

Educational Disparities in Smoking Before, During and After Pregnancy

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Smoking During Pregnancy

- Approximately 60% of mothers who smoke prior to pregnancy continue to smoke during pregnancy
- Half of all quitters resume smoking after their child is born (Colman & Joyce, 2003)
- Children born to mothers who smoke are at increased risk for:
 - Low birthweight (Kramer et al., 1990; Lieberman et al., 1994; McArthur & Knox, 1988)
 - SIDS (Shah et al., 2006)
 - Respiratory infections (Breese-Hall et al., 1984; Pullan & Hey, 1982)
 - Asthma (Cook & Strachan, 1997; DiFranza et al., 2004; US Environmental Protection Agency, 1992)
 - Lower cognitive scores (Fergusson et al., 1993; Olds et al., 1994)

Educational Disparities

- Women with higher educational attainment are less likely to smoke before pregnancy, more likely to quit during pregnancy, and less likely to relapse in the post-partum months (Colman & Joyce, 2003; Severson, et al. 1997)
- As such, studies have found a widening in educational disparities over the course of pregnancy at the post-partum period (Cornelius et al., 2004; Kahn et al., 2002)

Current Research Gaps

- Few studies, however, have used recent, national longitudinal datasets to examine educational disparities in smoking
- Further, it is not clear whether educational disparities in smoking have changed since the 1998 tobacco settlement and the rise of anti-smoking campaigns
- Existing studies that examine post-partum relapse also do not typically follow women beyond one year

Study Goals

- To use recent, national data to examine educational disparities in smoking before, during and after pregnancy, quitting smoking during pregnancy, as well as relapse by 24 months post-partum

Early Childhood Longitudinal Study Birth Cohort (ECLS-B)

- Nationally representative sample of children born in 2001
- Longitudinal sample of 10,688 children followed from birth through six years of age
- This study uses two waves of data collection (Wave 1: children at approximately 9 months old and Wave 2: 24 months old)
- The ECLS-B incorporates:
 - Parent report
 - Direct child assessments
 - Birth certificate data
 - Child care provider and school instruments

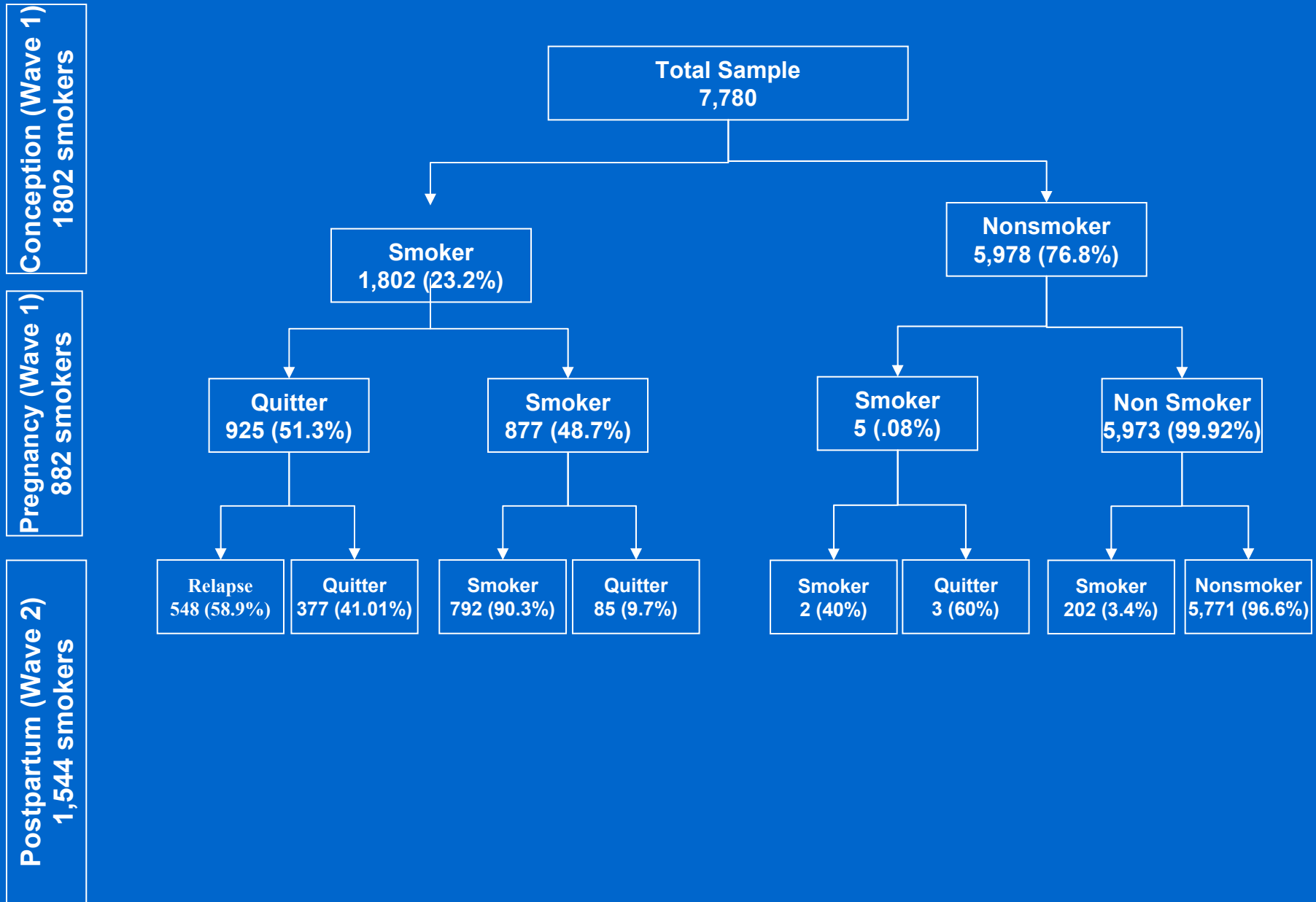
Hypotheses

- Mothers with less education would be more likely to smoke, less likely to quit, and more likely to relapse.
- In addition, clinical and contextual factors such as receipt of late or no prenatal care, not wanting the pregnancy, consuming alcohol, and living with other smokers would be associated with a higher risk of smoking.

Analytic Sample

- Smoking at conception, birth and 24 months post-partum:
N = 7,780 mothers with complete data and whose children were 18 months or younger at Wave 1
- Quitting during pregnancy:
N = 1,802 women reported smoking at conception
- Relapse by 24 months post-partum:
N = 925 women who quit smoking during pregnancy

Analytic Sample



Measures

- Maternal Smoking

Self-report at three time points:

- Conception (3 months before pregnancy)
- Birth (Last three months of pregnancy)
- 24 months post-partum

- Maternal Quitting and Relapse

Derived variables

- Quitting (Smoked at conception but not at birth)
- Relapse (Quit at birth but smoking at 24 months post-partum)

Measures cont.

- Sociodemographic Characteristics
 - Maternal education
 - Mother's race/ethnicity
 - Mother's age at time of birth
 - Total household income
 - Mother's marital status to biological father
 - Child's age

Measures cont.

- Clinical Characteristics
 - Receipt of prenatal care
 - Maternal parity
 - Mother's weight gain
- Contextual Factors
 - Alcohol consumption
 - Maternal pregnancy intention
 - Breastfeeding intention/practice
 - Number of household smokers
 - Maternal depression

Analytic Strategy

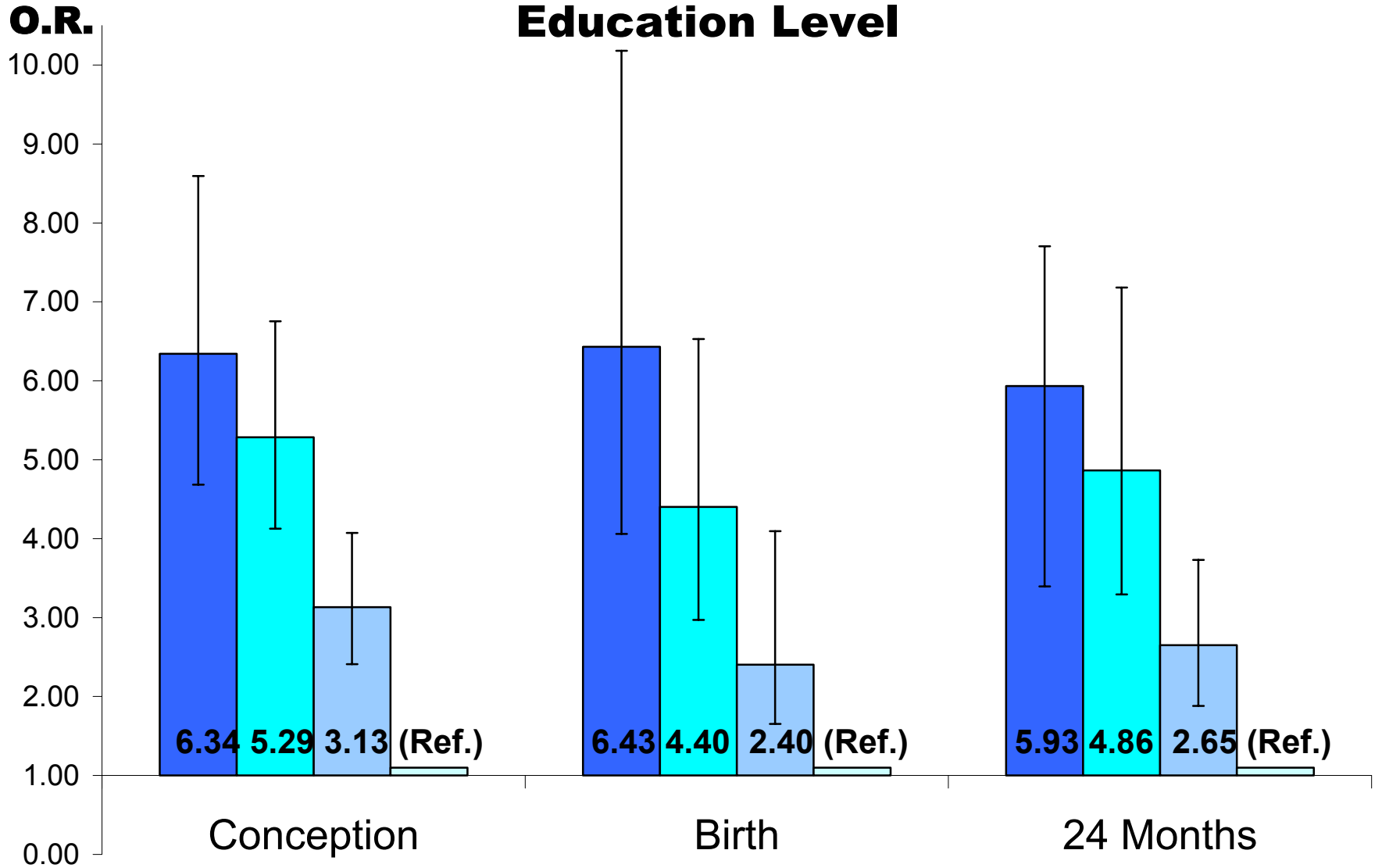
- Multivariate logistic regression models were used to examine the association between maternal education and smoking status at conception, birth, and 24 months post-partum, as well as quitting smoking during pregnancy and relapse by 24 months post-partum

Table 1. Sample Characteristics at Wave 1

Characteristics	Frequency (Percent)	
	N = 7,780	
Maternal education		
Less than HS	1813	(23.7)
HS diploma	1632	(21.4)
Some college/vocational	2139	(28.6)
BA/BS or higher	2196	(26.3)
Household income		
\$20,000 or less	1887	(23.2)
\$20,001-\$35,000	1785	(22.9)
\$35,001-\$50,000	1183	(15.4)
\$50,001+	2925	(38.5)
Mother's race/ethnicity		
White (non Hispanic)	3863	(61.0)
Black (non Hispanic)	1261	(13.4)
Hispanic	1275	(20.3)
Asian	873	(2.8)
Other	508	(2.6)
Mother's age at time of birth		
Under 20 years old	848	(10.3)
20-29 years old	3839	(51.1)
30 years +	3093	(38.6)
Marital status to biological father at birth		
Married	5081	(67.0)
Not married	2699	(33.0)
Number of previous live births		
0	2988	(40.1)
1 or more	4792	(59.9)
Mother's pregnancy intention		
Pregnancy wanted, right time or later	4380	(57.8)
Pregnancy unwanted or mistimed	3400	(42.2)

Odds Ratio & 95% CI for Maternal Smoking by

Education Level



Less than HS

HS Degree

Some college

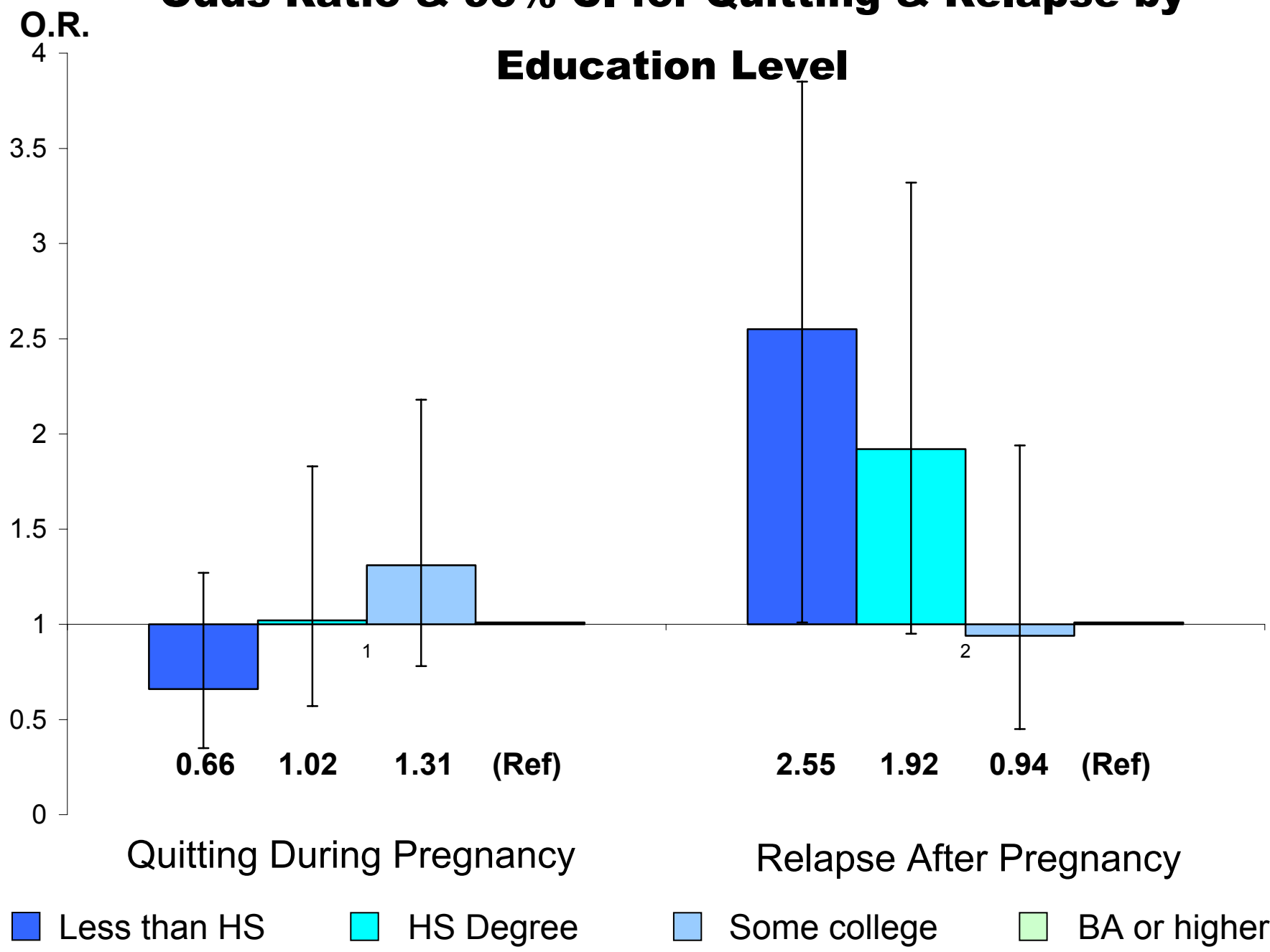
BA or higher

Results: Factors Predicting Smoking

Characteristics	Smoking at Conception	Smoking at Birth	Smoking at 24 Months
	OR (95% CI) N=7,780	OR (95% CI) N=7,780	OR (95% CI) N=7,780
Alcohol consumption			
Yes	2.81 (2.29, 3.46) ***	5.47 (2.96, 10.08) ***	2.62 (2.05, 3.36) ***
No	1.00	1.00	1.00
Mother breastfeeding			
Yes		1.00	1.00
No		1.62 (1.27, 2.06) ***	2.32 (1.73, 3.12) ***
Number of household smokers (excl. mom)			
0			1.00
1+			5.81 (4.83, 6.98) ***
Maternal depression			
Yes			1.52 (1.11, 2.08) **
No			1.00

*p<.05, **p<.001, ***p<.0001

Odds Ratio & 95% CI for Quitting & Relapse by Education Level



Results: Contextual Factors Predicting Quitting and Relapse

Characteristics	Quitting during Pregnancy	Relapse by 24 months post-partum
	OR (95% CI) N=1,802	OR (95% CI) N=925
Alcohol consumption		
Yes	0.34 (0.16, 0.75) **	3.21 (1.97, 5.21) ***
No	1.00	1.00
Mother breastfeeding		
Yes	1.00	1.00
No	0.75 (0.54, 1.04)	4.49 (2.16, 9.34) ***
Cigarettes smoked at conception		
1/2 pack a day or less	3.20 (2.37, 4.32) ***	0.86 (0.54, 1.37)
More than 1/2 pack a day	1.00	1.00
Number of household smokers (excl. mom)		
0		1.00
1+		5.06 (3.27, 7.83) ***

*p<.05, **p<.001, ***p<.0001

Conclusions

- Strong educational disparities in smoking during the pre- and postnatal periods remain
- However, contrary to previous studies, there does not appear to be a widening in educational disparities over time

Conclusions cont.

- In addition to educational attainment, many modifiable contextual factors such as alcohol consumption, living with other household smokers and breastfeeding were associated with smoking during pregnancy, quitting and relapse

Implications

- Results of this study should facilitate the creation of more targeted interventions for women at high risk for smoking during pregnancy including those who:
 - Have lower educational attainment
 - Consume alcohol during pregnancy
 - Choose not to breastfeed
 - Live with other smokers

Research in the service of children



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