

DRK5_3B

- ❑ 14 drinks or more a week
- ❑ 7 to 13 drinks a week
- ❑ 4 to 6 drinks a week
- ❑ 1 to 3 drinks a week
- ❑ Less than 1 drink a week
- ❑ I didn't drink then

32b. During the *3 months before* you got pregnant, how many times did you drink 5 alcoholic drinks or more in one sitting?

DRK5_3BB

- ❑ 6 or more times
- ❑ 4 to 5 times
- ❑ 2 to 3 times
- ❑ 1 time
- ❑ I didn't have 5 drinks or more in 1 sitting
- ❑ I didn't drink then

33a. During the *last 3 months* of your pregnancy, how many alcoholic drinks did you have in an average week?

DRK5_3L

- ❑ 14 drinks or more a week
- ❑ 7 to 13 drinks a week
- ❑ 4 to 6 drinks a week
- ❑ 1 to 3 drinks a week
- ❑ Less than 1 drink a week
- ❑ I didn't drink then

33b. During the *last 3 months* of your pregnancy, how many times did you drink 5 alcoholic drinks or more in one sitting?

DRK5_3LB

- ❑ 6 or more times
- ❑ 4 to 5 times
- ❑ 2 to 3 times
- ❑ 1 time
- ❑ I didn't have 5 drinks or more in 1 sitting
- ❑ I didn't drink then

Pregnancy can be a difficult time for some women. These next questions are about things that may have happened before and during your most recent pregnancy.

34. This question is about things that may have happened during the *12 months before* your new baby was born. For each item, circle **Y** (Yes) if it happened to you or circle **N** (No) if it did not. (It may help to use the calendar.)

		No	Yes
a.	A close family member was very sick and had to go into the hospital	N	Y
b.	I got separated or divorced from my husband or partner	N	Y
c.	I moved to a new address	N	Y
d.	I was homeless	N	Y
e.	My husband or partner lost his job	N	Y
f.	I lost my job even though I wanted to go on working	N	Y
g.	I argued with my husband or partner more than usual	N	Y
h.	My husband or partner said he didn't want me to be pregnant	N	Y
i.	I had a lot of bills I couldn't pay	N	Y
j.	I was in a physical fight	N	Y
k.	My husband or partner or I went to jail	N	Y
l.	Someone very close to me had a bad problem with drinking or drugs	N	Y
m.	Someone very close to me died	N	Y

STRS_FM3
STRS_DV3
STRS_MOV
STRS_HOM
STRS_JOB
STRS_WRK
STRS_ARG
STRS_PG
STRS_BIL
STRS_FT4
STRS_JL3
STRS_DRG
STRS_DH3

35. During the *12 months before* your new baby was born, did you feel emotionally upset (for example angry, sad, or frustrated) as a result of how you were treated *based on your race*?

- ❑ No
- ❑ Yes

RACEBIAS

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The next questions are about the time during the *12 months before* you got pregnant with your new baby.

36a. During the *12 months before* you got pregnant, did an ex-husband or ex-partner push, hit, slap, kick, choke, or physically hurt you in any other way?

PAB_XHUS

- ❑ No
- ❑ Yes

36b. During the *12 months before* you got pregnant, were you physically hurt in any way by your husband or partner?

PAB_HUS

- ❑ No
- ❑ Yes

The next questions are about the time during your most recent pregnancy.

37a. During your most recent pregnancy, did an ex-husband or ex-partner push, hit, slap, kick, choke, or physically hurt you in any other way?

PAD_XHUS

- ❑ No
- ❑ Yes

37b. During your most recent pregnancy, were you physically hurt in any way by your husband or partner?

PAD_HUS

- ❑ No
- ❑ Yes

The next questions are about your labor and delivery. (It may help to look at the calendar when you answer these questions.)

38. When was your baby due?

DUE_MTH, DUE_DAY, DUE_YR4

Month Day Year

39. When did you go into the hospital to have your baby?

DEL_MTH, DEL_DAY, DEL_YR4

Month Day Year

- ❑ I didn't have my baby in a hospital

40. When was your baby born?

IDOB_MTH, iDOB_DAY, IDOB_YR4

Month Day Year

41. When were you discharged from the hospital after your baby was born? (It may help to use the calendar.)

DIS_MTH, DIS_DAY, DIS_YR4

Month Day Year

- ❑ I didn't have my baby in a hospital

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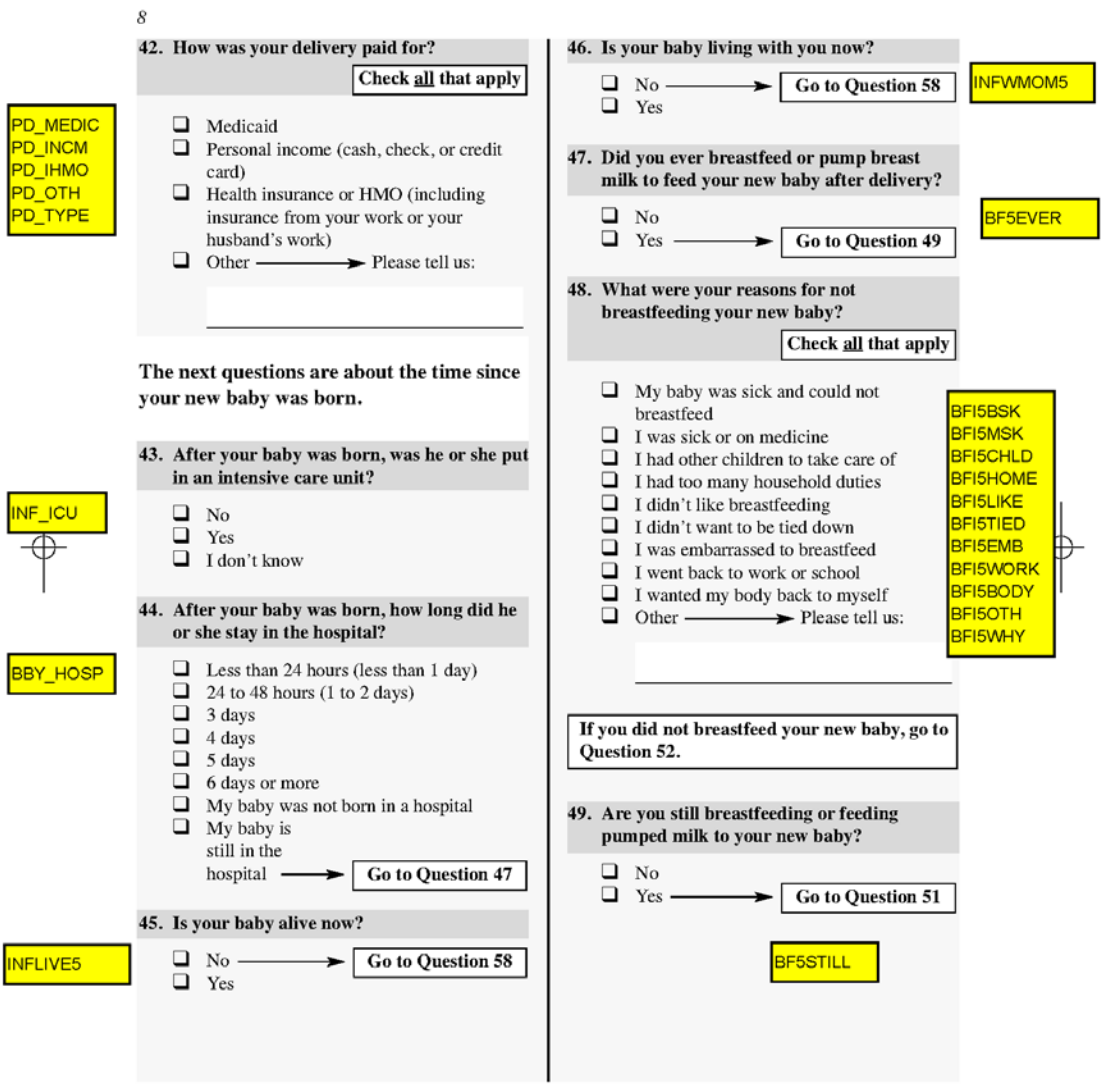

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42. How was your delivery paid for?

Check all that apply

PD_MEDIC
PD_INCM
PD_IHMO
PD_OTH
PD_TYPE

- ❑ Medicaid
- ❑ Personal income (cash, check, or credit card)
- ❑ Health insurance or HMO (including insurance from your work or your husband's work)
- ❑ Other → Please tell us:

The next questions are about the time since your new baby was born.

43. After your baby was born, was he or she put in an intensive care unit?

INF_ICU

- ❑ No
- ❑ Yes
- ❑ I don't know

44. After your baby was born, how long did he or she stay in the hospital?

BBY_HOSP

- ❑ Less than 24 hours (less than 1 day)
- ❑ 24 to 48 hours (1 to 2 days)
- ❑ 3 days
- ❑ 4 days
- ❑ 5 days
- ❑ 6 days or more
- ❑ My baby was not born in a hospital
- ❑ My baby is still in the hospital → **Go to Question 47**

45. Is your baby alive now?

INFLIVE5

- ❑ No → **Go to Question 58**
- ❑ Yes

46. Is your baby living with you now?

INFWMOM5

- ❑ No → **Go to Question 58**
- ❑ Yes

47. Did you ever breastfeed or pump breast milk to feed your new baby after delivery?

BF5EVER

- ❑ No
- ❑ Yes → **Go to Question 49**

48. What were your reasons for not breastfeeding your new baby?

Check all that apply

BFI5BSK
BFI5MSK
BFI5CHLD
BFI5HOME
BFI5LIKE
BFI5TIED
BFI5EMB
BFI5WORK
BFI5BODY
BFI5OTH
BFI5WHY

- ❑ My baby was sick and could not breastfeed
- ❑ I was sick or on medicine
- ❑ I had other children to take care of
- ❑ I had too many household duties
- ❑ I didn't like breastfeeding
- ❑ I didn't want to be tied down
- ❑ I was embarrassed to breastfeed
- ❑ I went back to work or school
- ❑ I wanted my body back to myself
- ❑ Other → Please tell us:

If you did not breastfeed your new baby, go to Question 52.

49. Are you still breastfeeding or feeding pumped milk to your new baby?

- ❑ No
- ❑ Yes → **Go to Question 51**

BF5STILL

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50. How many weeks or months did you breastfeed or pump milk to feed your baby?

BF5LNGTU
BF5LNGTH

_____ Weeks **OR** _____ Months

❑ Less than 1 week

51. How old was your baby the first time you fed him or her anything besides breast milk? Include formula, baby food, juice, cow's milk, water, sugar water, or anything else you fed your baby.

_____ Weeks **OR** _____ Months

BF5FOODU
BF5FOOD

❑ My baby was less than 1 week old
❑ I have not fed my baby anything besides breast milk

If your baby is still in the hospital, go to Question 58.

52. About how many hours a day, on average, is your new baby in the same room with someone who is smoking?

SMK_EXP

_____ Hours

❑ Less than 1 hour a day
❑ My baby is never in the same room with someone who is smoking

53. How do you *most often* lay your baby down to sleep now?

Check one answer

SLEEPPOS

❑ On his or her side
❑ On his or her back
❑ On his or her stomach

54. How often does your new baby sleep in the same bed with you or anyone else?

❑ Always
❑ Often
❑ Sometimes
❑ Rarely
❑ Never

SLEEPBED

55. Was your new baby seen by a doctor, nurse, or other health care worker during the first week after he or she left the hospital?

❑ No
❑ Yes

DR_1WK

56. Has your new baby had a well-baby checkup? (A well-baby checkup is a regular health visit for your baby usually at 2, 4, or 6 months of age.)

❑ No
❑ Yes

WBC_ANY

57. Has your new baby gone as many times as you wanted for a well-baby checkup?

❑ No
❑ Yes

WBC_ENUF

58. Are you or your husband or partner doing anything *now* to keep from getting pregnant? (Some things people do to keep from getting pregnant include not having sex at certain times [rhythm] or withdrawal, and using birth control methods such as the pill, condoms, cervical ring, IUD, having their tubes tied, or their partner having a vasectomy.)

❑ No
❑ Yes → **Go to Page 10, Question 60**

BC_NOW4

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59. What are your or your husband's or partner's reasons for not doing anything to keep from getting pregnant *now*?

Check all that apply

BCB_NSEX
BCB_PREG
BCB_WANT
BCB_HUSB
BCB_INFT
BCB_PAY
BCB_PNOW
BCB_OTH
BCB_WHAT

- ❑ I am not having sex
- ❑ I want to get pregnant
- ❑ I don't want to use birth control
- ❑ My husband or partner doesn't want to use anything
- ❑ I don't think I can get pregnant (sterile)
- ❑ I can't pay for birth control
- ❑ I am pregnant now
- ❑ Other → Please tell us:

_____

60. Since your new baby was born, have you had a postpartum checkup for yourself? (A postpartum checkup is the regular checkup a woman has after she gives birth.)

PPV_CHK

- ❑ No → **Go to Question 62**
- ❑ Yes

61. At that visit, did a doctor, nurse, or other health care worker advise you to take a multivitamin or a prenatal vitamin every day? These are pills that contain many different vitamins and minerals.

PPV_VITM

- ❑ No
- ❑ Yes

The next few questions are about the time during the *12 months before* your new baby was born.

62. During the *12 months before* your new baby was born, what were the sources of your household's income?

Check all that apply

INC_JOB
INC_FAM
INC_DIV
INC5AID
INC5UNEM
INC_ALIM
INC_SS
INC5OTH
INC_SRC

- ❑ Paycheck or money from a job
- ❑ Money from family or friends
- ❑ Money from a business, fees, dividends, or rental income
- ❑ Aid such as Temporary Assistance for Needy Families (TANF), welfare, WIC, public assistance, general assistance, food stamps, or Supplemental Security Income
- ❑ Unemployment benefits
- ❑ Child support or alimony
- ❑ Social security, workers' compensation, disability, veteran benefits, or pensions
- ❑ Other → Please tell us:

_____

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63. During the *12 months before* your new baby was born, what was your total household income before taxes? Include your income, your husband's or partner's income, and any other income you may have used. (All information will be kept private and will not affect any services you are now getting.)

Check one answer

INCOME5

- ❑ Less than $10,000
- ❑ $10,000 to $14,999
- ❑ $15,000 to $19,999
- ❑ $20,000 to $24,999
- ❑ $25,000 to $34,999
- ❑ $35,000 to $49,999
- ❑ $50,000 or more

64. During the *12 months before* your new baby was born, how many people, including yourself, depended on this income?

INC_NDEP

____ People

The next few questions are on a variety of topics.

65. During the *12 months before* you got pregnant with your new baby, did you have a miscarriage, fetal death (baby died before being born), or stillbirth?

MCR_BEFR

- ❑ No
- ❑ Yes

66. During your most recent pregnancy, did you feel you *needed* any of the following services? For each one, circle **Y** (Yes) if you felt you needed the service or **N** (No) if you did not feel you needed the service.

Did you *need*—

		No	Yes
a.	Money to buy food, food stamps, or WIC vouchers	N	Y
b.	Help with an alcohol or drug problem	N	Y
c.	Help to reduce violence in your home	N	Y
d.	Counseling information for family and personal problems	N	Y
e.	Help to quit smoking	N	Y
f.	Help with or information about breastfeeding	N	Y
g.	Other → Please tell us:		

SN_FOOD
SN_DRUG
SN_VIOL
SN_COUN
SN_SMOK
SN_BF
SN_OTH
SN_WHAT

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67. During your most recent pregnancy, did you *receive* any of the following services? For each one, circle **Y** (Yes) if you received the service or **N** (No) if you did not receive the service.

SR_FOOD
SR_DRUG
SR_VIOL
SR_COUN
SR_SMOK
SR_BF
SR_OTH
SR_WHAT

Did you *receive*—

		No	Yes
a.	Money to buy food, food stamps, or WIC vouchers	N	Y
b.	Help with an alcohol or drug problem	N	Y
c.	Help to reduce violence in your home	N	Y
d.	Counseling information for family and personal problems	N	Y
e.	Help to quit smoking	N	Y
f.	Help with or information about breastfeeding	N	Y
g.	Other → Please tell us:		

68a. *Since your new baby was born*, how often have you felt down, depressed, or hopeless?

MH_PPDPR

- ❑ Always
- ❑ Often
- ❑ Sometimes
- ❑ Rarely
- ❑ Never

68b. *Since your new baby was born*, how often have you had little interest or little pleasure in doing things?

MH_PPINT

- ❑ Always
- ❑ Often
- ❑ Sometimes
- ❑ Rarely
- ❑ Never

69. This question is about the care of your teeth during your most recent pregnancy. For each item, circle **Y** (Yes) if it is true or circle **N** (No) if it is not true.

DDS_PROB
DDS_WENT
DDS_TALK

		No	Yes
a.	I needed to see a dentist for a problem	N	Y
b.	I went to a dentist or dental clinic	N	Y
c.	A dental or other health care worker talked with me about how to care for my teeth and gums	N	Y

70. What is today's date?

TOD_MTH, TOD_DAY, TOD_YR4

Month Day Year

File location: K:\DPH\PRAMS\Data Collection-Mail\Survey Questions\English old

Phase 5: 2007 - 2008
PRAMS_WI_11-10_Eng_v1_vars.pdf
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Please use this space for any additional comments you would like to make about the health of mothers and babies in Wisconsin.

Thanks for answering our questions!

Your answers will help us work to make Wisconsin mothers and babies healthier.

November 10, 2006

File location: K:\DPH\PRAMS\Data Collection-Mail\Survey Questions\English old

Please mark your answers. Follow the directions included with the questions. If no directions are presented, check the box next to your answer or fill in the blanks. Because not all questions will apply to everyone, you may be asked to skip certain questions.

BEFORE PREGNANCY

First, we would like to ask a few questions about *you* and the time *before* you got pregnant with your new baby.

1. At any time during the *12 months before* you got pregnant with your new baby, did you do any of the following things? For each item, circle **Y** (Yes) if you did it or circle **N** (No) if you did not.

		No	Yes
PRE_DIET	I was dieting (changing my eating habits) to lose weight	N	Y
PRE_EXER	I was exercising 3 or more days of the week	N	Y
PRE_RX	I was regularly taking prescription medicines other than birth control	N	Y
PRE_DIAB	I visited a health care worker to be checked or treated for diabetes.	N	Y
PRE_HBP	c. I visited a health care worker to be checked or treated for high blood pressure	N	Y
PRE_MH	f. I visited a health care worker to be checked or treated for depression or anxiety	N	Y
PRE_HIST	g. I talked to a health care worker about my family medical history	N	Y
PRE_DDS	h. I had my teeth cleaned by a dentist or dental hygienist	N	Y

2. During the *month before* you got pregnant with your new baby, were you covered by any of these health insurance plans?

Check all that apply

- ❑ Health insurance from your job or the job of your husband, partner, or parents — INSWORK
- ❑ Health insurance that you or someone else paid for (not from a job) — INSPAID
- ❑ Medicaid, BadgerCare or BadgerCare Plus — INSMED
- ❑ TRICARE or other military health care — INSMIL
- ❑ Indian Health Service — INSIHS
- ❑ Other source(s) → Please tell us: — INSOTH

  _____ — INSTYPE
- ❑ I did not have any health insurance before I got pregnant — INSNONE

3. During the *month before* you got pregnant with your new baby, how many times a week did you take a multivitamin, a prenatal vitamin, or a folic acid vitamin?

- ❑ I didn't take a multivitamin, prenatal vitamin, or folic acid vitamin at all — VITAMIN
- ❑ 1 to 3 times a week
- ❑ 4 to 6 times a week
- ❑ Every day of the week

4. *Just before* you got pregnant with your new baby, how much did you weigh?

_____ Pounds **OR** _____ Kilos

MOMLBKGU MOM_LBKG

5. How tall are you without shoes?

MOM_FEET
MOM_INCH
MOM_HTU
Feet ____ Inches

MOM_MTRS
OR ____ Meters

6. What is *your* date of birth?

MDOB_MTH
MDOB_DAY
MDOB_YR4
____ / ____ / 19____
Month Day Year

7. *Before* you got pregnant with your new baby, were you ever told by a doctor, nurse, or other health care worker that you had Type 1 or Type 2 diabetes? This is not the same as gestational diabetes or diabetes that starts during pregnancy.

BPG_DIAB
❑ No
❑ Yes

8. During the *3 months before* you got pregnant with your new baby, did you have any of the following health problems? For each one, circle **Y** (Yes) if you had the problem or circle **N** (No) if you did not.

			No	Yes
HTH_ASMA	a.	Asthma	N	Y
HTH_HBP	b.	High blood pressure (hypertension)	N	Y
HTH_IRON	c.	Anemia (poor blood, low iron)	N	Y
HTH_HRT	d.	Heart problems	N	Y
HTH_SEIZ	e.	Epilepsy (seizures)	N	Y
HTH_THYR	f.	Thyroid problems	N	Y
HTH_MH	g.	Depression	N	Y
HTH_ANX	h.	Anxiety	N	Y

9. *Before* you got pregnant with your new baby, did you ever have any other babies who were born alive?

❑ No → **Go to Question 12**
❑ Yes

PREV_LB

10. Did the baby born *just before* your new one weigh *more* than 5 pounds, 8 ounces (2.5 kilos) at birth?

❑ No
❑ Yes

PREV6NBW

11. Was the baby *just before* your new one born *more* than 3 weeks before his or her due date?

❑ No
❑ Yes

PREV_PRE

The next questions are about the time when you got pregnant with your *new* baby.

12. Thinking back to *just before* you got pregnant with your *new* baby, how did you feel about becoming pregnant?

Check one answer

❑ I wanted to be pregnant sooner
❑ I wanted to be pregnant later
❑ I wanted to be pregnant then
❑ I didn't want to be pregnant then or at any time in the future

FEEL_PG

13. When you got pregnant with your new baby, were you trying to get pregnant?

PREG_TRY

❑ No
❑ Yes → **Go to Question 16**

Go to Question 14

14. When you got pregnant with your new baby, were you or your husband or partner doing anything to keep from getting pregnant? (Some things people do to keep from getting pregnant include not having sex at certain times [natural family planning or rhythm] or withdrawal, and using birth control methods such as the pill, condoms, vaginal ring, IUD, having their tubes tied, or their partner having a vasectomy.)

BC_WHEN4

- ❑ No
- ❑ Yes → **Go to Question 16**

15. What were your reasons or your husband's or partner's reasons for not doing anything to keep from getting pregnant?

Check all that apply

NBC_MIND
NBC_TIME
NBC_SIDE
NBC_GET
NBC_STER
NBC_HUSB
NBC_OTH
NBC_WHY

- ❑ I didn't mind if I got pregnant
- ❑ I thought I could not get pregnant at that time
- ❑ I had side effects from the birth control method I was using
- ❑ I had problems getting birth control when I needed it
- ❑ I thought my husband or partner or I was sterile (could not get pregnant at all)
- ❑ My husband or partner didn't want to use anything
- ❑ Other → Please tell us:

DURING PREGNANCY

The next questions are about the prenatal care you received during your most recent pregnancy. Prenatal care includes visits to a doctor, nurse, or other health care worker before your baby was born to get checkups and advice about pregnancy. (It may help to look at the calendar when you answer these questions.)

16. How many weeks or months pregnant were you when you were *sure* you were pregnant? (For example, you had a pregnancy test or a doctor or nurse said you were pregnant.)

SURE_PGU

____ Weeks **OR** ____ Months

SURE_PG

- ❑ I don't remember

17. How many weeks or months pregnant were you when you had your first visit for prenatal care? Do not count a visit that was only for a pregnancy test or only for WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children).

PNC_1STU

____ Weeks **OR** ____ Months

- ❑ I didn't go for prenatal care → **Go to Page 4, Question 19**

PNC_1ST

PNCNO

Go to Page 4, Question 18

18. Did you get prenatal care as early in your pregnancy as you wanted?

ERLY6PNC

- ❑ No
- ❑ Yes → **Go to Question 20**

19. Did any of these things keep you from getting prenatal care at all or as early as you wanted? For each item, circle **T** (True) if it was a reason that you didn't get prenatal care when you wanted or circle **F** (False) if it was not a reason for you or if something does not apply to you.

		True	False
EP6APPT	a. I couldn't get an appointment when I wanted one	T	F
EP6MONY	b. I didn't have enough money or insurance to pay for my visits	T	F
EP6TRAN	c. I had no transportation to get to the clinic or doctor's office	T	F
EP6START	d. The doctor or my health plan would not start care as early as I wanted	T	F
EP6BUSY	e. I had too many other things going on	T	F
EP6LEAVE	f. I couldn't take time off from work or school	T	F
EP6MEDI	g. I didn't have my Medicaid, BadgerCare or BadgerCare Plus card	T	F
EP6CHLD	h. I had no one to take care of my children	T	F
EP6PREG	i. I didn't know that I was pregnant	T	F
EP6SECRT	j. I didn't want anyone else to know I was pregnant	T	F
EP6PNC	k. I didn't want prenatal care	T	F

If you did not go for prenatal care, go to Question 22.

20. Did any of these health insurance plans help you pay for your *prenatal care*?

Check all that apply

PP_WORK
PP_PAID
PP_MEDIC
PP_MILIT
PP_IHS
PP_OTH
PP_TYPE
PP_NONE

- ❑ Health insurance from your job or the job of your husband, partner, or parents
- ❑ Health insurance that you or someone else paid for (not from a job)
- ❑ Medicaid, BadgerCare or BadgerCare Plus
- ❑ TRICARE or other military health care
- ❑ Indian Health Service
- ❑ Other source(s) → Please tell us:

_____

- ❑ I did not have health insurance to help pay for my prenatal care

21. *During any of your prenatal care visits*, did a doctor, nurse, or other health care worker talk with you about any of the things listed below? *Please count only discussions,* not reading materials or videos. For each item, circle **Y** (Yes) if someone talked with you about it or circle **N** (No) if no one talked with you about it.

		No	Yes	
a.	How smoking during pregnancy could affect my baby	N	Y	TLK_SMK
b.	Breastfeeding my baby	N	Y	TLK_BF
c.	How drinking alcohol during pregnancy could affect my baby	N	Y	TLK_DRK
d.	Using a seat belt during my pregnancy	N	Y	TLK_BELT
e.	Medicines that are safe to take during my pregnancy	N	Y	TLK_MEDS
f.	How using illegal drugs could affect my baby	N	Y	TLK_DRUG
g.	Doing tests to screen for birth defects or diseases that run in my family	N	Y	TLK_BDEF
h.	The signs and symptoms of preterm labor (labor more than 3 weeks before the baby is due)	N	Y	TLK_PRET
i.	What to do if my labor starts early	N	Y	TLK_LABR
j.	Getting tested for HIV (the virus that causes AIDS)	N	Y	TLK_HIVT
k.	What to do if I feel depressed during my pregnancy or after my baby is born	N	Y	TLK_DPRS
l.	Physical abuse to women by their husbands or partners	N	Y	TLK_ABUS

22. At any time during *your most recent* pregnancy or delivery, did you have a test for HIV (the virus that causes AIDS)?

HIVTEST

- ❑ No
- ❑ Yes
- ❑ I don't know

23. During *your most recent* pregnancy, were you on WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children)?

- ❑ No
- ❑ Yes

WIC_PREG

24. During *your most recent* pregnancy, were you told by a doctor, nurse, or other health care worker that you had gestational diabetes (diabetes that started during *this* pregnancy)?

- ❑ No
- ❑ Yes

PG_GDB

25. Did you have any of the following problems during *your most recent* pregnancy? For each item, circle **Y** (Yes) if you had the problem or circle **N** (No) if you did not.

		No	Yes	
a.	Vaginal bleeding	N	Y	MORB_BLD
b.	Kidney or bladder (urinary tract) infection	N	Y	MORB_KID
c.	***Severe*** nausea, vomiting, or dehydration	N	Y	MORB_NAU
d.	Cervix had to be sewn shut (cerclage for incompetent cervix)	N	Y	MORB_CRV
e.	High blood pressure, hypertension (including pregnancy-induced hypertension [PIH]), preeclampsia, or toxemia	N	Y	MORB5BP
f.	Problems with the placenta (such as abruptio placentae or placenta previa)	N	Y	MORB_PLA
g.	Labor pains more than 3 weeks before my baby was due (preterm or early labor)	N	Y	MORB_LAB
h.	Water broke more than 3 weeks before my baby was due (premature rupture of membranes [PROM])	N	Y	MORB_PRM
i.	I had to have a blood transfusion	N	Y	MORB_TRN
j.	I was hurt in a car accident	N	Y	MORB_CAR

The next questions are about smoking cigarettes around the time of pregnancy (before, during, and after).

26. Have you smoked any cigarettes in the *past 2 years*? SMK2YRS

- ❑ No → **Go to Question 30**
- ❑ Yes

27. In the *3 months before* you got pregnant, how many cigarettes did you smoke on an average day? (A pack has 20 cigarettes.) SMK6_3B

- ❑ 41 cigarettes or more
- ❑ 21 to 40 cigarettes
- ❑ 11 to 20 cigarettes
- ❑ 6 to 10 cigarettes
- ❑ 1 to 5 cigarettes
- ❑ Less than 1 cigarette
- ❑ I didn't smoke then

28. In the *last 3 months* of your pregnancy, how many cigarettes did you smoke on an average day? (A pack has 20 cigarettes.) SMK6_3L

- ❑ 41 cigarettes or more
- ❑ 21 to 40 cigarettes
- ❑ 11 to 20 cigarettes
- ❑ 6 to 10 cigarettes
- ❑ 1 to 5 cigarettes
- ❑ Less than 1 cigarette
- ❑ I didn't smoke then

29. How many cigarettes do you smoke on an average day *now*? (A pack has 20 cigarettes.) SMK6_3N

- ❑ 41 cigarettes or more
- ❑ 21 to 40 cigarettes
- ❑ 11 to 20 cigarettes
- ❑ 6 to 10 cigarettes
- ❑ 1 to 5 cigarettes
- ❑ Less than 1 cigarette
- ❑ I don't smoke now

30. Which of the following statements best describes the rules about smoking *inside* your home *now*?

Check one answer

- ❑ No one is allowed to smoke anywhere inside my home → **Go to Question 33** SMK_NWRL
- ❑ Smoking is allowed in some rooms or at some times
- ❑ Smoking is permitted anywhere inside my home

31. Does your husband or partner smoke inside your home? SMK6HUSB

- ❑ No
- ❑ Yes

32. Not including yourself or your husband or partner, does anyone else smoke cigarettes inside your home? SMK6OTH

- ❑ No
- ❑ Yes

The next questions are about drinking alcohol around the time of pregnancy (before, during, and after).

33. Have you had any alcoholic drinks in the *past 2 years*? A drink is 1 glass of wine, wine cooler, can or bottle of beer, shot of liquor, or mixed drink. DRK_2YRS

- ❑ No → **Go to Question 36**
- ❑ Yes

Go to Question 34a

34a. During the *3 months before* you got pregnant, how many alcoholic drinks did you have in an average week?

DRK6_3B

- ❑ 14 drinks or more a week
- ❑ 7 to 13 drinks a week
- ❑ 4 to 6 drinks a week
- ❑ 1 to 3 drinks a week
- ❑ Less than 1 drink a week
- ❑ I didn't drink

then → **Go to Question 35a**

34b. During the *3 months before* you got pregnant, how many times did you drink 4 alcoholic drinks or more in one sitting? A sitting is a two hour time span.

DRK6_3BB

- ❑ 6 or more times
- ❑ 4 to 5 times
- ❑ 2 to 3 times
- ❑ 1 time
- ❑ I didn't have 4 drinks or more in 1 sitting

35a. During the *last 3 months* of your pregnancy, how many alcoholic drinks did you have in an average week?

DRK6_3L

- ❑ 14 drinks or more a week
- ❑ 7 to 13 drinks a week
- ❑ 4 to 6 drinks a week
- ❑ 1 to 3 drinks a week
- ❑ Less than 1 drink a week
- ❑ I didn't drink

then → **Go to Question 36**

35b. During the *last 3 months* of your pregnancy, how many times did you drink 4 alcoholic drinks or more in one sitting? A sitting is a two hour time span.

DRK6_3LB

- ❑ 6 or more times
- ❑ 4 to 5 times
- ❑ 2 to 3 times
- ❑ 1 time
- ❑ I didn't have 4 drinks or more in 1 sitting

Pregnancy can be a difficult time for some women. The next questions are about things that may have happened *before* and *during* your most recent pregnancy.

36. This question is about things that may have happened during the *12 months before* your new baby was born. For each item, circle **Y** (Yes) if it happened to you or circle **N** (No) if it did not. (It may help to look at the calendar when you answer these questions.)

		No	Yes	
a.	A close family member was very sick and had to go into the hospital	N	Y	STRS_FM3
b.	I got separated or divorced from my husband or partner	N	Y	STRS_DV3
c.	I moved to a new address	N	Y	STRS_MOV
d.	I was homeless	N	Y	STRS_HOM
e.	My husband or partner lost his job	N	Y	STRS_JOB
f.	I lost my job even though I wanted to go on working	N	Y	STRS_WRK
g.	I argued with my husband or partner more than usual	N	Y	STRS_ARG
h.	My husband or partner said he didn't want me to be pregnant	N	Y	STRS_PG
i.	I had a lot of bills I couldn't pay	N	Y	STRS_BIL
j.	I was in a physical fight	N	Y	STRS_FT4
k.	My husband or partner or I went to jail	N	Y	STRS_JL3
l.	Someone very close to me had a problem with drinking or drugs	N	Y	STRS_DRG
m.	Someone very close to me died	N	Y	STRS_DH3

37. During the *12 months before* your new baby was born, did you feel emotionally upset (for example angry, sad, or frustrated) as a result of how you were treated *based on your race?*

- ❑ No
- ❑ Yes

RACEBIAS

38. During the *12 months before* you got pregnant with your new baby, did your husband or partner push, hit, slap, kick, choke, or physically hurt you in any other way?

PAB6HUS

- ❑ No
- ❑ Yes

39. During *your most recent* pregnancy, did your husband or partner push, hit, slap, kick, choke, or physically hurt you in any other way?

PAD6HUS

- ❑ No
- ❑ Yes

The next questions are about your labor and delivery. (It may help to look at the calendar when you answer these questions.)

40. When was your baby due?

DUE_MTH
DUE_DAY
DUE_YR4

___ / ___ / 20___
Month Day Year

41. When did you go into the hospital to have your baby?

DEL_MTH
DEL_DAY
DEL_YR4

___ / ___ / 20___
Month Day Year

- ❑ I didn't have my baby in a hospital

42. When was your baby born?

IDOB_MTH
IDOB_DAY
IDOB_YR4

___ / ___ / 20___
Month Day Year

43. When were you discharged from the hospital after your baby was born?

DIS_MTH
DIS_DAY
DIS_YR4

___ / ___ / 20___
Month Day Year

- ❑ I didn't have my baby in a hospital

44. Did any of these health insurance plans help you pay for the *delivery* of your new baby?

Check all that apply

PD_WORK
PD_PAID
PD_MEDIC
PD_MILIT
PD_IHS
PD_OTH
PD_TYPE
PD_NONE

- ❑ Health insurance from your job or the job of your husband, partner, or parents
- ❑ Health insurance that you or someone else paid for (not from a job)
- ❑ Medicaid, BadgerCare or BadgerCare Plus
- ❑ TRICARE or other military health care
- ❑ Indian Health Service
- ❑ Other source(s) → Please tell us:

_____

- ❑ I did not have health insurance to help pay for my delivery

AFTER PREGNANCY

The next questions are about the time since your new baby was born.

45. After your baby was born, was he or she put in an intensive care unit?

INF_ICU

- ❑ No
- ❑ Yes
- ❑ I don't know

46. After your baby was born, how long did he or she stay in the hospital?

LTH_HOSP

- ❑ Less than 24 hours (less than 1 day)
- ❑ 24 to 48 hours (1 to 2 days)
- ❑ 3 to 5 days
- ❑ 6 to 14 days
- ❑ More than 14 days
- ❑ My baby was not born in a hospital
- ❑ My baby is still in the hospital → **Go to Question 49**

47. Is your baby alive now?

INFLIVE5

- ❑ No → **Go to Page 10, Question 59**
- ❑ Yes

48. Is your baby living with you now?

INFWMOM5

- ❑ No → **Go to Page 10, Question 59**
- ❑ Yes

49. Did you ever breastfeed or pump breast milk to feed your new baby after delivery, even for a short period of time?

BF5EVER

- ❑ No
- ❑ Yes → **Go to Question 51**

50. What were your reasons for not breastfeeding your new baby?

Check all that apply

BFI5BSK
BFI5MSK
BFI5CHLD
BFI5HOME
BFI5LIKE
BFI6HARD
BFI6WANT
BFI5EMB
BFI5WORK
BFI5BODY
BFI5OTH
BFI5WHY

- ❑ My baby was sick and was not able to breastfeed
- ❑ I was sick or on medicine
- ❑ I had other children to take care of
- ❑ I had too many household duties
- ❑ I didn't like breastfeeding
- ❑ I tried but it was too hard
- ❑ I didn't want to
- ❑ I was embarrassed to breastfeed
- ❑ I went back to work or school
- ❑ I wanted my body back to myself
- ❑ Other → Please tell us:

If you did not breastfeed your new baby, go to Question 53b.

51. Are you currently breastfeeding or feeding pumped milk to your new baby?

BF5STILL

- ❑ No
- ❑ Yes → **Go to Question 53a**

52. How many weeks or months did you breastfeed or pump milk to feed your baby?

BF5LNGTU
BF5LNGTH

____ Weeks **OR** ____ Months

- ❑ Less than 1 week

53a. How old was your new baby the first time he or she drank liquids other than breast milk (such as formula, water, juice, tea, or cow's milk)?

BF6LIQDU
BF6LIQD

____ Weeks **OR** ____ Months

- ❑ My baby was less than 1 week old
- ❑ My baby has not had any liquids other than breast milk

53b. How old was your new baby the first time he or she ate food (such as baby cereal, baby food, or any other food)?

BF6FOODU
BF6FOOD

____ Weeks **OR** ____ Months

- ❑ My baby was less than 1 week old
- ❑ My baby has not eaten any foods

If your baby is still in the hospital, go to Page 10, Question 59.

46. After your baby was born, how long did he or she stay in the hospital?

LTH_HOSP

- ❑ Less than 24 hours (less than 1 day)
- ❑ 24 to 48 hours (1 to 2 days)
- ❑ 3 to 5 days
- ❑ 6 to 14 days
- ❑ More than 14 days
- ❑ My baby was not born in a hospital
- ❑ My baby is still in the hospital → **Go to Question 49**

47. Is your baby alive now?

INFLIVE5

- ❑ No → **Go to Page 10, Question 59**
- ❑ Yes

48. Is your baby living with you now?

INFWMOM5

- ❑ No → **Go to Page 10, Question 59**
- ❑ Yes

49. Did you ever breastfeed or pump breast milk to feed your new baby after delivery, even for a short period of time?

BF5EVER

- ❑ No
- ❑ Yes → **Go to Question 51**

50. What were your reasons for not breastfeeding your new baby?

Check all that apply

BFI5BSK
BFI5MSK
BFI5CHLD
BFI5HOME
BFI5LIKE
BFI6HARD
BFI6WANT
BFI5EMB
BFI5WORK
BFI5BODY
BFI5OTH
BFI5WHY

- ❑ My baby was sick and was not able to breastfeed
- ❑ I was sick or on medicine
- ❑ I had other children to take care of
- ❑ I had too many household duties
- ❑ I didn't like breastfeeding
- ❑ I tried but it was too hard
- ❑ I didn't want to
- ❑ I was embarrassed to breastfeed
- ❑ I went back to work or school
- ❑ I wanted my body back to myself
- ❑ Other → Please tell us:

If you did not breastfeed your new baby, go to Question 53b.

51. Are you currently breastfeeding or feeding pumped milk to your new baby?

BF5STILL

- ❑ No
- ❑ Yes → **Go to Question 53a**

52. How many weeks or months did you breastfeed or pump milk to feed your baby?

BF5LNGTU
BF5LNGTH

____ Weeks **OR** ____ Months

- ❑ Less than 1 week

53a. How old was your new baby the first time he or she drank liquids other than breast milk (such as formula, water, juice, tea, or cow's milk)?

BF6LIQDU
BF6LIQD

____ Weeks **OR** ____ Months

- ❑ My baby was less than 1 week old
- ❑ My baby has not had any liquids other than breast milk

53b. How old was your new baby the first time he or she ate food (such as baby cereal, baby food, or any other food)?

BF6FOODU
BF6FOOD

____ Weeks **OR** ____ Months

- ❑ My baby was less than 1 week old
- ❑ My baby has not eaten any foods

If your baby is still in the hospital, go to Page 10, Question 59.

54. In which *one* position do you *most often* lay your baby down to sleep now?

Check one answer

SLEEPPOS

- ❑ On his or her side
- ❑ On his or her back
- ❑ On his or her stomach

55. How often does your new baby sleep in the same bed with you or anyone else?

SLEEPBED

- ❑ Always
- ❑ Often
- ❑ Sometimes
- ❑ Rarely
- ❑ Never

56. Was your new baby seen by a doctor, nurse, or other health care worker for a *one week check-up* after he or she was born?

DR_1WK

- ❑ No
- ❑ Yes

57. Has your new baby had a well-baby checkup? (A well-baby checkup is a regular health visit for your baby usually at 1, 2, 4, and 6 months of age.)

WBC_HAD

- ❑ No → **Go to Question 59**
- ❑ Yes

58. Has your new baby gone as many times as you wanted for a well-baby checkup?

WBC_ENUF

- ❑ No
- ❑ Yes

59. Are you or your husband or partner doing anything *now* to keep from getting pregnant? (Some things people do to keep from getting pregnant include not having sex at certain times [natural family planning or rhythm] or withdrawal, and using birth control methods such as the pill, condoms, vaginal ring, IUD, having their tubes tied, or their partner having a vasectomy.)

BC_NOW4

- ❑ No
- ❑ Yes → **Go to Question 61**

60. What are your reasons or your husband's or partner's reasons for not doing anything to keep from getting pregnant *now*?

Check all that apply

BCB_NSEX
BCB_PREG
BCB_WANT
BCB_HUSB
BCB_INFT
BCB_PAY
BCB_PNOW
BCB_OTH
BCB_WHAT

- ❑ I am not having sex
- ❑ I want to get pregnant
- ❑ I don't want to use birth control
- ❑ My husband or partner doesn't want to use anything
- ❑ I don't think I can get pregnant (sterile)
- ❑ I can't pay for birth control
- ❑ I am pregnant now
- ❑ Other → Please tell us:

61. *Since your new baby was born*, have you had a postpartum checkup for yourself? (A postpartum checkup is the regular checkup a woman has about 6 weeks after she gives birth.)

- ❑ No → **Go to Question 63**
- ❑ Yes

PPV_CHK

62. At that visit, did a doctor, nurse, or other health care worker advise you to take multivitamins, prenatal vitamins, or folic acid vitamins?

PPV_VITM

- ❑ No
- ❑ Yes

63. Below is a list of feelings and experiences that women sometimes have after childbirth. Read each item to determine how well it describes your feelings and experiences. Then, write on the line the number of the choice that best describes how often you have felt or experienced things this way *since your new baby was born*. Use the scale when answering:

1 Never	2 Rarely	3 Sometimes	4 Often	5 Always

PP_SAD
PP_NHOPE
PP_SLOW

a. I felt down, depressed, or sad. . . ___
b. I felt hopeless . . . . . ___
c. I felt slowed down . . . . . ___

OTHER EXPERIENCES

The next questions are on a variety of topics.

64. During the *12 months before* you got pregnant with your new baby, did you have a miscarriage, fetal death (baby died before being born), or stillbirth?

MCR_BEFR

❑ No
❑ Yes

65. During *your most recent* pregnancy, did you feel you *needed* any of the following services? For each one, circle **Y** (Yes) if you felt you needed the service or circle **N** (No) if you did not feel you needed the service.

Did you *need*—

		No	Yes	
a.	Food stamps, WIC vouchers or money to buy food	N	Y	SN_FOOD
b.	Counseling information for family and personal problems.	N	Y	SN_COUN
c.	Help to quit smoking.	N	Y	SN_SMOK
d.	Help to reduce violence in your home	N	Y	SN_VIOL
e.	Other	N	Y	SN_OTH
	Please tell us:			SN_WHAT

66. During *your most recent* pregnancy, did you *receive* any of the following services? For each one, circle **Y** (Yes) if you received the service or circle **N** (No) if you did not receive the service.

Did you *receive*—

		No	Yes	
a.	Food stamps, WIC vouchers or money to buy food	N	Y	SR_FOOD
b.	Counseling information for family and personal problems.	N	Y	SR_COUN
c.	Help to quit smoking.	N	Y	SR_SMOK
d.	Help to reduce violence in your home	N	Y	SR_VIOL
e.	Other	N	Y	SR_OTH
	Please tell us:			SR_WHAT

67. This question is about the care of your teeth during your *most recent* pregnancy. For each item, circle **Y** (Yes) if it is true or circle **N** (No) if it is not true.

DDS_PROB
DDS_WENT
DDS_TALK

		No	Yes
a.	I needed to see a dentist for a problem	N	Y
b.	I went to a dentist or dental clinic	N	Y
c.	A dental or other health care worker talked with me about how to care for my teeth and gums	N	Y

The last questions are about the time during the *12 months before* your new baby was born.

68. During the *12 months before* your new baby was born, what was your yearly total household income before taxes? Include your income, your husband's or partner's income, and any other income you may have received. (All information will be kept private and will not affect any services you are now getting.)

INCOME5

- ❑ Less than $10,000
- ❑ $10,000 to $14,999
- ❑ $15,000 to $19,999
- ❑ $20,000 to $24,999
- ❑ $25,000 to $34,999
- ❑ $35,000 to $49,999
- ❑ $50,000 or more

69. During the *12 months before* your new baby was born, how many people, *including yourself*, depended on this income?

INC_NDEP

____ People

70. What is today's date?

TOD_MTH
TOD_DAY
TOD_YR4

____ / ____ / 20____
Month Day Year

Please use this space for any additional comments you would like to make about the health of mothers and babies in Wisconsin.

Thanks for answering our questions!

Your answers will help us work to make Wisconsin mothers and babies healthier.

December 19, 2008

APPENDIX C: DATA APPLICATION

State of Wisconsin

Department of Health Services

Division of Public Health

Wisconsin Vital Records and Wisconsin PRAMS Project

APPLICATION FOR ACCESS TO WISCONSIN PREGNANCY RISK ASSESSMENT MONITORING SYSTEM DATA WITH SELECTED BIRTH RECORD VARIABLES

This application is to be used to request access to Wisconsin PRAMS (Pregnancy Risk Assessment Monitoring System) data files which contain individual records for birth mothers who participated in the PRAMS study. Each individual record includes selected information from both the birth certificate and PRAMS survey responses provided by the participating mother, in linked records.

Wisconsin PRAMS data sets include all mothers who were sampled and who responded to the survey. Nonrespondents are not included. The data set year refers to the year in which the birth occurred. The data set includes a case weight; when the data are correctly weighted, analysis results are representative of all Wisconsin residents who gave birth in Wisconsin during one calendar year, excluding adoptions, Safe Haven (Act 2), foundling, and surrogate births.

Contact the staff person listed on the last page for additional information about the data set.

Wisconsin Vital Records and Wisconsin Pregnancy Risk Assessment Monitoring System (PRAMS) require information concerning your request. Some parts of birth records are confidential by law. Releasing the information may cause harm or violate an individual's rights. The State Registrar is authorized to allow the use of identifiable confidential data for specific purposes provided the proper confidentiality and data security safeguards are observed.

The information requested in this Application enables Wisconsin Vital Records and Wisconsin PRAMS to assist you in clarifying exactly which data items are required. Our staff is acquainted with the data collection and data definition process. They can inform you of built-in biases that may not be evident, or of other items which may supplement or better meet your needs. The information requested helps us to clarify your expectations. This prevents misunderstandings concerning your request and avoids disputes over costs for producing data which may not meet your expectations. It also allows us to determine if you are eligible, under ss: 69, to access confidential data for your research.

If this application is approved or approved with modification, you and all individuals with access to the data will be required to read, sign and adhere to a confidentiality/data use agreement. In addition, the approval is for the stated research project only and any additional use of the data (even by the same researchers) is prohibited. You must reapply to use the data for a different study or an expansion of the proposed study. Contact the staff person listed on last page for more information. Note: If you require aggregate data only, please stop and contact the staff person listed on the last page.

If this application is approved, you will be provided with an estimate of the charges to cover the costs of data set preparation.

Requests for PRAMS data from states other than Wisconsin should be directed to those states. Requests for PRAMS data from multiple states should go to the Centers for Disease Control and Prevention. More information is available from the staff person listed on the last page of this application.

Date of Application June 8, 2012

PRINCIPAL INVESTIGATOR (attach resume or cv)

Name and Title Trina C. Salm Ward, MSW Dissertator

Mailing Address (not PO Box) 3230 E Kenwood Blvd, Rm 221 Milwaukee, WI 53211

Institution University of Wisconsin-Milwaukee

E-Mail Address tsalm@uwm.edu

Telephone (414) 229-5155 Extension _____ Fax # (414) 229-3943

Affiliation (organization/institution name and address)
University of Wisconsin-Milwaukee College of Health Sciences (address above)

PROJECT DESCRIPTION

PROJECT TITLE: Factors Associated with Bed-Sharing Within a Racial Groups in a Sample of Mothers and Young Infants in Wisconsin

Intended Project Start Date: 6-1-2012

Intended Project Completion Date: 12-31-13

1. List the principal purposes of your project. What are the goals and research questions or hypotheses to be addressed? (attach additional sheets when necessary)

   See attached.

2. Explain the importance of your project, specifying how it will contribute to public health, add to the research literature, or make other important contributions. (attach additional sheets when necessary)

   See attached.

3. Describe your analytic plan and methods. Describe the types of statistical analysis you plan to use. Identify the statistical software package or program you plan to use. Note: PRAMS has a stratified sampling scheme necessitating use of analytic software that can apply case weights and conduct appropriate statistical tests. (SAS, SUDAAN, SPSS or STATA are preferred.) (attach additional sheets when necessary)

   See attached.

4. Has this project/study been reviewed by an Institutional Review Board? X Yes ____ No

   If yes, please indicate the name of the committee(s), institution(s), the decision(s) reached, the date of the review and whether the IRB is federally certified. Please attach a copy of the application and decision. (attach additional sheets when necessary)

[redacted]

If no, please indicate why an Institutional Review Board review has not been sought.
The project was reviewed by the University of Wisconsin-Milwaukee Institutional Review Board (FWA00006171) and determined exempt on 5/2/12. A copy of application is attached.

5. Are you conducting this research while you are a student, or do you anticipate that work on this project will result in the awarding of a degree or course credit?

____ No: go to item 6.

__X__ Yes:

Name of institution University of Wisconsin-Milwaukee

Name & Department Affiliation of Primary Faculty Advisor

Mary Kay Madsen, Ph.D., R.N.

College of Health Sciences

Research is expected to result in
Degree awarded Ph.D.
Credits awarded _____
Other (explain) _____

Note: Be sure to indicate the value of this research, beyond the personal value to you, in item 2.

6. List all data sources and/or data sets that will be used in your project. Indicate why PRAMS is a good source of data for your research. (attach additional sheets when necessary)

See attached.

7. Will any linkage of individual records occur across data sets?

__X__ No linkage with other data sets will occur. If intentions change, you must submit a new application.

____ Linkage only of aggregate data with the following data sets is intended.

____ Linkage of individual records with the following data sets is intended.

If linkage is planned, please **describe in detail**: (attach additional sheets when necessary)

a) What data sets will be involved ?

b) Describe the purpose for each linkage.

c) List the specific variables and how you are planning to use them for linkage from each data set.

d) Include a flow chart that explains the proposed linkage process. The flow chart(s) should illustrate what files will be linked, what (if any) new data sets will be created, when identifiers will be removed, etc.

[redacted]

e) Attach a letter of agreement from institution(s) and/or programs whose data set(s) will be linked.

8. Indicate the PRAMS data set years you wish to access. Currently, 2007 - 2008 (Phase 5) and 2009 - 2010 (Phase 6) are available.
2007-2008 and 2009-2010

9. Indicate the geographic region for requested records.
__X__ Entire state
_____ Other (specify) _____

Reason for sub-state selection of records:

10. Indicate your request for a standard or non-standard data set.
__X__ I request the standard PRAMS Research File data set with nonconfidential birth record variables as defined by CDC/PRAMS. (See separate document for list of variables in the PRAMS Research File.)
_____ I request the standard PRAMS Research File data set and additional variables specified in item #11. Note: This request may require additional review or a new application.
_____ I request a non-standard PRAMS Research File consisting of variables listed in #11. Note: This request may require additional review or a new application.

11. Indicate the additional variables you are requesting and specify which values are required.
(attach additional sheets when necessary)

12. Provide a short justification for each variable identified in the previous question. Include how the variable will be used in the analysis. Indicate how each variable will be used to address specific research questions or hypotheses described in your analytic plan and what groups of variables will be used in different parts of your analyses. (*For example*: "Differences in low birth weight (LBW) among sub-groups of Asian women will be investigated using regression analysis. Therefore, the variables race, ethnicity, mother's birth place, and birth weight are needed. The literature indicates that LBW varies by maternal age and plurality; thus, those variables are requested. Maternal age in five-year age groups is satisfactory. Education varies among sub-groups of Asian women and is related directly to age and must be accounted for in the analysis. Therefore, all mother's education variables are requested.) (attach additional sheets when necessary)

13. Indicate the way in which you would like to receive the data file.
__X__CD/ROM

____I will provide URL and password for secure file download site.

14. Data will be provided in PC_SAS format.

15. Describe the security and storage protection mechanisms to be used in your project. How will individual record data obtained through this application be stored and maintained? Specifically describe the

[redacted]

mechanisms for insuring that data will not be re-released or copied and for limiting access to individuals named in this application. Within one (1) year of the end of the project, the State-provided data will be destroyed by the recipient unless a written extension is obtained from the PRAMS Project Coordinator (listed on last page of this document). The recipient shall provide a certificate of data destruction to the PRAMS Project Coordinator within 30 days of the final destruction date. (attach additional sheets when necessary)

See attached.

16. Name the individuals who will require access to the individual-record data. All individuals named in this application as having access to these data will be required to sign the written confidentiality/data use agreement.

Name	Position	Institution
Trina Salm Ward, MSW	Dissertator	UW-Milwaukee
Susan E. Cashin, PhD	Statistician	UW-Milwaukee
Emmanuel Ngui, PhD	Faculty Advisor	UW-Milwaukee

*Please see note on attached sheet.

17. Will the results of your study/project be published or presented at a meeting?

____ Results will not be published or presented.
__X__ Results will be published or presented. Please describe.

See attached.

A review by Wisconsin PRAMS and Vital Records will be required prior to submission for publication in accordance with the confidentiality/data use agreement.

With my signature, I stipulate that to the best of my knowledge all the information provided is accurate and I will notify the PRAMS Project Coordinator if any changes occur. I also understand that there will be charges for all data requests and I will be provided with an estimate.

Signature_____ Title Dissertator

Date June 8, 2012

Please submit electronically with electronic signature to: kim.gonzalez@wisconsin.gov
OR return the completed application materials by mail or fax to:

Kim González
PRAMS Data Manager
Department of Health Services
Division of Public Health
1 West Wilson Street
P.O. Box 2659
Madison, WI 53701-2659

Telephone: 608-266-0377
Fax: 608-266-2431

Updated May 15, 2012

[redacted]

Wisconsin Dept. of Health Services Application for Access to Wisconsin PRAMS
Additional Sheet for Responses
Trina Salm Ward
June 8, 2012

1. **List the principal purposes of your project. What are the goals and research questions or hypotheses to be addressed?**

The purpose of this study is to examine the determinants of bed-sharing (BS) for African-Americans and Whites. Specific aims: (1) Determine the relationship between race and BS; (2) Examine the determinants of BS for African-Americans and Whites separately; and (3) Determine the relationship between BS and sleep position in African-Americans and Whites.

2. **Explain the importance of your project, specifying how it will contribute to public health, add to the research literature, or make other important contributions.**

This project is a unique contribution to public health in several ways.

First, it addresses three important gaps in the current literature: (1) examination of the factors associated with bed-sharing by race, (2) timing of the data collection, and (3) mixed findings on the relationship between bed-sharing and infant sleep position, especially among different racial groups. These gaps are described in more detail in the attached dissertation proposal (see "Gaps in the Literature on Bed-Sharing").

Second, I propose to focus specifically on Wisconsin, an environment conducive to examining racial differences in bed-sharing behaviors. With a disparity ratio of 2.93, Wisconsin ranks as one of the states with the highest racial disparities in IMR, tying for fifth place among all states (Mathews & MacDorman, 2011). Racial disparities in birth outcomes have been a strong focus for the state, most recently through their Statewide Advisory Committee on Eliminating Racial and Ethnic Disparities in Birth Outcomes (WDHS SAC, 2011). In addition to disseminating study results in national journals and at professional meetings, I also anticipate disseminating results through local presentations in an effort to help develop an understanding of bed-sharing here in Wisconsin.

Third, these study findings have the potential to inform development of culturally competent education for families on the risks of bed-sharing that has been called for by many (Hall & Volpe, 2012; Sobralske & Gruber, 2009; Aslam, Kemp, Harris & Gilbert, 2009; Fu, et al., 2008; Johnston & Johnston, 2008; Horsley, et al., 2007; Blanchard & Vermilya, 2007; van Wouwe & HiraSing, 2006). A first step in designing such a culturally sensitive intervention is to determine the characteristics of the target population (Hall & Volpe, 2012). This study is the first step in identifying race-specific factors associated with bed-sharing among African-American and White mothers with young infants in Wisconsin. Ball and Volpe (2012) note that such approaches can help to "engage communities in discussion about how bed-sharing can be conducted more safely, without alienating the target community by attacking a culturally-valued behavior," (p. 6).

3. **Describe your analytic plan and methods. Describe the types of statistical analysis you plan to use. Identify the statistical software package or program you plan to use.**

Data analysis will take into account the weighting of the dataset and will involve exploratory descriptive statistics, and logistic regression to identify significant factors associated with bed-sharing. SPSS's Complex Samples Module will be used for all analyses, using the CDC's guidance provided at: http://www.cdc.gov/prams/PDF/PRAMSetup-SUDAAN_SAS_SPSS_STATA.pdf. Extensive data screening will be conducted prior to running statistical analyses. Additionally, I will consult with Drs. Susan Cashin and Emmanuel Ngui, both of whom have experience working with

complex datasets, as well as Ms. Farrin Bridgewater, a Master's Student in Educational Psychology (specializing in statistics and measurement) at the University of Wisconsin-Milwaukee who has completed coursework in statistical analysis.

6. **List all data sources and/or data sets that will be used in your project. Indicate why PRAMS is a good source of data for your research.**

This project will utilize the PRAMS dataset only. PRAMS is a good source of data because of the timing of data collection (post-2005); the random, stratified sampling frame, and it is the only known representative dataset in Wisconsin which includes a question about bed-sharing as well as access to a broad range of other variables.

15. **Describe the security and storage protection mechanisms to be used in your project. How will individual record data obtained through this application be stored and maintained?**

The CD/ROM will be stored in a locked file cabinet in my office on campus. The electronic data file will be stored on one or more password-protected computers. Within one year of completion of the project, the electronic version will be deleted and the CD/ROM will be destroyed in a fashion that would prevent obtaining data off of it.

16. Additional Note: All of the individuals named above will have access to these data for the purposes of serving as consultants on my project, and will all sign the written confidentiality/data use agreement.

17. I plan to present results at national meetings such as the American Public Health Association, and publish results in a peer-reviewed journal.

APPENDIX D: DATA USE AGREEMENT

CONFIDENTIALITY / DATA USE AGREEMENT

BETWEEN THE

WISCONSIN DEPARTMENT OF HEALTH SERVICES
Division of Public Health
Pregnancy Risk Assessment Monitoring System Project

AND

Trina Salm Ward, MSW
Doctoral Candidate, College of Health Sciences, University of Wisconsin-Milwaukee
Dissertation Topic:
Factors Associated with Bed-Sharing Within Racial Groups in a Sample of Mothers and Young Infants in Wisconsin

FOR RELEASE OF

Wisconsin 2007-2008 Pregnancy Risk Assessment Monitoring System
Standard Research Data File

Date Prepared
6/29/12

I. PARTIES

The parties to this agreement are the Wisconsin Department of Health Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System Project (hereinafter referred to as "PRAMS Project") and Trina Salm Ward, MSW, Doctoral Candidate, College of Health Sciences, University of Wisconsin-Milwaukee (hereinafter referred to as the "recipient").

II. PURPOSE

The purpose of this agreement is to allow access to a data set of individual records collected by the PRAMS Project, for research purposes. The purpose of this dissertation project is to examine the determinants of bed-sharing (BS) for African-Americans and Whites. Specific aims: (1) Determine the relationship between race and BS; (2) Examine the determinants of BS for African-Americans and Whites separately; and (3) Determine the relationship between BS and sleep position in African-Americans and Whites.

This agreement directly corresponds to the "Application for Access to Pregnancy Risk Assessment Monitoring System Data with Linked Birth Data," dated 06/08/2012 that was submitted by the recipient. The dissertation project title in this application is "Factors Associated with Bed-Sharing Within Racial Groups in a Sample of Mothers and Young Infants in Wisconsin" (hereinafter referred to as the "Bed-Sharing Dissertation Project"). The Application is incorporated by reference into this agreement. The recipient is identified as the Principal Investigator in this Application. This agreement is for this stated research project only and any additional use of this data in any form other than this project is prohibited without further authorization.

III. DESCRIPTION OF DATA REQUESTED

The PRAMS Project staff will provide a standard PRAMS Research Data File to the recipient.
The following birth year(s) will be included in the file: 2007, 2008.
Each record in the file will contain the variables listed in **Attachment A**.
The data will be in the SAS format.

IV. AGREEMENT COORDINATORS

The PRAMS Project designates Kim González as the PRAMS Project Agreement Coordinator, assigned to act as communications contact between the PRAMS Project and the recipient. The PRAMS Project Agreement Coordinator will coordinate communications regarding data sharing, and any amendments and attachments to this agreement. See **Attachment E** for contact information. The PRAMS Project may assign these roles and duties to other staff members at any time.

The recipient designates Trina Salm Ward, Doctoral Candidate, as the Bed-Sharing Dissertation Project Agreement Coordinator, assigned to coordinate and administer amendments and attachments to this agreement, coordinate requests for data and

information in accordance with this agreement, and investigate all questionable or unauthorized use of the data and report it to the PRAMS Project Agreement Coordinator. The Bed-Sharing Dissertation Project Agreement Coordinator has overall responsibility for data safeguarding, insures that data will not be re-released or copied, and limits access only to individuals who have read this agreement and signed the confidentiality statement in **Attachment B**.

V. DATA CONFIDENTIALITY

The recipient, the Bed-Sharing Dissertation Project Agreement Coordinator, and all staff listed in Attachments B and D shall treat all data as confidential information. Release of any combination of elements that would produce identifiable data is prohibited. Failure to provide security for this data may result in termination of this agreement, loss of access to PRAMS data for the recipient and/or the recipient's organization in the future, or any applicable civil or criminal penalties.

VI. PROTECTION AGAINST UNAUTHORIZED USE, ACCESS OR DISCLOSURE

The recipient agrees to comply with the following measures to protect the data and data file(s) provided under this agreement against unauthorized access or disclosure:

A. The data and data file(s) subject to this agreement shall be used only for the purpose stated in Section II and only to the extent necessary to assist in the valid research and analysis needs of the recipient.

B. Only persons who have read this agreement and signed **Attachment B** or **Attachment D** of this Confidentiality/Data Use Agreement shall have access to the data and data files (this includes persons who have access to aggregate data). By reading this agreement and by their signature in Attachment B or Attachment D, they agree to abide by these restrictions. In addition, by his/her signature to this Agreement, the recipient guarantees that all of the recipient's staff will abide by the confidentiality restrictions set forth in this agreement.

C. No one with access to data covered by this agreement may share, disclose or release any data that identifies or contributes to the identification of individuals. These data shall be used only for the specific research project outlined in Section II and are not to be used by anyone involved in the research project for any personal use/gain such as dissertation work. In addition, if information is requested from the recipient via the Open Records Law, the recipient cannot release the information and must refer the requester to the PRAMS Project Agreement Coordinator.

D. Any follow-back (contact), including direct marketing, to subjects, families, relatives or providers is strictly prohibited.

E. No linking of the data covered by this agreement is permitted, unless linking is specifically described in Section II. If linking is involved, the recipient must have

authorization on file from any organizations or programs whose data is intended for linking.

F. The data covered by this agreement, when stored on any media, including but not limited to diskettes, compact disc (CD), digital versatile disc (DVD), and hardcopy, shall be stored in a locked, secure location. Access to the locked, secure location in which the data covered by this agreement are stored may be granted only to staff authorized by the recipient as defined in paragraph VI.B.

G. The data covered by this agreement, when stored on electronic media, including but not limited to diskettes, hard disks, CDs, and DVDs, shall be password protected. Only staff authorized by the recipient as defined in paragraph VI.B shall know the password.

H. Any presentations, reports, and research articles, or drafts of any of these, which are based on data covered by this agreement may present data in aggregate form only. No individual-level data may be included in any presentation or report.

I. No aggregate information that would enable the direct or indirect identification of an individual may be published.

J. All oral or written presentations and reports resulting from analysis of these data will include a statement of credit similar to this: "Wisconsin Pregnancy Risk Assessment Monitoring System (PRAMS) data were collected and provided by the PRAMS Project in the Division of Public Health, Wisconsin Department of Health Services. The Centers for Disease Control and Prevention Cooperative Agreement grant number UR6/DP000492 provided funding for data collection and some staff support. We also acknowledge the PRAMS Working Group." Each data table in a presentation or report will include this text, at the bottom of the table: "Source: Wisconsin PRAMS 2007-2008. Data file provided by Wisconsin Department of Health Services." Recipient may add other information to this source.

K. A review by PRAMS staff is required prior to presenting any oral or written reports or presentations. PRAMS staff will provide comments within two weeks of receiving the report or presentation.

L. The recipient will destroy all files and media of any type containing PRAMS data on or before a year from the date of receipt of such data, unless a written extension is obtained from the PRAMS Project Data Use Agreement Coordinator. The recipient shall provide a signed letter of destruction to the PRAMS Project Agreement Coordinator within 30 days of the final destruction date.

M. If the recipient requests identical data in the future utilizing a different year of birth data, a new Confidentiality/Data Use Agreement will be drawn up and provided to the recipient for new staff signatures. The recipient's Agreement Coordinator should contact the PRAMS Agreement Coordinator to request the new data.

N. Discussion that reveals potentially identifying information shall be limited to persons with authorized access to these data. Care will be taken to ensure that unauthorized

persons cannot overhear discussions or telephone conversations that include potentially identifying information.

O. The recipient's internal standards and disciplinary procedures will also apply to the data covered by this agreement.

VII. STAFF ACKNOWLEDGEMENT

The recipient attests that all staff with access to the data and data files covered under this agreement have read and signed this agreement. Staff will be required to adhere to the policies and procedures of the recipient regarding data confidentiality and security. The confidentiality, use, access and disclosure requirements of this agreement survive if the recipient terminates employment.

A list with names and signatures of all the recipient's staff (including but not limited to contractors/subcontractors, limited term staff, students, and unpaid personnel) with access to these data must be submitted with the signed agreement in Attachment B. Additionally, whenever a staff member leaves the Bed-Sharing Dissertation Project, the Agreement Coordinator must submit the name of that staff member whose access to PRAMS data has been terminated on **Attachment C**. Any new staff (including but not limited to contractors/subcontractors, limited term staff, and unpaid personnel) working for the recipient who will be utilizing PRAMS data must read this Confidentiality/Data Use Agreement, agree to adhere to it and sign Attachment D indicating that they agree to all confidentiality and security requirements. Attachment D should be sent to the PRAMS Agreement Coordinator before utilizing the data.

VIII. TERM

The confidentiality and disclosure requirements of this agreement survive the termination, for whatever reason, of the agreement itself, subject to applicable state and federal statutes and administrative rules.

This agreement may be terminated by the PRAMS Project at any time, without advance notice, if any terms of the agreement are violated. The PRAMS Project may also terminate this agreement, without cause, if the PRAMS Project provides written notice of the termination to the recipient 14 days in advance of the termination.

IX. AMENDMENT OF THIS AGREEMENT

All or part of this agreement may be amended at any time by written agreement signed by the recipient (Principal Investigator) and by the PRAMS Project Director. It is acknowledged that this agreement is subject to federal and state statutes and administrative rules, which may change. If applicable state or federal statutes and/or administrative rules change, this agreement will be considered immediately modified in accordance with each such change, without notice or written amendment.

X. PENALTIES FOR VIOLATION OF AGREEMENT

In addition to any potential civil and/or criminal penalties which may result from violation of any of the terms of this agreement, the PRAMS Project may demand and obtain the return of all media and copies of media containing data covered by this agreement. In addition, violation of this agreement may cause the recipient to lose all access to any future Wisconsin PRAMS data.

XI. INDEMNIFICATION AND HOLD HARMLESS

In the event of any third-party civil action based in whole or in part on a cause of action for damages resulting from the improper use or disclosure of the data covered by this agreement supplied to the recipient by the Division of Public Health, the recipient agrees to indemnify and hold the Division of Public Health or its successors harmless from any damages resulting from such claim.

XII. CHARGES INCURRED

The recipient agrees to pay an invoice from the Division of Public Health for reasonable charges incurred in this project. Charges for this project will be based on the following rates:

Data Set: $55.00 for the each data year

Data set charges include per-record fees paid to Vital Records.

Also required is a completed, useful product based on your analysis of PRAMS data, such as a report or a PowerPoint presentation.

An estimate of data request charges at the time this agreement was drawn up can be found in Attachment E.

This estimate includes charges for one hour of consultation with PRAMS Project staff, for assistance in using and understanding the data file. This consultation may take place in person, on the telephone, or by email.

Any consultation beyond one hour of time will be charged in a separate invoice at the rate of $100.00 per hour.

XIII. AUTHORIZING SIGNATURES

I have read the Confidentiality/Data Use Agreement between the Wisconsin Department of Health Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System Project, and Trina Salm Ward, Doctoral Candidate, College of Health Sciences, University of Wisconsin-Milwaukee, providing the terms of access to 2007 and 2008 individual PRAMS data. By my signature, I guarantee that the Bed-Sharing Dissertation Project staff, including myself, employees, contractors/subcontractors, limited term staff, students, and unpaid personnel will abide by all terms of this agreement.

Trina Salm Ward, MSW, Doctoral Candidate, College of Health Sciences, University of Wisconsin-Milwaukee
PO Box 413
Milwaukee, WI 53210-0413

Trina Salm Ward _____ 6/29/12

Trina Salm Ward, MSW, Principal Investigator — Date
Bed-Sharing Dissertation Project
College of Health Sciences Doctoral Program,
University of Wisconsin-Milwaukee

Wisconsin Department of Health Services
Division of Public Health
PRAMS Project

_____ _____

Katherine Kvale, Ph.D., PRAMS Project Director — Date

ATTACHMENT A

See the separate attachment
Included Variables 07_08.pdf

ATTACHMENT B

Staff Listing

Bed-Sharing Dissertation Project

Following is a list of staff, contractors/subcontractors, limited term staff, students, unpaid personnel, and all others of the Bed-Sharing Project who have access to Wisconsin PRAMS data and data files. By signing this page, these staff attest that they have read the Confidentiality/Data Use Agreement between the PRAMS Project and the Bed-Sharing Project and by their signature have agreed to abide by all terms of this agreement. If any additional staff is added, the Bed-Sharing Project Agreement Coordinator will ensure that they have read this agreement in its entirety and agreed to abide by all terms of the agreement. The Bed-Sharing Project Agreement Coordinator will forward to the PRAMS Project Agreement Coordinator a list of names and signatures of those additional staff before they utilize the PRAMS data (see Attachment D).

Name *(please print)*	Position	Signature	Date
Susan Cashin, PhD	Statistician/Faculty Advisor		6/30/12
Emmanuel Ngui, DrPH	Faculty Advisor		6/29/12

ATTACHMENT C

Authorization to Terminate Staff Access

I authorize the termination of access by _____ to
(print staff name)

the Wisconsin PRAMS Project data and data files, effective immediately.

_____ _____
Trina Salm Ward, Doctoral Candidate, Agreement Coordinator Date
Bed-Sharing Dissertation Project
University of Wisconsin-Milwaukee College of Health Sciences
PO Box 413
Milwaukee, WI 53201-0413

ATTACHMENT D

New Staff Authorization

Bed-Sharing Dissertation Project

I have read the Confidentiality/Data Use Agreement between the Department of Health Services, Division of Public Health, PRAMS Project and the Bed-Sharing Dissertation Project, providing all terms of access to Wisconsin PRAMS data files. By my signature, I agree that I will abide by all terms of this agreement.

_____ _____
Signature Date

_____
Printed Name

_____ _____
Signature
Trina Salm Ward, Doctoral Candidate, Agreement Coordinator Date
University of Wisconsin-Milwaukee College of Health Sciences
PO Box 413
Milwaukee WI 53201-0413

This form should be completed before the staff utilizes any data. It should be mailed immediately to:

Kim González
PRAMS Project Agreement Coordinator
DPH, Room 172
PO Box 2659
Madison, WI 53701

ATTACHMENT E

Estimate of Charges for
Wisconsin PRAMS Research Data File
2007-2008

Bed-Sharing Dissertation Project
Date of Estimate: 06/27/2012
Estimate is valid for three months.

Charges:

Dataset per year charge	= $55.00
Support time: one hour	= Included
TOTAL ESTIMATE	= $110.00

An invoice will be mailed separately.

Estimate Provided by:

Kim González
PRAMS Project Agreement Coordinator
DPH, Room 172
PO Box 2659
Madison, WI 53701

Phone: 608-266-0377
E-Mail: kim.gonzalez@wisconsin.gov

CONFIDENTIALITY / DATA USE AGREEMENT

BETWEEN THE

WISCONSIN DEPARTMENT OF HEALTH SERVICES
Division of Public Health
Pregnancy Risk Assessment Monitoring System Project

AND

Trina Salm Ward, MSW
Doctoral Candidate, College of Health Sciences, University of Wisconsin-Milwaukee
Dissertation Topic:
Factors Associated with Bed-Sharing Within Racial Groups in a Sample of Mothers and Young Infants in Wisconsin

FOR RELEASE OF

Wisconsin 2009-2010 Pregnancy Risk Assessment Monitoring System
Standard Research Data File

Date Prepared
6/29/12

I. PARTIES

The parties to this agreement are the Wisconsin Department of Health Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System Project (hereinafter referred to as "PRAMS Project") and Trina Salm Ward, MSW, Doctoral Candidate, College of Health Sciences, University of Wisconsin-Milwaukee (hereinafter referred to as the "recipient").

II. PURPOSE

The purpose of this agreement is to allow access to a data set of individual records collected by the PRAMS Project, for research purposes. The purpose of this dissertation project is to examine the determinants of bed-sharing (BS) for African-Americans and Whites. Specific aims: (1) Determine the relationship between race and BS; (2) Examine the determinants of BS for African-Americans and Whites separately; and (3) Determine the relationship between BS and sleep position in African-Americans and Whites.

This agreement directly corresponds to the "Application for Access to Pregnancy Risk Assessment Monitoring System Data with Linked Birth Data," dated 06/08/2012 that was submitted by the recipient. The project title in this application is "Factors Associated with Bed-Sharing Within Racial Groups in a Sample of Mothers and Young Infants in Wisconsin (hereinafter referred to as the "Bed-Sharing Dissertation Project"). " The Application is incorporated by reference into this agreement. The recipient is identified as the Principal Investigator in this Application. This agreement is for this stated research project only and any additional use of this data in any form other than this project is prohibited without further authorization.

III. DESCRIPTION OF DATA REQUESTED

The PRAMS Project staff will provide a standard PRAMS Research Data File to the recipient.
The following birth year(s) will be included in the file: **2009, 2010.**
Each record in the file will contain the variables listed in **Attachment A**.
The data will be in the SAS format.

IV. AGREEMENT COORDINATORS

The PRAMS Project designates Kim González as the PRAMS Project Agreement Coordinator, assigned to act as communications contact between the PRAMS Project and the recipient. The PRAMS Project Agreement Coordinator will coordinate communications regarding data sharing, and any amendments and attachments to this agreement. See **Attachment E** for contact information. The PRAMS Project may assign these roles and duties to other staff members at any time.

The recipient designates Trina Salm Ward, Doctoral Candidate, as the Bed-Sharing Dissertation Project Agreement Coordinator, assigned to coordinate and administer amendments and attachments to this agreement, coordinate requests for data and

information in accordance with this agreement, and investigate all questionable or unauthorized use of the data and report it to the PRAMS Project Agreement Coordinator. The Bed-Sharing Dissertation Project Agreement Coordinator has overall responsibility for data safeguarding, insures that data will not be re-released or copied, and limits access only to individuals who have read this agreement and signed the confidentiality statement in **Attachment B**.

V. DATA CONFIDENTIALITY

The recipient, the Bed-Sharing Dissertation Project Agreement Coordinator, and all staff listed in Attachments B and D shall treat all data as confidential information. Release of any combination of elements that would produce identifiable data is prohibited. Failure to provide security for this data may result in termination of this agreement, loss of access to PRAMS data for the recipient and/or the recipient's organization in the future, or any applicable civil or criminal penalties.

VI. PROTECTION AGAINST UNAUTHORIZED USE, ACCESS OR DISCLOSURE

The recipient agrees to comply with the following measures to protect the data and data file(s) provided under this agreement against unauthorized access or disclosure:

A. The data and data file(s) subject to this agreement shall be used only for the purpose stated in Section II and only to the extent necessary to assist in the valid research and analysis needs of the recipient.

B. Only persons who have read this agreement and signed **Attachment B** or **Attachment D** of this Confidentiality/Data Use Agreement shall have access to the data and data files (this includes persons who have access to aggregate data). By reading this agreement and by their signature in Attachment B or Attachment D, they agree to abide by these restrictions. In addition, by his/her signature to this Agreement, the recipient guarantees that all of the recipient's staff will abide by the confidentiality restrictions set forth in this agreement.

C. No one with access to data covered by this agreement may share, disclose or release any data that identifies or contributes to the identification of individuals. These data shall be used only for the specific research project outlined in Section II and are not to be used by anyone involved in the research project for any personal use/gain such as dissertation work. In addition, if information is requested from the recipient via the Open Records Law, the recipient cannot release the information and must refer the requester to the PRAMS Project Agreement Coordinator.

D. Any follow-back (contact), including direct marketing, to subjects, families, relatives or providers is strictly prohibited.

E. No linking of the data covered by this agreement is permitted, unless linking is specifically described in Section II. If linking is involved, the recipient must have

authorization on file from any organizations or programs whose data is intended for linking.

F. The data covered by this agreement, when stored on any media, including but not limited to diskettes, compact disc (CD), digital versatile disc (DVD), and hardcopy, shall be stored in a locked, secure location. Access to the locked, secure location in which the data covered by this agreement are stored may be granted only to staff authorized by the recipient as defined in paragraph VI.B.

G. The data covered by this agreement, when stored on electronic media, including but not limited to diskettes, hard disks, CDs, and DVDs, shall be password protected. Only staff authorized by the recipient as defined in paragraph VI.B shall know the password.

H. Any presentations, reports, and research articles, or drafts of any of these, which are based on data covered by this agreement may present data in aggregate form only. No individual-level data may be included in any presentation or report.

I. No aggregate information that would enable the direct or indirect identification of an individual may be published.

J. All oral or written presentations and reports resulting from analysis of these data will include a statement of credit similar to this: "Wisconsin Pregnancy Risk Assessment Monitoring System (PRAMS) data were collected and provided by the PRAMS Project in the Division of Public Health, Wisconsin Department of Health Services. The Centers for Disease Control and Prevention Cooperative Agreement grant number UR6/DP000492 provided funding for data collection and some staff support. We also acknowledge the PRAMS Working Group." Each data table in a presentation or report will include this text, at the bottom of the table: "Source: Wisconsin PRAMS 2007-2008. Data file provided by Wisconsin Department of Health Services." Recipient may add other information to this source.

K. A review by PRAMS staff is required prior to presenting any oral or written reports or presentations. PRAMS staff will provide comments within two weeks of receiving the report or presentation.

L. The recipient will destroy all files and media of any type containing PRAMS data on or before a year from the date of receipt of such data, unless a written extension is obtained from the PRAMS Project Data Use Agreement Coordinator. The recipient shall provide a signed letter of destruction to the PRAMS Project Agreement Coordinator within 30 days of the final destruction date.

M. If the recipient requests identical data in the future utilizing a different year of birth data, a new Confidentiality/Data Use Agreement will be drawn up and provided to the recipient for new staff signatures. The recipient's Agreement Coordinator should contact the PRAMS Agreement Coordinator to request the new data.

N. Discussion that reveals potentially identifying information shall be limited to persons with authorized access to these data. Care will be taken to ensure that unauthorized

persons cannot overhear discussions or telephone conversations that include potentially identifying information.

O. The recipient's internal standards and disciplinary procedures will also apply to the data covered by this agreement.

VII. STAFF ACKNOWLEDGEMENT

The recipient attests that all staff with access to the data and data files covered under this agreement have read and signed this agreement. Staff will be required to adhere to the policies and procedures of the recipient regarding data confidentiality and security. The confidentiality, use, access and disclosure requirements of this agreement survive if the recipient terminates employment.

A list with names and signatures of all the recipient's staff (including but not limited to contractors/subcontractors, limited term staff, students, and unpaid personnel) with access to these data must be submitted with the signed agreement in Attachment B. Additionally, whenever a staff member leaves the Bed-Sharing Dissertation Project, the Agreement Coordinator must submit the name of that staff member whose access to PRAMS data has been terminated on **Attachment C**. Any new staff (including but not limited to contractors/subcontractors, limited term staff, and unpaid personnel) working for the recipient who will be utilizing PRAMS data must read this Confidentiality/Data Use Agreement, agree to adhere to it and sign Attachment D indicating that they agree to all confidentiality and security requirements. Attachment D should be sent to the PRAMS Agreement Coordinator before utilizing the data.

VIII. TERM

The confidentiality and disclosure requirements of this agreement survive the termination, for whatever reason, of the agreement itself, subject to applicable state and federal statutes and administrative rules.

This agreement may be terminated by the PRAMS Project at any time, without advance notice, if any terms of the agreement are violated. The PRAMS Project may also terminate this agreement, without cause, if the PRAMS Project provides written notice of the termination to the recipient 14 days in advance of the termination.

IX. AMENDMENT OF THIS AGREEMENT

All or part of this agreement may be amended at any time by written agreement signed by the recipient (Principal Investigator) and by the PRAMS Project Director. It is acknowledged that this agreement is subject to federal and state statutes and administrative rules, which may change. If applicable state or federal statutes and/or administrative rules change, this agreement will be considered immediately modified in accordance with each such change, without notice or written amendment.

X. PENALTIES FOR VIOLATION OF AGREEMENT

In addition to any potential civil and/or criminal penalties which may result from violation of any of the terms of this agreement, the PRAMS Project may demand and obtain the return of all media and copies of media containing data covered by this agreement. In addition, violation of this agreement may cause the recipient to lose all access to any future Wisconsin PRAMS data.

XI. INDEMNIFICATION AND HOLD HARMLESS

In the event of any third-party civil action based in whole or in part on a cause of action for damages resulting from the improper use or disclosure of the data covered by this agreement supplied to the recipient by the Division of Public Health, the recipient agrees to indemnify and hold the Division of Public Health or its successors harmless from any damages resulting from such claim.

XII. CHARGES INCURRED

The recipient agrees to pay an invoice from the Division of Public Health for reasonable charges incurred in this project. Charges for this project will be based on the following rates:

Data Set: $55.00 for the each data year

Data set charges include per-record fees paid to Vital Records.

Also required is a completed, useful product based on your analysis of PRAMS data, such as a report or a PowerPoint presentation.

An estimate of data request charges at the time this agreement was drawn up can be found in Attachment E.

This estimate includes charges for one hour of consultation with PRAMS Project staff, for assistance in using and understanding the data file. This consultation may take place in person, on the telephone, or by email.

Any consultation beyond one hour of time will be charged in a separate invoice at the rate of $100.00 per hour.

XIII. AUTHORIZING SIGNATURES

I have read the Confidentiality/Data Use Agreement between the Wisconsin Department of Health Services, Division of Public Health, Pregnancy Risk Assessment Monitoring System Project, and Trina Salm Ward, Doctoral Candidate, College of Health Sciences, University of Wisconsin-Milwaukee, providing the terms of access to 2007 and 2008 individual PRAMS data. By my signature, I guarantee that the Bed-Sharing Dissertation Project staff, including myself, employees, contractors/subcontractors, limited term staff, students, and unpaid personnel will abide by all terms of this agreement.

Trina Salm Ward, MSW, Doctoral Candidate, College of Health Sciences, University of Wisconsin-Milwaukee
PO Box 413
Milwaukee WI 53201-0413

Trina Salm Ward — 6/29/12

Trina Salm Ward, MSW, Principal Investigator — Date
Bed-Sharing Dissertation Project
College of Health Sciences Doctoral Program,
University of Wisconsin-Milwaukee

Wisconsin Department of Health Services
Division of Public Health
PRAMS Project

Katherine Kvale, Ph.D., PRAMS Project Director — Date

ATTACHMENT A

Data Elements in Standard Wisconsin PRAMS Research Data File

Core Questionnaire Variables
Bef preg – insurance
Bef preg – Medicaid
Multivitamin -- # of times /wk
c) Moms birth – year
a) Moms weight – lbs or kilos
b) Moms weight – bef preg
a) Moms height – feet-inch/cm
b) Moms height – feet
c) Moms height – inches
d) Moms height – centimeters
Previous – live birth
Previous – low birth weight
Previous – premature
Preg – intention
Preg – trying
BC – use when got preg
a) No BC – didn't mind preg
b) No BC – couldn't at time
c) No BC – side effects
d) No BC – couldn't get
e) No BC – sterile
f) No BC – husb/part didn't want
g) No BC – other
h) No BC – other specified
a) Sure preg – wks/mnths
b) Sure preg – time
a) 1st PNC visit – wks/mnths
b) 1st PNC visit – number
PNC early – as wanted
a) PNC later – no appt
b) PNC later – no money
c) PNC later – no transportation
d) PNC later – no leave time
e) PNC later – no early ins care
f) PNC later – no Medicaid card
g) PNC later – no child care
h) PNC later – too busy
i) PNC later – keep preg secret
j) PNC later – other
k) PNC later – other specified
a) PNC paid by – Medicaid
b) PNC paid by – income
c) PNC paid by – insurance/HMO
d) PNC paid by – other
e) PNC paid by – other specified
a) HCW talk – smoking
b) HCW talk – breastfeeding
c) HCW talk – drinking alcohol
d) HCW talk – seatbelt use
e) HCW talk – postpartum BC
f) HCW talk – safe meds
g) HCW talk – illegal drugs
h) HCW talk – birth defects tests
i) HCW talk – early labor
j) HCW talk – testing for HIV
k) HCW talk – physical abuse
HIV test – have dur preg
WIC – dur preg
a) Morbidity – diabetes bef preg
b) Morbidity – diabetes dur preg
c) Morbidity – vag bleeding
d) Morbidity – kidney/bladder infect
e) Morbidity – nausea
f) Morbidity – cervix closed
g) Morbidity – HBP
h) Morbidity – placenta
i) Morbidity – preterm labor
j) Morbidity – PROM
k) Morbidity – Blood tranfusion
l) Morbidity – car crash injury
a) Morbidity – hosp <1 day
b) Morbidity – hosp 1-7 days
c) Morbidity – Hosp >7 days
d) Morbidity – bedrest
SMK -- >=100 cigs last 2 yrs
SMK – 3 mnths bef, # cigs/day
SMK – last 3 mnths, # cigs/day
SMK – now, # cigs/day
DRK – last 2 years
DRK – 3 mnths bef, drinks/wk
DRK – 3 mnths bef, five+ drinks/sit
DRK – last 3 mnths, drinks/wk
DRK – last 3 mnths, five+ drinks/sit
a) Stress – family member ill
b) Stress – divorce
c) Stress – moved
d) Stress – homeless
e) Stress – husb/part lost job
f) Stress – mom lost job
g) Stress – argue lots
h) Stress – husb/part preg no
i) Stress – couldn't pay bill
j) Stress – physical fight
k) Stress – husb/part in jail
l) Stress – others drugs
m) Stress – others died
a) Abuse – 12 mnths b4 preg, ex-h/p
b) Abuse – 12 mnths b4 preg, husb/part
a) Abuse – dur preg, ex-husb/part
b) Abuse – dur preg, husb/part
a) Due date – month
c) Due date – year
a) Admin for del – month
c) Admin for del – year
a) Infant birth – month
c) Infant birth – year
a) Mom discharge – month
c) Mom discharge – year
a) Delivery paid – Medicaid
b) Delivery paid – income
c) Delivery paid – insurance/HMO
f) Delivery paid – other
g) Delivery paid – other specified
Infant ICU – at birth
Hosp baby stay – length of time
Infant alive – now
Infant living – with mom
Breastfeed – ever
Breastfeed – still
a) BF duration – wks/mnths
b) BF duration – length of time
a) BF oth food – wks/mnths
b) BF oth food – baby's age
Smoke exposure – baby hrs
Sleeping position – baby
Doctor – baby visit 1st week
Well Baby C – any visits
Postpartum BC – using now
a) PP BC barrs – abstinence
b) PP BC barrs – want preg
c) PP BC barrs – didn't want to use
d) PP BC barrs – husb/part didn't want
e) PP BC barrs – thinks sterile
f) PP BC barrs – can't pay
g) PP BC barrs – preg now
h) PP BC barrs – other
i) PP BC barrs – other specified
a) Src income – wages
b) Src income – family/friend aid
c) Src income – business/fees
d) Src income – aid WIC/TANF
e) Src income – unemployment
f) Src income – child support/alimony
g) Src income – social security
h) Src income – other
i) Src income – other specified
Income – 12 mnths bef, total income
Income – dependents (+self)
a) Today's date – month
c) Today's date – year
Operations Variables
Mail vs phone
analysis weight
CDC Analysis Variables
VAR BC: COMPUTED GEST AGE (DAYS)
VAR BC: YEARS SINCE LAST LIVE BTH
VAR: # WEEKS FIRST FOOD
VAR: # WEEKS BREASTFED BABY
VAR: YES/NO DRINK 3 BEF PREG
VAR: YES/NO DRINK LAST 3 MTH PREG
VAR: CHANGE DRINKING DURING PREG

VAR: DAYS BETW DUE DATE & BIRTH
VAR: # BARRIERS TO EARLY PNC
VAR: HOSP DURING PREGNANCY
VAR: # SOURCES OF INCOME
VAR: INF AGE (DAYS) QUEST COMPLETED
VAR: INFANT ALIVE – NOW
VAR: INFANT LIVING – WITH MOM
VAR: MOM BODY MASS INDEX
VAR: MOM BMI GROUPED
VAR: MOM TOTAL HEIGHT (INCHES)
VAR: MOM NIGHTS IN HOSPITAL
VAR: MOM WT BEFORE PREGNANCY
VAR: BABY STAY IN HOSP?
VAR: MOTHER DELIVERED IN HOSP?
VAR: NO ABUSE BEFORE PREGNANCY?
VAR: NO ABUSE DURING PREGNANCY?
VAR: # SOURCES PAYMENT FOR DELIVERY
VAR: NO PNC VISITS
VAR: START PNC 1ST TRIMESTER?
VAR: WEEKS 1ST PNC VISIT
VAR: # SOURCES PAYMENT FOR PNC
VAR: HX PREV LIVE BIRTHS (lbw, preterm etc)
QUESTIONNAIRE PHASE NUMBER
VAR: YES/NO SMOKE 3 BEF PREG
VAR: YES/NO SMOKE LAST 3 MTH PREG
VAR: CHANGE SMOKING LAST 3 & NOW
VAR: CHANGE SMOKING DURING PREG
VAR: CHANGE SMOKING 3 BEFORE & NOW
VAR: YES/NO SMOKE NOW
VAR: TOTAL # STRESSES
VAR: TOTAL # STRESSES, GROUPED
VAR: WEEKS WHEN SURE PREG
VAR: 4-DIGIT YEAR OF INFANT BIRTH (BC)
VAR: 4-DIGIT YEAR OF MOTHER'S BIRTH (BC)

Standard Questionnaire Variables

(Standard questions selected by Wisconsin)

Asthma 3 mos before preg
Hypertension 3 mos before preg
Diabetes 3 mos before preg
Anemia 3 mos before preg
Heart Problems 3 mos before preg
Husband/partner smokes inside house
Other smokes inside house
Emotionally upset by race treatment 12 mo before
No breastfeed – baby sick
No breastfeed – mom sick
No breastfeed – other children
No breastfeed – duties
No breastfeed – don't like bf
No breastfeed – tied down
No breastfeed – embarrassed
No breastfeed – back to work
No breastfeed – my body back
No breastfeed – other
No breastfeed – specify
How often sleep in same bed
Well baby check – enuf times
Mom had postpartum check
Med advise to take vitamin
Miscarry, stillbirth 12 mos before preg
Needed services – money, food
Needed services – alcohol, drug
Needed services – violence
Needed services – counseling
Needed services – quit smoking
Needed services – breastfeeding
Needed services – other
Needed services – specify
Received services – money, food
Received services – alcohol, drug
Received services – violence
Received services – counseling
Received services – quit smoking
Received services – breastfeeding
Received services – other
Received services – specify
Depressed since baby born
Little interest since baby born
Needed dentist for problem
Went to dentist
How to care for teeth, gums

Birth Certificate Variables

Sex of infant
Infant Date of Birth – Month
Infant Date of Birth – Year
Type of Place of Birth
Maternal Age
Married at conception, at birth, or anytime in between
Maternal Years of Education
Paternal Years of Education
Maternal Hispanic Origin
Maternal Race
Maternal Race and Hispanic Ethnicity
Maternal Residence Metropolitan or Nonmetropolitan
Date Last Normal Menses – Month
Date Last Normal Menses – Year
Month during pregnancy of First Prenatal Care Visit
Number of Prenatal Care Visits, grouped
Number of Prenatal Care Visits
Maternal Weight Gain
Maternal Weight Gain, grouped
Did Mom Smoke?
Number of Cigarettes Smoked per Day
Number of Previous Live Births
Last Live Birth: Month
Last Live Birth: Year
Previous Other Pregnancy Outcomes
Gestational Diabetes
Hypertension
Premature Rupture of Membrane
Chorioamnionitis
Labor Abnormality
No Medical Risk Factors
No Complications
Vaginal Delivery?
Forceps Delivery?
Vacuum Delivery?
Vaginal Delivery after C-Section
First C-Section?
Repeated C-Section?
Birthweight – Grams, grouped
Obstetric Estimate of Gestation
Obstetric Estimate of Gestation, DPH groups
Obstetric Estimate of Gestation, CDC groups
Plurality
Congenital Anomalies

ATTACHMENT B

Staff Listing

Bed-Sharing Dissertation Project

Following is a list of staff, contractors/subcontractors, limited term staff, students, unpaid personnel, and all others of the Bed-Sharing Dissertation Project who have access to Wisconsin PRAMS data and data files. By signing this page, these staff attest that they have read the Confidentiality/Data Use Agreement between the PRAMS Project and the Bed-Sharing Dissertation Project and by their signature have agreed to abide by all terms of this agreement. If any additional staff is added, the Bed-Sharing Dissertation Project Agreement Coordinator will ensure that they have read this agreement in its entirety and agreed to abide by all terms of the agreement. The Bed-Sharing Dissertation Project Agreement Coordinator will forward to the PRAMS Project Agreement Coordinator a list of names and signatures of those additional staff before they utilize the PRAMS data (see Attachment D).

Name *(please print)*	Position	Signature	Date
Susan Cashin, PhD	Statistician/Faculty Advisor		6/30/12
Emmanuel Ngui, DrPH	Faculty Advisor		6/29/12

ATTACHMENT C

Authorization to Terminate Staff Access

I authorize the termination of access by _____ to
(print staff name)

the Wisconsin PRAMS Project data and data files, effective immediately.

_____ _____
Trina Salm Ward, Agreement Coordinator Date
Bed-Sharing Dissertation Project
University of Wisconsin-Milwaukee College of Health Sciences
PO Box 413
Milwaukee WI 53201-0413

ATTACHMENT D

New Staff Authorization

Bed-Sharing Dissertation Project

I have read the Confidentiality/Data Use Agreement between the Department of Health Services, Division of Public Health, PRAMS Project and the Bed-Sharing Dissertation Project, providing all terms of access to Wisconsin PRAMS data files. By my signature, I agree that I will abide by all terms of this agreement.

_____ _____
Signature Date

_____
Printed Name

_____ _____
Signature
Trina Salm Ward, Doctoral Candidate, Agreement Coordinator Date
University of Wisconsin-Milwaukee College of Health Sciences
PO Box 413
Milwaukee WI 53201-0413

This form should be completed before the staff utilizes any data. It should be mailed immediately to:

Kim González
PRAMS Project Agreement Coordinator
DPH, Room 172
PO Box 2659
Madison, WI 53701

ATTACHMENT E

Estimate of Charges for Wisconsin PRAMS Research Data File 2007-2008

Bed-Sharing Dissertation Project
Date of Estimate: 06/27/2012
Estimate is valid for three months.

Charges:

Dataset per year charge	= $55.00
Support time: one hour	= Included
TOTAL ESTIMATE	= $110.00

An invoice will be mailed separately.

Estimate Provided by:

Kim González
PRAMS Project Agreement Coordinator
DPH, Room 172
PO Box 2659
Madison, WI 53701

Phone: 608-266-0377
E-Mail: kim.gonzalez@wisconsin.gov

APPENDIX E: INSTITUTIONAL REVIEW BOARD SUBMISSION AND APPROVAL

Determination of UWM IRB Submission

INSTRUCTIONS: Not all research involving humans will require UWM IRB submission or approval. Only activities meeting the regulatory definitions of **(a)** "**research**" and **(b)** "**human subjects**" and where **(c)** UWM is "**engaged**" in the conduct of human subjects research require UWM IRB review and approval.

This form may be used as **(1)** a tool to help you determine whether you may need to file a New Study Submission to the UWM IRB, and/or **(2)** documentation of formal notice that the UWM IRB is not "engaged" in "human subjects research" requiring UWM IRB review/approval.

SECTION 1: DETERMINATION OF "RESEARCH"

Research – "a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge."

RESEARCH	NOT RESEARCH
Activities 'designed to develop or contribute to generalizable knowledge' are those activities designed to draw general conclusions (i.e., knowledge gained from a study may be applied to populations beyond the specific study population), inform policy, or generalize findings. The project may be "research" If it: • intends to advance general knowledge in the academic, scientific, or professional community; • is conducted using a research design that will lead to scientifically valid findings; • and the subjects are not expected to benefit personally from the knowledge gained.	Projects may be systematic but not "research." Some examples of not "research" include: • classroom projects solely to fulfill course requirements and the intention is to not share the results beyond the University community; • quality assurance activities designed to continuously improve the quality or performance of a department or program where it is not the intention to share the results beyond the University community. • Most of the subjects who participate in the project are expected to benefit from the knowledge gained and the main goal of the project is to improve services; • Oral history activities, in general, are designed to create a record of specific historical events and, as such, are not intended to contribute to generalizable knowledge. Only those oral history projects that conform to that regulatory definition of research need to submit their research protocols for IRB review.

Use the information above to answer the following questions.

1. Do the proposed activities involve a systematic approach? A "systematic" approach involves a predetermined method or a plan for studying a specific topic, answering a specific question, testing a specific hypothesis, or developing theory. A systematic approach incorporates collection of data, either quantitative or qualitative, or specimens; and analysis.

   [X] YES **[ ] NO**

   If NO, please explain why the proposed activities do not involve a systematic approach:
   <Type Here>

2. Is the intent of the proposed activities to *develop or contribute to generalizable (scholarly) knowledge*?

   [X] YES **[ ] NO**

If **NO**, please explain the intent of proposed activities and explain how the proposed activities are not intended to contribute to generalizable knowledge:
<Type Here>

If YES to 1 & 2, these activities constitute research. Go to Section 2.

Otherwise, the criteria for research are not met. Go to Section 4.

SECTION 2: DETERMINATION OF "HUMAN SUBJECT"

Human subject - a *living individual* about whom an investigator (whether faculty, student, or staff) conducting research obtains: (1) data through *intervention or interaction* with the individual or (2) *identifiable private information*.

(1) Intervention includes both physical procedures by which data are gathered (for example, venipuncture) and manipulations of the subject or the subject's environment that are performed for research purposes.

(1) Interaction includes communication or interpersonal contact between researcher and subject.

(2) Identifiable includes where the identity of the subject is or may be ascertained by the researcher or associated with the information

(2) Private information includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, and information which has been provided for specific purposes by an individual and which the individual can reasonably expect will not be made public (for example, a medical or educational record information). Private information must be individually *identifiable.*

Use the definitions above to answer the following questions.

1. Are the human subjects *living individuals*? This applies to charts reviews and datasets.

   [X] YES [ ] NO

   If NO to 1, the criteria for human subject are not met. Go to Section 4.

2. Do the activities involve UWM personnel obtaining information through *intervention* or *interaction* about the individuals (i.e., prospective collection of data/specimens)?

   [ ] YES [X] NO

3. Do the activities involve UWM personnel accessing *individually identifiable* (e.g., names, medical record numbers, social security numbers, study ID codes, etc.) **and** *private* information about living individuals? This applies to charts, records, datasets, and specimens. Even if you are not recording identifiers, if the source of the data contains identifiers, then mark this question as a "yes."

   [ ] YES [X] NO

4. Do the activities involve UWM personnel obtaining or receiving *individually identifiable* (e.g., study ID codes, names, medical record numbers, social security numbers, etc.) **and** *private* information about living individuals? This applies to charts, records, datasets, and specimens.

   [ ] YES [X] NO

   4a. If yes to #4, will the *data/specimens be coded* such that a link exists that could allow the source of

the data/specimens to be re-identified (i.e., key available to decipher the code)?

[ ] YES [ ] NO

4b. Is there a written agreement that prohibits the UWM researcher and his/her research team from having access to the link, or the likelihood for the UWM researcher to have access to the identifiers is extremely unlikely.

[ ] YES [ ] NO

If YES to 1 & 2, the activities involve human subjects. Go to Section 3.

If YES to 1 & 3, the activities involve human subjects. Go to Section 3.

If YES to 4 & 4a and NO to 4b, the activities involve human subjects. Go to Section 3.

Otherwise, human subjects are not involved. Go to Section 4.

SECTION 3: DETERMINATION OF "ENGAGED"

Engaged: An institution is considered to be engaged in research if certain federal criteria are met and may be subject to IRB review/approval.

UWM Auspices: UWM personnel (student, faculty, or staff) who: (1) act on behalf of the institution; (2) exercise institutional authority or responsibility; or (3) perform institutionally designated activities.

Non-UWM researchers wishing to conduct human subjects research using UWM personnel as subjects or its facilities are not considered to be engaged. This document is for the determination of UWM IRB review only and you are expected to obtain other permission as necessary. For example, the UWM IRB does not have authority to grant the release or use of UWM listservs, equipment, or facilities.

ENGAGED	NOT ENGAGED
UWM is considered to be engaged in human subjects research if UWM or UWM personnel are involved in any the following activities under UWM auspices: • direct awardee of a federal grant, award, or contract; • obtaining informed consent; • performing invasive or noninvasive procedures with subjects; • intervening for research purposes with any subjects by manipulating the environment; • interacting for research purposes with any subject; (e.g., conducting research interviews or administering questionnaires); or • obtaining private identifiable information.	UWM is considered to not be engaged in human subjects research if UWM or UWM personnel are solely involved in the following activities: • performing commercial/service where: (a) the services performed do not merit professional recognition or publication privileges; (b) the services performed are typically performed by those institutions for non-research purposes; and (c) the institution's employees or agents do not administer any study intervention being tested or evaluated under the protocol; • inform (e.g., provide a copy of informed consent document, information about contacting the investigator, seek or obtain the prospective subjects' permission for investigators to contact them) prospective subjects about the availability of the research but do not obtain subjects' consent for the research or act as representatives of the investigators; or

	• release of identifiable private information/specimens pertaining to the subjects of the research.

Use the information above to answer the following question.

1. Is UWM engaged in human subjects research?

[__] YES [_X_] NO*

*If YES or NO, please explain why UWM IS or is NOT engaged in human subjects research:
UWM personnel are obtaining a dataset (the Wisconsin Pregnancy Risk Assessment and Monitoring System - PRAMS) that will not include private identifiable information.

2. Is any non-UWM IRB involved in reviewing this project?

[__] YES* [_X_] NO

*If YES, please explain which IRB(s) and the status of IRB approval(s):
<Type Here>

If YES to 1, UWM is engaged in human subjects research. Go to Section 4.

Otherwise, UWM is not engaged in human subjects research. Go to Section 4.

SECTION 4: IS YOUR PROTOCOL HUMAN SUBJECTS RESEARCH, AND UWM IS ENGAGED?

If based on your responses in Section 1 the activities constitute research; and per your responses in Section 2 the activities involves human subjects; and per your responses in Section 3 UWM is engaged. Please complete and submit the appropriate documents for a New Study Submission. All forms are available on the IRB website under the Forms and Templates section. If you have questions, contact the IRB office at irbinfo@uwm.edu.

If the activities appear that UWM is not engaged in human subjects research, you are not required to submit an IRB application. If you would like confirmation and documentation from the IRB staff that your proposed activities do not constitute UWM being engaged in human subjects research, please complete this form including Sections 5 - 6 below and submit to irbinfo@uwm.edu. You will receive a completed pdf version of this form back within 2-3 working days.

SECTION 5: STUDY INFORMATION

1. Describe the purpose of the proposed activities. State the overall objectives and specific aims. Provide a brief description of the procedures.

The **purpose** of this study is to examine the determinants of bed-sharing for African-Americans and Whites in a 2007-2009 sample of data collected from mothers and young infants. This study will utilize the Wisconsin Pregnancy Risk Assessment and Monitoring System (PRAMS), a linked survey and birth certificate data set of mothers with young infants across the state.

The specific aims of the study are as follows:

Aim 1: Determine the relationship between race and bed-sharing in a sample of data collected after the AAP (2005) made recommendations against it.

Aim 2: Examine the determinants of bed-sharing for African-Americans and Whites.

Aim 4: Determine the relationship between, and determinants of, bed-sharing and sleep position (supine vs. prone or side-sleeping) in African-Americans and Whites.

Data analysis procedures will involve exploratory descriptive statistics, as well as logistic regression to identify significant determinants of bed-sharing.

2. Describe the subject population, or the type of data and/or specimens to be studied.

Wisconsin PRAMS is a collaborative project between the Wisconsin Department of Health Services and the Centers for Disease Control and Prevention. It is a population-based cross-sectional sample drawn from birth certificates. The data set includes linked survey-birth certificate information, but data is not identifiable.

3. Describe how the data and/or specimens will be obtained.

The PRAMS dataset will be obtained from the Wisconsin Department of Health Services via a data-sharing agreement. IRB approval (or determination of non-research) is required prior to obtaining the dataset.

SECTION 6: PROJECT TITLE AND RESEARCHER

Project Title:	DETERMINANTS OF RACIAL DISPARITIES IN BED-SHARING IN A SAMPLE OF MOTHERS WITH YOUNG INFANTS IN WISCONSIN		
Name:	Trina C. Salm Ward, MSW (Doctoral Student Investigator); Mary K. Madsen, Ph.D., R.N. (Faculty Advisor); Emmanuel Ngui, DrPH (Faculty Advisor)	**Department/ Institution:**	College of Health Sciences (Salm Ward & Madsen); Zilber School of Public Health (Ngui)
Telephone:	(414) 229-5155 (Salm Ward)	**Email:**	tsalm@uwm.edu

UWM IRB DETERMINATION OF UWM ENGAGEMENT IN HUMAN SUBJECTS RESEARCH

Researchers do not complete this section. **For IRB staff only**

[_X_] The activities as described **DO NOT** constitute UWM being engaged in Human Subjects Research. Submission of an IRB Application to UWM is not required.

[__] The activities as described **DO** constitute UWM being engaged in Human Subjects Research. Submission of a UWM IRB Application **IS REQUIRED**. IRB Approval must be obtained before the research can begin.

Melissa C. Spadanuda Melissa C. Spadanuda IRB Staff	5/2/2012 Date

APPENDIX F: DATA CODEBOOK

Variable	*Label*	*Codes*[1]	*Source*
AB	Abuse before or during pregnancy	1 = NO 2 = YES	Calculated
BF5STILL	Breastfeed – still	1 = NO 2 = YES	Questionnaire
BS_DICH	Bed-sharing dichotomous variable	1 = NO 2 = YES	Calculated
BS_THREE	Bed-sharing with three responses	1 = FREQUENT (Always/Often) 2 = INFREQUENT (Sometimes/Rarely) 3 = NEVER	Calculated
BW	Birthweight categorized based on distribution	1 = ≤ 2,750 2 = 2,751-3,750 3 = > 3,750	Calculated
DEP_SX	Depressive symptoms?	1 = NO 2 = YES	Calculated
GRAM	Birthweight in grams	*Interval*	Birth certificate
HISP_BC	Hispanic?	1 = YES 2 = NO	Birth certificate
INCOME5	Income – 12 months before, total income	1 = < $10,000 2 = $10,000 - $14,999 3 = $15,000 - $19,999 4 = $20,000 – $24,999 5 = $25,000 – $34,999 6 = $35,000 - $49,999 7 = ≥ $50,000	Questionnaire
INF_ICU	Infant ICU – at birth	1 = NO 2 = YES	Questionnaire
INFLIVE5	Infant alive – now?	1 = NO 2 = YES	Questionnaire
INFWMOM5	Infant living – with mom	1 = NO 2 = YES	Questionnaire
INQX	Was questionnaire completed?	0 = NO 1 = YES	Analytical
M_ED	Maternal education recoded	1 = <high school 2 = 12 years 3 = 13-15 years 4 = ≥ 16 years	Recoded
MARRIED	Marital Status	1 = MARRIED 2 = OTHER	Birth certificate
MAT_AGE	Maternal Age	*Interval*	Birth certificate
MAT_AGE_CAT	Maternal age categories categorized based on distribution	1 = <18 2 = 19-23 3 = 24-30 4 = 31-33 5 = ≥34	Calculated

Variable	*Label*	*Codes*[1]	*Source*
MAT_ED	Maternal Education	1 = 0-8 YRS 2 = 9-11 YRS 3 = 12 YRS 4 = 13-15 YRS 5 = ≥ 16 YRS	Birth certificate
MAT_RACE	Maternal Race	1 = OTH ASIAN 2 = WHITE 3 = BLACK 4 = AM INDIAN 5= CHINESE 6 = JAPANESE 7 = FILIPINO 8 = HAWAIIAN 9 = OTH RACE 10 = AK NATIVE 11 = MIXED	Birth certificate
MH_PPDPR[2] (2007-2008)	MH – depressed since birth	1 = ALWAYS 2 = OFTEN 3 = SOMETIMES 4 = RARELY 5 = NEVER	Questionnaire
MH_PPINT[2] (2007-2008)	MH – no interest since birth	1 = ALWAYS 2 = OFTEN 3 = SOMETIMES 4 = RARELY 5 = NEVER	Questionnaire
NEST_YR	Sample year		Operational
PAB_HUS PAD_HUS PAB_XHUS PAD_XHUS (2007-2008)	Abuse – 12 months before preg, h/p Abuse – dur preg, husb/p Abuse – 12 months before preg, ex-h/p Abuse – dur preg, ex-h/p	1 = NO 2 = YES	Questionnaire
PAB6HUS PAD6HUS (2009-2010)	Abuse – 12 months before preg, h/p Abuse – dur preg, husb/p	1 = NO 2 = YES	Questionnaire
PD_MEDIC	Delivery paid – Medicaid	1 = NO 2 = YES	Questionnaire
PP_NHOPE[2] PP_SAD PP_SLOW (2009-2010)	Hopeless Down, depressed, sad Slowed down	1 = NEVER 2 = RARELY 3 = SOMETIMES 4 = OFTEN 5 = ALWAYS	Questionnaire
RACEBIAS	PP-race bias	1 = NO 2 = YES	Questionnaire

Variable	*Label*	*Codes*[1]	*Source*
SLEEPBED	Sleep – someone with baby	1 = ALWAYS 2 = OFTEN 3 = SOMETIMES 4 = RARELY 5 = NEVER	Questionnaire
SLEEPPOS	Sleeping position – baby	1 = SIDE 2 = BACK 3 = STOMACH 4 = SIDE/BACK 6=BACK/STOMACH 7 = ALL 3 POSITIONS	Questionnaire
SLPOS	Sleeping position	1 = SUPINE 2 = NON-SUPINE	Calculated
SN_FOOD	Need services – food money	1 = NO 2 = YES	Questionnaire
STRATUMC	State stratification scheme provided by CDC		Operational
STR_EMOT STR_FIN STR_PART STR_TRAU	Emotional stress Financial stress Partner-associated stress Traumatic stress	1 = NO 2 = YES	Calculated
STRS_ARG STRS_BILL STRS_DH3 STRS_DRG STRS_DVS STRS_FM3 STRS_FT4 STRS_HOM STRS_JL3 STRS_JOB STRS_MOV STRS_PG STRS_WRK	Stress – argue lots Stress – couldn't pay bills Stress – others died Stress – others drug Stress – divorce Stress – family ill Stress – physical fight Stress – homeless Stress – husb/partner jail Stress-husband partner job Stress – moved Stress – husb/part pregnancy no Stress – mom lost job	1 = NO 2 = YES	Questionnaire
SUD_NEST	Calculated variable for analysis plan (STRATUMC*10000) + NEST_YR		Operational
TOD_YR4	Today's year		Questionnaire
TOTCNT	For analysis plan		Operational
URB_RUR	Maternal residence	1 = URBAN 2 = RURAL	Birth certificate
WTANAL	Analysis weight variable calculated by CDC		Operational

Notes:
[1]The coding of some Yes/No variables is different (for example, in some 1 = No, while in others 1 = Yes).
[2]Reverse order from previous year and vice versa.

CURRICULUM VITAE

Trina C. Salm Ward

Education

B.A., St. Norbert College, De Pere, Wisconsin — May 1996
Major: Psychology

M.S.W., University of Wisconsin-Milwaukee — August 1998
Major Focus: Family and Children
Certificate in Marriage and Family Therapy

Dissertation Title: Factors Associated with Bed-Sharing within Racial Groups in a Sample of Mothers and Young Infants in Wisconsin
Major Professor: Mary K. Madsen, Ph.D., R.N., FAAIDD, Professor of Health Informatics and Administration

Research Interests

I am interested in the application of mixed methods, community-based research approaches to pregnancy and infant health outcomes (low birth weight, preterm birth, and infant death), specifically addressing racial disparities in these outcomes.

Professional Experience

Joseph J. Zilber School of Public Health, University of Wisconsin-Milwaukee — 2012-present
Research Program Manager II

Reporting to the Dean, support development of the School's research portfolio. Developed and maintain award tracking tools and faculty research resources. Assist faculty in identifying funding opportunities, and grant proposal planning, development and submission.

Center for Urban Population Health, University of Wisconsin School of Medicine and Public Health, Milwaukee, WI — 2005-2012
Research Program Manager II

Reporting to Center Director, coordinate and oversee the conduct of applied urban population research, facilitate strategic planning, and support the Center's special focus area in Maternal and Infant Health. The Center is a collaborative partnership of the University of Wisconsin School of Medicine and Public Health, the University of Wisconsin-Milwaukee and Aurora Health Care, Inc.

College of Health Sciences, University of Wisconsin-Milwaukee
Ad hoc Lecturer — Spring 2011

Center for Applied and Behavioral Health Research, University of Wisconsin-Milwaukee
Site Coordinator/Associate Researcher — 2003-2005
Assessment Coordinator/Assistant Researcher — 2000-2003

Managed the day-to-day activities of pharmaceutical and federally-funded clinical

trials at the off-campus Clinical Trials Unit. Served as project coordinator or co-coordinator on most trials. Coordinated project staffing across UWM and Aurora Health Care staff, student employees, and student interns.

Fresh Start Program, All Saints Healthcare-St. Luke's Behavioral Health Services (Wheaton Franciscan Services), Racine, WI 1998-2000
Family Therapist II

Conducted individual, family, and group therapy; assessments; discharge planning; case management; and behavioral management within a multi-disciplinary treatment team. Fresh Start is a partial hospitalization program supporting chronically disruptive and aggressive children ranging from Kindergarten through 5th grade. Also provide in-home family therapy sessions as a member of the In-Home Family Therapy Program team.

S.A.F.E. Haven, Racine, WI 1997-1998
Graduate Social Work Field Intern

Provided crisis intervention, psychosocial assessments, care coordination, crisis line operation, and supervision of adolescents at risk of running away from home.

Milwaukee, WI
Contractor/Consultant 1996-2003

Provided research support services, including conducting research assessments in clinical trials; entering and managing data; creating surveys; providing data analysis support; and interview transcription.

School of Social Welfare Information Support Office, University of Wisconsin-Milwaukee 1996-1998
Graduate Project Assistant

Managed Social Welfare alumni database; facilitated upgrade from SPSS Unix to Windows; assisted faculty with survey creation, data entry, management, and basic analysis; and provided computer helpdesk support to faculty and students.

Catholic Charities, Sheboygan, WI 1994-1997
Graduate Social Work Field Intern

Conducted psychosocial assessments, treatment, and discharge planning with individuals and families; co-facilitated parenting program; facilitated children's social skills groups; and conducted individual sessions in a school setting.

Certifications and Licensures

Wisconsin Certified Advanced Practice Social Worker (A.P.S.W., No: 1540-121) 1999-present
Certified Clinical Research Coordinator (C.C.R.C.), Association of Clinical Research Professionals 2004-2012

Professional Affiliations

American Public Health Association 2012
Wisconsin Public Health Association 2011-present
Wisconsin Association for Perinatal Care 2011-present

American Association of University Women 2010-present
National Association of Social Workers 1998-present

Honors and Awards

Graduate Student Travel Award, UW-Milwaukee Graduate School October 2012
To present research at the 2012 Annual Public Health Association Meeting
Student Research Grant, UW-Milwaukee College of Health Sciences ($2,000) May 2012
To complete dissertation project
Graduate Student Travel Award, UW-Milwaukee Graduate School May 2012
To present research at the 2012 Wisconsin Association for Perinatal Care Conference
Chancellor's Graduate Student Award, UW-Milwaukee Dept. of Health Sciences Spring 2011
Chancellor's Graduate Student Award, UW-Milwaukee Dept. of Health Sciences Summer 2010
Best New Grantee Poster Presentation, Office of Adolescent and Pregnancy Programs Annual Grantee Meeting, San Antonio, TX (with co-authors P. Florsheim, S. Johnson, P. Simpson & M. Lemke) 2010
Milwaukee Health Champion Team Award, City of Milwaukee Health Department 2010
For team efforts in reducing teen pregnancy with the City of Milwaukee Health Department and the United Way of Greater Milwaukee
George A. Boyer Graduate Student Scholarship, UW-Milwaukee Foundation 2009
3rd Place Research Presentation Award, UW-Milwaukee College of Health Sciences Research Symposium Spring 2009

Teaching Experience

University of Wisconsin-Milwaukee
Client Diversity in Health Sciences: An Interdisciplinary Perspective 3 credits 2011
Undergraduate/graduate hybrid course. Team-taught with Paula Rhyner, Ph.D. (Lead Instructor); Lora Taylor de Oliveira, M.P.H., M.B.A.; and Patricia K. Thomas, M.P.A., C.T.R.S.

Service

Current Service

Ad Hoc Reviewer, *Journal of Health Care for the Poor and Underserved* and *Wisconsin Medical Journal* 2011-present
Community Member, Children's Hospital of Wisconsin Institutional Review Board 2010-present
Member, Wisconsin Emergency Assistance Volunteer Registry 2010-present
Member, Wisconsin Pregnancy Risk Assessment Monitoring System (PRAMS) Steering Committee 2009-present
Member, Milwaukee Fetal Infant Mortality Review committee 2008-present
Member, Infant Mortality Healthcare Collaborative, Milwaukee 2007-2012
Member, Workgroup to Revise Informed Consents, Children's Hospital of Wisconsin Institutional Review Board 2010-2012

Recent Past Service

Member, Milwaukee Lifecourse Initiative for Healthy Families (LIHF) 2010-2011
Social and Economic Inequities Taskforce
Grant Reviewer, Wisconsin Partnership Program, University of Wisconsin 2007-2011
School of Medicine and Public Health
Planning Committee Member, Aurora Family Service's Summit on Race, 2010
Families and Milwaukee focusing on Racial Disparities in Infant Mortality
Table Facilitator, City of Milwaukee Health Department Safe Sleep Summit 2010
Planning Committee Member, Healthy Babies Summit and Association of 2009-2011
Women's Health, Obstetric and Neonatal Nurses Bi-annual State
Conference
Registration Desk Volunteer, Wisconsin Association for Perinatal Care 2009-2011
Annual Statewide Perinatal Conference
Member, Improving Birth Outcomes and Promoting Healthy Child 2009-2010
Development Action Team, City of Milwaukee Health Department
Member, Healthy Birth Outcomes Data Work Group, Wisconsin 2008-2011
Department of Health Services' Statewide Advisory Committee to
Eliminate Racial and Ethnic Disparities in Birth Outcomes
Member, Wisconsin Association for Perinatal Care Southeast Region 2008-2011
Breastfeeding and Sleep Workgroup

Grant/Contract Funding

Current Grant/Contract Funding

APHPA006066-01
Office of Adolescent Pregnancy Programs (PI: P. Florsheim) 09/2010-02/2013
The Milwaukee Young Parenthood Study
Role: Inter-Institutional Liaison

Completed Grant and Contract Funding

1H75DP002736-01
Centers for Disease Control & Prevention (PI: R. Cisler) 09/2010-08/2012
Public Health Impact Initiative to Improve Healthy Births
Role: Project Manager

Children's Community Health Plan (Faculty Advisor: A. Harley) 12/2009-08/2011
Barriers to Initiating Early and Continuous Prenatal Care
Role: Student Principal Investigator

Milwaukee Public Schools (PI: P. Florsheim) 01/2010-02/2010
External Evaluation of the Mobile Urgent Treatment Team for Milwaukee Public Schools
Role: Co-Evaluator

Wisconsin Alzheimer's Institute (PI: M. Sager) 07/2007-06/2008
Wisconsin Registry for Alzheimer's Prevention, Milwaukee Site
Role: Research Program Manager

Lois & Samuel Silberman Fund Faculty Grant Program (PI: A. Begun) 07/2007-06/2008
Development of a Lifecourse Timeline Followback Approach to Assessing Alcohol Dependence and Change Attempts

Role: Interviewer/Project Coordinator

Wisconsin Partnership Fund (PI: R. Cisler) 01/2006-12/2008
Wisconsin Network for Health Research (WiNHR) Milwaukee Site
Role: Research Program Manager

National Institute of Alcohol Abuse & Alcoholism (PI: R. Cisler) 07/2000-08/2006
Economic & Cost Effectiveness of Combining Pharmacotherapy for Treating Alcoholism
Role: Project Coordinator, Milwaukee Site

National Institute of Alcohol Abuse & Alcoholism (PI: A. Zweben) 09/1997-08/2006
Project COMBINE: Combining Medications & Behavioral Interventions for Treatment of Alcoholism
Role: Project Coordinator, Milwaukee Site

Ortho-McNeil Janssen Scientific Affairs, LLC (PI: A. Begun) 03/2005-06/2006
CAPSS-278: A Multi-Center, Randomized, Double-Blind, Placebo-Controlled, Flexible Dose Study to Assess the Safety & Efficacy of Topiramate in the Treatment of Alcohol Dependence
Role: Co-Project Coordinator

Alkermes (PI: A. Zweben) 12/2001-08/2003
A Phase II, Multi-Center, Randomized, Double Blind, Placebo Controlled Study of the Efficacy & Safety of Medisorb Naltrexone in Alcohol Dependent Adults (ALK21-003)
Role: Assessment Coordinator, Milwaukee Site

Pfizer (PI: L. Longo) 10/2002-12/2004
Ziprasidone for the Treatment of Bipolar Disorder (TOPMAT- PDMD-005)
Role: Assessor

Oy-Contral (PI: A. Zweben) 01/2000-12/2001
Nalmefene for the Treatment of Alcohol Dependence
Role: Research Assistant

Publications

Journal Articles, refereed

1. **Salm Ward, T.C.**, Mazul, M., Ngui, E., Bridgewater, F.D. & Harley, A.E. (In press). "You Learn to Go Last": Prenatal care experiences in a sample of low-income African-American women in Milwaukee. *Maternal & Child Health Journal.* DOI: 10.1007/s10995-012-1194-5.
2. Begun, A.L., Berger, L.K. & **Salm Ward, T.C.** (2011). Building a lifecourse context for interpreting alcohol change attempt and formal treatment efforts among individuals with alcohol dependency. *Journal of Social Work Practice in the Addictions, 11*(2), 1-23.
3. Chen, H-Y., Chauhan, S.P., Mori, N., **Salm Ward, T.C.,** Gass, E. & Cisler, R.A. (2011). Aberrant fetal growth and early, late, and postneonatal mortality: An analysis of Milwaukee births, 1996-2007. *American Journal of Obstetricians & Gynecologists, 204*, 261.e1-e10.
4. **Salm Ward, T.C.**, Mori, N., Patrick, T.B., Madsen, M.K. & Cisler, R.A. (2010). Influence of socioeconomic factors and race on birth outcomes in urban Milwaukee. *Wisconsin Medical Journal, 109*(5), 254-260.

5. Mori, N., Blair, K.A., **Salm Ward, T.C.**, Bergstrom, J., Galvao, L. & Cisler, R.A. (2009). Trends in teen births in the city of Milwaukee: Setting a feasible goal to reduce births for young teenagers aged 15-17 years by 2015. *Wisconsin Medical Journal, 108*(7), 365-369.

Manuscripts under Review

1. **Salm Ward, T.C.**, Weiss, M., Steber, D., Conway, A., Marek, A. & Cisler, R.A. (Revision submitted 7/31/12). PeriData.Net®: Use of a hospital-based perinatal data platform for quality improvement and to impact public health. *Public Health Reports.*

Invited Publications and Technical Reports

1. **Salm Ward, T.C.**, Bridgewater, F.D. & Cisler, R.A. (2012). *Catalog of Initiatives Addressing Disparities in Birth Outcomes in Wisconsin.* Center for Urban Population Health, Milwaukee, WI. Available at: http://www.cuph.org/projects/birth-outcome-disparities-catalog/material/5621/binary/. Updated and released bi-annually since 2008.
2. **Salm Ward, T.C.,** Robinson, N., Lemke, M., Reese, K., Frazer, D., Rice, J. & Zerpa-Uriona, V. (2010). *Summary report of the May 3, 2010 City of Milwaukee Health Department safe sleep summit.* City of Milwaukee Health Department, Milwaukee, WI. Available at: http://www.milwaukee.gov/ImageLibrary/Groups/healthAuthors/MCH/PDFs/InfantMortality/Summary_Report_of_the_Safe_Sleep_Summit_2010.pdf
3. **Salm Ward, T.** (2005). Using social work skills in research. *Alcohol, Tobacco & Other Drugs, NASW SectionConnection, Summer*, 3-4.

Presentations and Posters

Peer-Reviewed Scientific Presentations and Posters

1. **Salm Ward, T.C.**, Mazul, M., Ngui, E., Bridgewater, F.D. & Harley, A.E. (2012 - Accepted). "You learn to go last." Prenatal care experiences in a sample of African-American women with limited incomes in Milwaukee, Wisconsin. Oral presentation, Joint *2012 CityMatCH Urban MCH Leadership Conference* and *18th Annual Maternal & Child Health Epidemiology Conference*, San Antonio, TX (December 12-14).
2. Florsheim, P., Johnson, S., Howard, M. & **Salm Ward, T.C.** (2012 - Accepted). Cultural adaptation of an evidence-based co-parenting counseling program for expectant teenage parents. Poster, Joint *2012 CityMatCH Urban MCH Leadership Conference* and *18th Annual Maternal & Child Health Epidemiology Conference*, San Antonio, TX (December 12-14).
3. **Salm Ward, T.C.**, Mazul, M., Ngui, E., Bridgewater, F.D. & Harley, A.E. (2012). "You Learn to Go Last": A qualitative study of perceptions of racism during prenatal care in a sample of low income African-American women in Milwaukee. Oral presentation, *American Public Health Association,* San Francisco, CA (October 30).
4. **Salm Ward, T.C.**, Conway, A., Weiss, M., Marek, A. & Cisler, R.A. (2012). PeriData.Net®: A tool for real-time access to state-wide perinatal data. Poster, *Leading the Way: A Joint Conference of the Medical College of Wisconsin-Advancing a Healthier Wisconsin and the University of Wisconsin School of Medicine and Public Health-Wisconsin Partnership Program*, Milwaukee, WI (September 27).
5. **Salm Ward, T.C.**, Mazul, M., Ngui, E., Bridgewater, F.D. & Harley, A.E. (2012). "You learn to go last." Prenatal care experiences in a sample of African-American women with limited incomes in Milwaukee. Oral presentation, *2012 Wisconsin Research Education Network (WREN) Fall Forum/"Network of Networks" Research Conference*, Madison, WI (September 21).
6. **Salm Ward, T.C.**, Marek, A., Weiss, M., Conway, A. & Cisler, R.A. (2012). PeriData.Net®: A tool for real-time access to state-wide perinatal data. Poster, *2012*

Wisconsin Research Education Network (WREN) Fall Forum/"Network of Networks" Research Conference, Madison, WI (September 20-21).

7. Bridgewater, F.D., **Salm Ward, T.C.**, Mazul, M., Ngui, E. & Harley, A.E. (2012). "You learn to go last.": Prenatal care experiences in a sample of African-American women with limited incomes. Poster, *Aurora Scientific Day,* Milwaukee, WI (May 16).
8. Mazul, M. & **Salm Ward, T.C.** (2012). "You Learn to Go Last": Prenatal Care Experiences in a Sample of Low-Income African-American Women in Milwaukee. Oral presentation and poster, *14th Annual Southeastern Wisconsin Nursing Research Nursing Conference*, Milwaukee, WI (May 10).
9. **Salm Ward, T.C.**, Mazul, M., Ngui, E., Bridgewater, F.D. & Harley, A.E. (2012). "You Learn to Go Last": A qualitative study of perceptions of racism during prenatal care in a sample of low income African-American women in Milwaukee. Poster, *Wisconsin Association for Perinatal Care 2012 Meeting*, Green Bay, WI (April 16).
10. **Salm Ward, T.C.**, Mazul, M., Perry, S.J., Bridgewater, F.D., Harley, A.E. & Madsen, M.K. (2011). Barriers to initiating early and continuous prenatal care: African American women's perceptions of racism. Poster, *Wisconsin Public Health Association – Wisconsin Association of Local Health Departments Annual Conference: Healthiest State in One Generation*, Appleton, WI (May 24-26).
11. Bridgewater, F.D., **Salm Ward, T.C.**, Mazul, M., Perry, S.J., Harley, A.E. & Madsen, M.K. (2011). Barriers to initiating early and continuous prenatal care: African American women's perceptions of racism. Poster, *Aurora Scientific Day*, Milwaukee, WI (May 24).
12. **Salm Ward, T.C.**, Mazul, M., Perry, S.J., Bridgewater, F.D., Harley, A.E. & Madsen, M. K. (2011). African American Women's Perceptions of Discrimination during Prenatal Care. Oral Presentation and Poster, *University of Wisconsin-Milwaukee College of Health Sciences' 2011 Research Symposium*, Milwaukee, WI (April 15).
13. Chen, H-Y., Chauhan, S.P., Mori, N., **Salm Ward, T.C.,** Gass, E. & Cisler, R.A. (2010). Aberrant fetal growth and mortality (early, late, and postneonatal): An analysis of Milwaukee births, 1996-2007. Oral presentation, *Central Association of Obstetricians & Gynecologists*, Las Vegas, NV (October 27-30).
14. **Salm Ward, T.C.**, Weiss, M., Conway, A.E., Steber, D.L. & Cisler, R.A. (2010). PeriData.Net®: A tool for real-time access to state-wide perinatal data. Poster, *Wisconsin Public Health Association – Wisconsin Association of Local Health Departments Annual Conference: Achieving Health Equity through Policy and Partnerships,* Madison, WI (May 25-27).
15. Chen, H-Y., Chauhan, S.P., Mori, N., **Salm Ward, T.C.** & Cisler, R.A. (2010). Aberrant fetal growth and mortality (early, late, and postneonatal): An analysis of Milwaukee births, 1996-2007. Oral presentation, *Aurora Scientific Day,* Milwaukee, WI (May 4).
16. **Salm Ward, T.C.**, Mazul, M., Perry, S.J., Bridgewater, F.D. & Harley, A.E. (2010). Barriers to initiating early and continuous prenatal care: African American women's perceptions of racism. Work in Progress Poster Session, *Aurora Scientific Day,* Milwaukee, WI (May 4).
17. **Salm Ward, T.C.**, Weiss, M., Conway, A.E., Steber, D.L. & Cisler, R.A. (2010). PeriData.Net®: Wisconsin's comprehensive perinatal data platform. Poster, *Wisconsin Association for Perinatal Care Annual Conference*, Wisconsin Dells, WI (April 19-20).
18. Chen, H.Y., Chauhan, S.P., Mori, N., **Salm Ward, T.C.**, Gass, E. & Cisler, R.A. (2010). Aberrant fetal growth and mortality (Early, Late, and Postneonatal): An Analysis of Milwaukee Births, 1996-2007. Poster (Salm Ward), *2010 Population Health Sciences Poster Session*, Madison, WI (March 22).

19. Chen, H.Y., Mori, N., **Salm Ward, T.C.** & Bergstrom, J. (2009). Risk factors for infant mortality in the city of Milwaukee, 1993-2007. Poster, *Population Health Sciences in Wisconsin and Beyond – Providing Evidence for Clinical Practice and Public Health,* Madison, WI (August 27-28).
20. **Salm Ward, T.C.**, Mori, N., Blair, K., Bergstrom, J., Galvao, L. & Cisler, R.A. (2009). Setting a goal to reduce teen births in Milwaukee by 2015. Poster, *Population Health Sciences in Wisconsin and Beyond – Providing Evidence for Clinical Practice and Public Health,* Madison, WI (August 27-28).
21. **Salm Ward, T.C.**, Patrick, T., Mori, N. & Madsen, M.K. (2009). Racial and socioeconomic disparities in birth outcomes in the city of Milwaukee. Poster, *Population Health Sciences in Wisconsin and Beyond – Providing Evidence for Clinical Practice and Public Health,* Madison, WI (August 27-28).
22. **Salm Ward, T.C.**, Weiss, M., Conway, A., Steber, D. & Cisler, R.A. (2009). PeriData.Net®: Wisconsin's comprehensive perinatal platform. Poster, *Population Health Sciences in Wisconsin and Beyond – Providing Evidence for Clinical Practice and Public Health,* Madison, WI (August 27-28).
23. **Salm Ward, T.C.**, Mori, N. & Patrick, T.B. (2009). The effects of socioeconomic status and race on poor birth outcomes in Milwaukee, Wisconsin. Oral presentation, *Aurora Scientific Day*, Milwaukee, WI (May 28).
24. **Salm Ward, T.C.**, Mori, N. & Patrick, T.B. (2009). The effects of socioeconomic status and race on poor birth outcomes in Milwaukee, Wisconsin. Oral presentation, *University of Wisconsin-Milwaukee College of Health Sciences Research Symposium*, Milwaukee, WI (April 17) (won 3rd Place Research Presentation Award).
25. Begun, A., Berger, L., Brondino, M. & **Salm Ward, T.** (2008). Assessing lifecourse change attempts among a subset of COMBINE Study alcohol dependent participants. Poster, *Joint Research Society on Alcoholism and International Society for Biomedical Research on Alcoholism Meetings*, Washington, DC (June 28-July 2).
26. Mori, N., **Salm Ward, T.**, Bergstrom, J., Galvao, L., Cisler, R.A. & Blair, K. (2008). Assessing reproductive health disparities in Milwaukee: Developing a goal to reduce births for young teenagers by 2015. Poster, *Academy for Health Equity 1st Meeting*, Denver, CO (June 26-27).
27. **Salm Ward, T.C.**, Weiss, M., Conway, A.E., Cisler, R.A. & Steber, D. (2008). PeriData.Net®: Developing a tool for real-time access to state-wide perinatal data. Poster, S*ociety for Pediatric and Perinatal Epidemiology 21st Annual Meeting*, Chicago, IL (June 23-24).
28. Berger, L.K., **Salm Ward, T.C.**, Erickson, D.J. & Peterson, S. (2003). Recruitment in alcohol pharmacotherapy controlled clinical trials: The development, implementation, and evaluation of a scientifically responsible and cost-effectiveness approach. Oral presentation, *Aurora Scientific Day*, Milwaukee, WI (May 15).

Guest Lectures

1. Health Disparities in Milwaukee. (2012). In N. Mori (Adjunct Professor), *HCA 307: Epidemiology for the Health Sciences* undergraduate course, College of Health Sciences, University of Wisconsin-Milwaukee (May 3).
2. Examining Health Disparities Using the Milwaukee Health Report. (2012). In E. Gass (Adjunct Professor), *PH 101: Introduction to Public Health* undergraduate course, School of Public Health, University of Wisconsin-Milwaukee (February 9).

3. Birth outcomes in the City of Milwaukee. (2011). In N. Mori (Adjunct Professor), *HCA 307: Epidemiology for the Health Sciences* undergraduate course, College of Health Sciences, University of Wisconsin-Milwaukee (June 16).
4. Birth outcomes in the City of Milwaukee. (2011). In N. Mori (Adjunct Professor), *HCA 307: Epidemiology for the Health Sciences* undergraduate course, College of Health Sciences, University of Wisconsin-Milwaukee (April 28).
5. Racial Disparities in birth outcomes in the City of Milwaukee. (2011). In P. Rhyner (Professor) & V. Moerchen (Assistant Professor), *Preparing Academically Successful Students in Maternal Child Health* undergraduate program, College of Health Sciences, University of Wisconsin-Milwaukee (April 19).
6. Birth outcomes in the City of Milwaukee. (2010). In N. Mori (Adjunct Professor), *HCA 307: Epidemiology for the Health Sciences* undergraduate course, College of Health Sciences, University of Wisconsin-Milwaukee (June 15).
7. Birth outcomes in the City of Milwaukee. (2010). In P. Rhyner (Professor) & V. Moerchen (Assistant Professor), *Preparing Academically Successful Students in Maternal Child Health* undergraduate program, College of Health Sciences, University of Wisconsin-Milwaukee (April 27).
8. Birth outcomes in the City of Milwaukee. (2010). In N. Mori (Adjunct Professor), *HCA 307: Epidemiology for the Health Sciences* undergraduate course, College of Health Sciences, University of Wisconsin-Milwaukee (April 8).
9. A population health approach for conducting interdisciplinary and translational research. (2009). *University of Wisconsin School of Medicine and Public Health M4 Student Presentation*, Milwaukee, WI (July 14).
10. Form 90 training. (2005). Training provided to undergraduate and graduate psychology students. Presented with M.A. Keller (Student Research Assistant). Marquette University, Milwaukee, WI (May).
11. Social workers in the research field. (2005). In S. Peterson (Adjunct Professor) graduate social work class, School of Social Welfare, University of Wisconsin-Milwaukee (January).
12. Form 90 training. (2004). Training provided to undergraduate and graduate psychology students. Presented with D.L. Sittig (Student Research Assistant). Marquette University, Milwaukee, WI (March).

Invited Presentations

1. **Salm Ward, T.C.**, Mazul, M. & Bridgewater, F.D. (2012). "You Learn to Go Last": Prenatal Care Experiences in a Sample of Low-Income African-American Women in Milwaukee. Oral presentation, Zilber School of Public Health's *On Public Health* series, Milwaukee, WI (April 25).
2. **Salm Ward, T.C.**, Mazul, M. & Bridgewater, F.D. (2011). "You Learn to Go Last": Prenatal Care Experiences in a Sample of Low-Income African-American Women in Milwaukee. Oral presentation to the *Prenatal Care Coordinator Partners Meeting, Southeast Region, Wisconsin Division of Public Health*, West Allis, WI (October 21).
3. Cisler, R.A., **Salm Ward, T.C.** & Bridgewater, F.D. (2011). Social Determinants of Infant Mortality in Wisconsin. Oral presentation, *The Healthy Babies Summit and Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) State Conference: Connecting the Dots, Building a System of Care*, Pewaukee, WI (October 14).
4. **Salm Ward, T.C.**, Mazul, M. & Bridgewater, F.D. (2011). "You Learn to Go Last": Prenatal Care Experiences in a Sample of Low-Income African-American Women in

Milwaukee. Oral presentation to leadership at the *YWCA of Greater Milwaukee*, Milwaukee, WI (July 14).

5. **Salm Ward, T.C.** & Mazul, M. (2011). "You Learn to Go Last": Prenatal Care Experiences in a Sample of Low-Income African-American Women in Milwaukee. Oral presentation at the *Children's Community Health Plan Lunch and Learn* meeting, Wauwatosa, WI (July 1).
6. Mazul, M. & **Salm Ward, T.C.** (2011). African-American Women's Perceptions of Discrimination During Prenatal Care. Oral presentation (Mazul) at the *Milwaukee Fetal and Infant Mortality Review* committee quarterly meeting, Wauwatosa, WI (May 17).
7. Florsheim, P., **Salm Ward, T.**, Johnson, S., Simpson, P. & Lemke, M. (2010). The Milwaukee Young Parenthood Study (MYPS): Co-parenting counseling for pregnant adolescents and their partners. Poster, *Office of Adolescent Pregnancy Programs National Adolescent Family Life Care Grantee Annual Conference*, San Antonio, TX (December 13-15).
8. **Salm Ward, T.C.** (2010). Racial Disparities in Infant Mortality: The Research. Oral presentation and facilitated discussion in two-hour breakout session, *Aurora Family Service 4th Annual Race, Families and Milwaukee Summit*, Milwaukee, WI (October 29).
9. Cisler, R.A. & **Salm Ward, T.C.** (2010). Social determinants of health focusing on infant health outcomes. Oral presentation, the *Milwaukee Fetal Infant Mortality Review Committee*, Milwaukee, WI (August 10).
10. Begun, A., Berger, L. & **Salm Ward, T.** (2008). Challenge to conventional assessment of alcohol use disorders: The case for a lifecourse perspective. Oral presentation, *University of Wisconsin-Milwaukee Center for Addiction and Behavioral Health Research Brown Bag Research Seminar*, Milwaukee, WI (May 9).
11. **Salm Ward, T.C.**, Lemke, M., Frazer, D., Cisler, R.A., Baumgardner, D.J. & Galvao, L. (2008). Center for Urban Population Health: A resource for interdisciplinary and community-based research in Milwaukee. Poster, *Creating Collaborative Research Conversations Lecture,* University of Wisconsin Institute for Clinical and Translational Research, Madison, WI (April 17).
12. **Salm Ward, T.C.** & Cisler, R.A. (2006). Recruitment and retention successes in the COMBINE Study. Oral presentation, *Working Consortium on the Inclusion and Care of the Underrepresented in Clinical Research* via Videoconference, Milwaukee, WI (September).
13. Berger, L.K., **Salm Ward, T.C.** & Hubatch, S. (2003). Recruitment in alcohol pharmacotherapy controlled clinical trials. Panel discussion, *Aurora Health Care Research Department Recruitment Training*. Aurora Health Care, Milwaukee, WI (August).
14. Barrett, D., Hubatch, S. & **Salm Ward, T.** (2002). Adherence and retention in the COMBINE clinical trial. Workshop presentation, *COMBINE Project Coordinator Training Meeting*, Baltimore, MD (October).