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Retail Environment

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Tobacco Retailer Density and Birth Outcomes in the United States: 2000-2016

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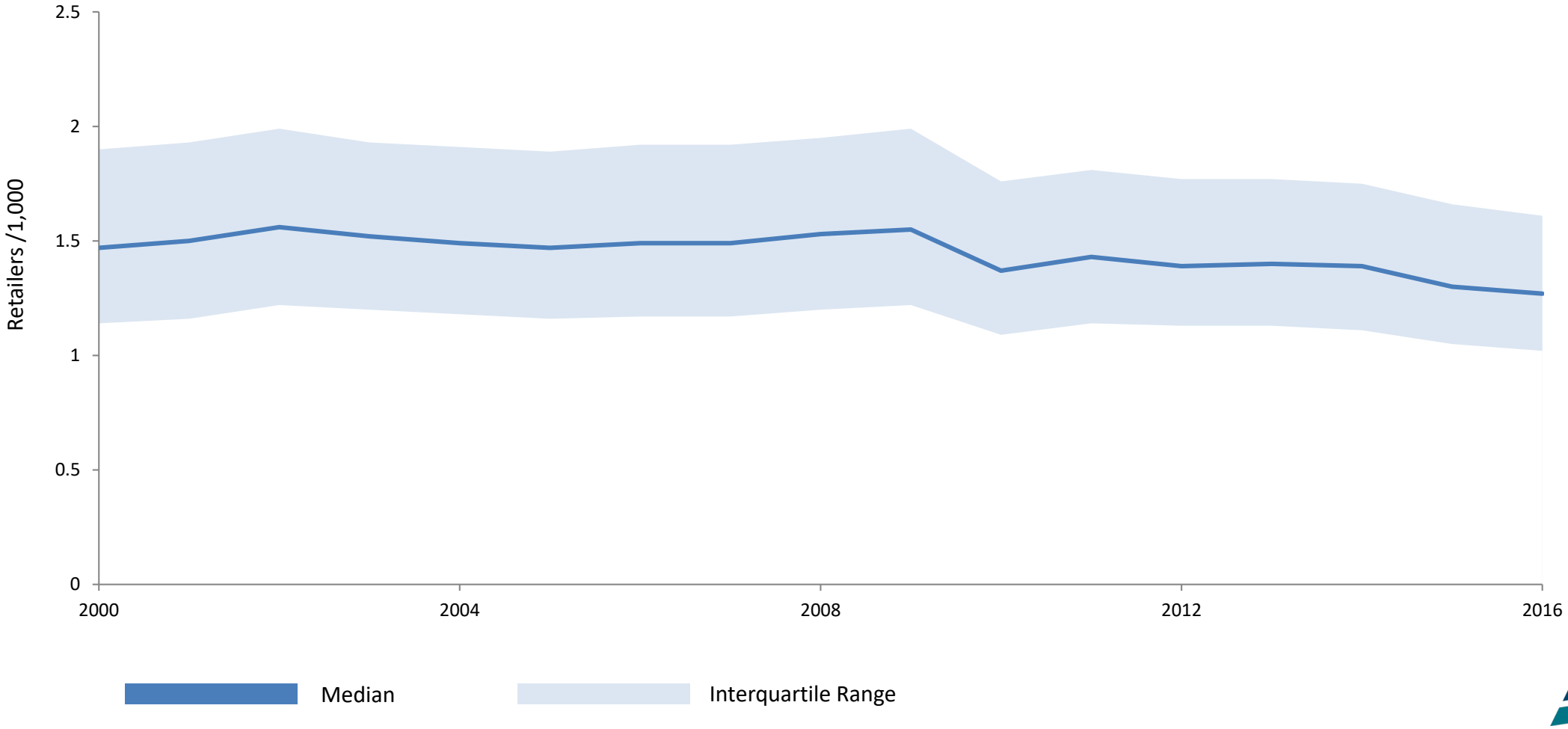
Background

- Tobacco retailer density associated with health outcomes
  - COPD, heart disease, life expectancy, mortality
- Birth outcomes of particular interest
  - Pregnant women in high density neighborhoods more likely to be smokers
- Adverse birth outcomes may lead to:
  - neurodevelopmental problems, cardiometabolic diseases, increased infant mortality, socioeconomic and psychosocial in adulthood

Aim

- Estimate the effect of a capping intervention to reduce tobacco retailer density below 1.4 retailers per 1,000 on rates of birth outcomes

Tobacco Retailer Density



Data Sources and Outcomes

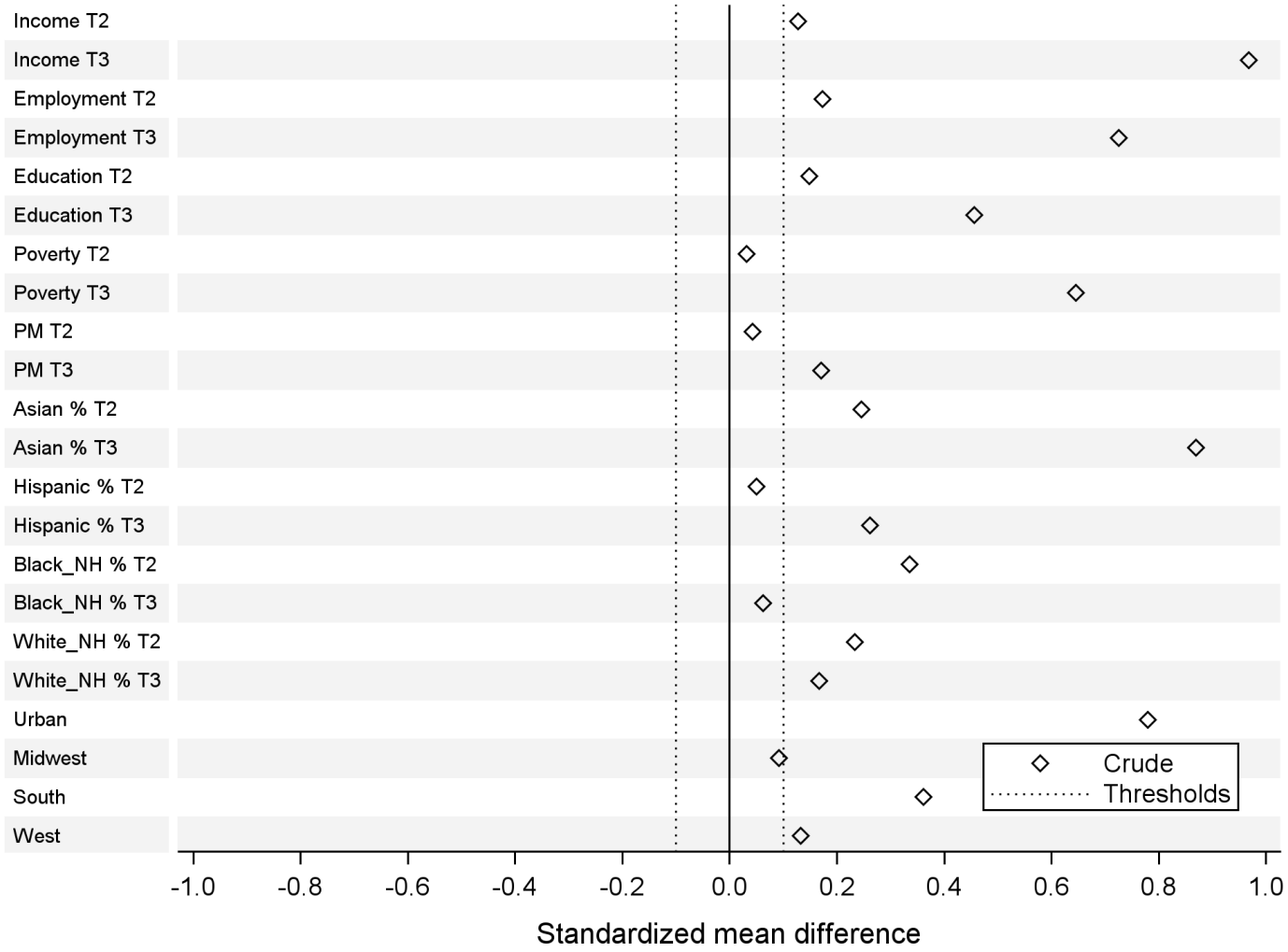
- Retailer Density
  - National Establishment Time Series (NETS), 2000-2016
- Birth/Death Certificates
  - National Center for Health Statistics, 2000-2016
    - Preterm birth (≤36 weeks), low birth weight (<2500 g), small-for-gestational age (Alexander et al.)
    - All-cause infant mortality, SIDS
- County-level Covariates
  - US Census and ACS, EPA air monitors
    - employment, education, poverty, racial composition, rurality, region, PM2.5

ASPiRE

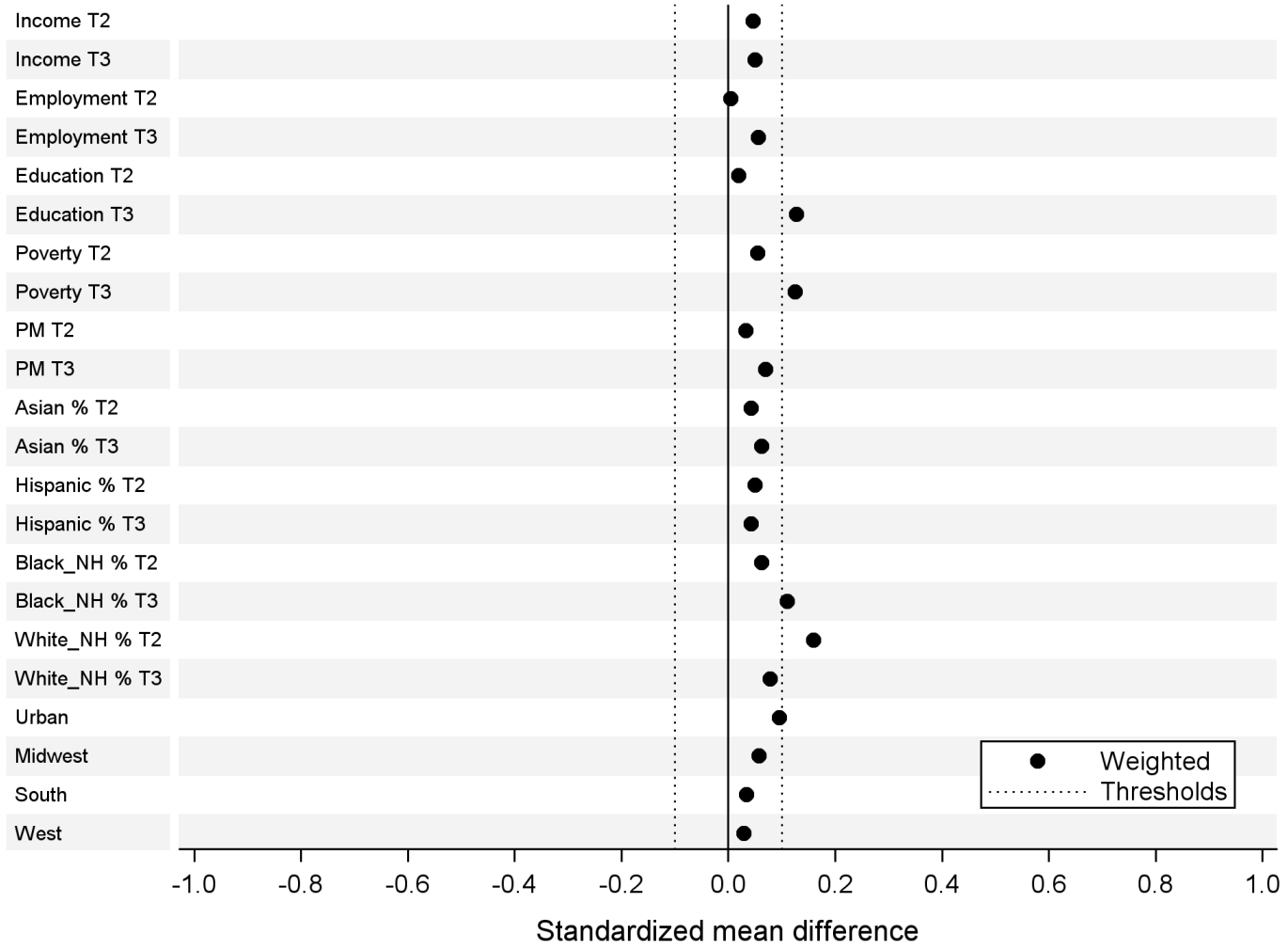
Methods

- Propensity Score Weighting
  - Probability of “treatment”
  - **How would birth outcomes differ if those counties with a high density instead had a low density?”**

Covariate distribution pre-weighting



Covariate distribution- post weighting

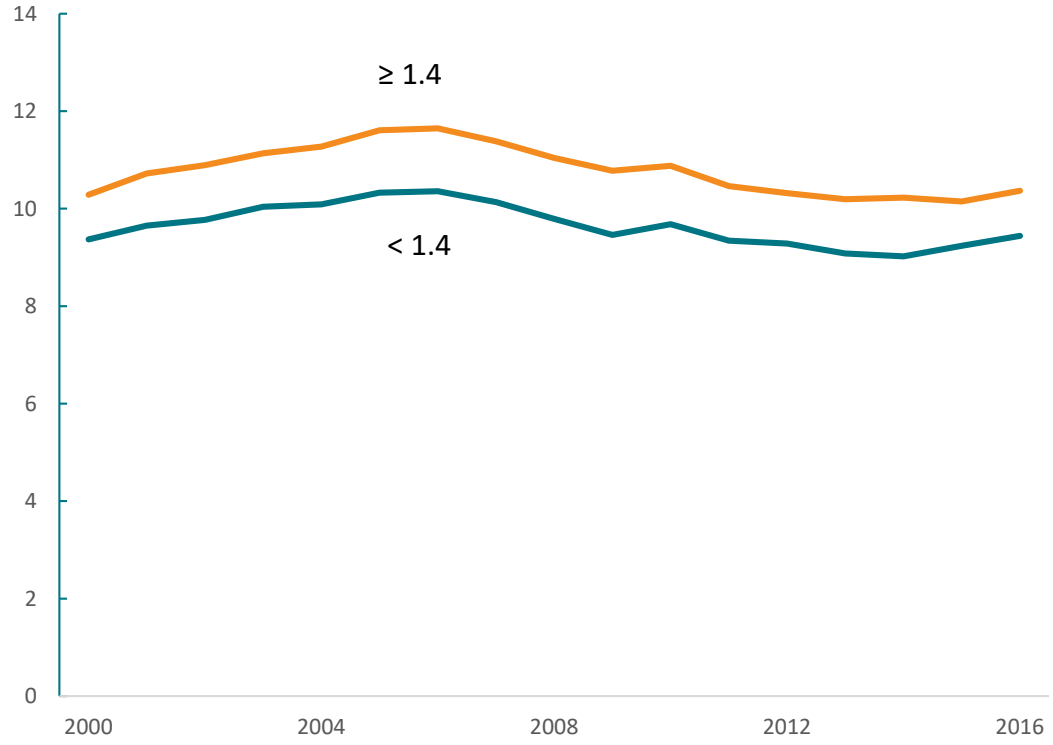


Methods

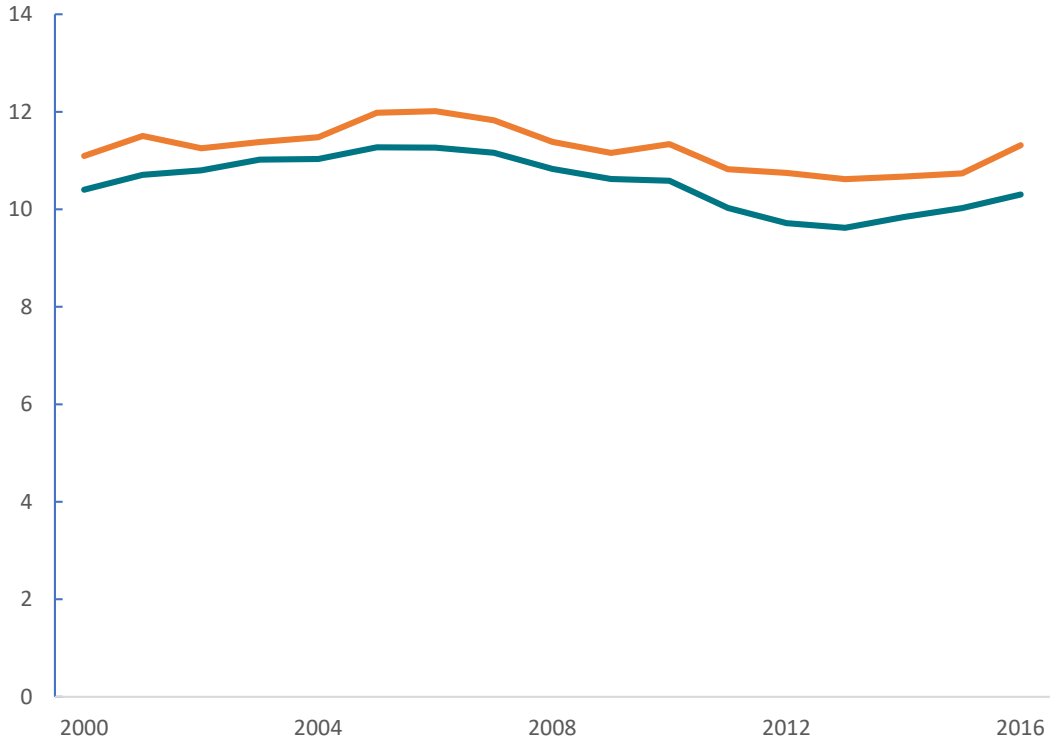
- Propensity Score Weighting
  - Probability of “treatment”
  - **How would birth outcomes differ if those counties with a high density instead had a low density?”**
- Weighted Poisson model with repeated measures (year)
  - Birth Outcome = Density
  - N=3,105

Preterm Birth by Year

Unadjusted

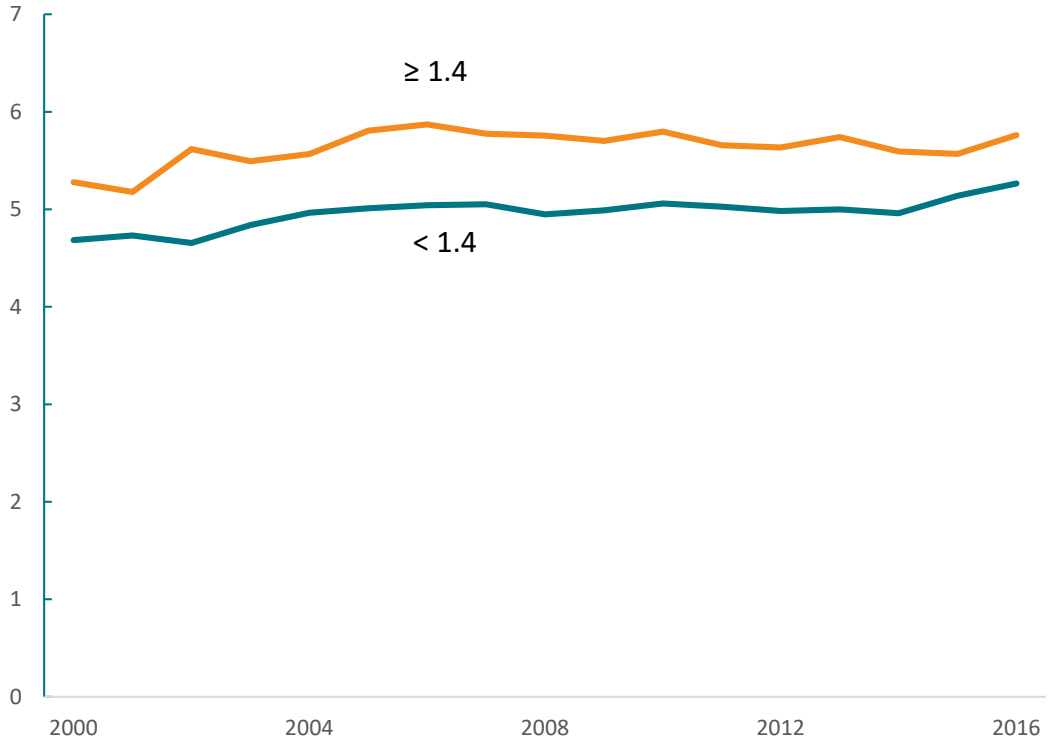


Model Predicted

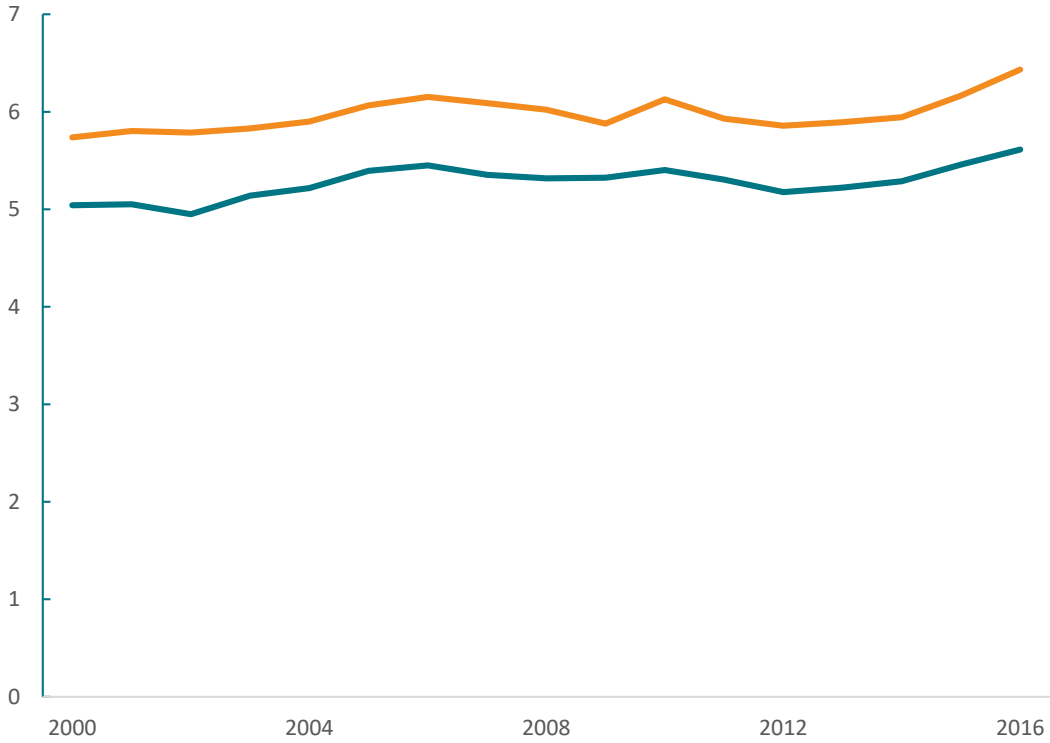


Low Birth Weight by Year

Unadjusted

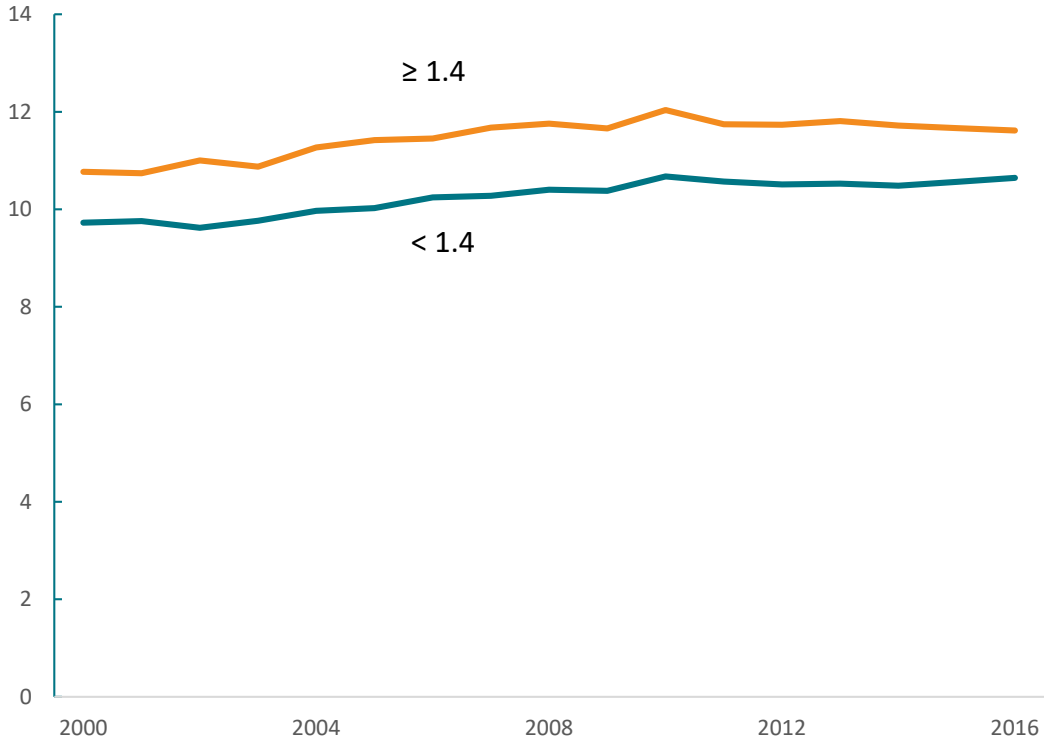


Model Predicted

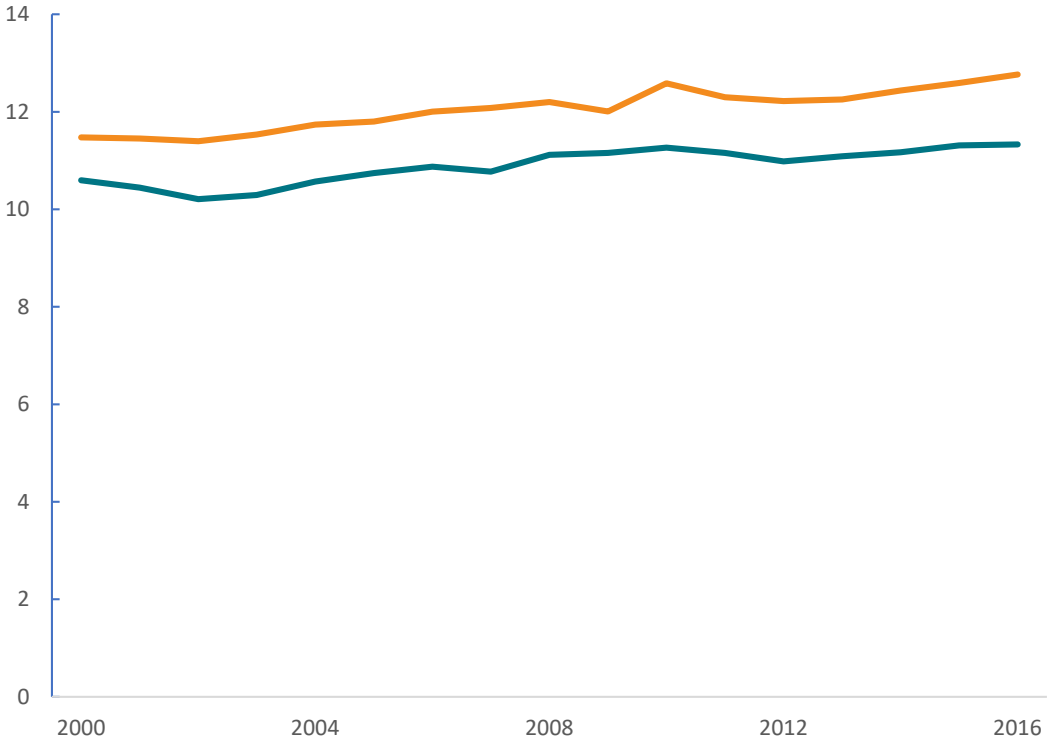


Small-for-Gestational Age by Year

Unadjusted

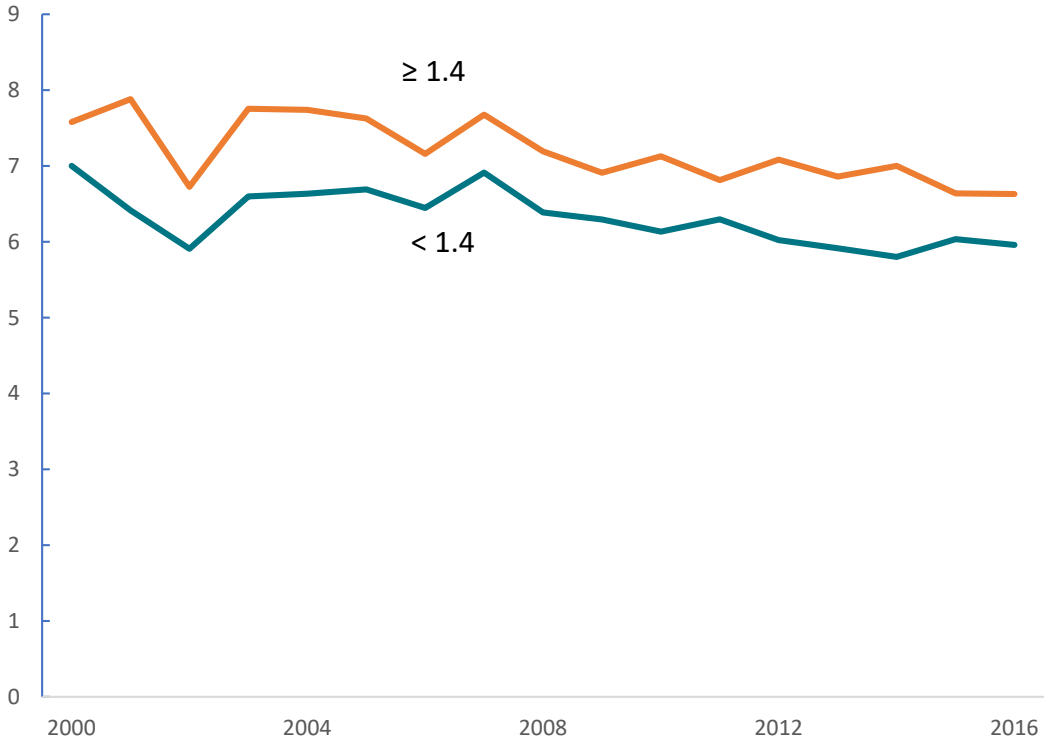


Model Predicted

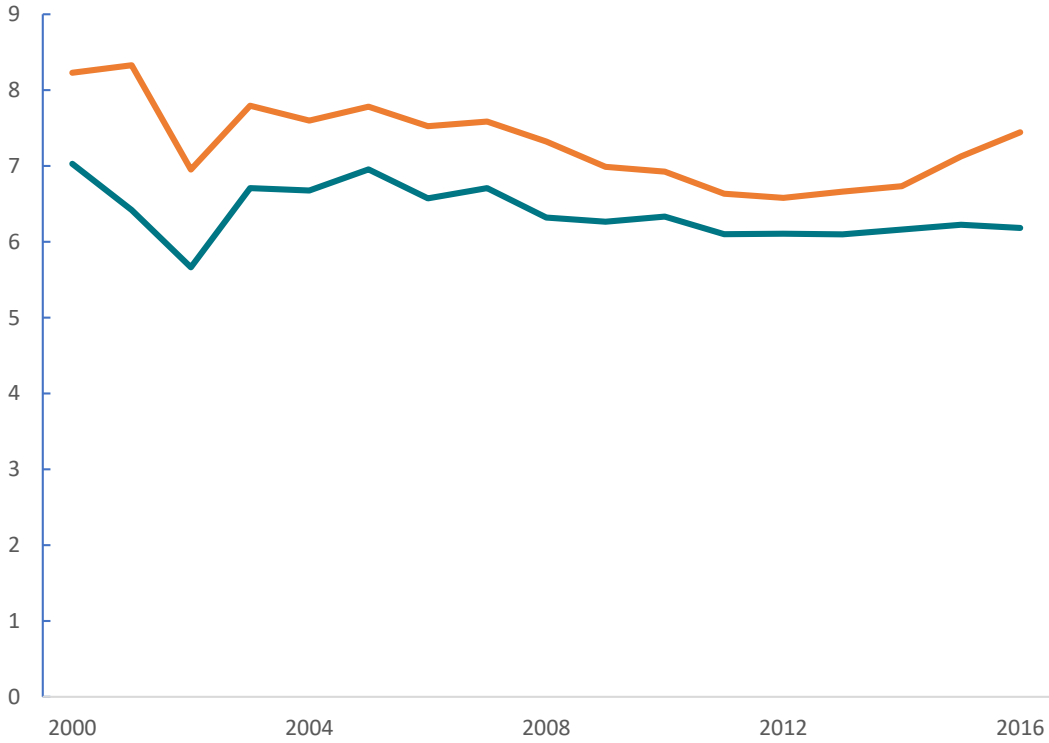


All-cause Infant Mortality by Year

Unadjusted

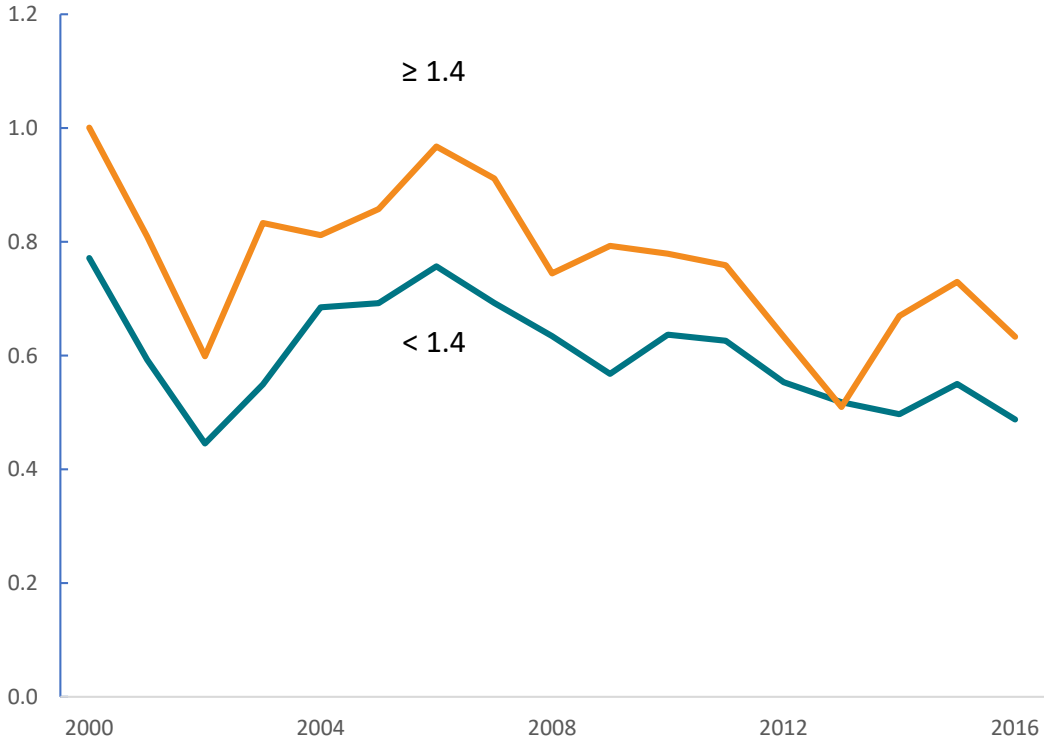


Model Predicted

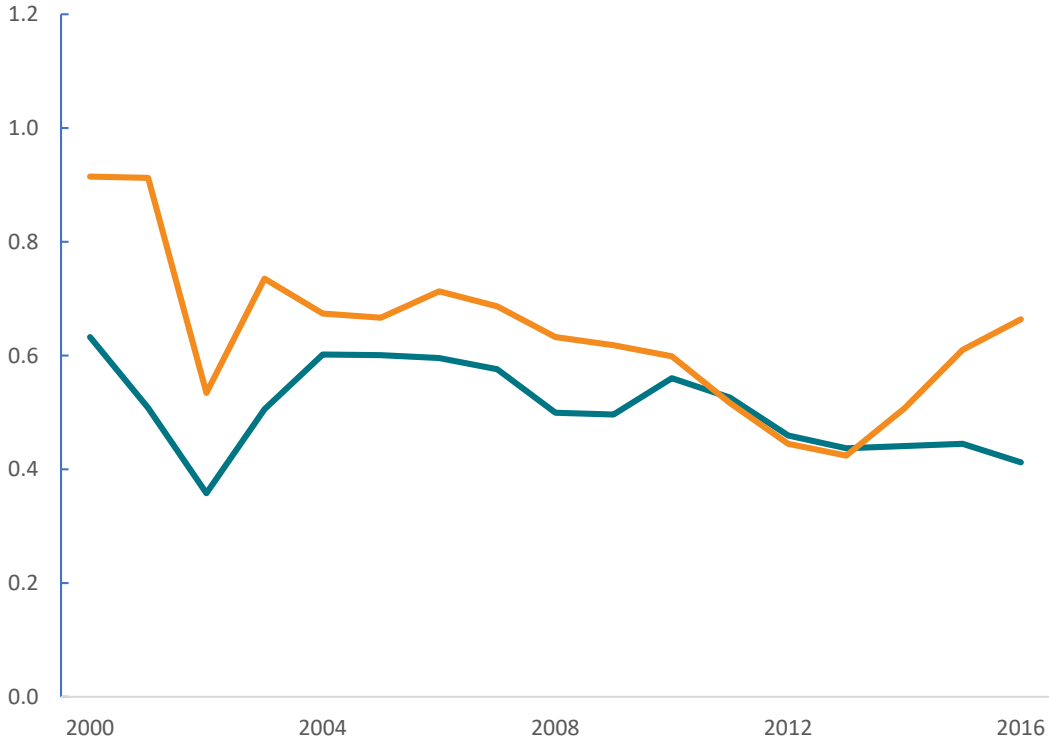


SIDS by Year

Unadjusted



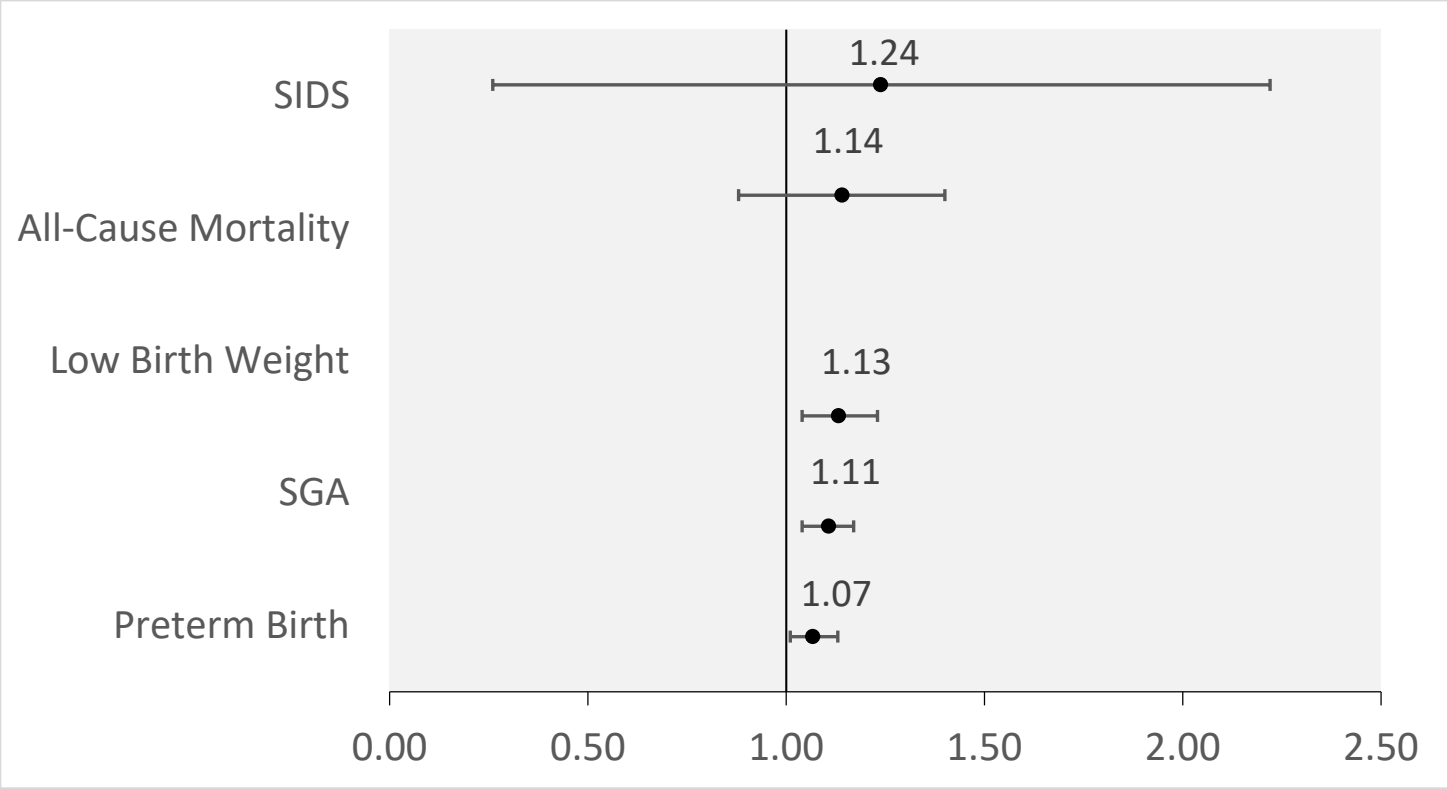
Model Predicted



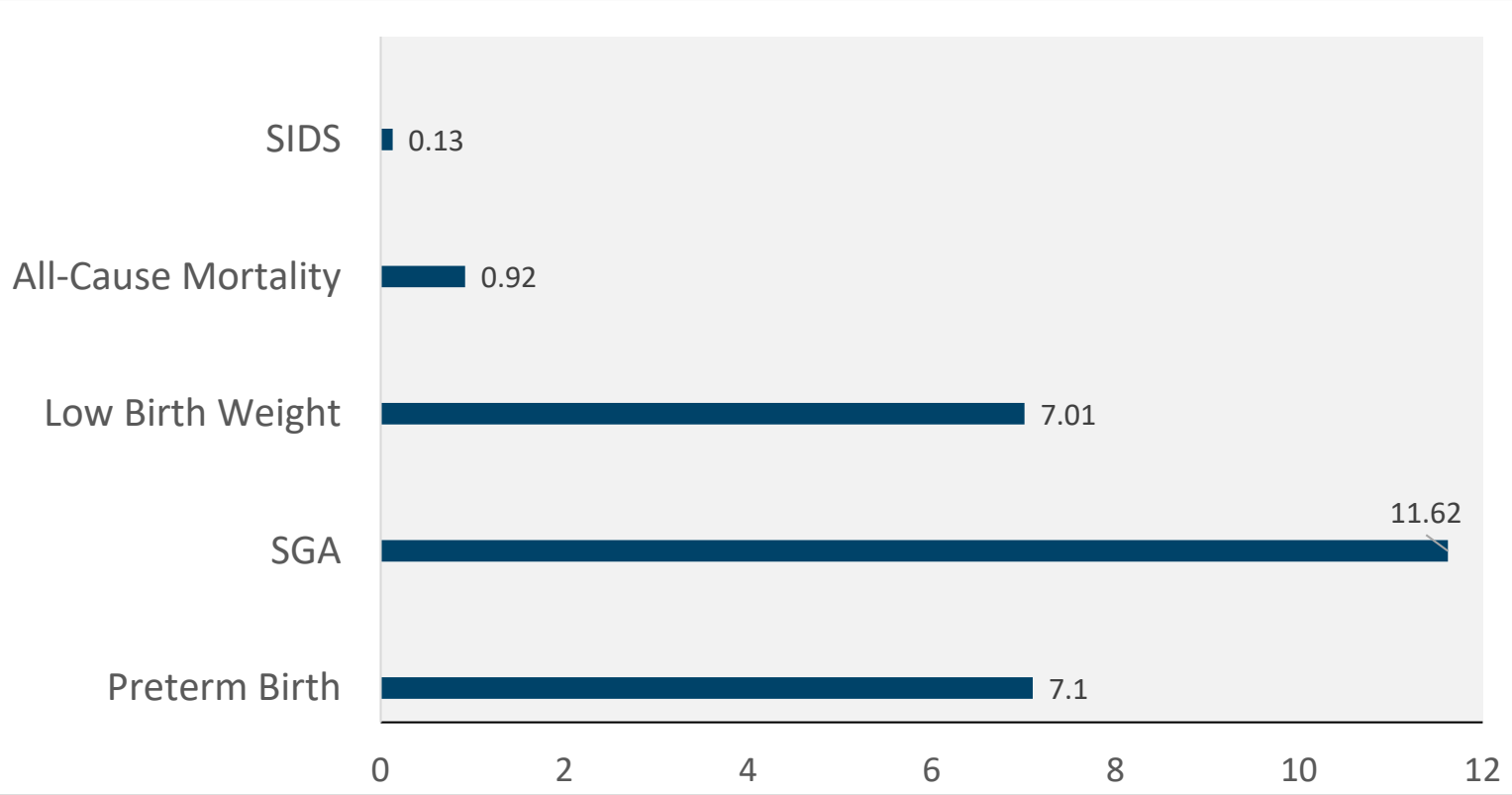
Relative Risk

Comparison group: Low density counties

Decreased risk in high density counties ← → Increased risk in high density counties



Reduction / 1,000 Births



Conclusions

- If counties with high tobacco retailer density had low density their rates of preterm birth, SGA, and low birth weight would be lower
  - No association found between density and infant mortality outcomes

Limitations and Future Work

- Single year estimates
  - working on weighted longitudinal models
- Single density cut point
  - sensitivity analyses with other thresholds
- Only birth outcomes
  - additional analyses to include CVD, respiratory diseases, and cancer

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