Rurality and Birth Outcomes: Findings from Southern Appalachia and the Potential Role of Pregnancy Smoking

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RESEARCH QUESTIONS

1. Are community conditions (rurality, income, poverty, unemployment) associated with newborn outcomes in Southern Appalachia?
2. Can associations between community conditions and birth outcomes be explained by pregnancy smoking?

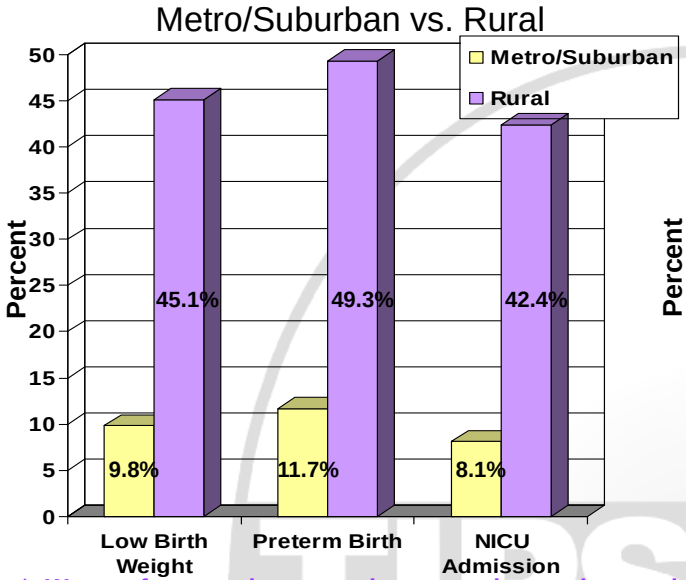
METHODS

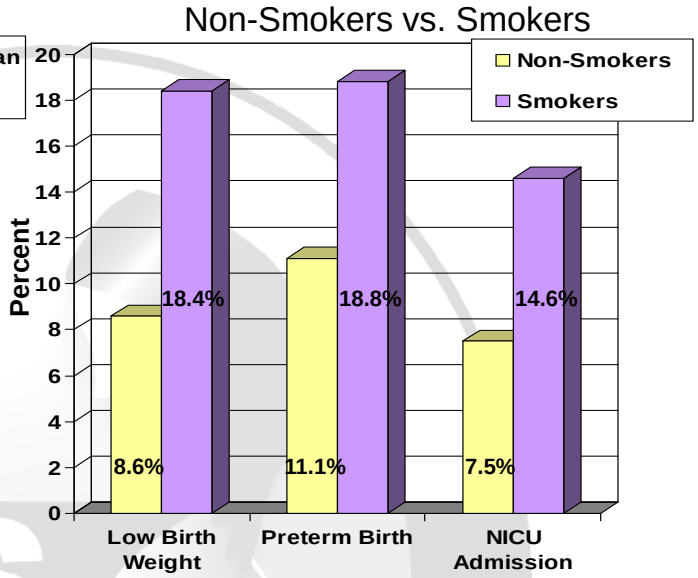
- Data from all births in Washington County over a 2- year period (2006-2007) were extracted from hospital delivery records.
- Newborn outcomes of interest included birth weight, birth length, gestational age at delivery, and newborn nursery assignment.
- County of residence for each mother was noted. Data recorded for each county included: rurality (Rural-Urban Continuum Code, 1-6 vs. 7-9), per capita income, poverty rate, unemployment rate
- Self-report of smoking status (smoker or non-smoker) at delivery was recorded.

RESULTS

- Data were available for 4144 deliveries to women from 45 different Appalachian counties in TN, VA, NC, and KY.
- 14.8% of babies were low birth weight and 16.9% were preterm (nat'l rates=8.2% and 12.7%).
- One quarter (25%) of women self-reported as smokers at delivery (nat'l rate=12%).
- All county conditions were significantly related to birth outcomes, with the most dramatic differences seen for rurality of residence county.

RESULTS





- Women from rural areas and women who smoke are significantly more likely to have poor birth outcomes.
- Compared with babies born to metro/suburban women, newborns born to rural women were 700gm lighter, 1.5 inches shorter, and were born more than 3 weeks earlier on average.
- Rural women were significantly more likely to smoke than remaining women (35% vs 24%).
- Regression analyses revealed that county conditions were still significantly related to all birth outcomes after adjustment for smoking status, but the amount of variance explained was reduced. Thus, smoking status partially, but not completely, mediated the association between county conditions and birth outcomes.

CONCLUSIONS

- Rates of low birth weight, preterm birth, and smoking exceeded national averages in this population.
- Babies born to women residing in the most rural areas were at an enormous disadvantage at birth.
- A cost analysis revealed that newborn costs in this sample attributable to low birth weight over the 2 year study period exceeded $20 million, not including long-term health, educational, and behavioral expenses.
- While pregnancy smoking appears to explain some of the effect of rurality in this sample, other aspects of rurality, or factors associated with rural residence, contributed significantly to poor birth outcomes.
- Improving birth outcomes in rural areas of the South will likely require finding ways to increase access to health care services and health information, including offering incentives for health care provider retention, increasing availability of public health services (including smoking cessation assistance), increasing awareness and education, and working with communities in the areas of transportation services and employment opportunities.