Project HOPE Data Report
February 25, 2019

Prepared by: Debra Andersen, Diane Bell, Gabrielle Jacobi

Thank you to: Chris Botsko, Senior Consultant, Altarum;
Eva Carter, Technical Assistance Specialist;
Binitha Kunnel, Senior Biostatistician, Maternal and Child Health, Oklahoma State Department of Health
I. Describe the inequity focus of your HOPE work.

Infant mortality was selected as an indicator of focus for Project HOPE, as it represents a measure of overall health of a community and is unfortunately an indicator in our state in which significant disparities exist. Infant mortality is a measure that can be compared across geographic, racial and income levels, and can serve as a compass to monitor the impact of a collaborative approach to improving infant health. Historically, improvements in community conditions such as access to care in remote geographical regions have shown a positive impact in reducing infant mortality rates. “Race/ethnicity and a general lack of health equity are linked to exclusion or discrimination and are known to influence health status” (U.S. Department of Health and Human Services (HHS) Action Plan to Reduce Disparities and www.nimhd.nih.gov/recovery/gosocialdeterm.asp). Through Project HOPE, we will focus on infant mortality to help us understand how barriers, discrimination and a lack of access impact this indicator.

While the overall infant mortality rate (IMR) in Oklahoma has declined, Oklahoma has one of the highest IMR in the nation. Despite recent improvements, significant racial disparities persist. The IMR for American Indians (11.3 deaths per 1000 births in 2014-2016) is more than 1.5 times that of non-Hispanic whites (6.3) and the non-Hispanic black IMR (13.4) is more than double. There has been a steep increase in the IMR in American Indian population, primarily in the post-neonatal (infants who are at least 28 days but less than 365 days old) period. The rise in Latino IMR is of concern especially given the rapid growth of this population in Oklahoma.

Source: Maternal and Child Health Services Title V Block Grant Oklahoma FY 2019 Application/FY 2017 Annual Report

See detailed data charts in Appendix.
II. What is behind the inequity?

Infant mortality is a complex health issue with multiple medical, social, and economic determinants, including race/ethnicity, maternal age, education, smoking and health status. There is a significant body of scholarly evidence suggesting that racial disparities and the cumulative effects of structural racism are significantly associated with infant mortality.

Leading Causes of Infant Death By Race in Oklahoma:

**White**
1. Congenital anomalies
2. Disorders related to short gestation and low birth weight
3. Sudden Infant Death Syndrome

**African American/Black**
1. Disorders related to short gestation and low birth weight
2. Congenital anomalies
3. Sudden Infant Death Syndrome

**American Indian**
1. Disorders related to short gestation and low birth weight
2. Congenital anomalies
3. Sudden Infant Death Syndrome

**Hispanic**
1. Congenital anomalies
2. Disorders related to short gestation and low birth weight
3. Sudden Infant Death Syndrome

The Maternal and Child Health Service, Oklahoma State Department of Health, has identified the following contributors to infant mortality:

Preterm births

*Smoking during pregnancy* – During 2010-2013, among women who delivered a preterm infant, 20.1% reported to have smoked three months before or during pregnancy. Approximately 21% of white mothers smoked, 18.3% of African American mothers, 21.9% of American Indian mothers, and 5.8% among Hispanic mothers.

*Secondhand smoke exposure* – Mothers less than 20 years, education less than high school, those with income less than $25,000, unmarried mothers and African American mothers reported lower rates of completely smoke-free homes.

*Unintentional injury* – The fifth leading cause of infant deaths in Oklahoma has declined slightly since 2010. The top three causes for unintentional injuries among infants are suffocation, motor vehicle accidents and drowning.
**Safe Sleep** – Oklahoma PRAMS results in 2011 indicated 70% of new mothers placed infants on their backs to sleep. Nearly 67% of infants shared sleep surfaces with someone else. Safe sleep behaviors have improved steadily since 2004, but significant racial and ethnic disparities persist. African American mothers had the lowest rate for laying infants on their back to sleep and not sharing a sleeping surface. SIDS is the third leading cause of infant death, accounting for nearly 12% of total infant deaths in 2012. Deaths due to both these conditions were higher among American Indian infants compared to White and African American infants. The Appendix includes a number of charts and documents that discuss potential causes and issues related to infant mortality in Oklahoma in more detail.

Source: Maternal and Child Health Services Title V Block Grant Oklahoma FY 2019 Application/FY 2017 Annual Report, p. 38

**III. What do you see as HOPE’s contribution to addressing this inequity?**

Through Project HOPE, we will work in partnership with community organizations in locations where data indicate high disparities in infant mortality. We recognize and respect that there are existing efforts in place to decrease infant mortality and intend to build upon strategies that have contributed to success. We also intend to explore why traditional community approaches have not been successful by gathering personal stories that represent the populations with whom disparities are noted. With in-depth, targeted strategies and a community-specific approach, OPSR will approach the issue of infant mortality in Oklahoma through an equity lens. We will strategically select a community experiencing disproportionately high rates of infant mortality to listen and learn from community members with lived experience to gain a deeper understanding of the unique and complex social, economic, cultural and systemic determinants that may contribute to disparate infant outcomes. Using the Equity Impact Toolkit provided by the Institute for Public Health Innovation, we will collaboratively design a sensitive and responsive model of community engagement and intervention using this tool to guide conversations with community members through an equity lens.

We have developed a strategic approach with tribal representatives from early childhood programs to explore partnership opportunities with Project HOPE.

After a thorough review of data and looking at community strengths, we will identify a community and establish partnerships with organizations who are trusted by family members to begin the conversations. To make sure we have an understanding of the families and providers in the chosen community we will work with trained and trusted community members (Citizen Journalists) to gather stories using the SenseMaker® framework that will provide us with their lived experiences and authentic voices and perspectives. This qualitative data will help identify common themes and patterns to guide community-led conversations to explore the underlying causes within the context of the community and envision possibilities and actionable solutions.

This data will lay the groundwork for Vital Village to provide assistance to us to engage and empower community leaders and coalitions to identify a strategic action plan to reduce disparities with lower infant mortality as the intended outcome.
A desired outcome of this community process is the creation of a flexible model for community and family engagement that can be implemented in diverse communities across Oklahoma and leads to the effective promotion of child, family and community wellbeing. We believe our efforts will support and expand the capacity of existing community systems, while building strong alliances across diverse sectors. By supporting continuous feedback from diverse stakeholders, we will promote family and community protective factors and responsive social change.

Short-term activities

- Identification of data on infant mortality and related indicators in selected community
- Development of communication strategies on data indicators for community members
- Engagement of community leadership on the E-LEaD Team
- Citizen journalists trained and gathering family and community voice
- Vital Village consults on planning community
- Action Plan in place for selected community

IV. What resources do you need to support your work in this area?

OPSR will continue to partner with state agency representatives to assist in data collection and interpretation; in particular the Oklahoma State Department of Health Maternal and Child Health (MCH) Service. This partnership ensures we are working in tandem with state agency priorities and initiatives. Project HOPE will benefit from the data analysis and evaluation expertise available through MCH, including population-based surveillance for assessing risk factors associated with poor infant health outcomes.

We look forward to continued support from Project HOPE technical assistance specialist, Eva Carter, Nemours staff and data support from Altarum. OPSR will continue to design and implement the story gathering process using the SenseMaker® framework with technical assistance from the University of Kansas Center for Public Partnership and Research.

We look forward to continued technical assistance from Vital Village as we begin to work with our identified community to develop a framework for an Oklahoma community engagement model.
## Appendix

Oklahoma Counties with Infant Mortality Rates above State Average, OSDH

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Births and Infant Mortality 2000-2016 Compiled by Binitha Kunnel, OSDH

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<th>Births</th>
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Kids Count
2012 - 2016 Infant Mortality Rates of Oklahoma
(Oklahoma State Average 7.4)

Infant Mortality Rate
- 7.9 or less
- 8.0-8.9
- 9.0-10.9
- 11.0-12.9+

The map shows the infant mortality rates for each county in Oklahoma from 2012 to 2016, with the state average being 7.4. The rates range from 0.0 to 13.0, with different colors indicating different ranges.
Receiving prenatal care in the first trimester is recommended for all pregnant women to achieve optimal pregnancy health. The Healthy People 2020 goal for prenatal care is to increase the percent of pregnant women who receive prenatal care in the first trimester to 77.9%. In Oklahoma, the percent of mothers who began prenatal care in the first trimester was 68.5%.  

To better understand the status of early entry into prenatal care (PNC), Oklahoma PRAMS data for first time mothers were examined for barriers to receiving PNC as early as the mother wanted. Overall, 20.5% of first time mothers in Oklahoma stated they did not get PNC as early as they wanted.

Those mothers who reported not receiving care when wanted were asked to indicate the reasons why; more than one response could be selected (Figure 1). The three most commonly reported barriers were that mothers could not get an appointment earlier, they did not know they were pregnant, and/or they did not have their Medicaid/SoonerCare card. Almost 13% of first time mothers did not want anyone to know they

**Figure 1. Barriers to Receiving Prenatal Care as Early as Wanted Among First Time Mothers, Oklahoma PRAMS 2009-2011**

- Did not want anyone to know about pregnancy: 12.7%
- Did not know I was pregnant: 43.3%
- Did not have my Medicaid card: 43.0%
- Could not take time off from work/school: 8.6%
- Had too many other things going on: 20.6%
- Doctor would not start care earlier: 20.7%
- No transportation: 16.3%
- Not enough money to pay for visits: 31.0%
- Could not get appointment earlier: 44.5%

**OKLAHOMA FACTS**

- 68.5% of mothers in Oklahoma receive prenatal care in the first trimester.
- 1 in 5 first time mothers did not receive prenatal care as early in their pregnancy as they wanted.
- Inability to get an earlier appointment was a barrier for 44.5% of first time mothers.
- Transportation was a barrier to early prenatal care for 16.3% of first time mothers.
- 29.1% of Black mothers did not receive care as early in their pregnancy as they wanted.
- Almost 1 in 3 mothers less than 20 years old did not receive prenatal care as early as they wanted.
- 28.8% of mothers with annual household incomes of less than $25,000 did not receive prenatal care as early as they wanted.
acknowledgements
Special assistance for this Brief was provided by Binitha Kunnel, MS; Alicia Lincoln, MSW, MSPH; Jill Nobles-Botkin, MSN, APRN-CNM; and, Wanda Thomas.

Funding for PRAMS is provided by the Centers for Disease Control and Prevention (CDC) and the Maternal and Child Health Bureau, Department of Health and Human Services, Maternal and Child Health Services (MCH) Title V Block Grant.

PRAMS is a population-based surveillance system about maternal behaviors and experiences before, during, and after pregnancy. Approximately 250 mothers are selected to participate in Oklahoma each month. Mothers are sent as many as three mail questionnaires seeking their participation with follow-up phone interviews for non-respondents. Information included in the birth registry is used to develop analysis weights that adjust for probability of selection and non-response. Prevalence rates were calculated and the potential risk factors were identified using the Cochran-Mantel-Haenszel Chi-Square (χ²) Test. PRAMS had 8,834 respondents for 2009-2011 for a response rate of 68.3%.

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were pregnant. Transportation was an issue for 16.3%.

Figure 2 shows PNC as early as wanted by maternal race. First time Black mothers have the lowest rate at 70.9%.

Seventy-nine percent of non-Hispanic mothers received care as early as wanted, compared to 83.5% of Hispanic mothers (data not shown).

A striking disparity in early prenatal care by maternal age is depicted in Figure 3. Almost 1 in 3 mothers less than 20 years old did not receive care as early as wanted.

Ninety-one percent of mothers with annual household incomes of $50,000 or more per year received PNC as early as wanted compared to 71.2% of mothers with incomes of less than $25,000 per year. Within the $25,000-$49,999 range, 87.8% of mothers received care as early as wanted (data not shown).

These data are self-reported for receiving prenatal care as early as wanted, irrespective of the month PNC began. Due to the large percentage of mothers who indicated issues with Medicaid cards or getting appointments, targeted outreach about online enrollment for Medicaid, for both young women (printing a temporary card) and providers (accepting temporary cards/print outs) may be needed.

References:

Figure 2. Percent Receiving Prenatal Care as Early as Wanted Among First Time Mothers, by Maternal Race, Oklahoma PRAMS 2009-2011

Figure 3. Percent Receiving Prenatal Care as Early as Wanted Among First Time Mothers, by Maternal Age, Oklahoma PRAMS 2009-2011

“ I feel you need a prenatal visit as soon as you find out you are pregnant.”

- PRAMS Mom
Discrimination in Accessing Health Care

Inequities in the quality of health care patients receive are often associated with unfair treatment felt while accessing care. Members of racial and ethnic minority groups and patients of lower socioeconomic status are more likely to report being the subject of negative attitudes and discriminatory practices during the health care process.1

This report used The Oklahoma Toddler Survey (TOTS) data from 2011-2013 to examine self-reported unfair treatment when accessing health care and its relationship to health care access. The survey asked mothers about unfair treatment due to seven reasons when seeking health care. Reasons recorded as “Other” were also included.

Overall, 11.8% of mothers reported some form of unfair treatment. Ability to pay was the most reported reason for discrimination (Figure 1).

Non-Hispanic (NH) Black mothers reported the highest rate of discrimination (20.1%), followed by unmarried mothers, and mothers less than 25 years of age (Figure 2). Conversely, mothers who were NH white, educated (greater than high school), and married all experienced lower rates of unfair treatment.

Mothers reporting discrimination while accessing health care had significantly (p<0.05) lower rates of medical home access for their toddler compared to those mothers who reported no discrimination (87.5% vs 71.5%).

Nearly 93% of mothers not reporting discrimination accessed a family doctor or pediatrician as the toddler’s personal doctor compared to 83% of mothers reporting discrimination (Figure 3). A significantly higher percent of mothers reporting discrimination while accessing health care had significantly lower rates of medical home access for their toddler.

In Oklahoma:
• 11.8% of mothers of 2-year-olds reported some form of unfair treatment when accessing health care for their toddler.
• Ability to pay was the most reported reason for unfair treatment/discrimination.
• Non-Hispanic Black mothers, unmarried mothers, and mothers less than 25 years all reported higher rates of discrimination.
• Mothers reporting discrimination had significantly lower rates of medical home access for their toddler.

Figure 1. Self-Reported Reasons for Unfair Treatment while Accessing Health Care - TOTS 2011-2013
discrimination accessed a physician assistant (PA), nurse practitioner (NP) or another type of provider for the primary care of their toddler (17% vs 7%).

Disparities persist despite considerable progress in the delivery of health care services and efforts to improve the quality of patient care both nationally and statewide.

Raising public and provider awareness about existing disparities, including how unfair treatment influences the likelihood of continuing care and accessing needed services is an important step in improving the quality of health care for all.

Improving the conditions of health care settings, from the intake staff to the patient-clinician encounter, and the policies governing the practices of health systems may also improve the efficiency and equity of care for all patients.

Reference:
2017 PREMATURE BIRTH REPORT CARD

Oklahoma

Preterm Birth Rate: 10.6%
Grade: D

Premature Birth Report Card grades are assigned by comparing the 2016 preterm birth rate in a state or locality to the March of Dimes goal of 8.1 percent by 2020. The Report Card highlights priority areas for action with county and racial/ethnic disparities data and a disparity ratio. Report Cards are intended to spur action to improve equity and reduce preterm birth, with the goal of giving every mother and baby a fair chance for a healthy pregnancy and birth.

COUNTIES

Counties with the greatest number of births are graded based on their 2015 preterm birth rates.

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<th>County</th>
<th>Grade</th>
<th>Preterm birth rate</th>
<th>Change in rate from previous year</th>
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<td>B</td>
<td>8.5%</td>
<td>Worsened</td>
</tr>
<tr>
<td>Cleveland</td>
<td>D</td>
<td>10.6%</td>
<td>Worsened</td>
</tr>
<tr>
<td>Comanche</td>
<td>B</td>
<td>8.4%</td>
<td>Improved</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>D</td>
<td>10.5%</td>
<td>Worsened</td>
</tr>
<tr>
<td>Rogers</td>
<td>C</td>
<td>9.4%</td>
<td>Improved</td>
</tr>
<tr>
<td>Tulsa</td>
<td>D</td>
<td>10.8%</td>
<td>Worsened</td>
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</table>

RACE & ETHNICITY IN OKLAHOMA

The March of Dimes disparity ratio measures and tracks progress towards the elimination of racial/ethnic disparities in preterm birth. It is based on Healthy People 2020 methodology and compares the group with the lowest preterm birth rate to the average for all other groups. Progress is evaluated by comparing the current disparity ratio to a baseline disparity ratio. A lower disparity ratio is better, with a disparity ratio of 1 indicating no disparity.

Percentage of live births in 2013-2015 (average) that are preterm

- Asian/Pacific Islander: 9.2%
- Hispanic: 9.4%
- White: 10.1%
- American Indian/Alaska Native: 10.4%
- Black: 14.0%

In Oklahoma, the preterm birth rate among black women is 40% higher than the rate among all other women.

Disparity ratio: 1.17
Change from baseline: No Improvement

For details on data sources and calculations, see Technical Notes.
For more information on how we are working to reduce premature birth, visit www.marchofdimes.org.

marchofdimes.org/reportcard
Table 1: Preterm birth rate range and scoring criteria

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<th>Preterm birth rate range</th>
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<td>Preterm birth rate of 10.4% to 11.4%</td>
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<tr>
<td>E</td>
<td>Preterm birth rate greater than or equal to 11.5%</td>
<td>Score greater than 3.0</td>
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**PRETERM BIRTH: DEFINITION AND SOURCE**

Premature or preterm birth is birth less than 37 weeks gestation based on the obstetric estimate of gestational age. Data used in this report card came from the National Center for Health Statistics (NCHS) natality files, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. This national data source was used so that data are comparable for each state and jurisdiction-specific report card. Data provided on the report card may differ from data obtained directly from state or local health departments and vital statistics agencies, due to timing of data submission and handling of missing data. The preterm birth rate shown at the top of the report card was calculated from the NCHS 2016 final natality data. Preterm birth rates in the trend graph are from the NCHS 2007-2016 final natality data. County preterm birth rates are from the NCHS 2015 final natality data. Preterm birth rates for bridged racial and ethnic categories were calculated from NCHS 2013-2015 final natality data. Preterm birth rates were calculated as the number of preterm births divided by the number of live births with known gestational age multiplied by 100.

**TECHNICAL NOTES**

**GRADING METHODOLOGY**

Grade ranges were established in 2015 based on standard deviations of final 2014 state and District of Columbia preterm birth rates away from the March of Dimes goal of 8.1% by 2020. Grades were determined using the following scoring formula: (preterm birth rate of each jurisdiction – 8.1%) / standard deviation of final 2014 state and District of Columbia preterm birth rates. The resulting scores were rounded to one decimal place and assigned a grade. See the table for details.

**PRETERM BIRTH BY COUNTY**

Report cards for states and jurisdictions, except District of Columbia, display up to 6 counties with the greatest number of live births. Counties are not displayed if the number of preterm births is less than 20. Counties are ordered alphabetically. Grades were assigned based on criteria described above. Change from previous year was assessed by comparing the 2015 county preterm birth rate to the 2014 rate.

**PRETERM BIRTH BY RACE/ETHNICITY OF THE MOTHER**

Mother’s race and Hispanic ethnicity are reported separately on birth certificates. Rates for Hispanic women include all bridged racial categories (white, black, American Indian/Alaska Native, and Asian/Pacific Islander). Rates for non-Hispanic women are classified according to race. The Asian/Pacific Islander category includes Native Hawaiian. In order to provide stable rates, racial and ethnic groups are shown on the report card if the group had 20 or more preterm births in each year from 2010-2015. To calculate preterm birth rates on the report card, three years of data were aggregated (2013-2015). Preterm birth rates for not stated/unknown race are not shown on the report card.

**PRETERM BIRTH DISPARITY MEASURES**

The March of Dimes disparity ratio is based on Healthy People 2020 methodology and provides a measure of the differences, or disparities, in preterm birth rates across racial/ethnic groups within a geographic area. The disparity ratio compares the racial/ethnic group with the lowest preterm birth rate (comparison group) to the average of the preterm birth rate for all other groups.

To calculate the disparity ratio, the 2013-2015 preterm birth rates for all groups (excluding the comparison group) were averaged and divided by the 2013-2015 comparison group preterm birth rate. The comparison group is the racial/ethnic group with the lowest six-year aggregate preterm birth rate (2010-2015) among groups that had 20 or more preterm births in all years from 2010-2015. A disparity ratio was calculated for each U.S. state (excluding Maine, Puerto Rico, Vermont, and West Virginia), the District of Columbia, and the total U.S. A lower disparity ratio is better, with a disparity ratio of 1 indicating no disparity.

Progress towards eliminating racial and ethnic disparities was evaluated by comparing the 2013-2015 disparity ratio to a baseline (2010-2012) disparity ratio. Change between time periods was assessed for statistical significance at the 0.05 level using the approach recommended by Healthy People 2020. If the disparity ratio significantly improved because the average preterm birth rate for all other groups got better, we displayed “Improved” on the report card. If the disparity ratio significantly worsened because the lowest group got better or the average of all other groups got worse, we displayed “Worsened” on the report card. If the disparity ratio did not significantly change, we displayed “No Improvement” on the report card.

The report card also provides the percent difference between the racial/ethnic group with the 2013-2015 highest preterm birth rate compared to the combined 2013-2015 preterm birth rate among women in all other racial/ethnic groups. This percent difference was calculated using only the racial/ethnic groups displayed on the state or jurisdiction-specific report card. This difference was calculated for each U.S. state with adequate numbers and the District of Columbia.

**CALCULATIONS**

All calculations were conducted by the March of Dimes Perinatal Data Center.

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Introduction:
The American Academy of Pediatrics (AAP) recommends room sharing (with a crib, bassinet or cradle near the parents bed) for infants, as opposed to bed-sharing (sharing a sleep surface with a parent or other child).\(^1\) Currently, no specific bed-sharing situations are considered safe; epidemiologic studies have shown that bed-sharing is highly associated with an increased risk of sudden infant death syndrome (SIDS), sudden unexpected infant death (SUID) or suffocation.\(^{1,2}\) For the infant, bed-sharing can increase the occurrence of several risk factors for SIDS and SUID, including overheating, airway obstruction, infant head covering, and exposure to tobacco smoke.\(^1\)

Willinger et al. found that routine bed-sharing in the United States was more likely among mothers younger than 18 years of age, mothers who were African American or Asian/Pacific Islander, mothers with annual household incomes of less than $20,000, those living in southern states, and/or mothers with infants less than 8 weeks of age.\(^{2,3}\)

Breastfeeding is a protective factor for SIDS.\(^{4-6}\) The protective effect of breastfeeding of any duration increases with exclusivity. A study in Germany found that exclusive breastfeeding reduced the risk for SIDS by half, while breastfeeding of any duration, exclusive or not, has been found to reduce the risk of SIDS when compared to no breastfeeding.\(^{3,5,7,8}\) In addition, breastfeeding has been associated with a lower risk of post-neonatal mortality.\(^9\)

Breastfeeding has also been associated with an increased likelihood of bed-sharing. A study, using Oregon PRAMS data, reviewed the frequency of bed-sharing among racial groups. Results showed that 76.6% of mothers reported to have bed-shared at least sometimes. African Americans had the highest proportion of bed-sharing followed by Asians/Pacific Islanders. Hispanics had the lowest proportion. In addition, women who breastfed more than four weeks, had annual family incomes less than $30,000, or were unmarried were more likely to bed-share frequently (always or almost always).\(^{10}\) Another PRAMS study in Florida found a similar relationship with bed-sharing and breastfeeding among white and African American mothers who breastfed for four or more weeks.\(^{11}\)

This study explored bed-sharing practices among first time mothers who breastfed at least eight weeks post-partum in Oklahoma.
Methods:

Oklahoma PRAMS survey data for the years 2009-2011 (n=8,834) were used in this report, with an overall unweighted response rate of 68.3%. PRAMS asked new mothers “How often does your new baby sleep or nap on the same sleep surface with you or anyone else?” Mothers could answer “Always, 5 or more times per week but not always, 3-4 times per week, 1-2 times per week, or Never.” For this study, mothers were categorized as “At least sometimes” if they gave any answer other than “Never.” Only first time mothers with breastfeeding duration of eight weeks or more were analyzed for this study (n=1,120). This was to reduce potential bias from previous breastfeeding and infant sleep experiences.

Analysis for this study utilized SAS callable SUDAAN. Prevalence rates and 95% confidence interval (C.I.) estimates were calculated. Potential associations were identified using the Cochran-Mantel-Haenszel Chi-Square (χ2) Test. Variables were considered significant at p <0.05. Multivariate logistic regression models were used to calculate adjusted risk ratios (ARR).

Results:

In Oklahoma, 25.6% (n= 329) of first time mothers who breastfed their infants for eight weeks or longer reported that their infant never shared a bed or sleeping surface (Figure 1). However, 17.4% of new mothers reported their infant always bed-shared, and 23.0% bed-shared 5 or more times per week. Almost three in four infants (74.4%, n=747) born to first time mothers who breastfed eight or more weeks bed-shared at least sometimes.

Table 1 highlights the bed-sharing practices (never bed-shared vs. sometimes or always bed-shared) of first time mothers who breastfed for at least eight weeks by selected maternal demographics.

Maternal age, marital status, education, household income, and Medicaid status were significantly associated with bed-sharing sometimes or always. Mothers who breastfed their infants for eight weeks or longer reported that their infant never shared a bed or sleeping surface (Figure 1). However, 17.4% of new mothers reported their infant always bed-shared, and 23.0% bed-shared 5 or more times per week. Almost three in four infants (74.4%, n=747) born to first time mothers who breastfed eight or more weeks bed-shared at least sometimes.

Table 1. Bed-sharing Prevalence Among First Time Mothers who Breastfed for Eight Weeks or More by Maternal Demographics, Oklahoma PRAMS 2009-2011

<table>
<thead>
<tr>
<th>Maternal Demographic</th>
<th>Never Bed-shared Rate (%)</th>
<th>95% C.I.</th>
<th>Sometimes or Always Bed-shared Rate (%)</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20 years</td>
<td>21.3</td>
<td>10.9 - 37.3</td>
<td>78.7</td>
<td>63.7 - 89.1</td>
</tr>
<tr>
<td>20-29 years</td>
<td>22.5</td>
<td>17.8 - 28.0</td>
<td>77.5</td>
<td>72.0 - 82.2</td>
</tr>
<tr>
<td>≥ 30 years</td>
<td>36.7</td>
<td>27.6 - 47.0</td>
<td>63.3</td>
<td>53.0 - 72.4</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>28.5</td>
<td>23.6 - 34.0</td>
<td>71.5</td>
<td>66.0 - 76.4</td>
</tr>
<tr>
<td>African American</td>
<td>-</td>
<td>-</td>
<td>89.1</td>
<td>63.2 - 97.5</td>
</tr>
<tr>
<td>American Indian</td>
<td>-</td>
<td>-</td>
<td>84.9</td>
<td>66.3 - 94.2</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>-</td>
<td>78.4</td>
<td>65.1 - 87.6</td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27.1</td>
<td>22.6 - 32.1</td>
<td>72.9</td>
<td>67.9 - 77.4</td>
</tr>
<tr>
<td>Yes</td>
<td>16.0</td>
<td>8.1 - 29.3</td>
<td>84.0</td>
<td>70.7 - 91.9</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>31.3</td>
<td>26.0 - 37.1</td>
<td>68.7</td>
<td>62.9 - 74.0</td>
</tr>
<tr>
<td>Other</td>
<td>15.6</td>
<td>10.0 - 23.4</td>
<td>84.4</td>
<td>76.6 - 90.0</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; HS</td>
<td>-</td>
<td>-</td>
<td>88.7</td>
<td>67.9 - 96.7</td>
</tr>
<tr>
<td>HS</td>
<td>16.1</td>
<td>9.5 - 16.0</td>
<td>83.9</td>
<td>74.0 - 90.5</td>
</tr>
<tr>
<td>&gt; HS</td>
<td>30.1</td>
<td>25.0 - 35.8</td>
<td>69.9</td>
<td>64.2 - 75.0</td>
</tr>
<tr>
<td><strong>Household income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; $25,000</td>
<td>18.6</td>
<td>13.1 - 25.8</td>
<td>81.4</td>
<td>74.2 - 86.9</td>
</tr>
<tr>
<td>$25,000 - $49,999</td>
<td>14.4</td>
<td>8.6 - 23.0</td>
<td>85.6</td>
<td>77.0 - 91.4</td>
</tr>
<tr>
<td>$50,000 or more</td>
<td>40.1</td>
<td>32.3 - 48.5</td>
<td>59.8</td>
<td>51.5 - 67.7</td>
</tr>
<tr>
<td><strong>Medicaid</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>32.5</td>
<td>26.5 - 39.1</td>
<td>67.5</td>
<td>60.8 - 73.5</td>
</tr>
<tr>
<td>Yes</td>
<td>18.4</td>
<td>13.3 - 24.9</td>
<td>81.6</td>
<td>75.1 - 86.6</td>
</tr>
</tbody>
</table>

1 Significant at p <0.05
2 * Cell size less than 30

The Pregnancy Risk Assessment Monitoring System (PRAMS) is an ongoing, population-based study designed to collect information about maternal behaviors and experiences before, during, and after pregnancy. Monthly, PRAMS sampled between 200 to 250 recent mothers taken from the Oklahoma live birth registry. Mothers were mailed up to three questionnaires seeking their participation. Follow-up phone interviews for non-respondents were conducted. A systematic stratified sampling design was used to yield sample sizes sufficient to generate population estimates for groups considered at risk for adverse pregnancy outcomes. Information included in the birth registry is used to develop analysis weights that adjust for probability of selection and non-response.
less than 20 years of age had the highest bed-sharing rates (78.7%) compared to the other age groups. African American mothers bed-shared more than the other races. Socio-economic status influenced bed-sharing, as those mothers with incomes less than $50,000 and those with Medicaid-funded prenatal or delivery care bed-shared more. Rates of bed-sharing ranged from 59.8% for mothers with $50,000 or more annual household income to 89.1% for African American mothers. However, the confidence intervals were wide in many cases, indicating small sample sizes.

Infants of first time mothers who breastfed for eight or more weeks were more likely to bed-share if their mothers had an unintended pregnancy, smoked (before and/or after pregnancy), and reported symptoms of postpartum depression (Table 2). Eighty-eight percent of first time, breastfeeding mothers with postpartum depression symptoms reported infant bed-sharing compared to 73.0% of mothers without symptoms. Prenatal care in the first trimester and maternal body mass index (BMI) were not significantly associated with bed-sharing among this population.

Table 2. Bed-sharing Prevalence Among First Time Mothers who Breastfed for Eight Weeks or More by Selected Maternal Experiences, Oklahoma PRAMS 2009-2011

<table>
<thead>
<tr>
<th>Maternal Experiences</th>
<th>Never Bed-shared Rate (%)</th>
<th>95% C.I.</th>
<th>Bed-shared Sometimes or Always Rate (%)</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prenatal Care in 1st trimester</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25.8</td>
<td>21.1 - 31.0</td>
<td>74.2</td>
<td>69.0 - 78.9</td>
</tr>
<tr>
<td>No</td>
<td>20.9</td>
<td>12.6 - 32.6</td>
<td>79.1</td>
<td>67.4 - 87.4</td>
</tr>
<tr>
<td>Pre-pregnancy BMI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>28.4</td>
<td>22.7 - 35.0</td>
<td>71.6</td>
<td>65.0 - 77.3</td>
</tr>
<tr>
<td>Overweight</td>
<td>19.3</td>
<td>12.6 - 28.6</td>
<td>80.6</td>
<td>71.4 - 87.4</td>
</tr>
<tr>
<td>Obese</td>
<td>20.4</td>
<td>12.8 - 30.9</td>
<td>79.6</td>
<td>69.1 - 87.2</td>
</tr>
<tr>
<td>Pregnancy intention*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intended</td>
<td>29.5</td>
<td>24.3 - 35.4</td>
<td>70.5</td>
<td>64.6 - 75.7</td>
</tr>
<tr>
<td>Unintended</td>
<td>18.5</td>
<td>12.7 - 26.3</td>
<td>81.5</td>
<td>73.7 - 87.3</td>
</tr>
<tr>
<td>Smoking 3 months before pregnancy*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>28.2</td>
<td>23.5 - 33.6</td>
<td>71.7</td>
<td>66.4 - 76.5</td>
</tr>
<tr>
<td>Yes</td>
<td>14.2</td>
<td>8.2 - 23.5</td>
<td>85.8</td>
<td>76.5 - 91.8</td>
</tr>
<tr>
<td>Smoking at time of survey*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27.3</td>
<td>22.8 - 32.3</td>
<td>72.7</td>
<td>67.7 - 77.2</td>
</tr>
<tr>
<td>Yes</td>
<td>14.8</td>
<td>7.2 - 28.0</td>
<td>85.2</td>
<td>72.0 - 92.8</td>
</tr>
<tr>
<td>Postpartum depression symptoms*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27.0</td>
<td>22.5 - 31.9</td>
<td>73.0</td>
<td>68.1 - 77.5</td>
</tr>
<tr>
<td>Yes</td>
<td>12.3</td>
<td>6.3 - 22.5</td>
<td>87.7</td>
<td>77.4 - 93.7</td>
</tr>
</tbody>
</table>

* Significant at p < 0.05
- Cell size less than 30

Figure 2 provides the prevalence of bed-sharing practices by the mother’s receipt of prenatal care counseling on infant safe sleep practices. First time, breastfeeding mothers who reported receiving some counseling on safe sleep had a lower prevalence rate of bed-sharing sometimes or always but the difference was not statistically significant in the bivariate analysis.

Multiple logistic regression analysis was done to assess the factors that were significantly associated with bed-sharing practices among first time breastfeeding mothers. Controlling for maternal demographics, prenatal care, and tobacco use, only three variables maintained a significant association: maternal race, prenatal counseling on infant safe sleep, and postpartum depression symptoms (Table 3). African American and American Indian first time breastfeeding mothers were 33% and 21% more at risk (respectively) to report bed-sharing with their infant. Prenatal counseling on infant safe sleep was a protective factor, reducing the risk of bed-sharing, compared to mothers who did not receive counseling on this issue.

Discussion:

Bed-sharing in Oklahoma is a common phenomenon among first time mothers who breastfeed for at least eight weeks. Racial differences found in other bed-sharing studies were observed in Oklahoma. Among mothers who breastfed for eight weeks or longer, a protective factor for SIDS, rates of bed-sharing were significantly higher for African American/Black and American Indian mothers.

A Missouri study reviewing 119 SIDS and SUID cases found that 47.1% of the infants died while sharing a sleep surface with one or more bed mates. Bed-sharing is associated with infant death, either from SIDS or uninten-
tional asphyxiations and involves unsafe sleep surfaces.\textsuperscript{12} The Oklahoma Child Death Review Board found that sleep-related deaths made up over 37\% (103 out of 278) of all child deaths reviewed in 2013. Of those 103 cases, 60 (58.3\%) were associated with bed-sharing.\textsuperscript{13} Mothers who did have prenatal counseling on safe sleep practices for their infant were at a slightly lower risk of bed-sharing compared to mothers who did not receive any counseling on this topic. This reinforces the need for comprehensive counseling on safe sleep at multiple points, during prenatal care, at the delivery hospital and after the infant has come home. However, even among mothers who receive education on infant safe sleep practices, fatigue and lack of quality sleep may override knowledge and usual safety practices.

Mothers who did have prenatal counseling on safe sleep practices for their infant were at a slightly lower risk of bed-sharing compared to mothers who did not receive any counseling on this topic. This reinforces the need for comprehensive counseling on safe sleep at multiple points, during prenatal care, at the delivery hospital and after the infant has come home. However, even among mothers who receive education on infant safe sleep practices, fatigue and lack of quality sleep may override knowledge and usual safety practices.

Among the first time mothers with breastfeeding duration of eight weeks or more, postpartum maternal depression was a slightly elevated risk for bed-sharing. Mothers who were depressed have been found in other research studies to be less likely to follow infant safety guidelines, including infant sleep position recommendations.\textsuperscript{14} One small study found that infants of mothers who are depressed took longer to fall asleep and had more sleep disturbances, issues that might prompt tired new mothers to bring an infant to bed with them.\textsuperscript{15}

One key limitation of this study was the analytic sample size; the sub-analysis produced estimates with wide confidence intervals. Other limitations for this study include the lack of measurable information regarding the breadth and depth of prenatal care counseling concerning safe sleep and lack of information about the sleeping environment (including who was bed-sharing with the infant). Social desirability bias may be causing an over-reporting of breastfeeding in the state and/or an under-reporting of bed-sharing. This study only reviewed first time mothers who breastfed for at least eight weeks. This group is demographically different from mothers who did not breastfeed for as long or at all (in terms of maternal race, education, age) and may have other distinct health behaviors, other than breastfeeding duration. Causation cannot be assessed, only relationships and associations.

**Recommendations:**

1. Discuss with all members of the family and other potential caregivers the importance of safe sleep practices, what a safe sleep environment looks like and how to encourage its use, and the importance of roomsharing, not bed-sharing.

2. Support and encourage breastfeeding mothers, as every infant feeds and sleeps differently, and reinforce the proximate but separate bed arrangement for optimal breastfeeding and safe sleep success.

3. Support new mothers by allowing them time to sleep without concerns about the infant or household.

4. Advocate for the Office of the Chief Medical Examiner and law enforcement agencies to adopt the Centers for Disease Control and Prevention’s model policy for investigation and classification of Sudden Unexpected Infant Deaths (SUID) and Sudden Infant Death Syndrome (SIDS), including the use of scene re-creation and digital photography. The methods currently utilized do not adequately provide the opportunity to distinguish accidental overlay (smothering) from undetermined causes and do not collect information available that would identify risk factors.
5. Provide paid maternity leave for all mothers so they have time to physically recover and bond with their new infant without losing financial support from their job.

6. Incorporate infant safe sleep messages, including statistics, in all levels of care for the mother/baby dyad, including prenatal care, pediatric visits, and postpartum health visits.

7. Adopt a policy regarding in-house infant safe sleep issues in all Oklahoma birthing hospitals that specifies modeling safe sleep positions and environments.

8. Affordable childbirth classes should be available to all expectant mothers and address safe sleep issues prior to birth. Scholarships should also be available to those who cannot afford classes.

9. Support programs that distribute cribs for low-income families, to include information about the importance of roomsharing and why the crib is safer than an adult bed.


11. Strengthen the referral network for mothers with symptoms of postpartum depression, as some areas do not have adequate services for new mothers.

12. Discuss and assess, via focus groups, those barriers that relate to safe sleep to gain an understanding of why new mothers bed-share, even if they have received education and have resources for providing safe sleep environments.

13. Understand that there are many cultural perspectives associated with bed-sharing, and that educational approaches cannot be “one size fits all” if they are to be successful.

14. Refer all families to the Tobacco Quitline (1-800-Quit-Now) if someone in the household smokes.

References:


15. Armitage R; Flynn H; Hoffmann R; Vazquez D; Lopez J; Marcus S. Early developmental changes in sleep in infants: the impact of maternal depression. SLEEP 2009;32(5):693-696.

Acknowledgments

Special assistance for this edition was provided by: Nancy Bacon, MS, RD/LD, CDE; Peggy Byerly, MS; Janette Cline, MPH, MHR, CHES; Denise Cole, RNC-NIC, MS (Office of Perinatal Quality Improvement); Binita Kunnel, MS; Alicia M. Lincoln, MSW, MSPH; Becky Mannel, BS, IBCLC, FILCA (OUHSC College of Obstetrics and Gynecology); Dr. Mary Anne McCaffree, MD (OUHSC); Jill Nobles-Botkin, MSN, APRN-CNM; Paul Patrick, MPH; Lisa Rhoades (Oklahoma Child Death Review Board); Agatha Shula, MPH (MCH Intern); Rosanne Smith, RD/LD, IBCLC (OSDH WIC); Linda Thomas, MEd (OSDH Office of Minority Health); and, Wanda Thomas.

Funding for the PRAMS Project is provided in part by the Centers for Disease Control and Prevention, Atlanta, GA, and the Maternal and Child Health Services Title V Block Grant, Maternal and Child Health Bureau, Department of Health and Human Services. The views expressed here are the responsibility of the authors and may not reflect the official views of the CDC or MCHB/HRSA.

The PRAMSGRAM is issued by the Oklahoma State Department of Health, as authorized by Terry L. Cline, Ph.D., Commissioner of Health and Secretary of Health and Human Services. Comtech Design Print & Mail printed 3,000 copies in August, 2014 at a cost of $850.55. This and other Oklahoma PRAMS publications can be found on the web at: http://www.health.ok.gov Keyword: PRAMSGRAM

For additional copies or questions please call 1-405-271-6761 or email Prams@health.ok.gov
Introduction:

Oklahoma has one of the highest rates of infant mortality in the nation. Infant mortality is often used as a measure of the overall health of a population. According to 2013-2015 vital statistics data, the infant mortality rate (IMR) in Oklahoma was 7.4 per 1,000 live births; the United States for the same period was 5.9 per 1,000 births. Although there is a difference between Oklahoma and the US when it comes to the overall IMR, one similarity when looking at which babies live to their first birthday is the inequity that exists between racial and ethnic groups.

In Oklahoma, Non-Hispanic (NH) American Indians had the second highest IMR at 10.1 per 1,000 live births from 2013-2015. The rate among this population has been increasing since 2011, while the rate among other groups has been declining. Additionally, NH American Indians had higher infant mortality due to sleep-related conditions such as Sudden Infant Death Syndrome (SIDS) and Sudden Unexpected Infant Death (SUID) than did all other racial and ethnic groups (25.1%; data not shown).

In response to continued cases of Sudden Infant Death Syndrome (SIDS) and other sleep-related infant deaths, in 2016 the American Academy of Pediatrics (AAP) released updated environment recommendations for infant safe sleep. The newest recommendations address room-sharing, the use of bed and in-bed sleepers, and expand on how to create a safe sleep environment. Evidence shows that safe sleep environments and avoiding bed-sharing (a type of sleep-surface sharing) can reduce the risk of sleep-related infant deaths.

Sudden unexpected infant death (SUID) includes deaths related to accidental suffocation and strangulation in bed, unknown causes, and SIDS. A SIDS death is only declared after all other causes and risk factors have been eliminated through a scene investigation, complete autopsy and review of the infant medical history. Nearly 21% of all infant deaths in Oklahoma for 2013-2015 were attributed to SIDS and other sleep-related conditions.

Yet, the reasons these inequities exist are not completely clear, indicating that factors not typically captured in population-based data collection, such as the influence of culture, tradition, or social context, may play a role. This report used 2012-2014 data from the Oklahoma Pregnancy Risk Assessment Monitoring System (PRAMS) to examine sleep-surface sharing and other safe sleep-related practices among American Indian mothers in Oklahoma.

Methods:

PRAMS is a population-based surveillance system about maternal behaviors and experiences before, during, and after pregnancy. This report used PRAMS aggregated data from 2012-2014 with a total sample size of 8800 and average weighted response rate of 63.1%.
Detailed PRAMS methodology is described elsewhere. To estimate the prevalence of sleep-surface sharing and other sleep related practices, several questions were used including the position the infant was often put to sleep. Prevalence and 95% confidence intervals were estimated. All analyses were done using SAS-callable SUDAAN.

Differences in maternal demographic characteristics by safe sleep practices were examined using chi-square tests at P ≤ 0.05. Race and Hispanic origin are categorized as NH White, NH Black, NH American Indian, NH other, and Hispanic.

PRAMS asked mothers to select no or yes to statements that described how their new baby usually slept. Response options available were if the new baby slept: (1) in a crib or portable crib, (2) on a firm or hard mattress, (3) with a pillow and/or stuffed toys, (4) with bumper pads, (5) with a blanket, or (6) with me (mother) or another person. The options were not restricted to just bed-sharing. PRAMS also asked mothers about the one sleep position they most often lay their baby to sleep. Response options were: (1) on his or her side, (2) on his or her back, or (3) on his or her stomach.

Results

Over 28% of all Oklahoma mothers indicated that someone shared a sleep surface with their infants. Figure 1 shows sleep-surface sharing by maternal race. As compared to NH White mothers at 24.5%, other racial and ethnic groups have higher percentages of sleep-surface sharing. NH Black mothers reported the highest percentage of sleep-surface sharing (47.6%), followed by NH other (34.2%), NH American Indian mothers (30.6%), and Hispanic mothers (27.4%). Figure 2 shows infant sleep environments by maternal race. Slightly more than 79% of NH American Indian mothers reported that their infant usually slept in a crib while 78.5% reported that their infant usually slept on a firm or hard mattress. NH American Indian mothers reported the lowest rate of their infants sleeping with pillows or stuffed toys (7.8%). When looking at infants sleeping with bumper pads, NH American Indian mothers reported the second highest rate at 29.6%. These mothers also reported the highest rates of their infants usually sleeping with blankets at 77.3%.

Several studies have shown that breastfeeding is related to sharing sleep surfaces with infants. In Oklahoma, NH American Indian mothers who did not initiate breastfeeding tended to share a sleep surface at a higher rate than those who initiated breastfeeding (39.1% vs. 27.2%). However, NH American Indian mothers who breastfed for a longer duration (8 weeks or more) tended to share sleep surface more (35.4% vs. 27.5%; figure 3).

Among NH American Indian mothers, those who were
less than 25 years old, those who were unmarried, and those with an income equal to or less than $26,000 all had higher rates of sharing a sleep surface with infants. Moreover, over half (56%) of NH American Indian mothers who had a high school education or less shared a sleep surface with their infants (Table 1).

NH American Indian mothers who used alcohol or smoked cigarettes three months before pregnancy tended to share a sleep surface at a lower rate than mothers who did not engage in these behaviors (data not shown).

Over 71% of NH American Indian mothers lay their infants on their backs to sleep, 19.5% lay them on their sides, and 8.1% lay them on their stomach (Figure 4).

Table 1. Infant sleep-surface sharing among NH American Indian mothers by selected demographics, Oklahoma PRAMS 2012-2014

<table>
<thead>
<tr>
<th>Maternal Characteristics</th>
<th>Infant Sleep With a Person (%)</th>
<th>95% C.I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25 yrs</td>
<td>34.4</td>
<td>23.6 - 47.2</td>
</tr>
<tr>
<td>&gt;=25 yrs</td>
<td>27.0</td>
<td>18.8 - 37.2</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; = High School</td>
<td>56.0</td>
<td>41.4 - 69.7</td>
</tr>
<tr>
<td>&gt;High School</td>
<td>42.5</td>
<td>31.4 - 54.4</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>26.3</td>
<td>18.3 - 36.2</td>
</tr>
<tr>
<td>Other</td>
<td>34.3</td>
<td>23.8 - 46.7</td>
</tr>
<tr>
<td>Annual Household Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; = $26,000</td>
<td>34.4</td>
<td>24.5 - 45.9</td>
</tr>
<tr>
<td>&gt;26,000</td>
<td>26.4</td>
<td>17.2 - 38.3</td>
</tr>
<tr>
<td>Pre-Pregnancy BMI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight and Normal</td>
<td>30.8</td>
<td>18.8 - 46.0</td>
</tr>
<tr>
<td>Overweight &amp; Obese</td>
<td>30.3</td>
<td>22.2 - 40.0</td>
</tr>
<tr>
<td>Medicaid (During Pregnancy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>32.9</td>
<td>21.8 - 46.4</td>
</tr>
<tr>
<td>Yes</td>
<td>29.4</td>
<td>21.0 - 39.5</td>
</tr>
<tr>
<td>Overall</td>
<td>30.6</td>
<td>23.6 - 38.6</td>
</tr>
</tbody>
</table>

Limitations

The current analysis did not identify a statistically significant association between sharing a sleep surface, sleep environment, and maternal characteristics or behaviors. This may largely be due to the small sample size available for the NH American Indian population in the PRAMS 2012-2014 data. Additionally, PRAMS does not account for cultural differences relating to sleep-surface sharing and sleep environment in the American Indian population, as well the cultural differences between the tribes represented by the mothers.

Discussion

In the US and in Oklahoma, the mortality rate for Black infants has consistently been the highest among all racial and ethnic groups (more than twice as high as the rate of white infants for decades), but the increase in deaths among American Indian infants over the last few years is noteworthy. There appear to be factors that continue to influence mothers’ decisions to have their infants share a sleep space and utilize a safe sleep environment.

It is unknown what conditions within the home lead to sleep-surface sharing; this information in not captured in PRAMS. However, there are numerous reasons people share sleep surfaces with infants, intentionally or unintentionally. Limited space, economics, belief systems, and exhaustion are just a few of the reasons. This is applicable to American Indians as well as other populations.

Although American Indian parents in the United States routinely position their infants to sleep on their back, bed sharing with infants is still common. The higher percentages of sleep-surface sharing among American
Indian mothers less than 25 years of age, those unmarried, those with an income equal to or less than $26,000 annual household income, and those with less education suggest an interrelationship between access to resources and the propensity to share a sleep surface. Further research would be needed to assess this relationship more in depth.

Oklahoma’s American Indian Data Community of Practice group noted that cultural factors might also play a part in creating safe sleep environments. Blankets and other textiles have a long history of use within many American Indian tribes, often given as a sign of honor or respect. This contextual point may partially explain the higher percentage of blanket use for American Indian infants. Other cultural factors such as traditional belief systems, the influence of community, and respect and listening to the wisdom and advice of elders may also influence sleep environment and sleep-surface sharing in a way not easily captured by modern population-based data collection systems. Moreover, other environmental factors (such as limited space or the unavailability of safe sleep spaces) may play a role in why American Indian parents bed-share with infants or may have spaces that are not safe sleep environments.

(Workgroup meeting, July 17, 2017)

The results of this study support the need for more tailored messages surrounding safe sleep and the risks associated with sleep-surface sharing. It also supports the need to increase access to safe sleep resources, including those that are culturally relevant.

**Recommendations**

The AAP Task Force on SIDS recommended a series of safe sleep practices to address SUID. These included placing infants on their back for sleep, sharing a room without bed-sharing (ideally for the first year of life, but at least for the first six months), using a firm sleep surface, avoiding soft bedding such as crib bumpers, blankets, pillows and soft toys and preventing exposure to commercial tobacco smoke, alcohol and illicit drugs.\(^6\)

However, reducing the risk for SIDS requires action from the entire community, not just the individual family unit, in order to understand and practice risk reduction.\(^14\) Therefore, education and outreach efforts must go beyond just the mother and father and reach out to the larger, extended network. Within the American Indian community, the influence and value of trusted sources of information cannot be overlooked. Providers need to work with tribal elders, grandparents, tribal leadership, community members, home visitors, and others within the community in order to raise awareness, tailor messages, and carry out interventions that fit appropriately within the local social context and culture. Recommendations include:\(^14\)

1. Implement listening circles (focus groups) to determine best approaches for safe sleep messaging;
2. Tailor safe sleep messages to include cultural values and beliefs;
3. Incorporate models that look traditional and non-traditional when designing safe sleep materials;

**Terms**

Infant mortality – the death of a child less than one year of age.

Social context – the environment that shapes people’s daily experiences that directly and indirectly affect health and behavior.\(^15\)

Sleep-surface sharing – a sleep arrangement in which an infant sleeps on the same surface with another person (can include sharing a bed).\(^16\)

Sudden Infant Death Syndrome (SIDS) – the sudden death of an infant younger than one year that cannot be explained even after a full investigation.\(^16\)

Sudden Unexpected Infant Death (SUID) – the death of an infant younger than one year that occurs suddenly and unexpected. After an investigation, the deaths may be classified into several types such as SIDS, entrapment, suffocation, or undetermined.\(^16\)

Culture – the customary beliefs, social forms, and material traits of a racial, religious, or social group; the characteristic features of everyday existence shared by people in a place or time.\(^17\)
4. Incorporate pictures of the cradleboard in messages and tailor messages that highlight American Indian specific safe sleep practices;
5. Reflect cultural heritage by hanging blankets on the wall in the child’s room and not in the crib;
6. Incorporate traditional messages – such as the 7th Generation Principle (the concept that current generations should consider how decisions today will benefit seven generations into the future) into safe sleep messages and materials;
7. Develop a public service message with tribal leaders to promote safe sleep;
8. Provide culturally specific materials on the danger of co-sleeping and develop cultural specific messaging around the value of room-sharing.

Education is necessary but not always sufficient to invoke change on its own. While it is important to be consistent about the basic overall safe sleep messages, they must be tailored to the needs and issues specific within that American Indian community, nation, or tribe. Cultural norms may particularly influence behaviors, responses, and understanding when looking within the context of infant mortality. Therefore, when considering interventions to reduce the infant mortality rate, particularly related to safe sleep among the American Indian population, it is important to consider multiple factors that may be involved, including cultural and behavioral aspects.

**REFERENCES**

The Pregnancy Risk Assessment Monitoring System (PRAMS) is an ongoing, population-based study designed to collect information about maternal behaviors and experiences before, during, and after pregnancy.

Monthly, PRAMS sampled between 200 to 250 recent mothers taken from the Oklahoma live birth registry. Mothers were mailed up to three questionnaires in either English or Spanish seeking their participation. Follow-up phone interviews for non-respondents were conducted.

A systematic stratified sampling design was used to yield sample sizes sufficient to generate population estimates for groups considered at risk for adverse pregnancy outcomes. Information included in the birth registry is used to develop analysis weights that adjust for probability of selection and non-response.

Acknowledgements

Special assistance for this edition was provided by: Ayesha Lampkins, MPH; Binitha Kunnel, MS; Mary Anne McCaffree, MD (OU Pediatrics); Linda Thomas, M.Ed.; Andie Chan, MPH (Office of the Tribal Liaison); Rachel Erkenbeck-Hart (Tulsa FIMR); James Craig, MSW, LSW; and Wanda Thomas.

Funding was made possible by PRAMS, grant number SU01DP006234, and by the Maternal and Child Health Bureau, Department of Health and Human Services, Maternal and Child Health Services Title V Block Grant, grant number is 804MC30635.

This publication was issued by the Oklahoma State Department of Health (OSDH), an equal opportunity employer and provider. A digital file has been deposited with the Publications Clearinghouse of the Oklahoma Department of Libraries. Copies have not been printed but are available for download at www.health.ok.gov. | April 2018

FOR MORE INFORMATION

Visit www.health.ok.gov – keyword “PRAMS” or email Prams@health.ok.gov

TO SIGN-UP TO RECEIVE FUTURE PRAMSgrams

Click on the link below

Sign-up
Infant Mortality

Infant mortality rate is measured as the annual number of infants who die before their first birthday per 1,000 live births.

Source: 2006-2010 National Vital Statistics System, Centers for Disease Control and Prevention

### NATIONAL RATE

<table>
<thead>
<tr>
<th>Infant Mortality Rate</th>
<th>Deaths per 1,000 Live Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Rate</td>
<td>6.4</td>
</tr>
<tr>
<td>HOPE Goal</td>
<td>2.4</td>
</tr>
</tbody>
</table>

### DISTANCE TO GOAL

17,000 more infants surviving to their first birthday per year in the U.S. to achieve the HOPE Goal

#### National Progress Toward HOPE Goal

**INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS**

**By Race, Ethnicity, and Education**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Less than HS</th>
<th>HS Grad</th>
<th>Some College</th>
<th>College Grad</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Black</td>
<td>Hispanic</td>
<td>Asian/PI</td>
<td>AI/AN</td>
</tr>
</tbody>
</table>

#### By State and Region

Data for NH, VT, HI, MT, KY, WY, WV, DE, and DC not reported.

For rates, see Appendix.
State Progress Toward HOPE Goal

INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS

By Race and Ethnicity

- White
- Black
- Hispanic
- Asian/PI
- AI/AN

By Education

- Less than HS
- HS Grad
- Some College
- College Grad

Data for DC not reported. Data for additional race and ethnic groups in NH, VT, HI, KY, WY, WV, DE, and DC not reported.

For rates, see Appendix.
Low Birth Weight

Low birth weight is measured as the annual portion of infants weighing less than 2,500 grams at birth.

Source: 2006-2010 National Vital Statistics System, Centers for Disease Control and Prevention

NATIONAL RATE

8%

of infants are born with low birth weight

HOPE GOAL

5%

of infants born with low birth weight

DISTANCE TO GOAL

123,000

more low-weight births would need to be avoided per year in the U.S. to achieve the HOPE Goal

National Progress Toward HOPE Goal

PERCENT WITH LOW BIRTH WEIGHT

By Race, Ethnicity, and Education

By State and Region

Farthest from HOPE Goal

Closest to HOPE Goal

Data for VT not reported.

For rates, see Appendix.
State Progress Toward HOPE Goal

PERCENT WITH LOW BIRTH WEIGHT

By Race and Ethnicity

By Education

Data for Multiracial group not reported. Data for AI/ANs in VT not reported.
MISSION OF WIC

To assure healthy pregnancies, healthy birth outcomes and healthy growth and development for women, infants and children up to age 5 who are at nutritional risk, by providing nutritious supplemental foods, breastfeeding promotion and support, education on healthy eating, and referrals to healthcare and critical social services.

FUN FACTS

INTER-TRIBAL COUNCIL OF OKLAHOMA
WIC HAS A MONTHLY PARTICIPATION OF APPROXIMATELY 720 PEOPLE

INTER-TRIBAL COUNCIL OF OKLAHOMA WIC SHOWS THAT 65% OF THEIR MOMS INITIATE BREASTFEEDING

FROM OUR PARTICIPANTS

"WIC has always been there to help, even if it just for emotional support."

WIC Inter-Tribal Council of Oklahoma

WHO PARTICIPATES IN WIC?

Inter-Tribal Council of Oklahoma WIC Participation FY 2016

<table>
<thead>
<tr>
<th>Category</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant Women</td>
<td>56</td>
</tr>
<tr>
<td>Fully Breastfeeding Women</td>
<td>[34]</td>
</tr>
<tr>
<td>Total Breastfeeding Women</td>
<td>44</td>
</tr>
<tr>
<td>Postpartum Women</td>
<td>71</td>
</tr>
<tr>
<td>Infants</td>
<td>180</td>
</tr>
<tr>
<td>Children</td>
<td>460</td>
</tr>
<tr>
<td>Total</td>
<td>810</td>
</tr>
<tr>
<td>Coverage (% eligible)</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: USDA FNS WIC Program Data FY2016 https://www.fns.usda.gov/pd/wic-program
WIC IS EFFICIENT
Inter-Tribal Council of Oklahoma Food and Nutrition Services Benefits FY 2016

Average monthly food value per participant $55.23
Net federal food cost $536,970
Competitive bidding savings $65,880
Nutrition, client services, and program management $344,003
Total funds to state $946,853
Source: USDA FNS WIC Program Data FY2016 https://www.fns.usda.gov/pd/wic-program

EBT STATUS
Inter-Tribal Council of Oklahoma has implemented WIC EBT statewide. All state WIC programs must transition from paper vouchers to electronic benefit transfer cards (EBT) by 2020.

WIC SUPPORTS MILITARY FAMILIES
Inter-Tribal Council of Oklahoma serves very few military families.

CONTACT DETAILS

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visit nwica.org

National WIC Association
Your child has you. And you have WIC.
American Indian Fast Facts
January 2019

American Indian Enrollment by Aid Category

<table>
<thead>
<tr>
<th>Qualifying Group</th>
<th>Enrollment</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children/Parents</td>
<td>105,275</td>
<td>81.13%</td>
</tr>
<tr>
<td>Aged/Blind/Disabled</td>
<td>15,642</td>
<td>12.05%</td>
</tr>
<tr>
<td>Oklahoma Cares</td>
<td>64</td>
<td>0.05%</td>
</tr>
<tr>
<td>TEFRA</td>
<td>49</td>
<td>0.04%</td>
</tr>
<tr>
<td>OTHER</td>
<td>2,183</td>
<td>1.68%</td>
</tr>
<tr>
<td>SoonerPlan</td>
<td>5,405</td>
<td>4.17%</td>
</tr>
<tr>
<td>Insure Oklahoma</td>
<td>1,564</td>
<td>1.20%</td>
</tr>
<tr>
<td>Employer-Sponsored Insurance (ESI)</td>
<td>887</td>
<td>0.68%</td>
</tr>
<tr>
<td>Insure Oklahoma Individual Plan (IP)</td>
<td>258</td>
<td>0.20%</td>
</tr>
</tbody>
</table>

American Indian Enrollment by Delivery System

- SoonerCare Traditional: 33,907
- SoonerCare Choice: 89,306
- SoonerPlan: 5,405
- Insure Oklahoma Individual Plan (IP): 258
- Insure Oklahoma Employer-Sponsored Insurance (ESI): 887
- Other: 2,183

American Indian Race Breakdown

- American Indian Only: 81,099
- Multiple Race American Indian: 48,664
- American Indian with Hispanic Ethnicity: 5,960
- Multiple Race American Indian with Hispanic Ethnicity: 4,671

Age Breakdown of American Indian Enrollment

- Children Age 18 and Under: 94,960 (73%)
- Adults Age 19 to 64: 29,884 (23%)
- Adults Age 65 and Over: 4,919 (4%)

Gender Breakdown of American Indian Enrollment

- Female: 70,683
- Male: 59,080

Indian Health Service/Tribal/Urban (I/T/U) Providers

- Clinics: 53
- Hospitals: 8

I/T/U Providers Accepting Non-Indian Members: 13

American Indian Fast Facts
January 2019

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Infant Mortality State Resources

OSDH Maternal and Child Health – Joyce Marshall, MPH joycem@health.ok.gov

Child and Adolescent Health Division; MCH Assessment; Perinatal and Reproductive Health Division

Oklahoma State Department of Health, Maternal Child Health, Title V Block Grant priorities:
Reduction of Infant Mortality, Reduction of Preterm and Low Birth Weight Infants, Reduction of Unplanned Pregnancy, Reduction in the prevalence of chronic health conditions among women of childbearing age, and Reduction of health disparities.


Fetal Infant Mortality Review (FIMR) of Central Oklahoma - Oklahoma, Cleveland, Canadian, Logan, Pottawatomi Counties. https://www.occhd.org/fimr

Oklahoma Perinatal Quality Improvement Collaborative (OPQIC). http://opqic.org/


Oklahoma participates in several CoIIN learning networks to reduce infant death.

NICHD Safe to Sleep Campaign Risk Reduction for Sudden Infant Death Syndrome (SIDS) and Other Sleep-Related Causes of Death: Continuing Activity for Nurses. https://www1.nichd.nih.gov/cbt/sids/nurseecourse/Welcome.aspx