Michigan Department of Community Health

# MI PRAMS Delivery

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## Infant Safe Sleep, MI PRAMS 2001-2008

Sudden unexpected infant deaths (SUID) are those that "occur suddenly and unexpectedly, and whose manner and cause of death are not immediately obvious prior to investigation".[1] Sudden Infant Death Syndrome (SIDS) is one of the several causes of death included under the broad diagnostic umbrella of SUID shown in Figure 1. SIDS is a diagnosis of exclusion, or one that is made when no other cause of death can be identified. Historically, SIDS has been the most widely recognized SUID, but the focus has shifted to include all diagnoses encompassed by SUID as improved death investigation and reporting began to emerge at the turn of the twenty-first century.

In 1992, based on a series of studies reporting that infants who died of SIDS were more likely to be placed to sleep in the prone position (i.e. on the stomach) than infants who died of other causes, the American Academy of Pediatrics (AAP) released a position statement recommending that infants be placed to sleep in the lateral (on the side) or supine (on the back) position.[2]

The recommendation was followed by the launch of the AAP's Back to Sleep Campaign in 1994, a collaborative effort with the National Institute of Child Health and Human Development (NICHD), the US Public Health Service, the SIDS Alliance, and the Association of SIDS and Infant Mortality Programs.[3] This national public health initiative promoted the supine sleep position for all infants without medical contraindications. The subsequent nationwide decline in SIDS during the mid-1990's has been contributed to the Back to Sleep Campaign.

However, around 1999, it appeared that the decline in the SIDS rate was being offset by an increase in the rate of other SUID's, such as suffocation.[1] This diagnostic shift lead the Centers for Disease Control and Prevention (CDC) to revise the way SUID's are reported in the United States. The CDC's SUID Initiative was created to improve the data collection process of SUID's by updating the existing SUID investigation reporting form and promoting consistent data collection across all reporting jurisdictions nationwide.

While the CDC was leading the effort to increase the quality of SUID reporting, the AAP continued to review the evidence regarding risk factors of SIDS and other SUID's. The latest AAP recommendations from 2005 advise caregivers to place infants to sleep only in the supine position since side sleeping may lead to infants rolling over into the prone position.[3] In addition, the AAP added several other recommendations regarding infants' sleep environment, including the advice that bed sharing is not recommended while the caregiver is sleeping due to the risk of infant suffocation. For more on the AAP's latest safe sleep recommendations, in addition to resources for grieving parents, visit our partners, Tomorrow's Child / MI SIDS, at www.tomorrowschildmi.org.

This issue of the *MI PRAMS Delivery* focuses on two of the AAP's 2005 recommendations: infant back sleeping position and bed sharing. It is a follow up to the October 2005 issue titled "Bed Sharing Practices Among Michigan Mothers and Their Infants." ◊

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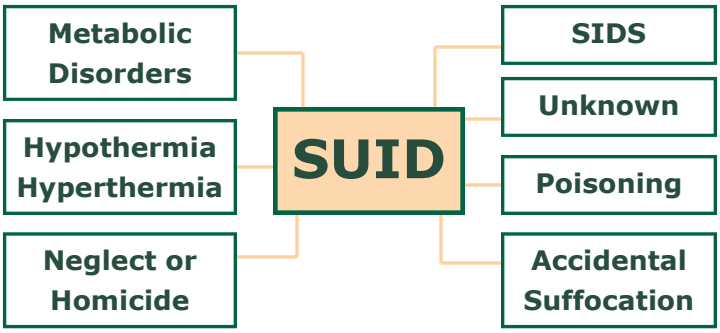
Figure 1. Diagnoses Categorized as Sudden Unexpected Infant Death (SUID)[1]



## About MI PRAMS

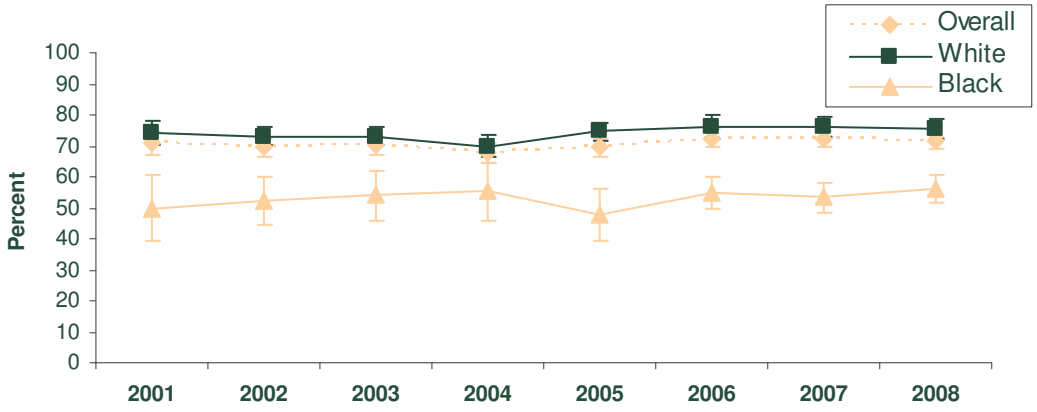
The Pregnancy Risk Assessment Monitoring System (PRAMS), a population based survey, is a CDC initiative to provide data about risk factors for infant mortality and low birth weight.

It is a combination mail/telephone survey designed to monitor selected self-reported maternal behaviors and experiences of women who delivered a live infant in Michigan that occur before and during pregnancy, as well as early postpartum period. Information regarding the health of the infant is also collected for analysis.

Annually, over 2,000 Michigan mothers are selected at random to participate from a frame of eligible birth certificates. Women who deliver a low birth weight infant are oversampled in order to ensure adequate representation. The results are weighted to represent the entire cohort of women who delivered during that time frame. ◊

# Trends in Infant Safe Sleep Practices, MI PRAMS 2001-2008

Figure 2. Trends of Infant Back Sleep Position by Race, MI PRAMS 2001-2008




PRAMS participants were asked the following question regarding the sleep position of their infants: "How to you *most often* lay your baby down to sleep? On his or her side, On his or her back, or On his or her stomach".

Figure 2 illustrates the trend in the percent of mothers who answered that they most often placed their infants on their backs to sleep, from 2001 to 2008. Minimal, but statistically significant changes were found in the overall prevalence of back sleeping position during this period (71.1% in 2001 and 71.5% in 2008; p-value for trend = 0.04).

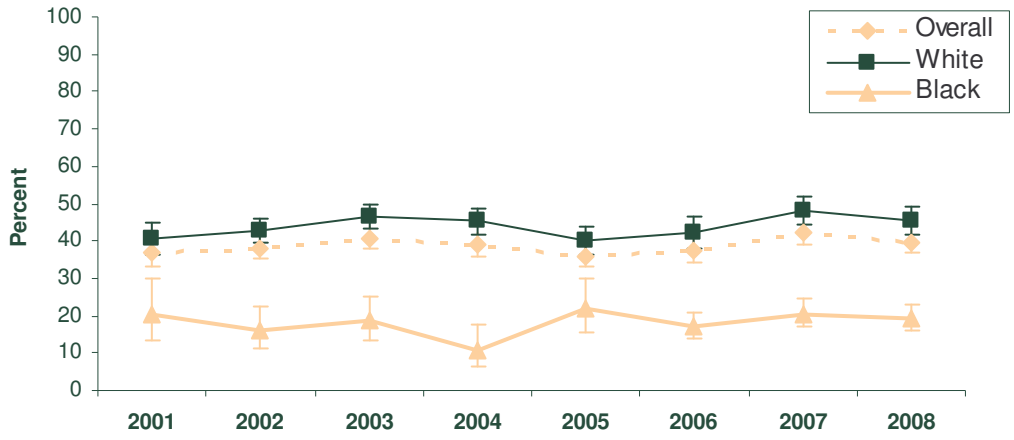
When stratified by maternal race (Figure 2), the prevalence of infant back sleeping position increased slightly for non-Hispanic white mothers (74.5% in 2001 and 75.6% in 2008; p-value for trend = 0.03), but no significant increase was found for non-Hispanic black mothers (49.9% in 2001 and 56.1% in 2008; p-value for trend = 0.92). Variability in the estimates for non-Hispanic black women contributed to this non-significant finding. (For further information on the methods used for trend analysis in the *MI PRAMS Delivery*, see the Epi Corner on page 4.)

Respondents were also asked the question: "How often does your new baby sleep in the bed with someone else? Always, Often, Sometimes, Rarely, or Never." From these responses, the prevalence of *never* bed sharing was estimated each year from 2001 to 2008 (Figure 3).

No significant changes were observed in the percent of women who reported never bed sharing between 2001 and 2008: the prevalence remained stable at around 40% during this time period (36.9% in 2001 and 39.7% in 2008; p-value for trend = 0.70).

Even though the prevalence of never bedsharing was consistently between 20% to 35% higher for non-Hispanic white women, the percent didn't change significantly over time for this group (40.9% in 2001 and 45.5% in 2008; p-value for trend = 0.71). Likewise, there was no evidence of a trend over time in the prevalence of never bed sharing for non-Hispanic black mothers from 2001 (20.4%) to 2008 (19.3%; p-value for trend = 0.27). ◊

Figure 3. Trends of Never Bed Sharing by Race, MI PRAMS 2001-2008



# Association Between Sleep Information Source and Infant Safe Sleep Practices, PRAMS 2006-2008

In order to investigate the role of mothers' sources of information regarding infant sleep on the prevalence of their actual safe sleep practices, multivariate logistic regression models were built for both back sleep position and any bed sharing.

PRAMS respondents were asked whether or not they received information on safe sleep practices, and those who answered 'Yes' were then asked to give the sources of information or advice they received. Those who indicated that they received safe sleep information from a hospital nurse, obstetrician or midwife, or their baby's doctor were classified in the "info from provider" group. Likewise, those who reported receiving safe sleep information from their mother, grandmother, or other family members were classified in the "info from family" group. Since mothers could indicate more than one source of safe sleep information, some mothers were in both the info from provider and info from family groups. Multivariate logistic regression is a statistical tool that can account for this overlap in classification by estimating the effect of info from provider on sleep practices, while holding info from family constant, and vice versa.

Additionally, factors considered for potential confounding were maternal age, race, pre-pregnancy insurance status, and educational attainment. Education was not associated with either infant sleep practice in bivariate analyses, so it was not used in the regression models.

Table 1 shows that after controlling for info from family, race, and age, mothers who received safe sleep information from a health care provider were 30% more likely to place their infants on their backs to sleep than those who did not receive advice from a provider. Conversely, after controlling for confounding, mothers who received sleep information from their families were 20% less likely to place their infants on their backs to sleep than women who didn't receive advice from family members. Younger women were also 20% less likely to utilize the back sleeping position than women at least 30 years old.

Table 1. Association Between Sleep Information Source and Prevalence of Infant Back Sleep Position, MI PRAMS 2006-2008

| Factor | Odds Ratio | 95% Confidence Interval |
|---|---|---|
| Info from Provider | 1.3 | (1.0 - 1.7) |
| No Info from Provider | 1.0 | Reference |
| Info from Family | 0.8 | (0.7 - 0.9) |
| No Info from Family | 1.0 | Reference |
| Black | 0.4 | (0.3 - 0.5) |
| White | 1.0 | Reference |
| Age <20 | 0.8 | (0.6 - 1.0) |
| Age 20 - 29 | 0.8 | (0.6 - 0.9) |
| Age 30+ | 1.0 | Reference |

Table 2 depicts the likelihood of bed sharing, after controlling for confounding, for all levels of each factor, compared to the respective reference level.

Women who received safe sleep info from a provider were 30% less likely to report that their infants share a bed with someone else to sleep, when compared to women who did not receive advice from a provider. However, there was no effect of safe sleep info from family on bed sharing, after adjustment for confounding. Also, teens were almost twice as likely to bed share than older women.

Finally, mothers who were uninsured before pregnancy were 40% more likely to report bed sharing than their privately insured counterparts, while there was no significant difference in bed sharing between Medicaid recipients and those privately insured since the confidence interval for this odds ratio crosses one.

These logistic regression results provide evidence that age, race, and info from a provider affect both infant safe sleep practices, while info from family only affects sleep position. ◇

Table 2. Association Between Sleep Information Source and Prevalence of Bed Sharing, MI PRAMS 2006-2008

| Factor | Odds Ratio | 95% Confidence Interval |
|---|---|---|
| Info from Provider | 0.7 | (0.6 - 0.9) |
| No Info from Provider | 1.0 | Reference |
| Info from Family | 1.0 | (0.9 - 1.2) |
| No Info from Family | 1.0 | Reference |
| Black | 3.5 | (2.9 - 4.2) |
| White | 1.0 | Reference |
| Age <20 | 1.9 | (1.4 - 2.6) |
| Age 20 - 29 | 1.0 | (0.9 - 1.2) |
| Age 30+ | 1.0 | Reference |
| Uninsured | 1.4 | (1.1 - 1.7) |
| Medicaid | 0.9 | (0.7 - 1.1) |
| Private Insurance | 1.0 | Reference |

## References

1. CDC. SIDS and SUID: home. www.cdc.gov/SIDS. Accessed April 11, 2011.
2. AAP Task Force on Infant Positioning and SIDS. Positioning and SIDS. *Pediatrics* 1992;89(6): 1120-6.
3. AAP Task Force on SIDS. The changing concept of SIDS: diagnostic coding shifts, controversies regarding the sleep environment, and new variables to consider in reducing risk. *Pediatrics* 2005;116(5): 1245-55.
4. Kleinbaum DG, Kupper LL, Muller KE. Applied regression analysis and other multivariable methods. Belmont, CA: Thomson; 2008: 453-80.

**Past and future editions of the MI PRAMS Delivery newsletter are available electronically at:**

***www.michigan.gov/prams***

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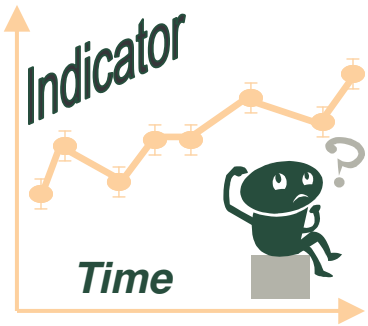
## Epi Corner: Trend Analysis

There are several methods that can be used to test data for trends over time. Perhaps the most common method is to plot the value of an indicator at each time point (e.g. every year) over the period of interest. One can then look at the graph to get a general idea of whether the indicator is increasing, decreasing, or constant over time.

While this graphical method is an essential starting point for assessing trends, it can be difficult to determine whether the indicator is truly increasing or decreasing over time (see Figures 2 and 3 for examples), or if the changes are due to chance alone.

The *MI PRAMS Delivery* uses a statistical method that employs linear contrasts, or comparisons between the data points for each year, to determine whether or not a linear trend exists.[4] The term linear trend is another way to state that an indicator is either increasing or decreasing over time. A statistical program then calculates a p-value for the trend, which gives the probability that the observed increase or decrease occurred by chance. If the p-value is less than 0.05 (i.e. the probability of the trend occuring by chance is less than 5%), then the trend is considered to be statistically signficant.

Further, differences between groups are significant at any given time point if the bars representing the 95% confidence intervals do not overlap. ◊