The Determinants of Prone Infant Sleep Position:

Analysis of the1998-1999 Oregon PRAMS Dataset

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SIDS defined

"Sudden Infant Death Syndrome (SIDS) is the sudden death of a child under one year of age that remains unexplained after a thorough case investigation, including performing a complete autopsy, examination of the death scene and review of clinical history."

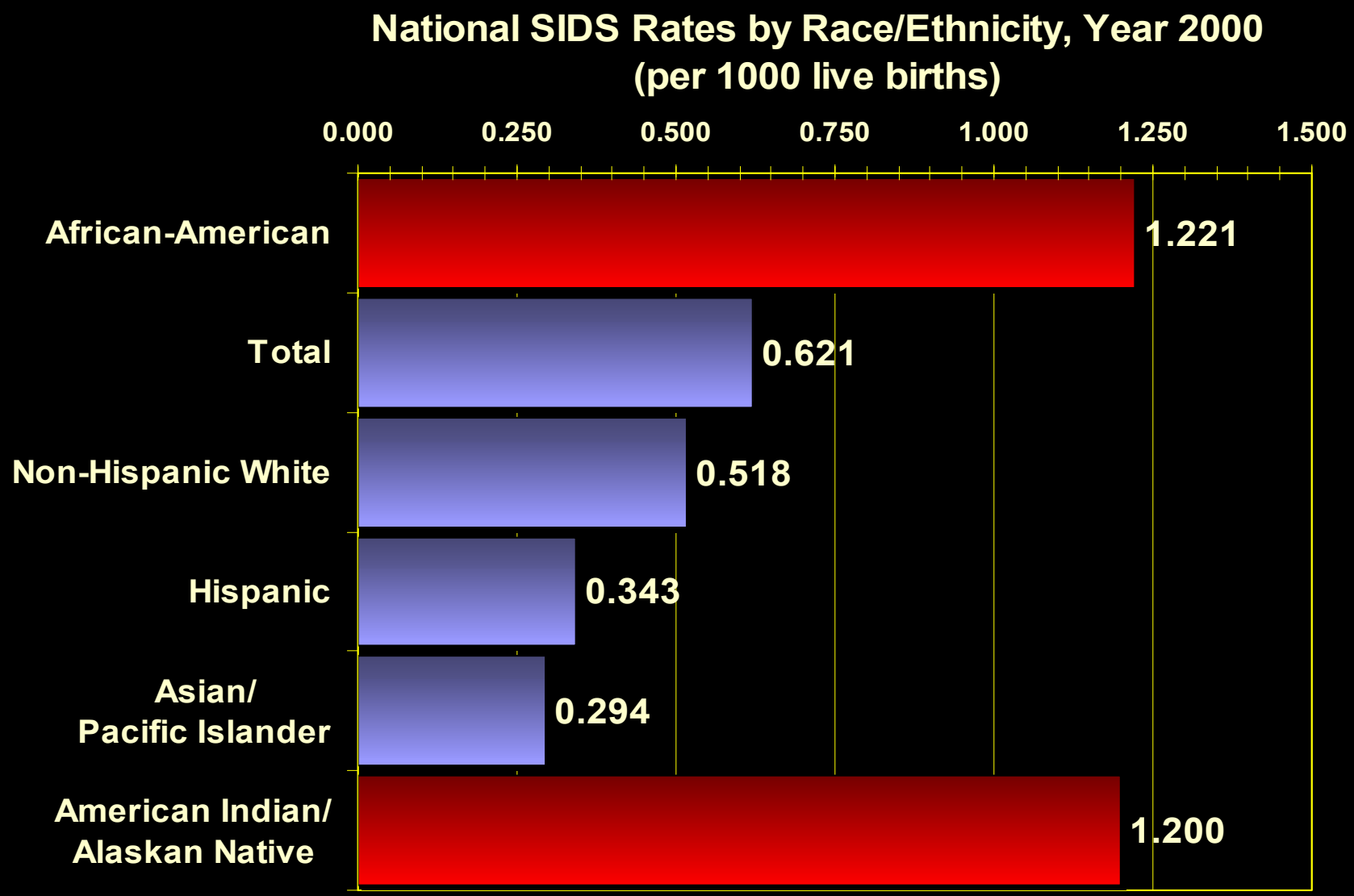
- Willinger M, James LS, Catz C "Defining the Sudden Infant Death Syndrome (SIDS): deliberations of an expert panel convened by the National Institute of Child Health and Human Development." Pediatr Pathol 1991; 11:677-684

SIDS mortality 2000

	National *	Oregon †
Total deaths	2523	51
Age-specific (under one year of age) rate per 1000 live born	.529	1.114
Proportion of all deaths under one year of age	7.7%	20.0%
Rank cause of infant mortality (< 12 months)	3rd	3rd
Rank cause of post-neonatal infant mortality (28 days through 364 days)	1st	1st

* Hoyert DL, Freedman MA, Strobino DM, Guyer B "Annual summary of Vital Statistics: 2000" Pediatrics 2001; 108:1241-1255.

† Oregon Center for Health Statistics/Department of Human Services http://www.ohd.hr.state.or.us/chs/vol2.htm



Source: Mathews TJ, Menacker F, MacDorman MF. "Infant mortality statistics from the 2000 period linked birth/infant death data set." Natl Vital Stat Rep 2002 Aug 28;50(12):1-28.

Table III:1

The Most Significant Facts in the Epidemiology of SIDS

1. **AGE:** SIDS spares first month (1947), rare after 6 months (1892, 1947)
2. **SEASON:** more common in winter (1892, 1945)
3. **SOCIOECONOMICS:** more common in poor (1892) and non-white population (1956)
4. **ILLNESS:** most victims had mild symptoms prior to SIDS (1956)
5. **MATERNAL FACTORS:** SIDS more common in unwed mothers (1892), younger mothers (1959, 1966), multiparous mothers (1959), with shorter inter-pregnancy intervals (1959), cigarette-smoking mothers (1966), and mothers who utilize health care less and later (1959, 1966)

from Guntheroth WG, *Crib Death (The Sudden Infant Death Syndrome)*, 1982

Table III:1

The Most Significant Facts in the Epidemiology of SIDS

6. **INFANT FACTORS:** SIDS more common in prematures (1956) and small-for-gestational age infants (1966); their growth after birth is slower than average (1970)
7. **SLEEP:** most deaths unobserved; sleep common (1892), although not universal (1956)
8. **FEEDING:** Bottle-feeding more prevalent in SIDS (1960), but breast-fed infants not immune (1960)
9. **FAMILIAL RECURRENCE:** greater than normal population (1959), but only 1% to 2% risk (1960). No evidence of genetic link (1960).
10. **SPECIFICITY:** occurrence rate of SIDS parallels the rate for general infant mortality (1945, 1965)

from Guntheroth WG, *Crib Death (The Sudden Infant Death Syndrome)*, 1982

Current risk factors for SIDS

- Prone infant sleep position
- Maternal smoking, pre- and post-natal
- Non-standard or soft sleep surfaces or use of pillows
- Bottle feeding
- No pacifier use
- Hyperthermia, over-bundling
- Recent respiratory illness
- Low birthweight and prematurity
- Multiple births

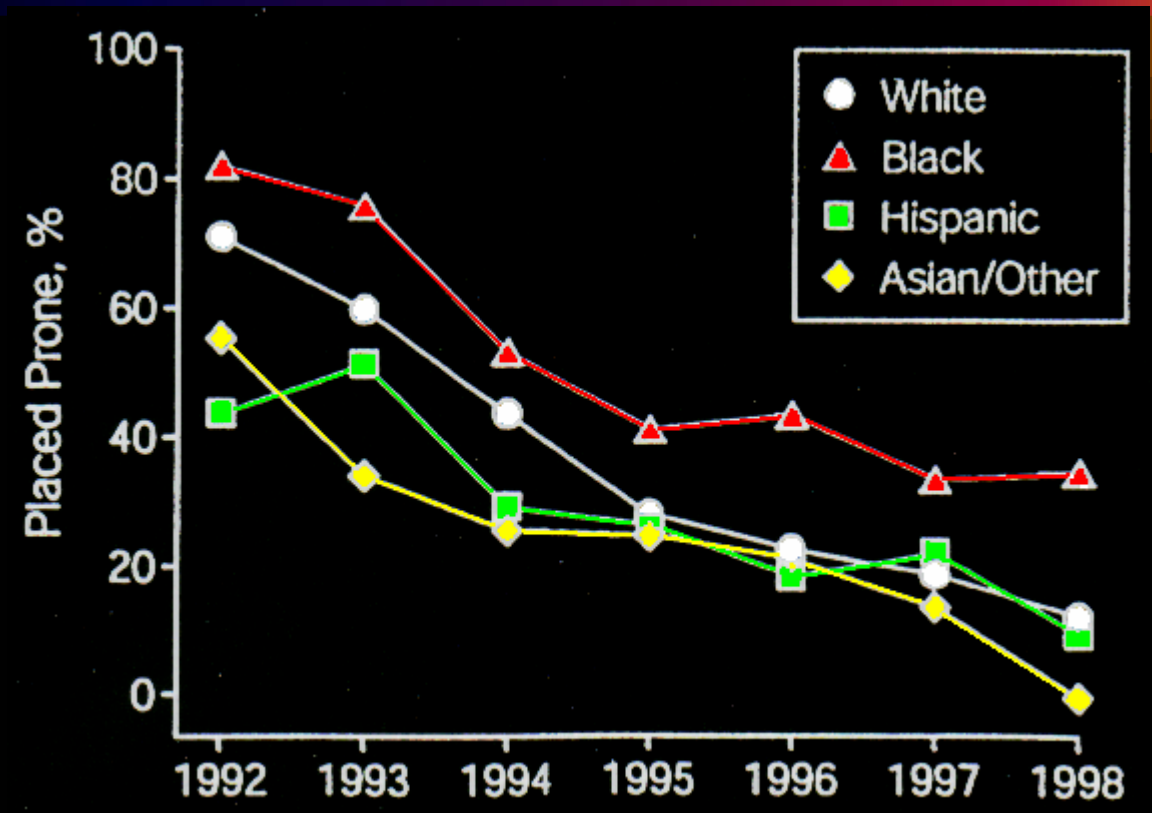
Current risk factors for SIDS

- Previous history os SIDS (1-2% recurrence)
- Multiparity
- Male infant
- Unmarried mother
- Younger mother
- Lower SES, lower education
- Late or no prenatal care
- Co-sleeping?
  -- if smoking! if with other than parent? if with parent?
- Side infant sleep position

"Back to Sleep" Campaign

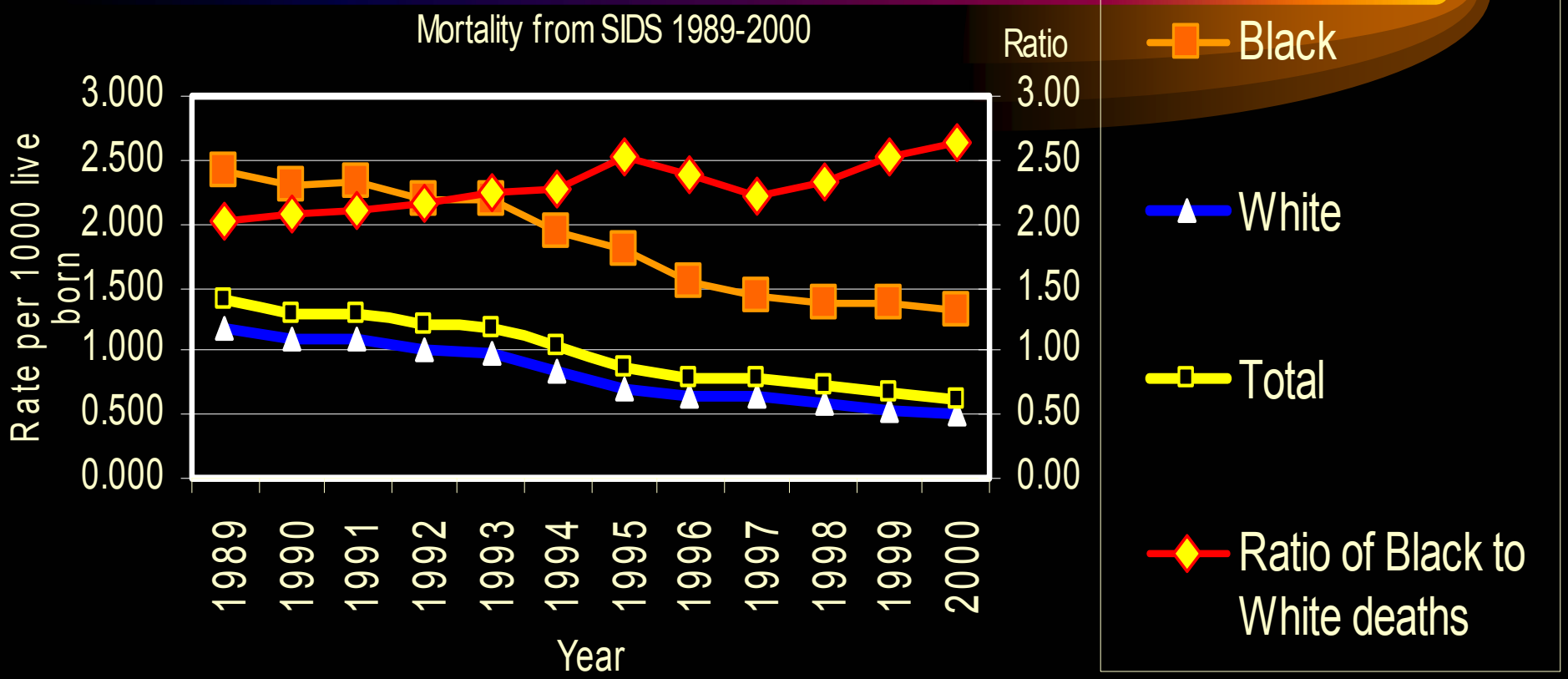
- 1992 – the American Academy of Pediatrics (AAP) recommends non-prone sleep position for all healthy infants
- 1994 – "Back to Sleep" campaign, joint effort of the AAP, U.S. Public Health Services, SIDS Alliance and the Association of SIDS and Infant Mortality Programs
- 1996 – AAP reaffirms recommendation, indicates side sleep position less desirable but acceptable

Decline in choice of prone positioning, 1992-1998



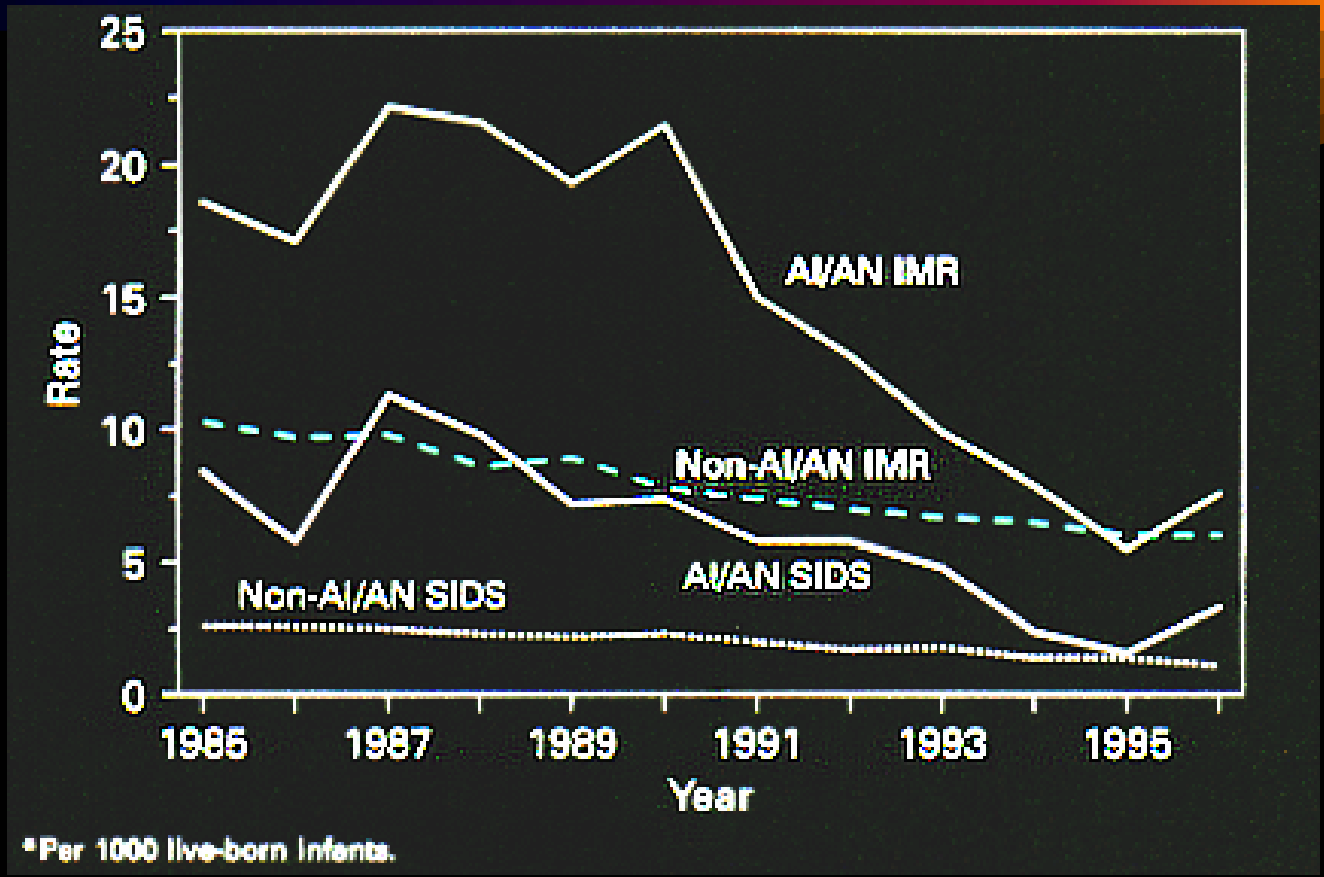
Adapted from M Willinger, CW Ko, HJ Hoffman, et. al. Factors associated with caregiver's choice of infant sleep position, 1994-1998: The National Infant Sleep Position Study. JAMA 2000;283:2135-2142

Racial disparities in SIDS mortality



Taken from the CDC's National Center for Health Statistics' mortality data from the National Vital Statistics System, at http://www.cdc.gov/nchs/about/major/dvs/mortdata.htm.

SIDS mortality Northwest American Indians/Alaskan Natives, 1985-1996



from Robertson LD, DeRoo LA, Gaudino JA, Hahn CG, Rosenberg KD. Decrease in infant mortality and Sudden Infant Death Syndrome among Northwest American Indians and Alaskan Natives -- Pacific Northwest, 1985-1996. MMWR 1999;48:181-184.

Reported risk factors for prone infant sleep position

- African-American race, OR 1.5 – 2.5
- Parity, OR 1.5 – 2.5
- Late or no initiation of prenatal care,
  OR 1.5 – 3.5
- Infant age older than 2 months, OR 1.5
- Baby's grandmother in the home,
  OR 1.5 – 2.5

Reported risk factors for prone infant sleep position

- Normal birthweight
- Male infant gender
- Single mother
- Younger maternal age
- Use of public clinics for pediatric care
- Mother's education (both less than and more than high school)

Oregon PRAMS

"Oregon PRAMS, the Pregnancy Risk Assessment Monitoring System, is a project of the DHS Office of Family Health with support from the national Centers for Disease Control and Prevention (CDC). PRAMS collects data on maternal attitudes and experiences prior to, during, and immediately after pregnancy for a sample of Oregon women."

Oregon PRAMS

- Sample selected from birth certificates (BC) monthly
- Stratified samples, random within strata, oversampling
  - Non-Hispanic Whites (NHW) with normal birthweight babies (NBW)
  - Non-Hispanic Whites (NHW) with low birthweight babies (LBW)
  - African-Americans
  - Hispanics
  - American Indians & Alaskan Natives
  - Asians & Pacific Islanders
- Mixed mode survey
  - Mail-1
  - Mail-2
  - Computer-Assisted Telephone Interview (CATI)

Oregon PRAMS

- Weighted to Oregon's population
  - NHW with NBW = 61.754
  - NHW with LBW = 3.773
  - African-Americans = 2.156
  - Hispanics = 9.738
  - Asians & Pacific Islanders = 3.992
  - American Indians & Alaskan Natives = 1.945
- Weighted for non-response (response = 64%)
  - 1.19 – 2.74, using race/ethnicity, marital status, parity, initiation of prenatal care, maternal age, maternal education
- Weighted to account for BCs lost from sampling frame = 0.9998
- Linked with birth certificate demographic information

The determinants of prone infant sleep position:
using Oregon PRAMS surveillance for program evaluation

Goals:

- Determine the distribution of infant sleep positions among Oregon women
- Identify maternal and infant factors associated with, and predictive of, increased likelihood of prone infant sleep position
- Identify potential target populations for intensified “Back to Sleep” efforts

Hypotheses

The following characteristics and behaviors are positively associated with prone infant sleep position among Oregon women:

- Race/ethnicity, specifically African-Americans compared to non-Hispanic Whites;
- Increasing parity;
- Late or no initiation of prenatal care.

PRAMS Question 61. Infant Sleep Position.

61. How do you put your new baby down to sleep ***most*** of the time?

Check one answer.

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

PRAMS Question 21. Initiation of Prenatal Care

63. About how many weeks or months pregnant were you when you had your ***first*** visit for prenatal care?
Don't count a visit that was only for a pregnancy test or only for WIC (Women, Infants, and Children's Nutrition Program).

___Weeks or ___ Months

- I did not go for prenatal care

Birth Certificate
Initiation of Prenatal Care

25. MONTH OF PREGNANCY PRENATAL CARE BEGAN First, second, etc. (Specify)

PRAMS Question 25. Prenatal Care Site.

25. Where did you go ***most of the time*** for your prenatal visits?

Don't include visits for WIC.

Check one answer.

- Hospital Clinic
- Health Department Clinic
- Private doctor's office or HMO clinic
- Other • Please tell us:

_____

PRAMS Question 64. Routine Well Baby Care Site

64. When your baby goes for ***routine*** well baby care, where do you take him or her?

Check all the places that you use.

- Hospital Clinic
- Health Department Clinic
- Private doctor's office or HMO clinic
- Other • Please tell us:

_____

*"Change-in-point-estimate" method of binary logistic regression **

- Identifies a confounder based on the change in the odds ratio of the target variable, eg. African-American race when it is added to the model; no *a priori* identification of confounders.
- A series of models are compared to identify the candidate variable producing the greatest change in the odds ratio, if at least 10%; that one candidate variable is then added to the model.
- A new series of models, consisting of the target variable and any confounder(s) added a previous steps, is then generated and the selection procedure repeated.

*** S Greenland. Modeling and variable selection in epidemiologic analysis. Am J Public Health 1989;79:340-349.**

Characteristics of respondents
n = 1763

	Mean ± 2 SD	Range
Maternal age (years)	**26.75 ± 0.45**	**13 - 48**
Maternal education (years)	**13.49 ± 0.57**	**0 - 17**
Parity	**1.95 ± 0.08**	**1 - 9**
Birthweight (grams)	**3434.92 ± 35.40**	**538 - 5414**

means & proportions based on weighted data

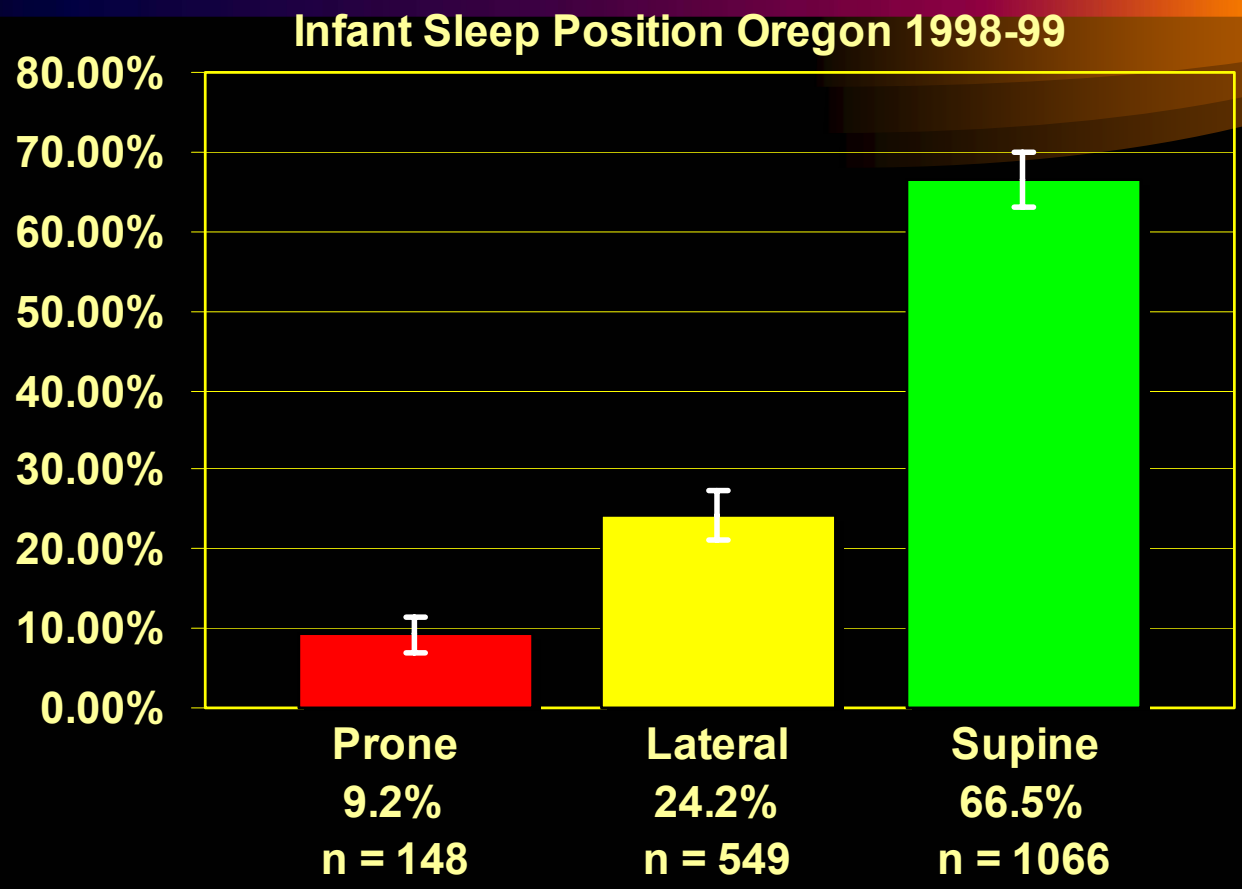
Characteristics of respondents
n = 1763

Marital status unmarried/divorced	**29.3%**
Breasfeeding > 4 weeks	**75.3%**
Co-sleeping at least sometimes	**76.4%**
Smoked during pregnancy	**12.9%**
Current smoker	**20.3%**
Annual family income < $15,000	**26.4%**
Oregon Health Plan enrollment at L&D	**31.0%**
Initiation of prenatal care after the first trimester	**18.8%**
WIC enrollment	**42.5%**
Prenatal care at health department clinic	**8.6%**
Prenatal care from private physician/HMO	**72.3%**
Well baby care at health department clinic	**9.1%**
Well baby care from private physician/HMO	**69.2%**

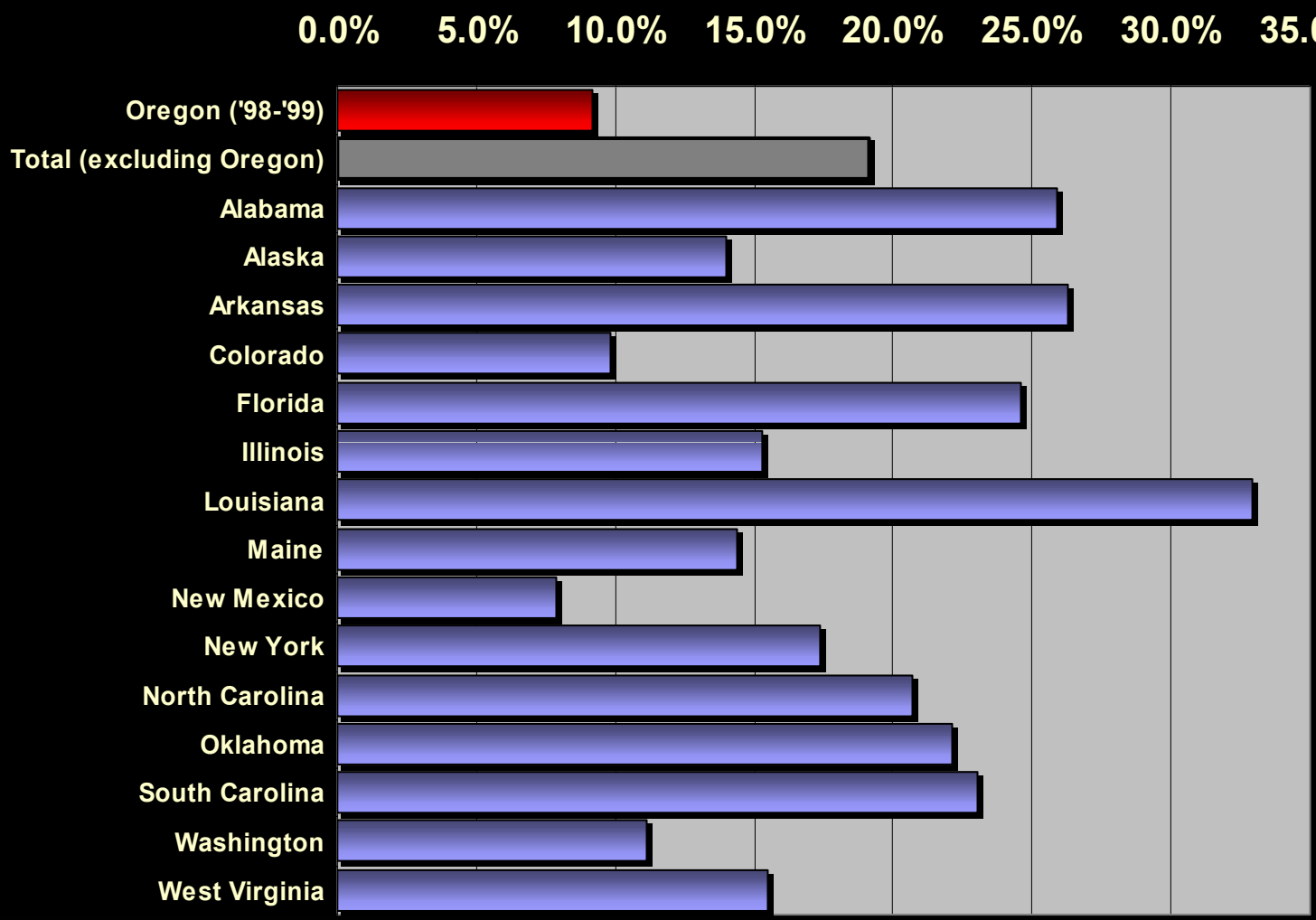
means & proportions based on weighted data

PRAMS Q61

Usual infant sleep position

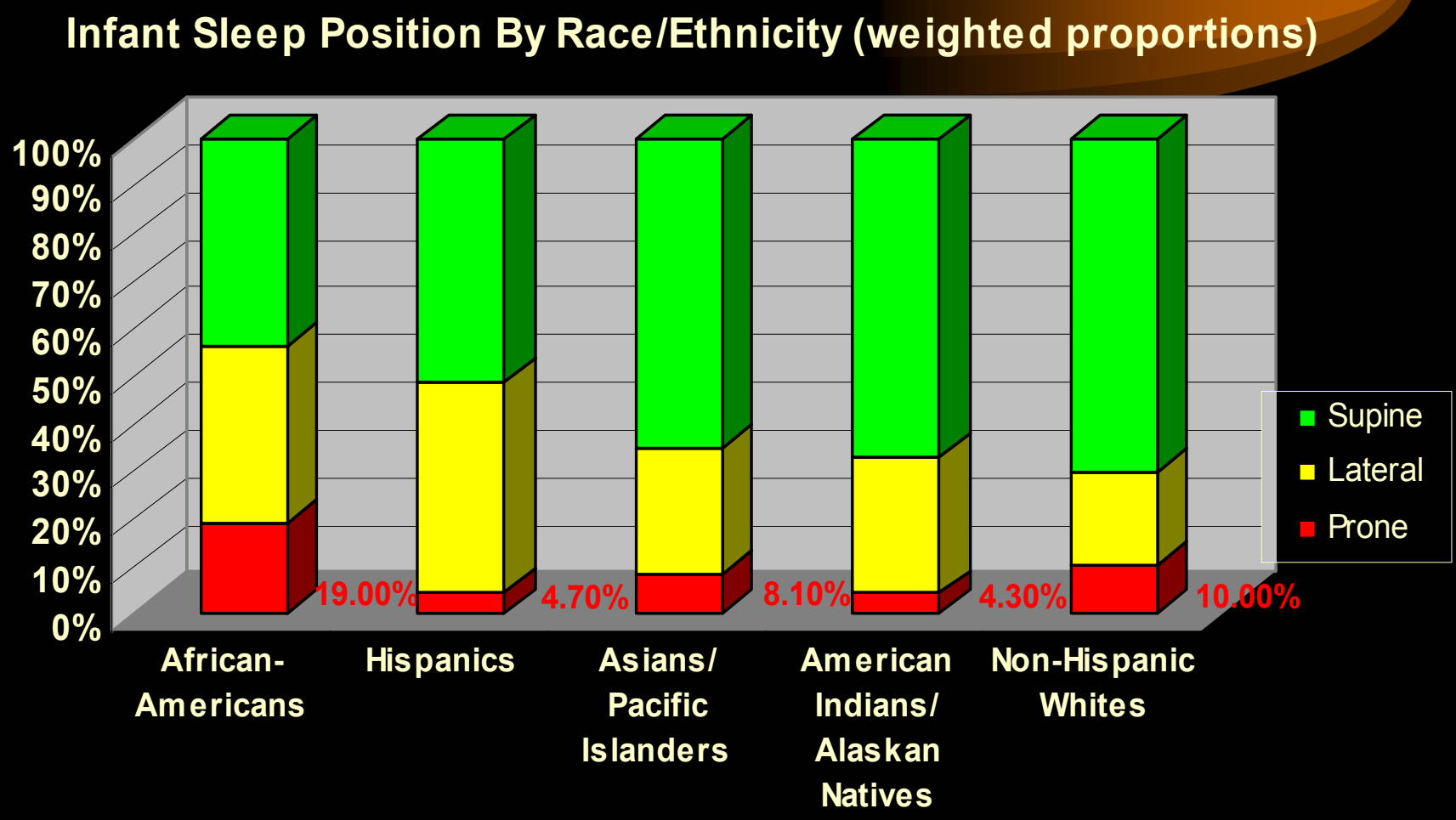


PRAMS 1998 prevalence of prone infant sleep position

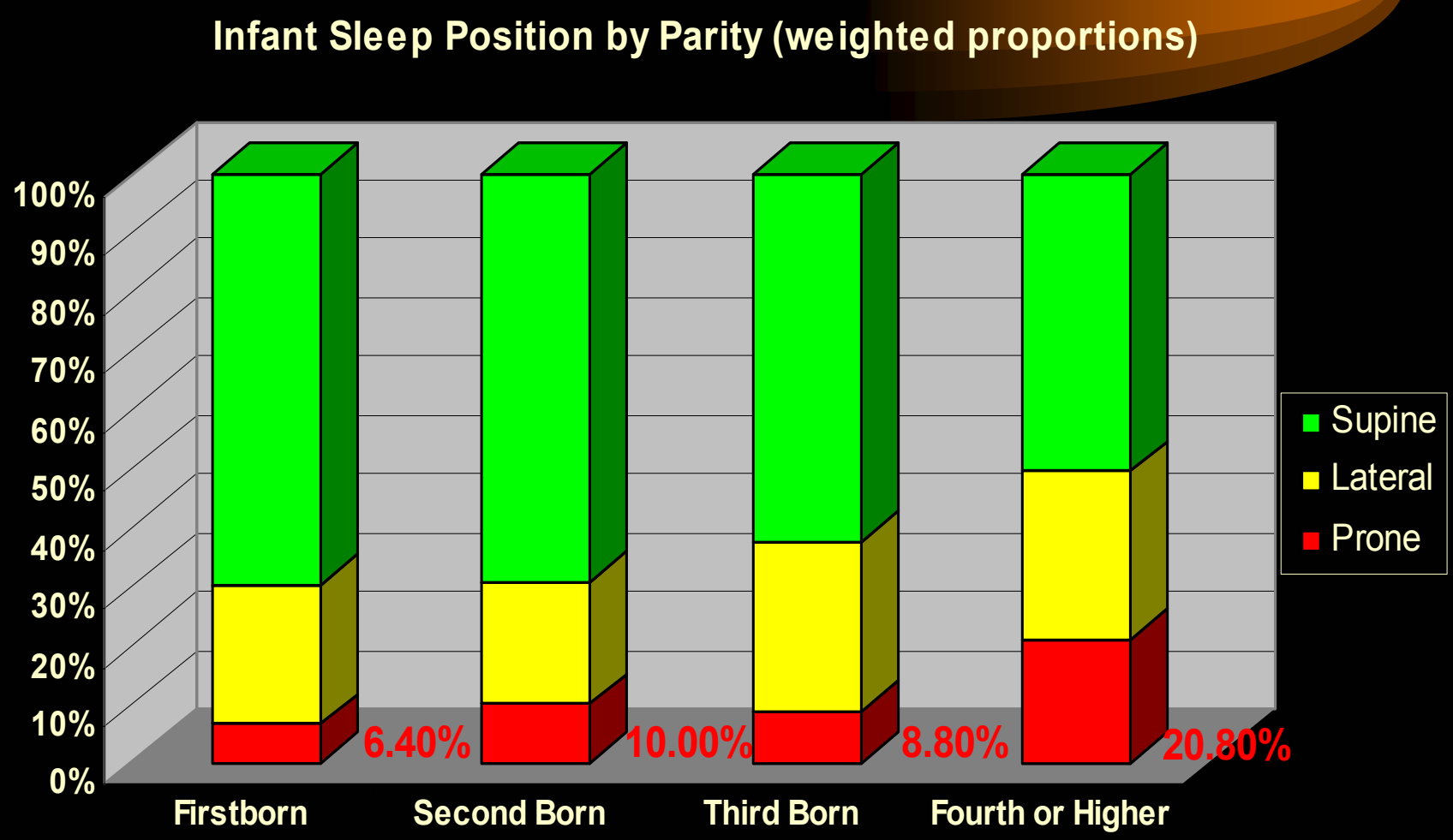


Adapted from the CDC's PRAMS 1998 Surveillance Report

Prone sleep and race/ethnicity

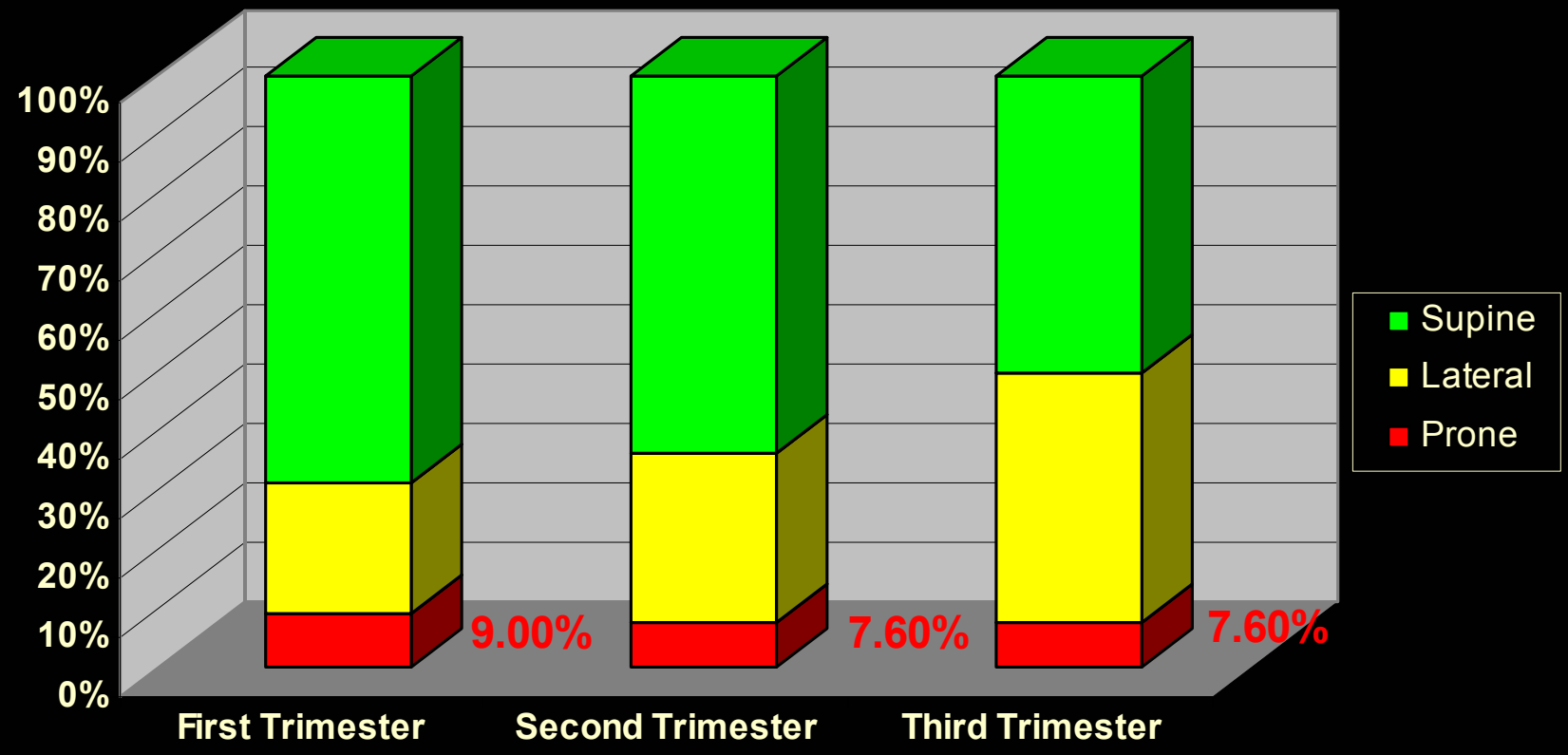


Prone sleep and parity

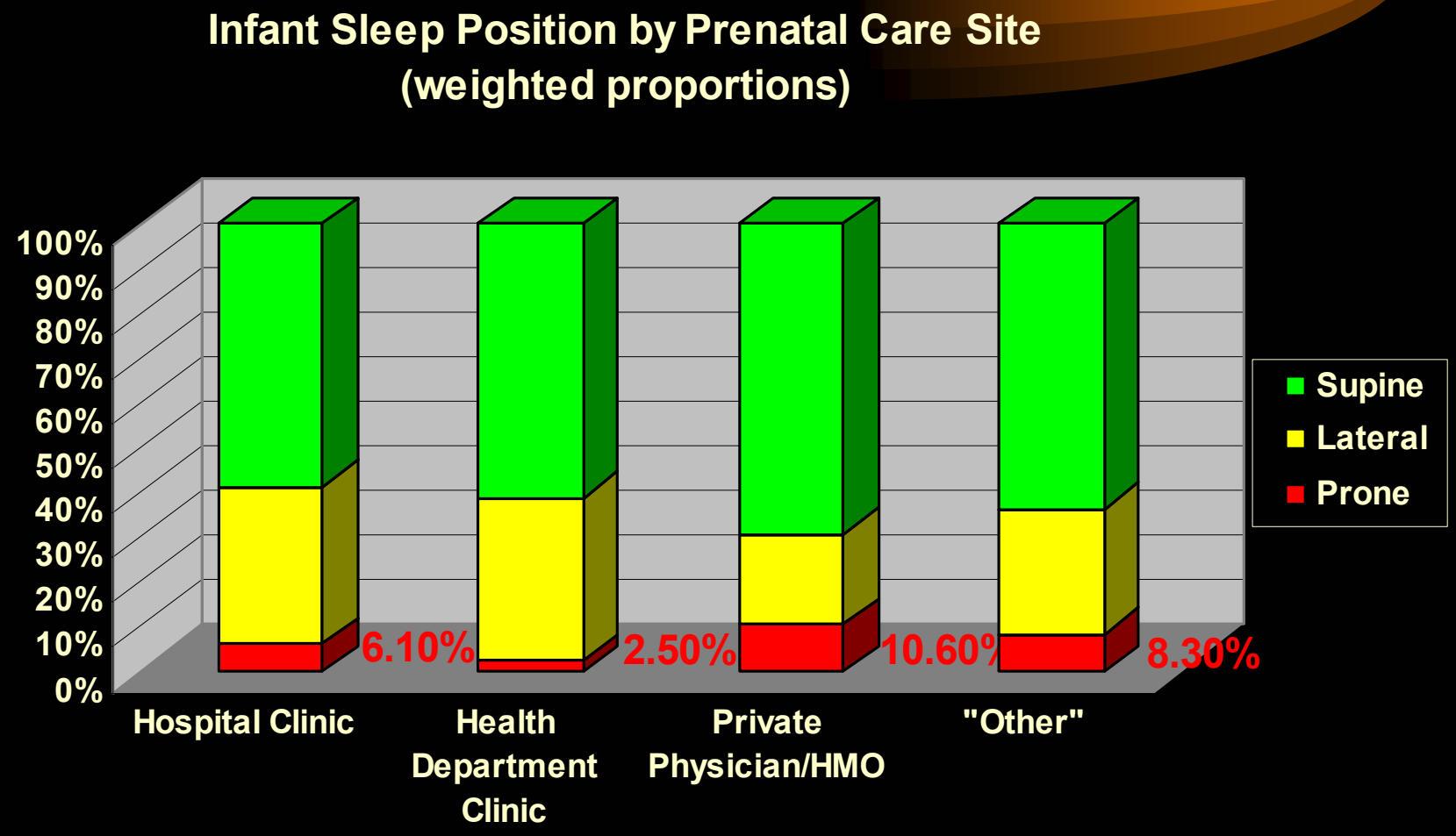


Prone sleep and initiation of prenatal care

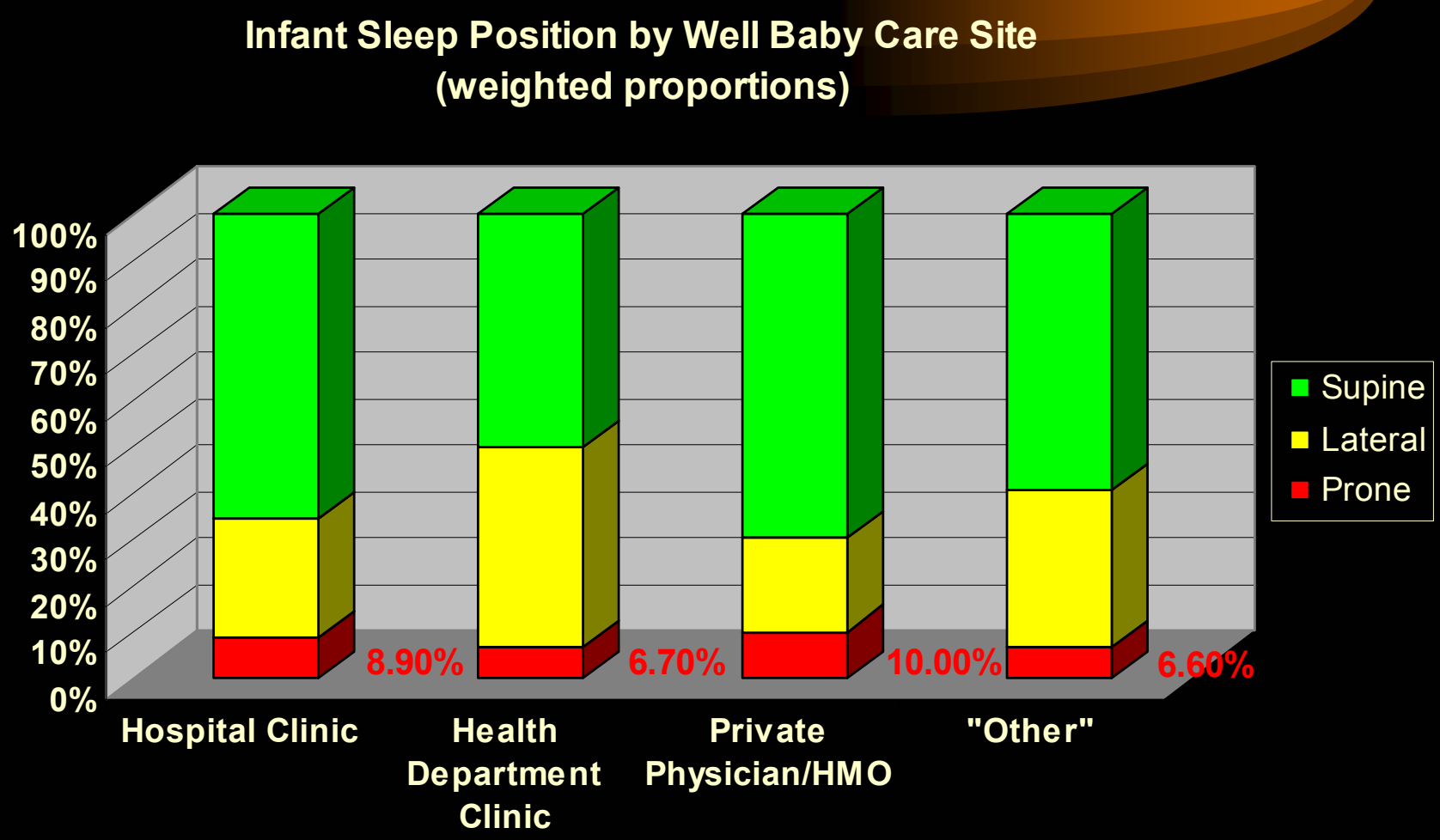
Infant Sleep Position by Initiation of Prenatal Care, from PRAMS (weighted proportions)



Prone sleep and PRAMS Q25 prenatal care site



Prone sleep and PRAMS Q63 & 64 well baby care site



Candidate variables, $p < .05$ in univariable analysis

- Race/ethnicity, $p < .0001$ (target variable)
- Maternal education $\geq$ 10 years, $p = .0002$
- Prenatal care site, $p = .0021$
- Parity, $p = .0061$
- Parity (4 levels), $p = .0147$ (target variable)
- Parity not firstborn, $p = .0314$
- Co-sleeping, $p = .0367$

Candidate variables, $.05 \leq p < .25$ in univariable analysis

- PRAMS source, p = .1233
- Maternal education (three levels), p = .1189
- Maternal education < 16 years, p = .1948
- Maternal education ≥ 12 years, p = .2015
- Breastfeeding > 4 weeks, p = .2461

Candidate variables, clinically and intuitively significant

- Maternal age per year, p = .7400
- Maternal age < 18 years, p .3056
- Maternal age < 20 years, p = .7440
- Maternal age (4 levels), p = .8411
- Maternal education by year, p = .3162
- Infant gender, p = .8945
- Infant birthweight ≥ 2.5 kg, p = .4324
- Infant age , 13 weeks, p = .8329
- Breastfeeding, any, p = .8277
- Breastfeeding at 10 weeks, p = .8986
- Initiation of prenatal care (BC), p = .9603
- Initiation of prenatal care (PRAMS), p = .5781
- Marital status, p = .4600
- Family income (4 levels), p = .9526
- Family income ≥ $15,000, p = .5887
- Well baby care site, p = .7622
- WIC enrollment (BC), p = .2667
- WIC enrollment (RPAMS), p = .4328
- BC Insurance at Labor & Delivery, multiple codings, p = .6235 - .8928
- PRAMS Insurance at Labor & Delivery, multiple codings, p = .4434 - .6957
- PRAMS current insurance, multiple codings, p = .2811 - .7173
- BC Smoker, p = .9530
- PRAMS smoker before pregnancy, p = .4160
- PRAMS smoker last trimester, p = .3396
- PRAMS current smoker, p = .9857
- Other smoker in the house, p = .3304
- Any smoker in the house, p = .6226
- PRAMS mode of administration, p = .6418

Prone sleep and race/ethnicity

	Variable	OR	.95 CI (OR)	p-value
Crude Odds Ratio	**BC † Race/Ethnicity**			**< .0001**
	African-American	**2.11**	**1.35 - 3.30**	
	Hispanic	**0.44**	**0.26 - 0.77**	
	Asian/Pacific Islander	**0.79**	**0.48 - 1.31**	
	American Indian/AN	**0.41**	**0.22 - 0.79**	
	Non-Hispanic White (referent)	**1.00**		
Adjusted for confounding *	**BC Race/Ethnicity**			**< .0001**
	African-American	**4.35**	**2.55 – 7.42**	
	Hispanic	**0.95**	**0.53 – 1.71**	
	Asian/Pacific Islander	**0.99**	**0.57 – 1.72**	
	American Indian/AN	**0.56**	**0.27 – 1.16**	
	Non-Hispanic White (referent)	**1.00**		

*** Confounders:** ***breastfeeding status at 4 weeks, co-sleeping, prenatal care site*** **and** ***family income.***

† BC = Birth Certificate

Prone sleep and parity

	Variable	OR	.95 CI (OR)	p-value
Crude Odds Ratio	**BC † Parity**			**.0147**
	Firstborn (referent)	**1.00**		
	Second	**1.62**	**0.83 – 3.15**	
	Third	**1.41**	**0.63 – 3.17**	
	Fourth or higher	**3.83**	**1.69 – 8.65**	
Adjusted for confounding *	**BC Parity**			**.0001**
	Firstborn (referent)	**1.00**		
	Second	**2.79**	**1.43 – 5.44**	
	Third	**2.26**	**0.99 – 5.14**	
	Fourth or higher	**7.56**	**3.13 – 18.27**	

* Confounders: *initiation of prenatal care, mother's age, mother's education, infant age,* and *annual family income*. † BC = Birth Certificate

Prone sleep and initiation of prenatal care

	Variable	OR	.95 CI (OR)	p-value
Crude Odds Ratio	**BC † Prenatal Care Initiation by Month** odds ratio per month of initiation	**1.04**	**0.88 – 1.22**	**.6512**
	BC Prenatal Care Initiation Within the first trimester Later or no prenatal care (referent)	 **1.02** **1.00**	 **0.51 – 2.02**	**.9603**
	PRAMS Prenatal Care Initiation Wihin the first trimester Later or no prenatal care (referent)	 **1.20** **1.00**	 **0.63 – 2.28**	**.5781**
Adjusted for Confounding*	**PRAMS Prenatal Care Initiation** Within the first trimester Later or no prenatal care (referent)	 **1.06** **1.00**	 **0.55 – 2.03**	**.8604**

* Confounder: *prenatal care site*. † **BC = Birth Certificate**

Prone sleep and PRAMS Q25 prenatal care site

	Variable	OR	.95 CI (OR)	p-value
Crude Odds Ratio	**Prenatal Care Site**			**.0021**
	Hospital Clinic	**2.55**	**0.88 – 7.32**	
	Health Dept. Clinic (referent)	**1.00**		
	Private Physician/HMO	**4.62**	**2.07–10.31**	
	Other	**3.55**	**1.02–12.36**	
Adjusted for confounding *	**Prenatal Care Site**			**.0063**
	Hospital Clinic	**2.56**	**0.53 – 12.47**	
	Health Dept. Clinic (referent)	**1.00**		
	Private Physician /HMO	**8.80**	**2.23 – 34.73**	
	Other	**5.51**	**1.10 – 27.71**	

* Confounders: *mother's education, infant age, WIC enrollment, well baby care site, breastfeeding status at 4 weeks, PRAMS source, parity, mother's age* and *smoking status before pregnancy.*

Prone sleep and PRAMS Q63 & 64 well baby care site

	Variable	OR	.95 CI (OR)	p-value
Crude Odds Ratio	**Well Baby Care Site †**			**.7622**
	Hospital Clinic	**1.36**	**0.43 – 4.31**	
	Health Dept. Clinic (referent)	**1.00**		
	Private Physician	**1.56**	**0.59 – 4.09**	
	Other	**0.99**	**0.19 – 5.10**	
Adjusted for confounding *	**Well Baby Care Site †**			**.0949**
	Hospital Clinic	**0.55**	**0.13 – 2.30**	**(.4127)**
	Health Dept. Clinic (referent)	**1.00**		
	Private Physician	**0.25**	**0.07 – 0.94**	**(.0403)**
	Other	**0.31**	**0.04 – 2.28**	**(.2501)**

* Confounders: *prenatal care site, breastfeeding status at 4 weeks, annual family income, parity, PRAMS source, mother's age, mother's education* and *smoking status in the third trimester*.

† Restricted to respondents reporting only a single type of site (n = 1646)

Comparison Oregon PRAMS & Pollack and Frohna's 15-state 3-year PRAMS

Variable	**Oregon PRAMS n = 1763**	**15-state PRAMS * n = 55,263**
Race		
African-American	**2.24 (1.27 – 3.96)**	**1.45 (1.33 – 4.59)**
Hispanic	**0.45 (0.22 – 0.91)**	**0.81 (0.69 – 0.95)**
Other	0.73 (0.44 – 1.20)	**0.74 (0.58 – 0.93)**
Non-Hispanic White (referent)	1.00	1.00

* HA Pollack, JG Frohna. Infant sleep placement after the Back to Sleep Campaign. Pediatrics 2002;109:608-614.

Comparison Oregon PRAMS & Pollack and Frohna's 15-state 3-year PRAMS

Variable	**Oregon PRAMS n = 1763**	**15-state PRAMS * n = 55,263**
Initiation of Prenatal Care	Small cell sizes preclude analysis using the same coding as Pollack and Frohna; the variable below was substituted	
First trimester		0.93 (0.80 – 1.09)
Third trimester or never		1.18 (0.39 – 3.51)
Second trimester (referent)		1.00
Initiation of Prenatal Care (BC)		
First trimester	0.95 (0.44 – 2.07)	
Not first trimester (referent)	1.00	

* HA Pollack, JG Frohna. Infant sleep placement after the Back to Sleep Campaign. Pediatrics 2002;109:608-614.

Comparison Oregon PRAMS & Pollack and Frohna's 15-state 3-year PRAMS

Variable	**Oregon PRAMS n = 1763**	**15-state PRAMS * n = 55,263**
Parity		
Fourth or higher	**4.62 (1.89 – 11.30)**	**1.72 (1.08 – 2.74)**
Third	1.68 (0.71 – 3.96)	1.41 (0.88 – 2.24)
Second	1.94 (1.00 – 3.77)	1.12 (0.70 – 1.78)
First	1.00	1.00

* HA Pollack, JG Frohna. Infant sleep placement after the Back to Sleep Campaign. Pediatrics 2002;109:608-614.

Prone sleep and forward stepwise regression

- African-American race OR 2.97 (1.74 – 5.07), and
  American Indian/Alaskan Native OR 0.40 (0.19 – 0.84), $p < .0001$
- Parity per live born child OR 1.43 (1.13 – 1.80), $p = .0027$
- Maternal education ≥ 10 years OR 4.04 (1.48 – 11.06), $p = .0065$
- Private physician/HMO prenatal care site OR 3.29 (1.54 – 7.05), $p = .0072$
- Maternal age < 18 years OR 5.49 (1.58 – 19.04), $p = .0073$
- Never co-sleeping OR 2.02 (1.08 – 3.75), $p = .0269$

Prone sleep and forward stepwise regression

Variable	OR	.95 CI OR	p-value
Race			**< .0001**
African-American	**2.97**	**1.74 – 5.07**	
Hispanic	**0.82**	**0.45 – 1.47**	
Asian/Pacific Islander	**0.96**	**0.56 – 1.67**	
American Indian/Alaskan Native	**0.40**	**0.19 – 0.84**	
Non-Hispanic White (referent)	**1.00**		
Parity (continuous)	**1.43 (per birth)**	**1.13 – 1.80 (per birth)**	**.0027**
Mother's education			**.0065**
≥ 10 years of education	**4.04**	**1.48 – 11.06**	
< 10 years (referent)	**1.00**		
Prenatal Care Site			**.0072**
Hospital Clinic	**1.84**	**0.68 – 4.95**	
Health Department Clinic (referent)	**1.00**		
Private MD/HMO	**3.29**	**1.54 – 7.05**	
Other	**3.16**	**0.87 – 11.56**	
Mother's age			**.0073**
< 18 years old	**5.49**	**1.58 – 19.04**	
≥ 18 years old (referent)	**1.00**		
Co-sleeping			**.0269**
Never	**2.02**	**1.08 – 3.75**	
Sometimes/Almost Always/Always (referent)	**1.00**		

Summary of results

- African-American race is a strong predictor of prone infant sleep position, with a crude OR 2.11 (1.35 – 3.30) and adjusted OR 4.35 (2.55 – 7.42), compared to non-Hispanic whites.
- Increasing parity is a strong predictor of prone infant sleep position, with a crude OR for a fourth or higher child 3.83 (1.69 – 8.65) and adjusted OR 7.56 (3.13 – 18.27); the risks for second- and third-born infants are intermediate.

Summary of results

- Prenatal care at private physicians or HMOs – compared to health department clinics – was strongly associated with prone infant sleep position, with a crude OR 4.62 (2.07 – 10.31) and an adjusted OR 8.80 (2.23 – 34.73).
- Prenatal care at "other" sites was similarly but less strongly associated with prone sleep; care at hospital clinics was not significantly associated with prone sleep.

Summary of results

- The initiation of prenatal care was not a significant predictor of prone infant sleep position but the study had a power of only 0.61 to detect an OR ≥ 2.0
- An association with health department clinic attendance for well baby care – compared to private physicians or HMOs – approached but did not achieve significance; the study had a power of only 0.57 to detect an OR ≥ 2.0.

Discussion: caregiver's choice of sleep position

- Those who choose supine positioning tend to report SIDS prevention and medical provider recommendations as the reasons
- Those who choose prone positioning tend to report infant comfort/improved sleep and past experience
- Research suggests that infants placed prone do sleep "better"
- This begs the question – why are some women motivated by concern about SIDS and others by concern about infant sleep quality?

Discussion: race/ethnicity and prone infant sleep position

- African-American race is a consistent predictor of choice of prone sleep.
- Choice of prone infant sleep position by African-American women has declined, but less rapidly than that of white women.
- This disparity in choice of prone positioning is a significant contributor to the racial disparities in SIDS mortality rates.
- The reasons African-American women persist in choosing prone positioning are not clear.

Discussion: care sites and prone infant sleep position

- An association between prenatal care site and prone positioning has not been previously reported.
- This association may be specific to Oregon or may be a generalized phenomenon.
- It may be related to other, unidentified, demographic factors or to the different patterns of hospital affiliations and those hospitals' post-natal practices.
- An association between pediatric care at public clinics has been previously reported; it could not be confirmed, nor could it be ruled out.

Discussion: parity and prone infant sleep position

- The association between increasing parity and choice of prone positioning has been previously reported and was confirmed by the PRAMS data.
- The Oregon results were similar to, but stronger than, those of the 15-state PRAMS study
- Cohort effect? The more children a women has, the older she would be – and the more likely that she would have started her child-bearing prior to or closer to the start of the "Back-to-Sleep" campaign.

Limitations of this study

- Combining lateral sleep with supine sleep
- 36% non-response
- "Social acceptability" bias and "mode of administration" bias
  - PRAMS alcohol use during the third trimester
  - Smoking?
  - Sleep position?
- Well baby care site – multiple responses allowed
- Only moderate correlation between certain Birth Certificate and PRAMS variables
  - Initiation of prenatal care
  - WIC
- Residual confounding?

Directions for future research

- Determination of the reasons behind women's choice of infant sleep positioning
- Identification of other possible causes of the racial disparities in SIDS mortality rates
- Identification of the causes of the association between prenatal care site and sleep positioning
- Clarification of the role of well baby care site in choice of sleep positioning

Conclusions

- African-American women in Oregon are at high risk for choice of prone infant positioning
- Additional effective, culturally-competent public health efforts need to be directed at reducing the prevalence of prone positioning in this community
- Women with multiple children are at higher risk and additional efforts should be directed at reducing their risk

Conclusions

- Private providers of prenatal care should examine their practices – and their hospital's practices – regarding encouragement of supine sleep positioning and institute more effective measures

"Ideal" public health strategy to reduce use of prone positioning

- Focus groups to better identify caregiver motivations
- Identify usual practices of medical providers
- Develop better, more culturally-competent approaches and materials
- Prospective study, factorial design
  - Usual vs. Enhanced approach at prenatal care sites
  - Usual vs. Enhanced approach at well baby care sites
  - Document hospital practices
- Survey caregivers upon nursery discharge, at 1 month and at 4 months: experiences, attitudes, practices


Extras