
Socioeconomic Gradients in Birth Outcomes Across Race, Ethnicity and Nativity

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SES and Health

- Well-established relationship between SES & health
- SES as ‘fundamental cause’ of disease
 - Those of higher status are able to obtain more knowledge, power, social connections, and other resources to improve their health and that of their families (Link and Phelan 1995)

SES/Health Gradients

- Evidence of graded relationship b/w SES and health
 - Differences not just b/w rich and poor
 - Differences throughout the SES distribution
(Marmot et al. 1987)
- More recently, SES health gradients have been found for child health
(Case et al. 2002, Chen et al. 2002, 2006)

Birth Outcomes

- Evidence of graded relationship b/w SES & birth outcomes:
 - Both parents' education / occupation and low birth weight, small for gestational age, and preterm birth
(Parker et al. 1994)
 - Income and infant mortality and low birth weight (Finch 2003)
 - However, evidence of threshold effect, beyond which higher levels of SES do not convey further benefits

Disparities by Race/Ethnicity

- In US also large health disparities by race and ethnicity
 - Black children are more likely to be poor and have worse health outcomes
 - Low birth weight
 - Black 13.4% vs. white 6.9% (NCHS)
- However, some groups are poor, but don't have worse outcomes
 - Mexicans, some immigrants
 - 'Epidemiologic paradox'

SES/Health Relationship

- SES/Health relationship may be different for different groups
- Few (2) studies have looked at SES/health relationships by race/ethnicity
 - SES gradients found for white and black children, but not for Hispanic and Asian children (Chen et al. 2006)
 - But only for some health outcomes
 - Data from 1994
 - SES gradients found for white and black children for LBW and SGA, but not preterm birth (Parker et al. 1994)
 - But, only for some measures of SES
 - Data from 1988

Gaps in Prior Literature

- No recent evidence
- No (or little) information about some groups: Asians, Native Americans, Hispanics
- Few controls
- Inconsistent results

Aims of Study

- Describe birth outcomes for a number of racial/ethnic groups in the U.S.
- Identify whether SES gradients exist for birth outcomes
- Identify whether SES gradients are present across all racial/ethnic groups

Contributions

- New, nationally representative data
- Large samples of groups which have not been examined previously
- Have birth outcomes
- Rich set of SES measures and controls

Data

- Early Childhood Longitudinal Study-Birth Cohort (ECLS-B)
- Nationally representative study of over 10,000 children born in 2001 in U.S.
- Baseline interview at 9 months, follow-up at 24 months, preschool and kindergarten entry
- Birth certificate data are appended
- Oversamples of:
 - low and very low birth weight children
 - twins
 - Chinese, other Asians and Pacific Islanders
 - American Indians

Current Study

- Data from birth certificates and baseline interviews (9 months old)
- Analysis sample = 9,339 children
 - Biological mother was primary respondent
 - No missing data on dependent variables
 - Only one twin per household (dropped 795 matched twins)

Birth Outcomes

- From birth certificate
 - Low birth weight (< 2500 gms)
 - Constructed from continuous birth weight
 - Preterm birth (< 37 weeks)
 - Constructed from continuous gestational age
 - Whether infant stayed in the Neonatal Intensive Care Unit (NICU) after birth

Socioeconomic Status

- SES is a complex and ambiguous concept
 - Evidence that usual measures of SES (education, income, poverty) have very different meanings
 - Evidence that different measures of SES may be incomparable across race
 - Multi-dimensional measures of SES are preferable (Braveman et al. 2001, 2005; Kaufman et al. 1997)

Measures: SES

- Index of 5 SES indicators
 - Education (both parents)
 - Occupation status (both parents)
 - Household income
- Collapsed into quintiles
 - Highest is reference

Race, Ethnicity, Nativity

- Mother's race/ethnicity from birth certificate
 - Non-Hispanic white
 - Non-Hispanic black
 - Mexican
 - Non-Mexican Hispanic
 - Chinese
 - Non-Chinese Asian
 - American Indian
- Nativity from birth certificate
 - US or foreign-born

Sociodemographics

- Mothers' age (BC)
 - <21, 21-30, 31+
- Education
 - <HS, HS, some college, BA+
- Marital status at birth (BC)
- First birth (BC)
- Child's sex
- Multiple birth
- Number of people in family
- Mother lived w/both biological parents till 16
- Region of residence
 - Northeast, Midwest, South, West

Health Behaviors and Medical Risk Factors

- Smoking during pregnancy (either from survey or birth certificate)
- Prenatal care in 1st trimester (BC)
- Any maternal medical risk factor (BC)
 - anemia, diabetes, hypertension, previous LBW or preterm birth, eclampsia, cardiac or lung disease, other

Analyses

- Describe measures across groups
- Show odds ratios of having poor birth outcome at each quintile of SES
 - Reference = highest quintile
 - Crude and adjusted
 - 95% CI's
 - For pooled sample and across groups
- Show predicted probabilities of poor birth outcomes at each SES quintile, across groups
- All analyses use SVY commands in Stata to account for complex design effects in ECLS-B

Unweighted Sample Sizes (Sub-groups are estimates)

	<i>N</i>	% of Full Sample
All	9339	100%
White, non-Hispanic	4300	46%
Black, non-Hispanic	1600	17%
Mexican	1050	11%
Other Hispanic	500	5%
Chinese	450	5%
Other Asian	950	10%
Native American	500	5%
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Native-born	6800	73%
Foreign-born	2550	27%

Sample Characteristics by Race/Ethnicity

	White, non- Hispanic	Black, non- Hispanic	Mexican	Other Hispanic	Chinese	Other Asian	Native American
Birth Outcomes							
Low birth weight	5.9	11.3*	5.4	7.4*	4.0*	7.1*	4.9
Preterm birth	9.7	15.5*	11	11.7	5.3*	10.8	11.7
Any NICU Stay	6.7	9.4*	6.5	7.7	5.4	7.2	5.5
Quintiles of SES*							
1st SES quintile	10	34	47	25	9	10	26
2nd SES quintile	17	24	25	28	6	13	29
3rd SES quintile	21	20	16	20	8	19	21
4th SES quintile	25	13	9	17	12	21	19
5th SES quintile	27	8	3	10	65	37	6

*Statistically significant differences b/w whites and other groups at the 10% level or better
All figures are weighted using (W1R0)

Sample Characteristics by Race/Ethnicity

	White, non- Hispanic	Black, non- Hispanic	Mexican	Other Hispanic	Chinese	Other Asian	Native American
Categories of Education*							
Less than HS	17	34	59	40	10	18	37
HS/GED	21	30	18	22	7	16	25
Some college	29	27	17	24	15	23	29
College +	32	10	7	14	70	42	8
Married	78	33*	61*	53*	97*	83*	44*
Lived w/bio pars	61	35*	67*	52*	86*	75*	41*
Maternal Behavior and Medical Risk Factors							
Smoked during preg	19	11*	2*	6*	0*	4*	27*
Prenatal care 1st tri	89	74*	75*	81*	91	85*	72*
Any med risk factor	32	35	25*	31	22*	24*	38*

* Statistically significant differences b/w whites and other groups at the 10% level or better
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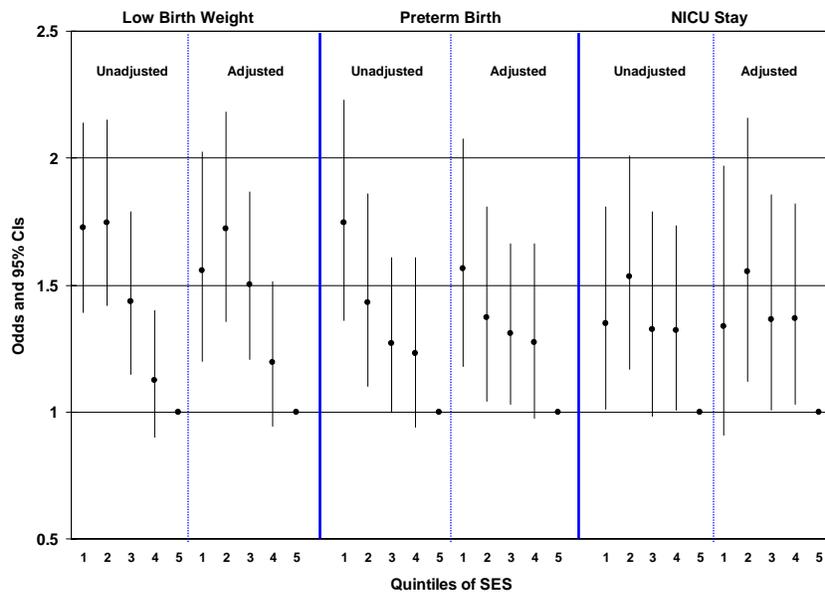
Sample Characteristics by Nativity

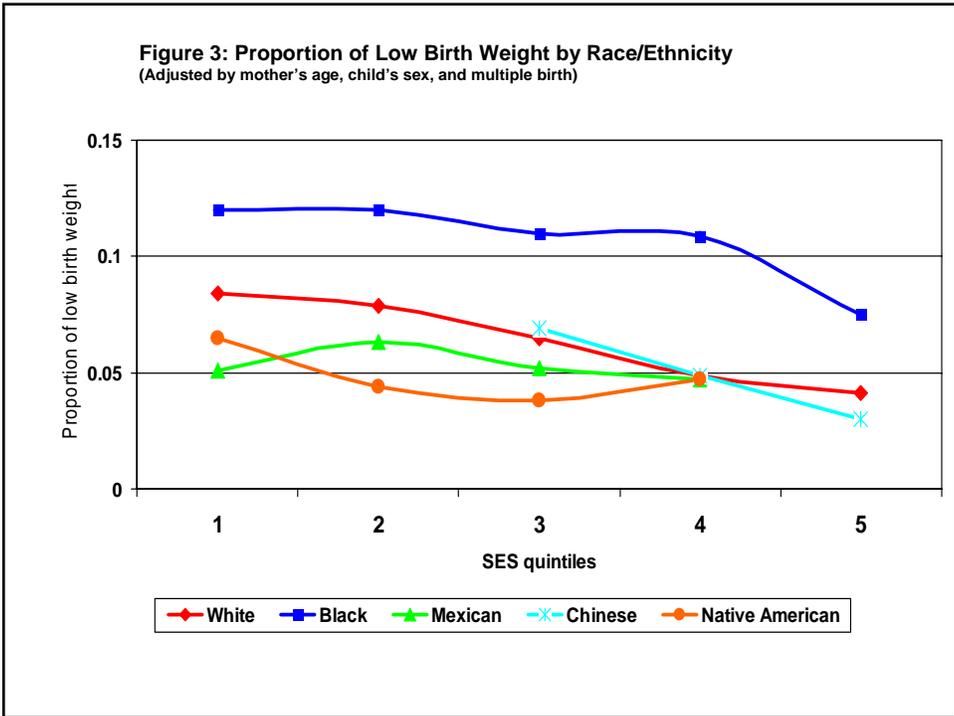
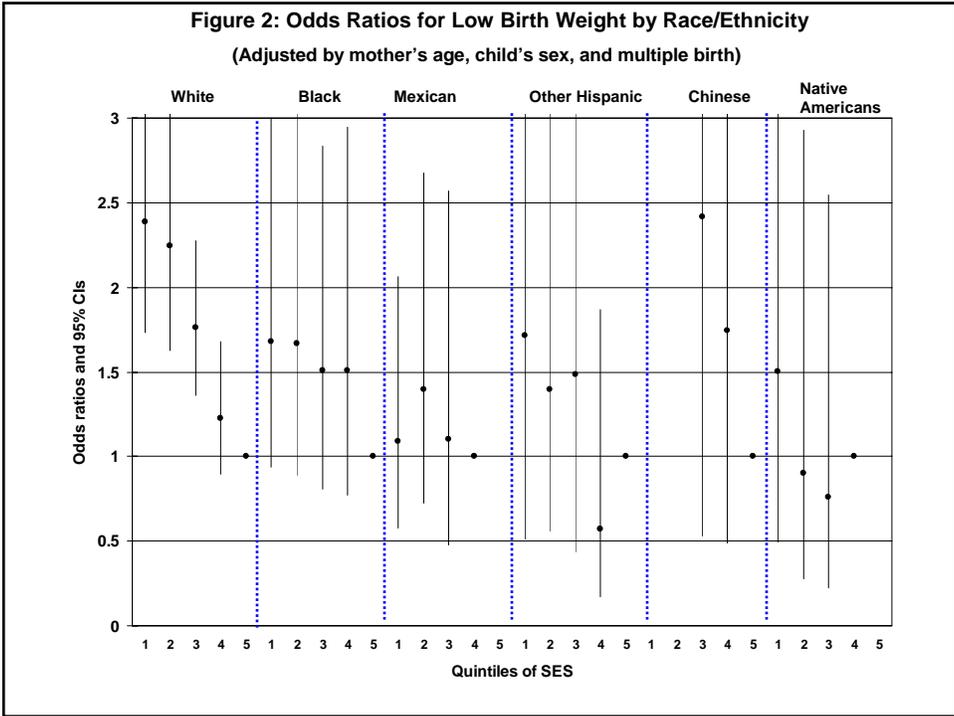
	Native- born	Foreign- born
Birth Outcomes		
Low birth weight	6.7	6.6
Preterm birth	10.7	11.6
Any NICU Stay	7.3	6.5
Quintiles of SES*		
1st SES quintile	15	36
2nd SES quintile	20	22
3rd SES quintile	21	16
4th SES quintile	22	14
5th SES quintile	22	13

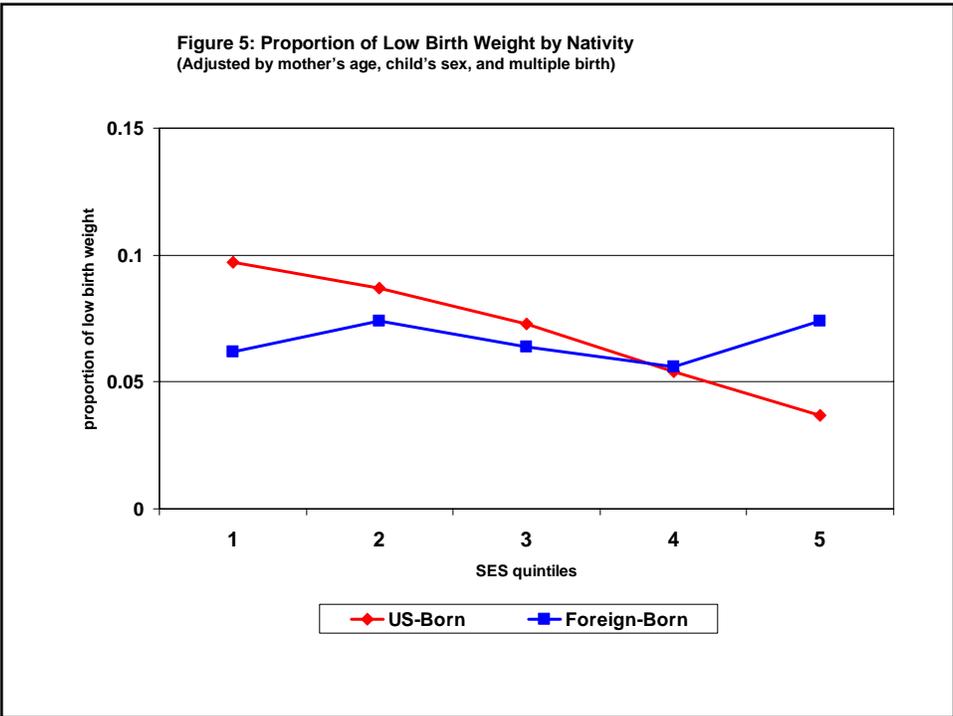
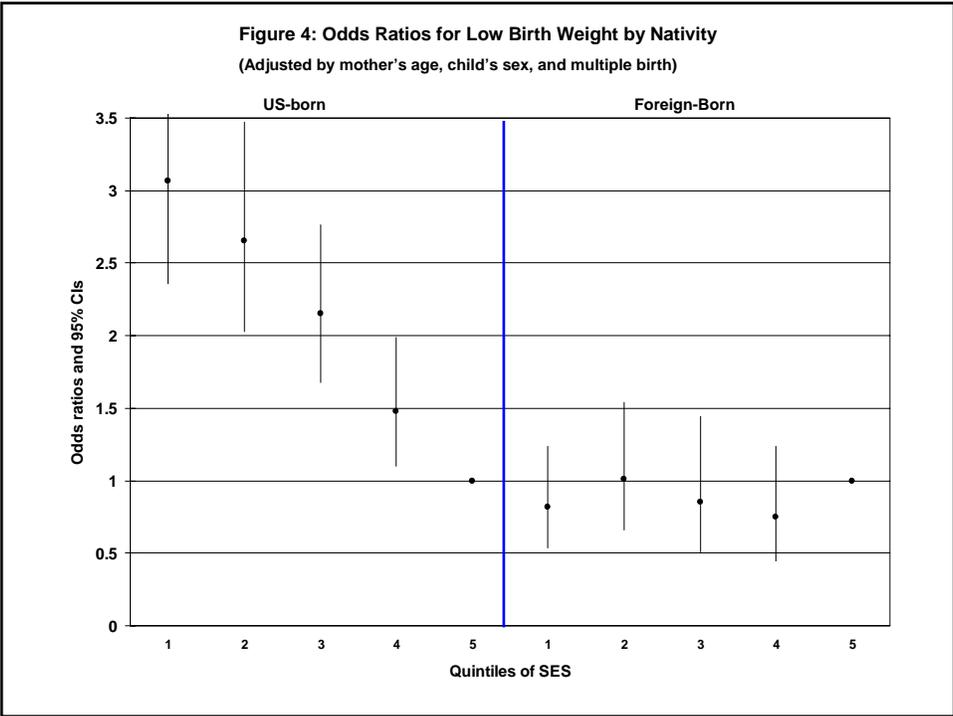
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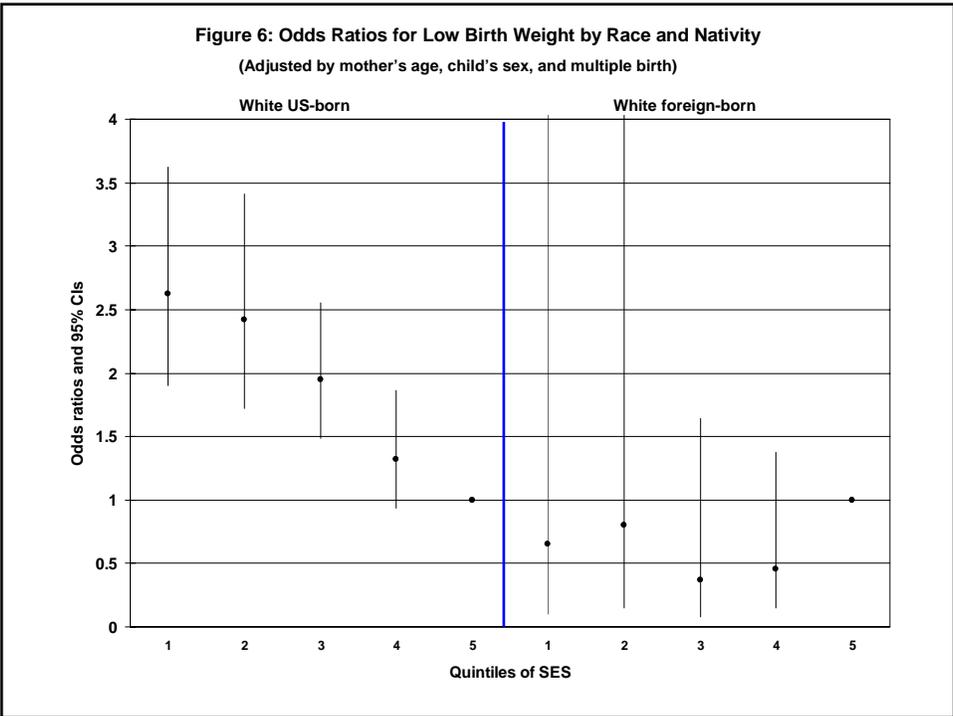
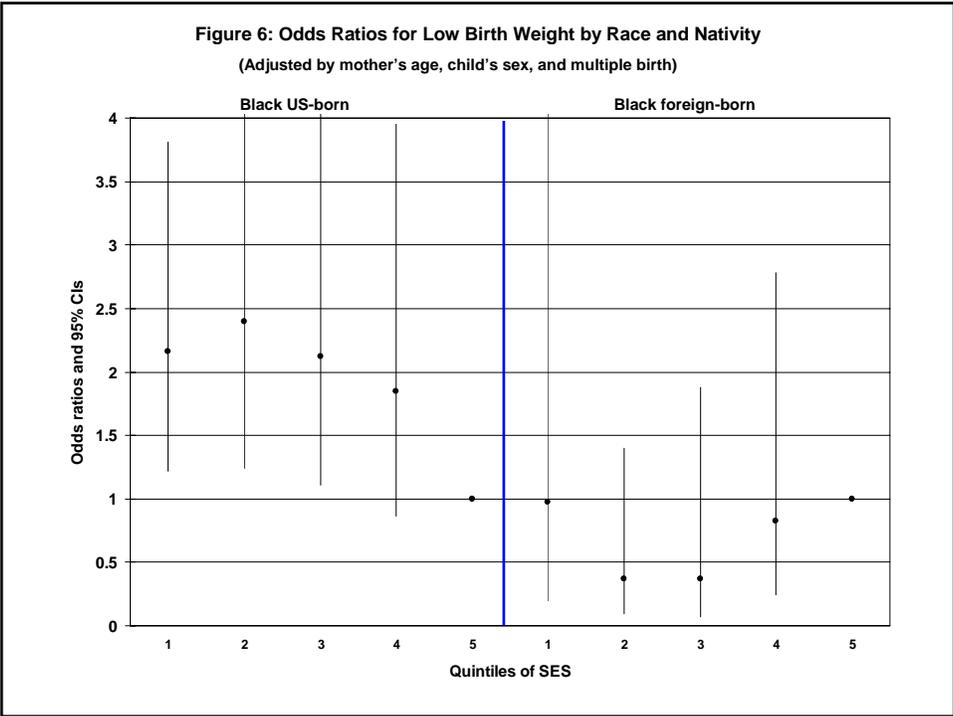
	Native-born	Foreign-born
Categories of Education*		
Less than HS	22	47
HS/GED	23	18
Some college	29	17
College +	26	18
Married	67	69
Lived w/bio pars	55	68*
Maternal Behavior and Medical Risk Factors		
Smoked during preg	17	2*
Prenatal care 1st tri	86	77*
Any med risk factor	32	25*

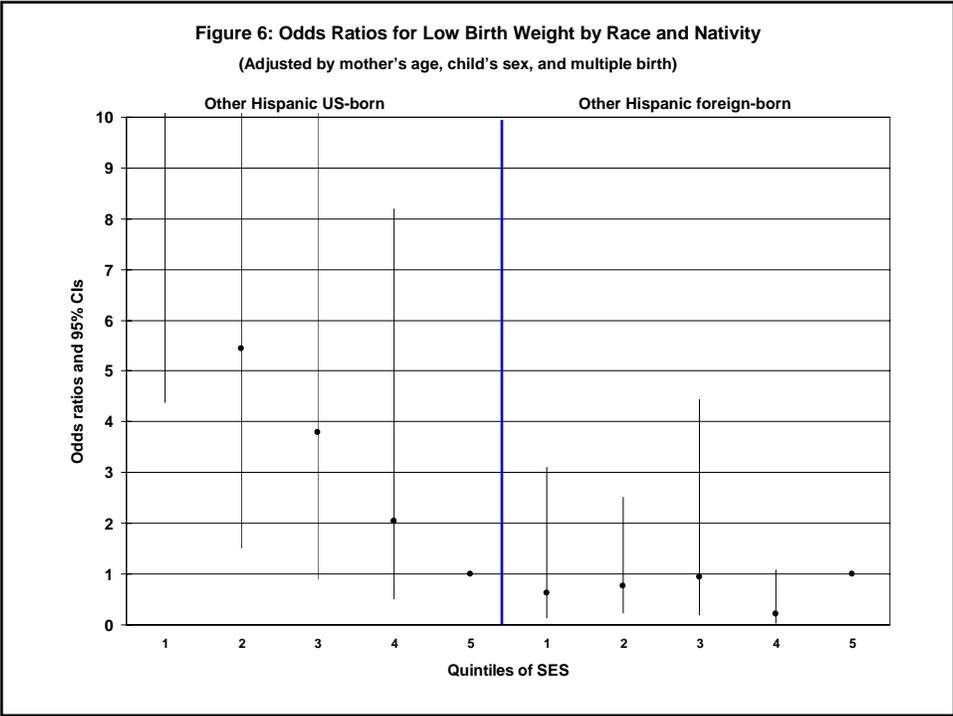
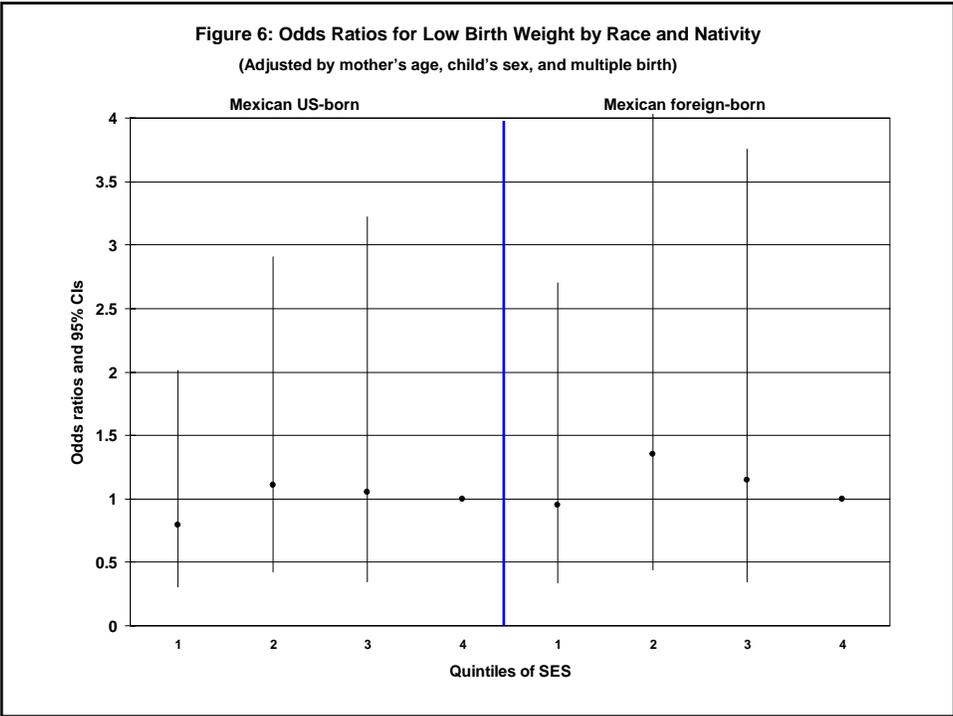
Figure 1: Unadjusted and Adjusted Odds of Three Birth Outcomes for Full Sample











Summary

- SES disparities are evident in birth outcomes
- Disparities persist after including controls
- Graded relationship exists for LBW and preterm, but not NICU
- SES/birth outcome relationship:
 - Exists for US-born whites (graded)
 - US-born blacks and US-born non-Mexican Hispanics (beneficial effects only for best off group),
 - No other group
- No SES/birth outcome relationship for foreign-born (of any group)

Discussion

- Disparities in low birth weight by race/ethnicity are different at different points in the distribution
 - Disparities appear greater b/w blacks and whites in middle of distribution for LBW
 - Overall foreign-born rates underestimate advantage
- If SES is not protective, how do we improve birth outcomes and reduce disparities?

Limitations

- Small sample sizes in tails of SES distribution across groups
- Indicators of SES may not be right for certain groups (measurement error)
- SES index not measured pre-birth (reverse causation??)
- Chinese sample appears to be very affluent (??)

Next Steps

- Separate out components of SES
- Add other measures of SES: poverty, wealth, neighborhood
- Look at subsequent measures of child health (do poor birth outcomes predict poor health)
- What are mechanisms?

Thank You

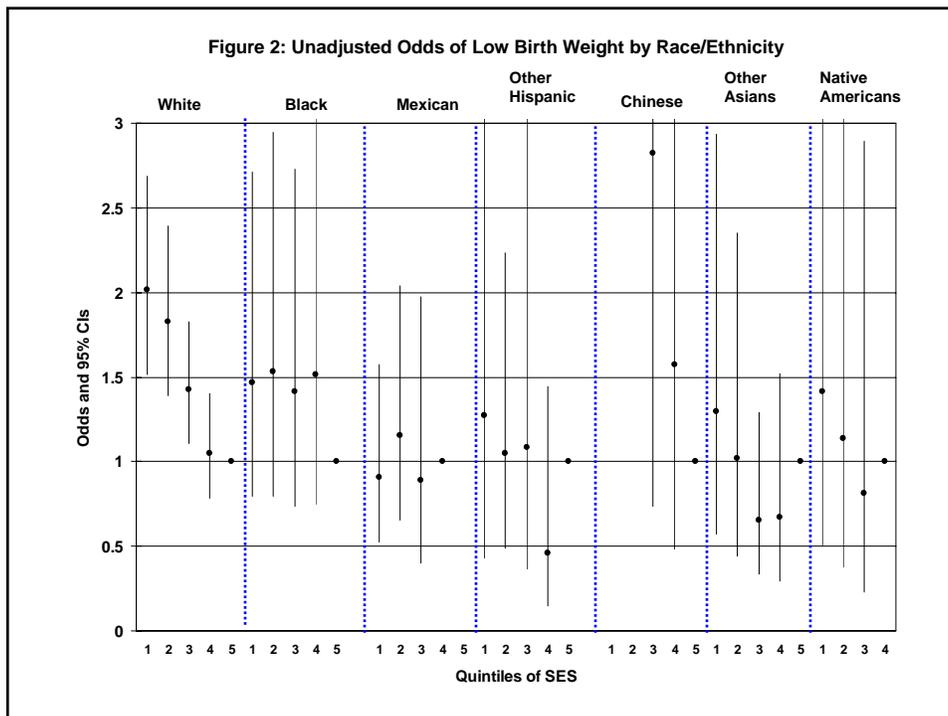


Figure 3: Unadjusted and Adjusted Odds of Preterm Birth for US-born Black and White Mothers

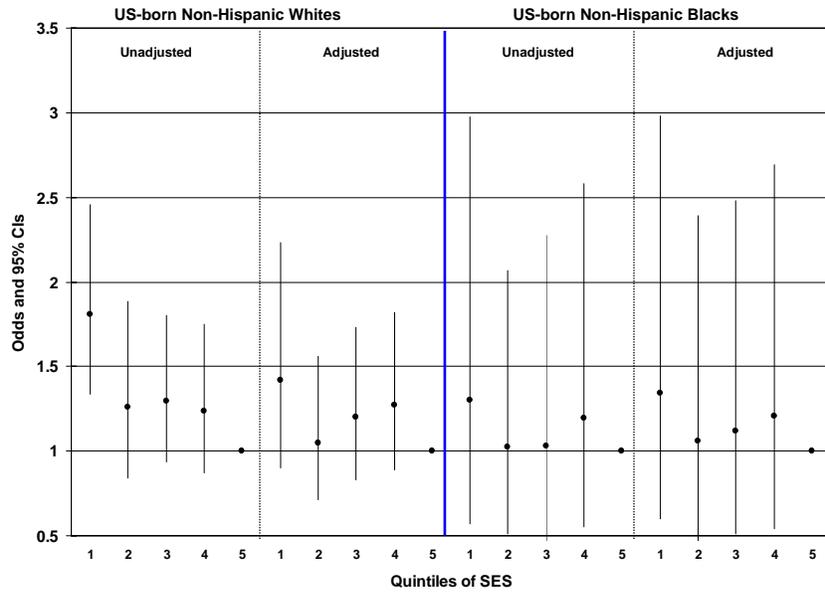
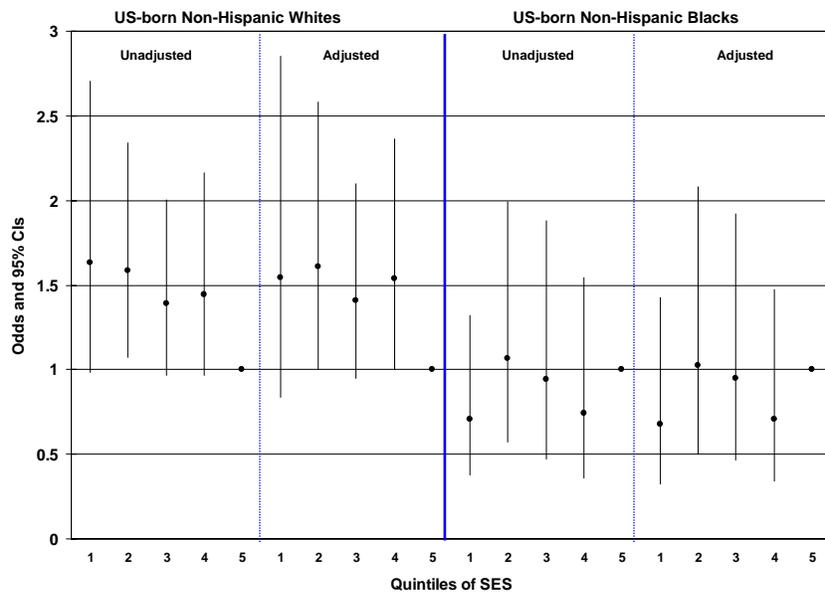


Figure 6: Unadjusted and Adjusted Odds of NICU Stay for US-born Black and White Mothers



SES and Early Child Health

- Lower SES associated with poor birth outcomes
 - Infant Mortality
 - Preterm birth (<37 weeks gestation)
 - Low birth weight (<2500 g)
 - 8.7% of mothers with <high school degree
 - 6.4% of mothers with >= college degree
- (2001 Vital Statistics)