Mapping and Modeling Idaho Maternal Health Drivers

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www.modelingidahohealth.org

Maternal Health in Idaho

Maternal health refers to the overall well-being of women and people during pregnancy, childbirth, and the postpartum period, as well as their ability to access necessary healthcare services and support to ensure a safe and healthy pregnancy and childbirth experience (Joseph et al, 2021).

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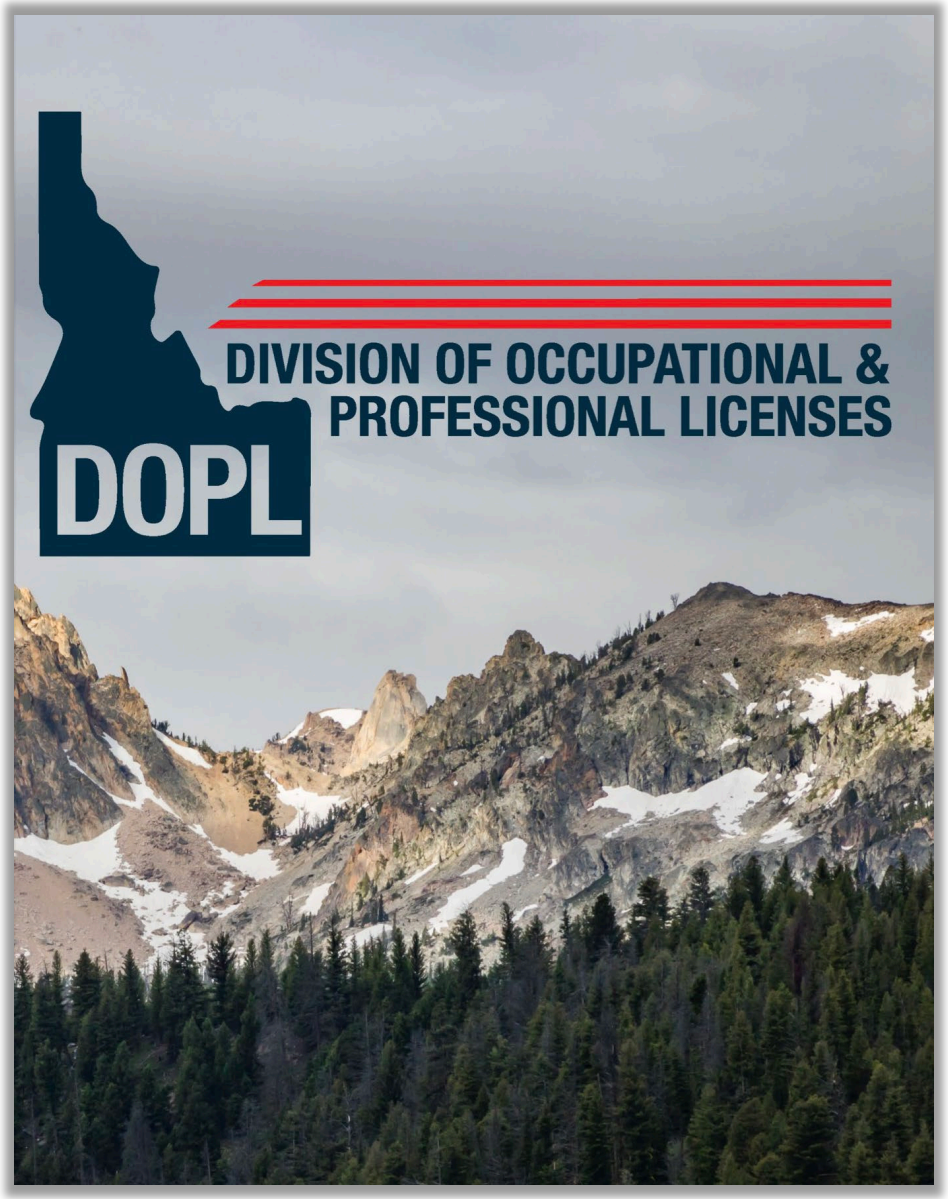
Maternal Health in Idaho

Components critical for maternal health success, including:

- preconceptual and prenatal healthcare and nutrition;
- health education and psychosocial services;
- safe and supportive birth environments;
- family and social support;
- extended postpartum care; as well as
- advocacy and policy to support maternal health for all (Collier, Molina, 2019).



Sullender, 2023

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The central question of this project is: Can we model the factors that drive maternal and infant health, at spatial and temporal scales which can be useful for policymakers and community leaders to effect change?

Our focus is the State of Idaho and adjacent communities.

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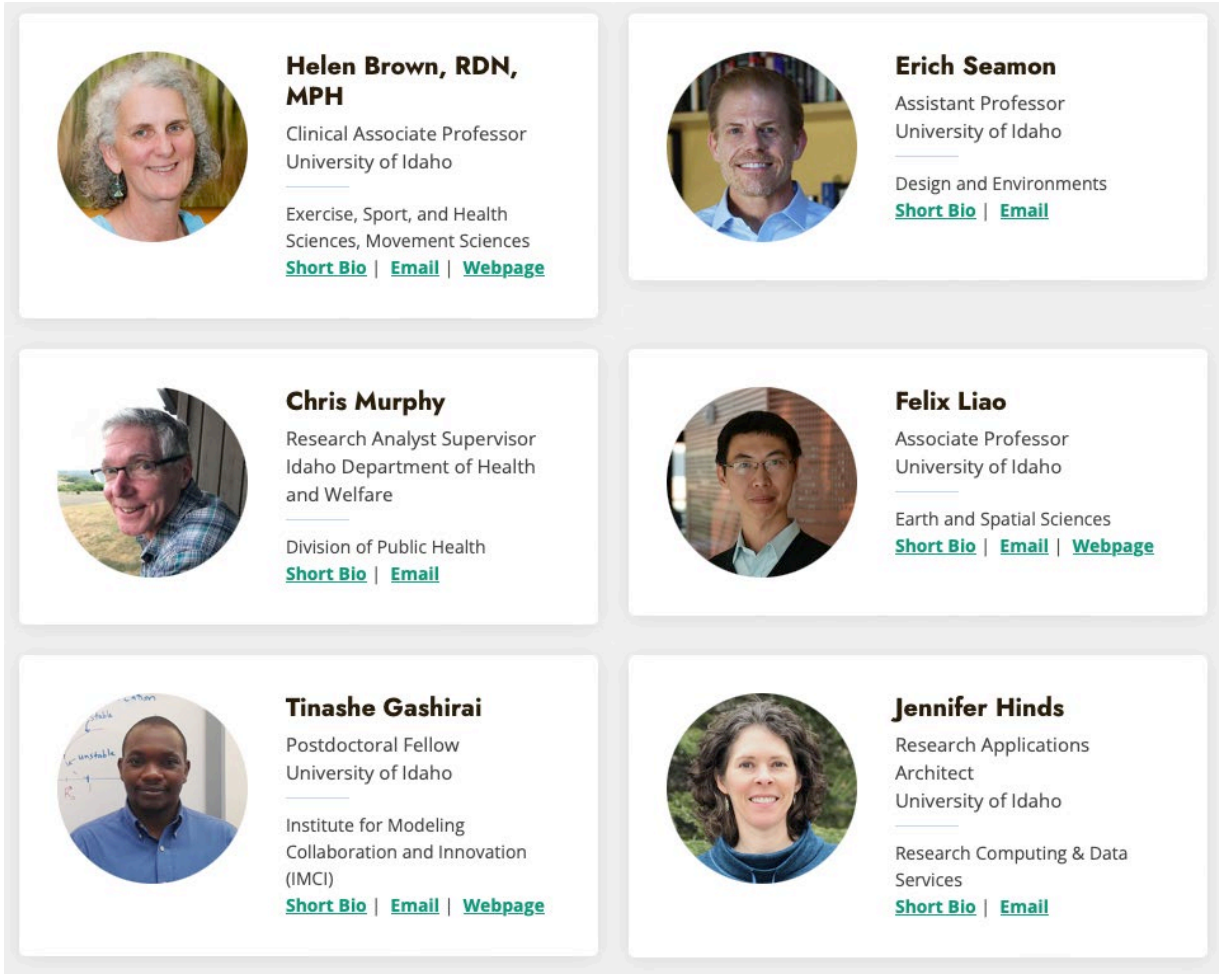
Our Team

IDAHO DEPARTMENT OF HEALTH & WELFARE

IMCI
Institute for Modeling Collaboration and Innovation



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Maternal Health and Idaho

- **Maternal Health Concerns:** Maternal Mortality and Morbidity
    - Shared risks: Lower rates of Prenatal care in 1st trimester, limited mental health treatment, rural, poor, nonwhite women, younger and older women
- **Healthcare and provider shortages:** Rural access, OB access, birthing hospitals
- **External Drivers of Health :** Poverty, education, primary care & insurance access, broadband, transportation

Women's preconception health - ages 15-49 – lacking data

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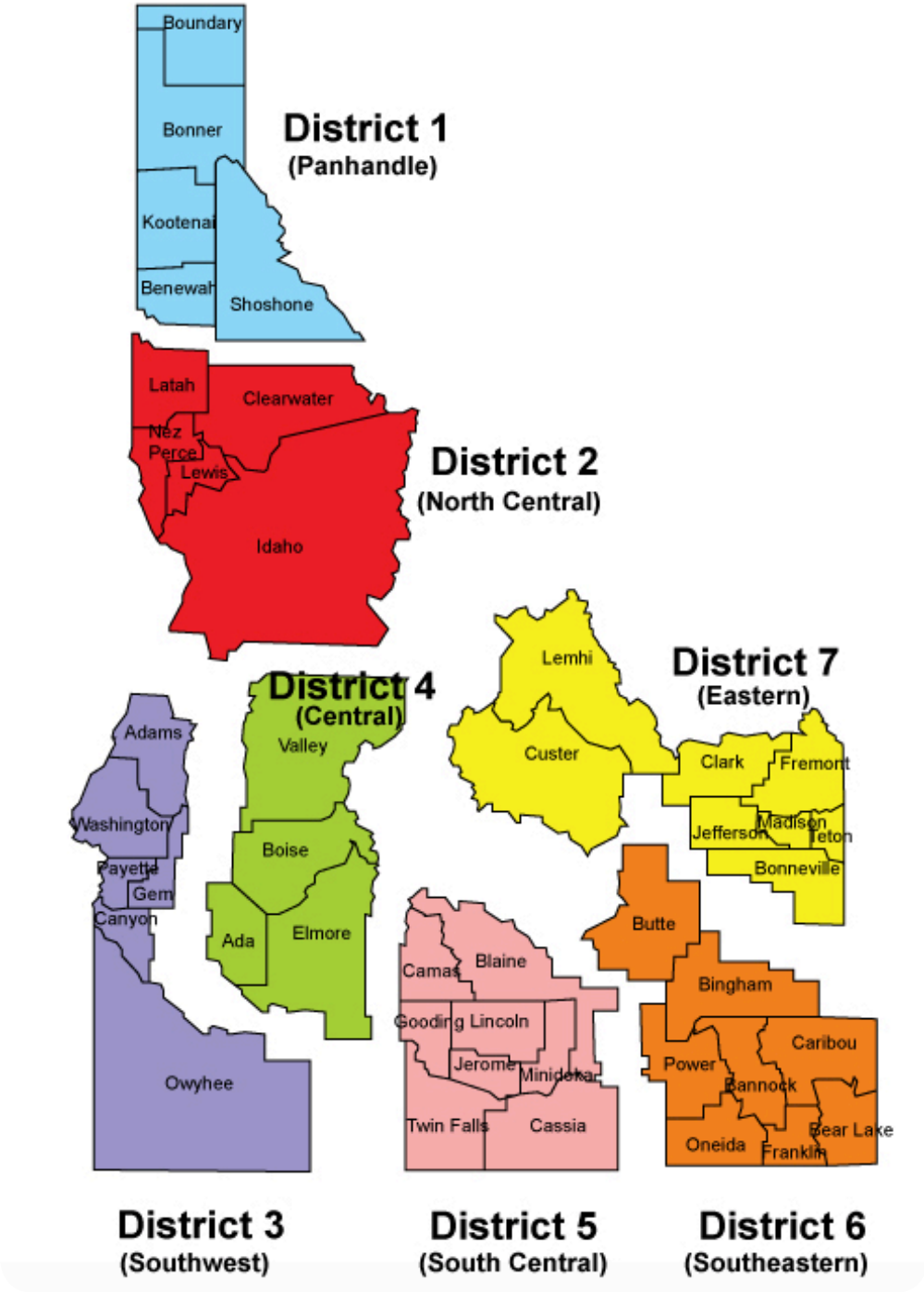
The Challenge

Previous research has shown these key factors impact maternal health:

- direct health measures (diabetes, hypertension, cancer, heart disease)
- healthcare access (proximity to healthcare, access to transportation, Medicaid/insurance availability)
- care quality
- non-medical health drivers (education, poverty, etc.)



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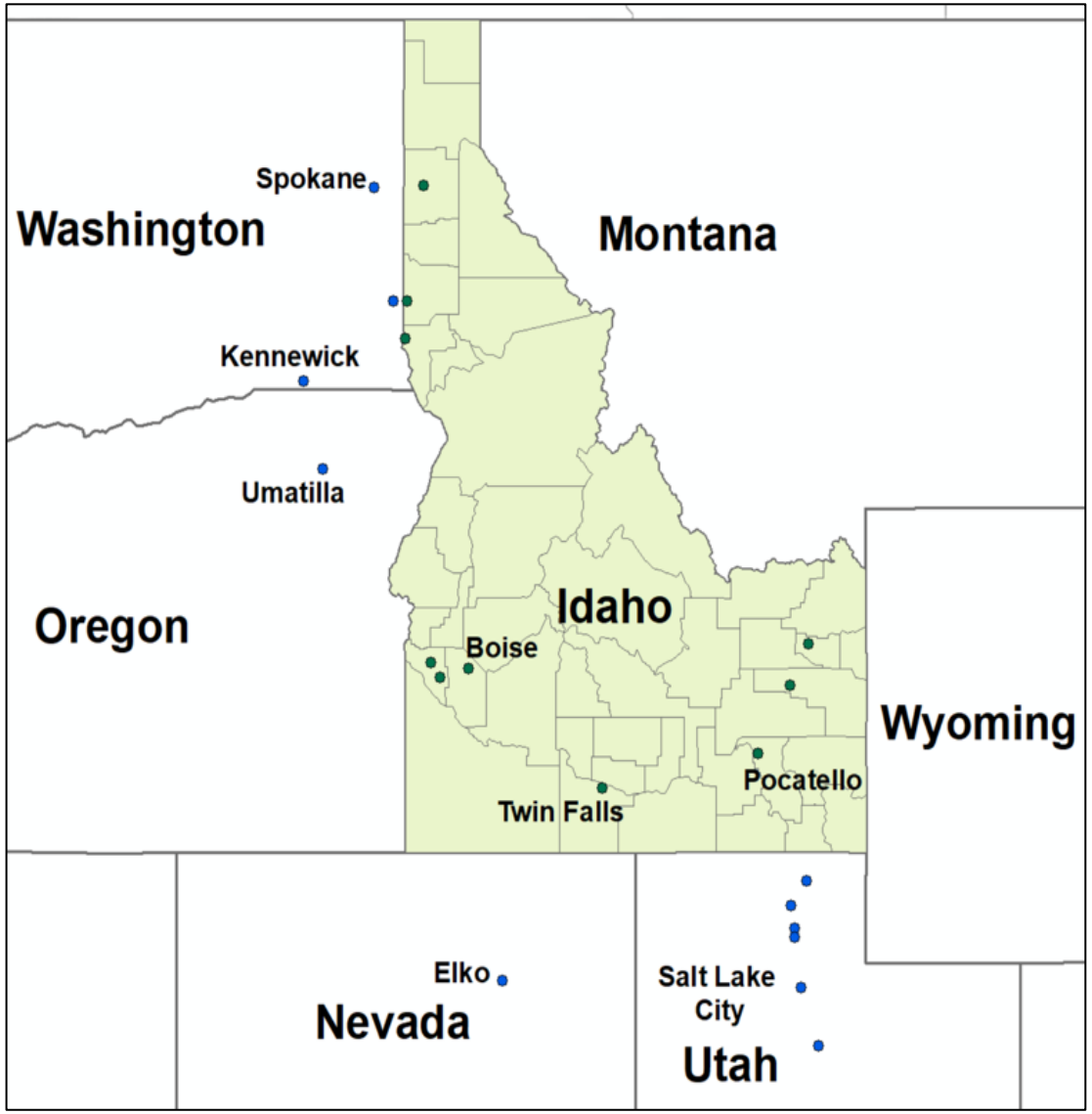

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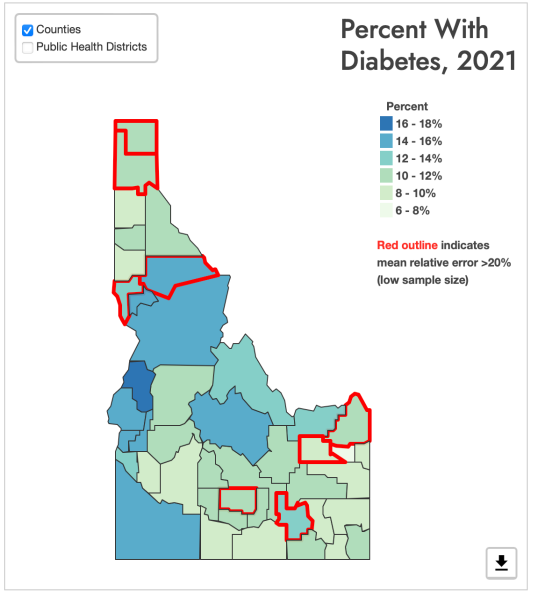

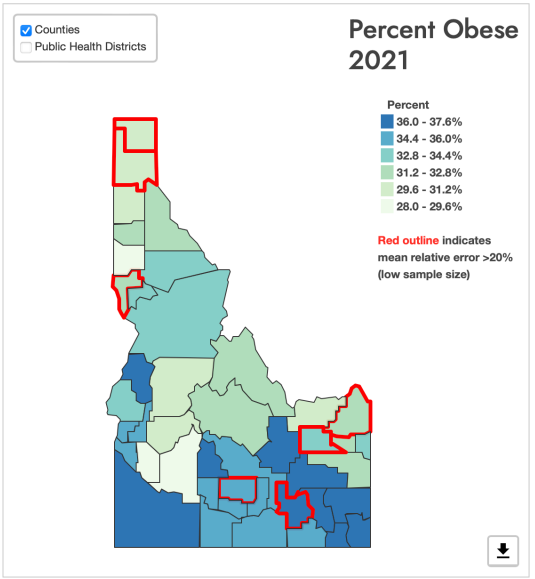

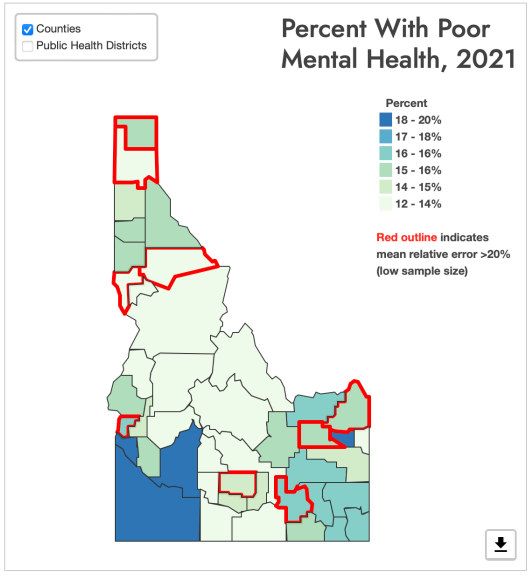

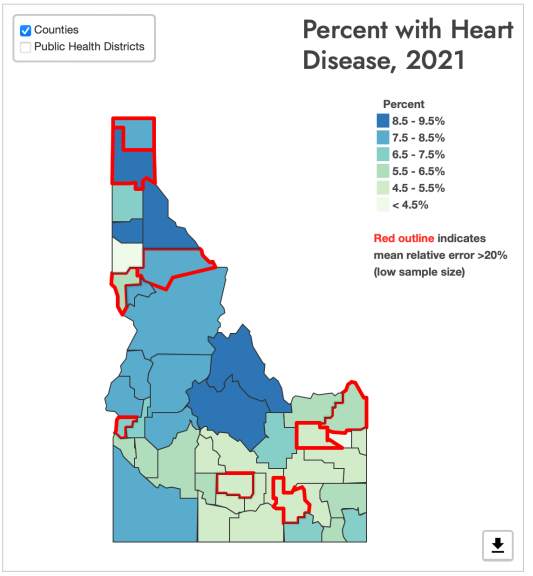

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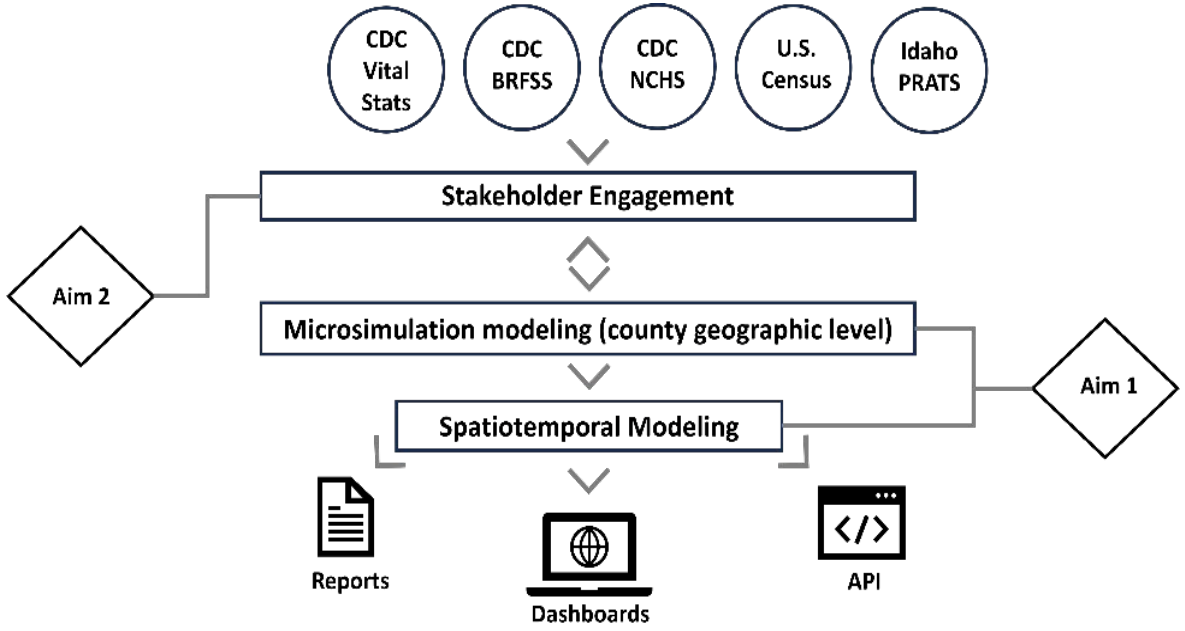
Core Aims



A1 Model a wide set of spatiotemporal variables which impact and/or moderate maternal and infant birth health factors

A2 Engage with stakeholders to better understand the factors which impact maternal and infant health.

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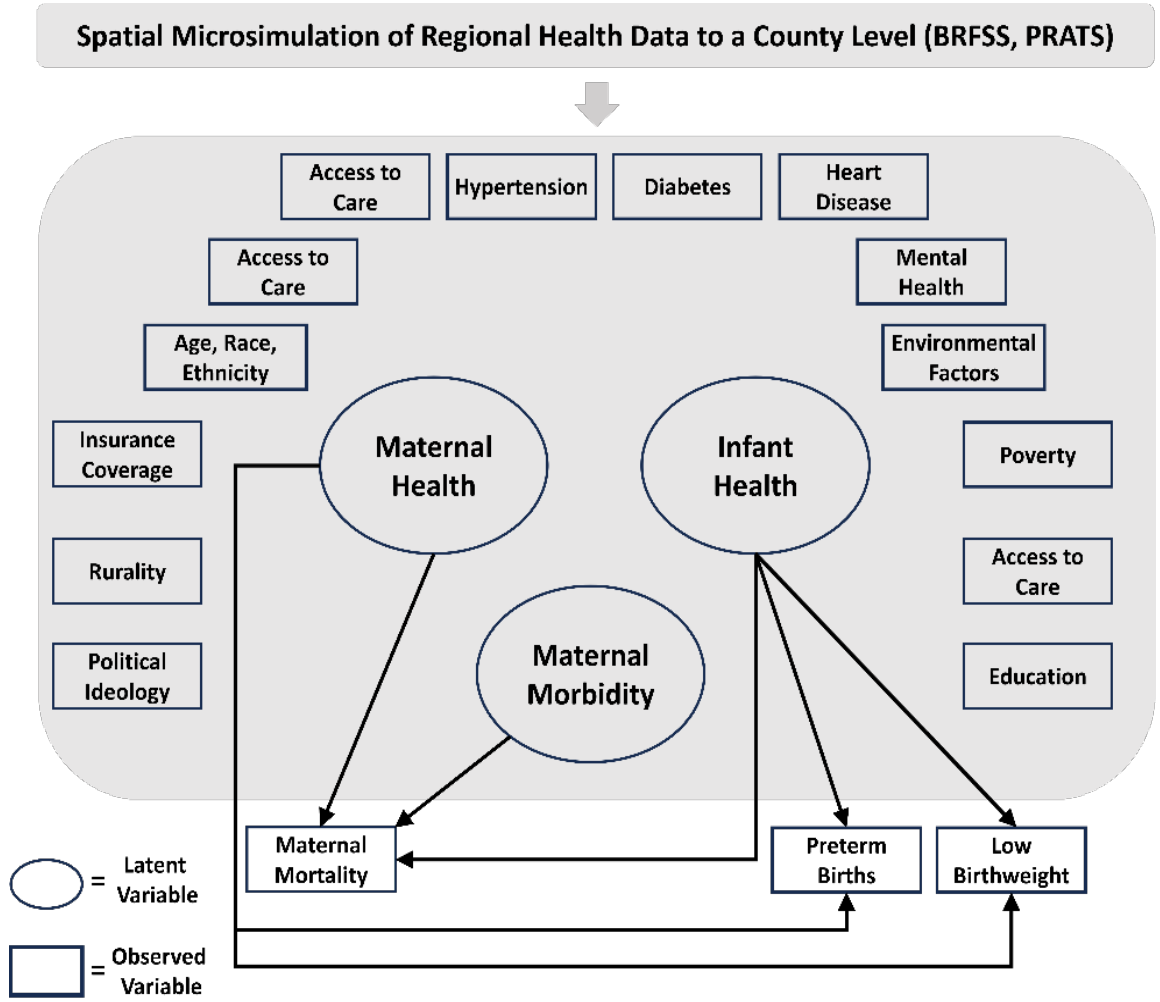

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Data (2014-2023)

- CDC Behavioral Risk Factors Surveillance System (BRFSS)
- American Community Survey (ACS) 2014-2023
- Idaho Vital Statistics Records
- Idaho Pregnancy Risk Assessment Tracking System (PRATS)
- Calculated Access to Care distances

Behavioral Risk Factors Surveillance System (BRFSS)

Annual Health Survey Data, Filtered for Women 18-50 yrs

- **Access to Healthcare:** Insurance, primary provider
- **Preexisting Conditions:** diabetes, hypertension, obesity, mental health
- **Health Behaviors:** tobacco, alcohol
- **Non-Medical Drivers of Health:** housing, education

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Vital Statistics Records

Examples of data collected from vital statistics/birth records

- **Access to Care:** Access to early and adequate prenatal care, delivery transfer, NICU
- **Preexisting Conditions:** diabetes, hypertension, obesity
- **Maternal Morbidity factors:** cardiac disease, pulmonary embolism, hypertensive disorders of pregnancy, hemorrhage, venous thromboembolism, infection, and postpartum depression
- **Delivery outcomes:** Maternal health & birth complications, infant health outcomes

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Idaho Pregnancy Risk Assessment Tracking System (PRATS)

Collected at the State and Public Health District level.

Variables include:

- Preconceptual health
- Prenatal care access, education, barriers
- Maternal Morbidity
- Infant health outcomes

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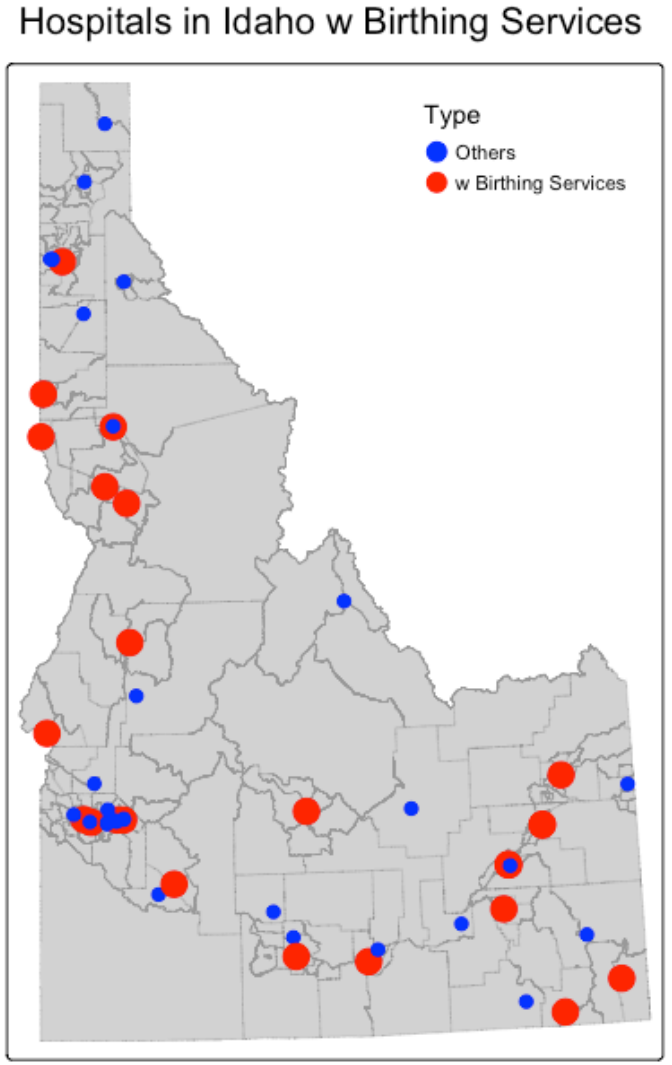
Preliminary Results

Mapping Hospitals w Birthing Services

- Travel time and distances matter for maternal health
- In Idaho, 19.7% of women had no birthing hospital within 30 minutes under normal traffic conditions (March of Dimes or MoD, 2023).
- 2.6% of women live over 60 minutes from nearby birthing hospitals vs. 1% in the U.S. (MoD, 2023).
- 15% of babies are born to women living in rural counties, while 6.6% of maternity care providers practice in rural areas (MoD, 2023).



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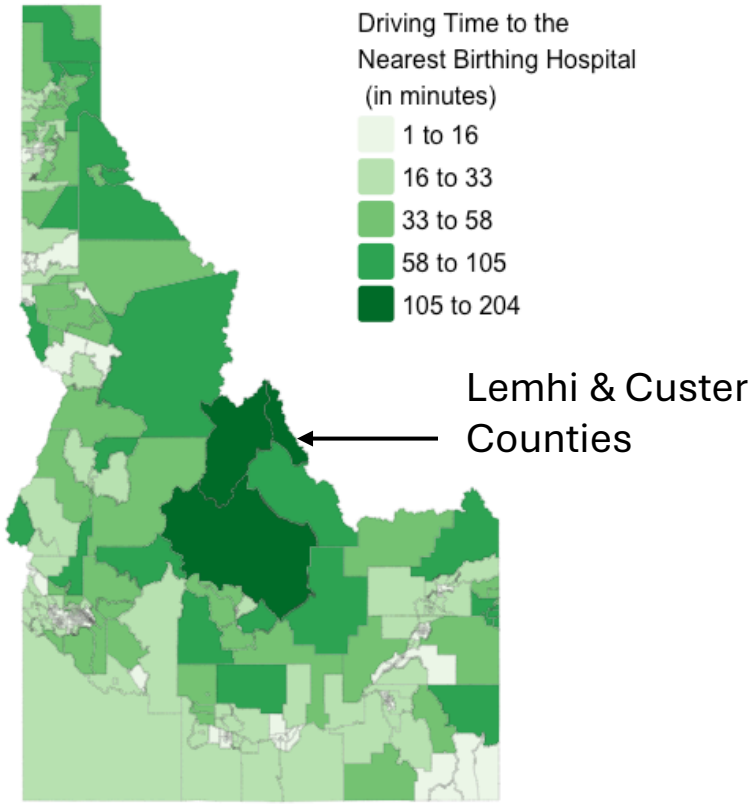
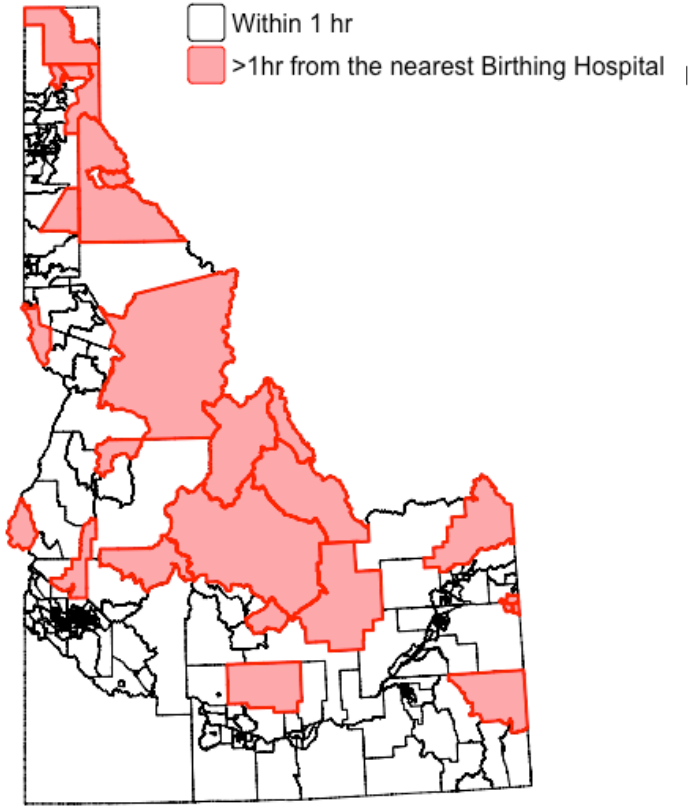
Access to Hospitals with Birthing Services at the Tract Level

- 25 or 5 % of tracts: >1 hour driving distances
- 94 or 21 % of tracts: >30 min. driving distances
- Average: 21 minutes (as compared to 16 minutes in the U.S.).
- 13.5 miles in Idaho vs. 9.7 miles in the U.S.
- Maximum driving time/distance: 3.4 hours or 137 miles



Driving Time (in minutes) to the Nearest Birthing Hospital



Census Tracts Located Further Than 1 Hour from the Nearest Birthing Hospital

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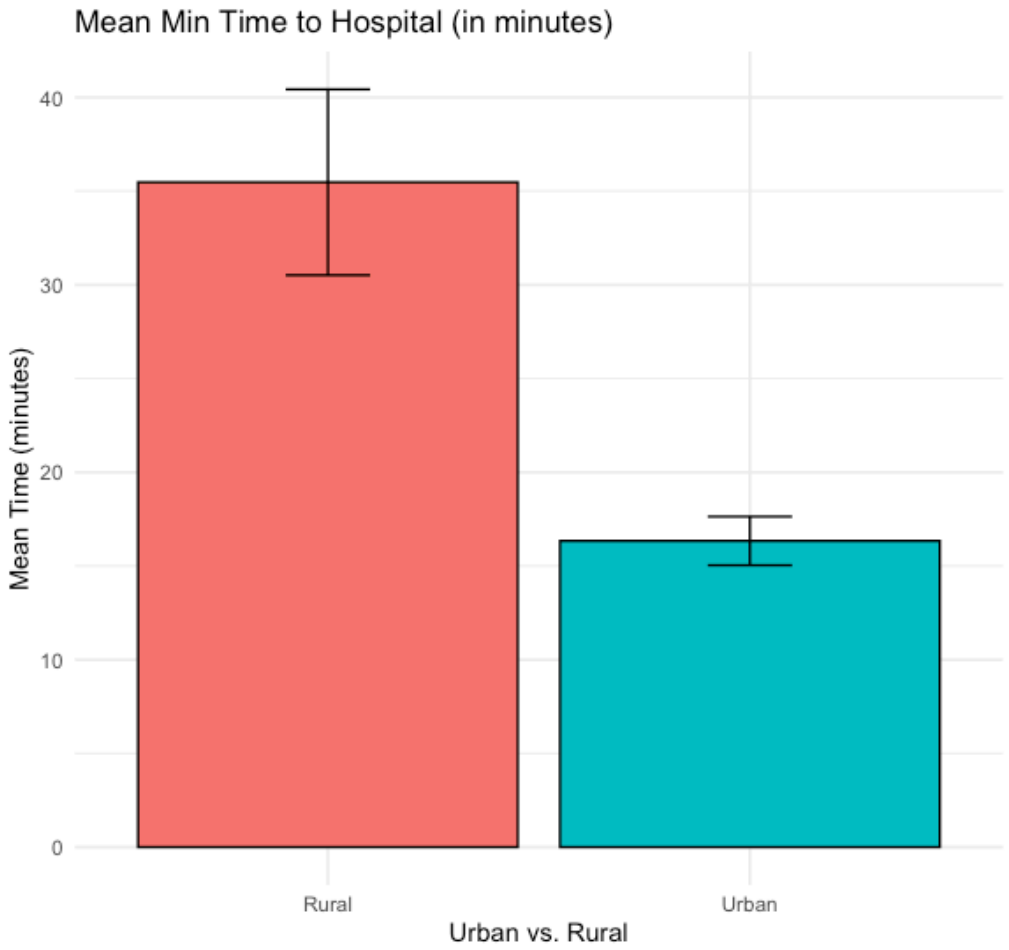
Access to Hospitals with Birthing Services: Rural-urban Disparities



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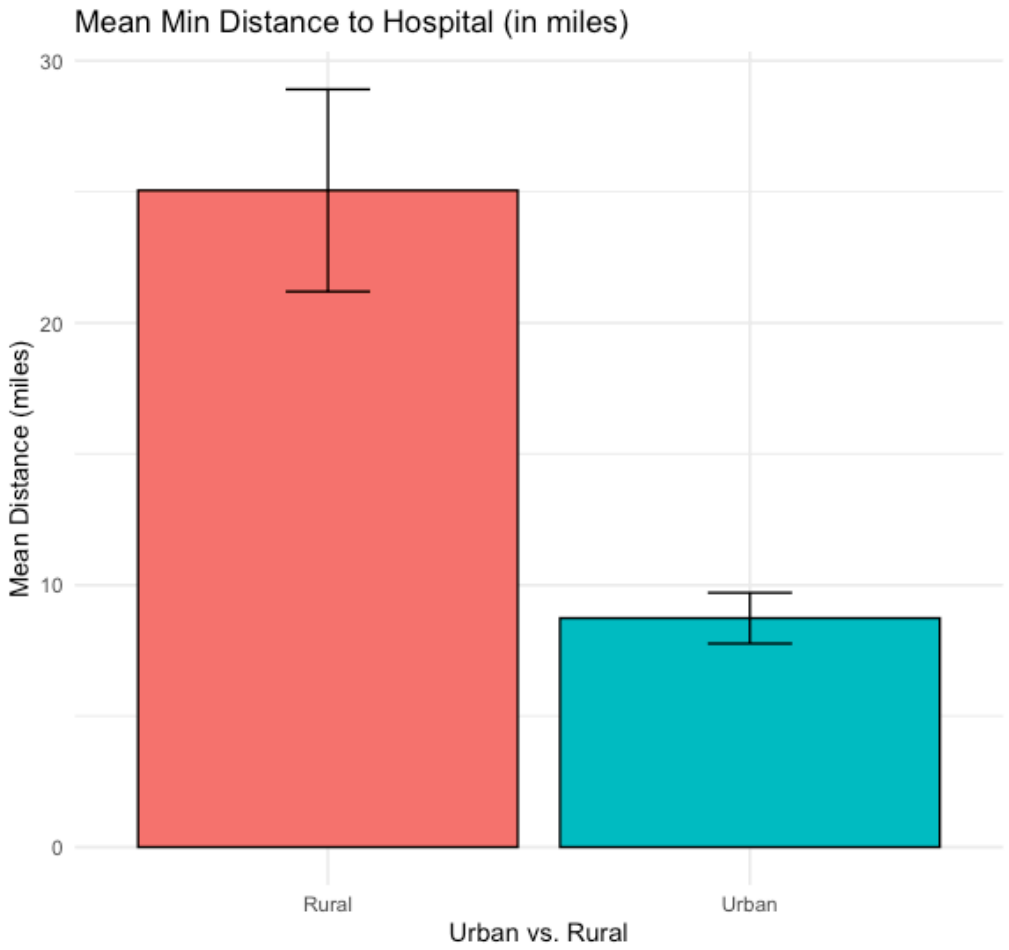
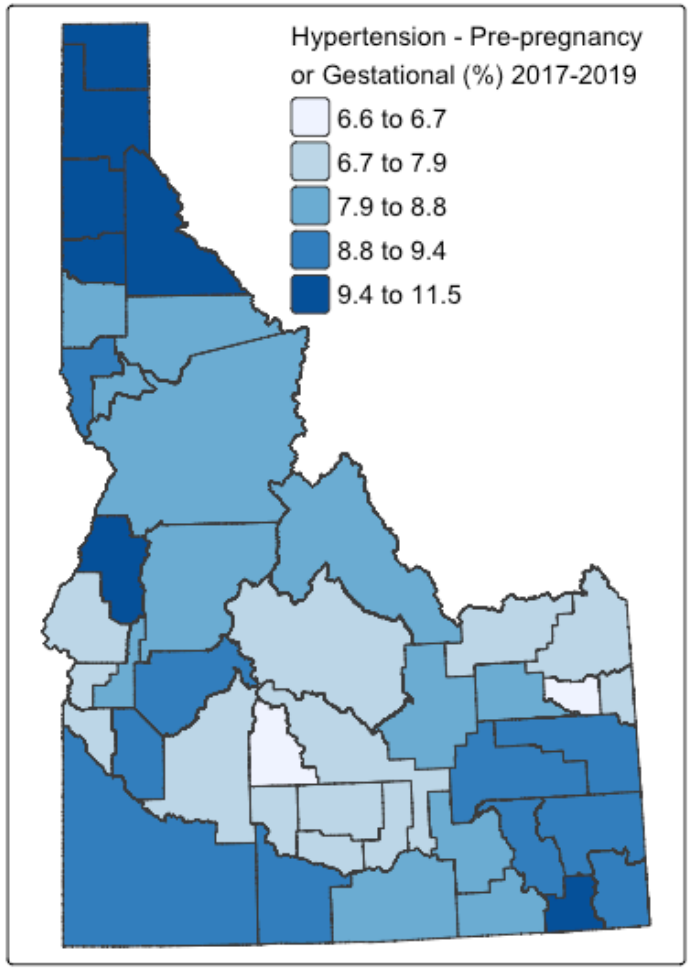
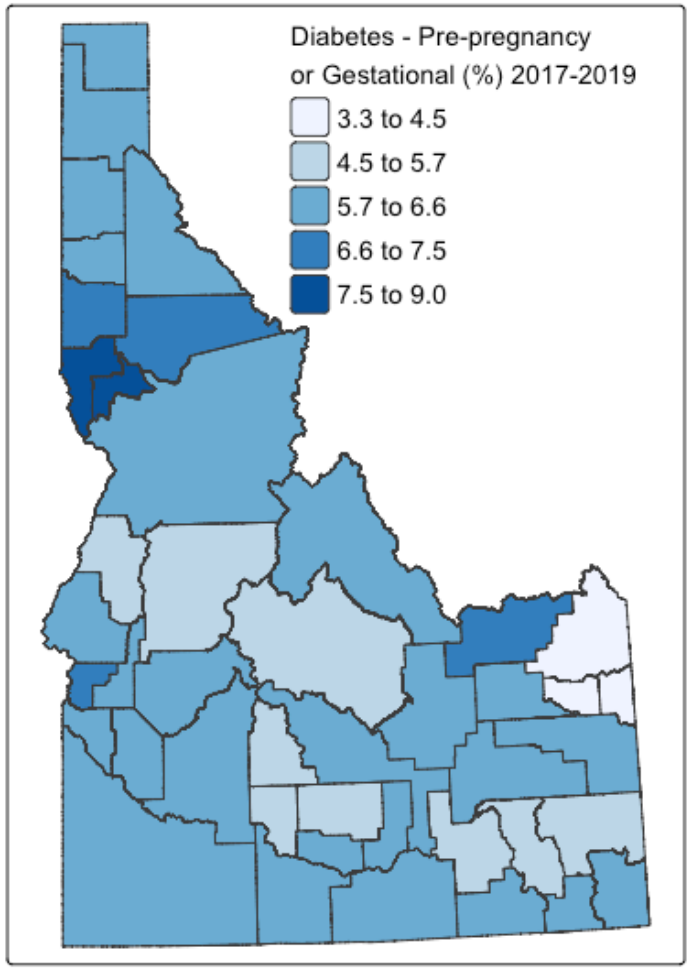
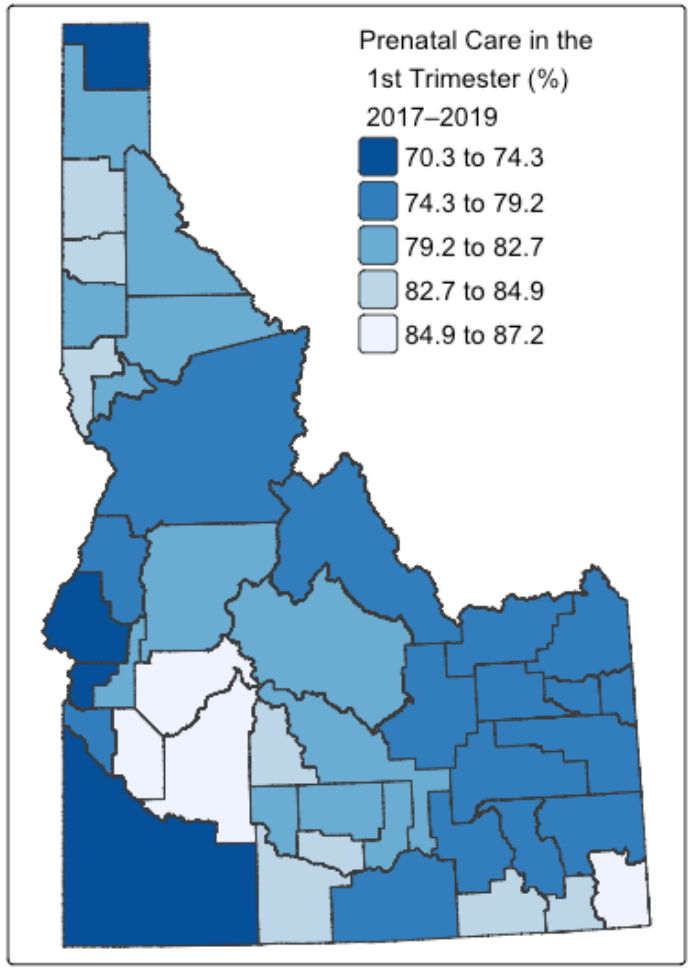


Driving Distances

Mapping Maternal Health and Access to Care at the County Level

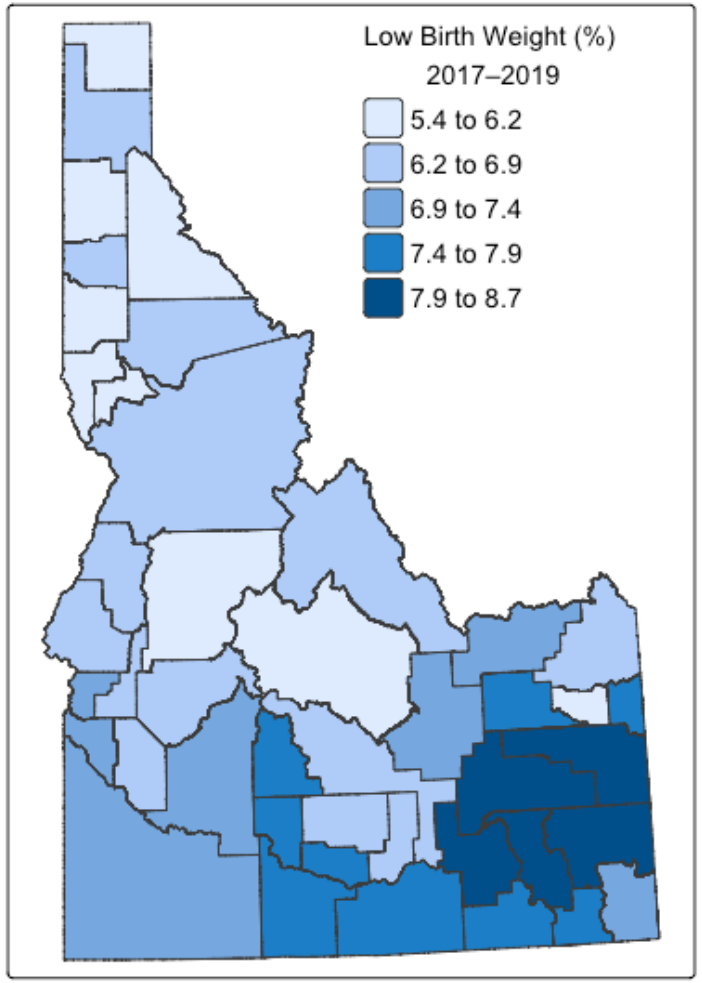


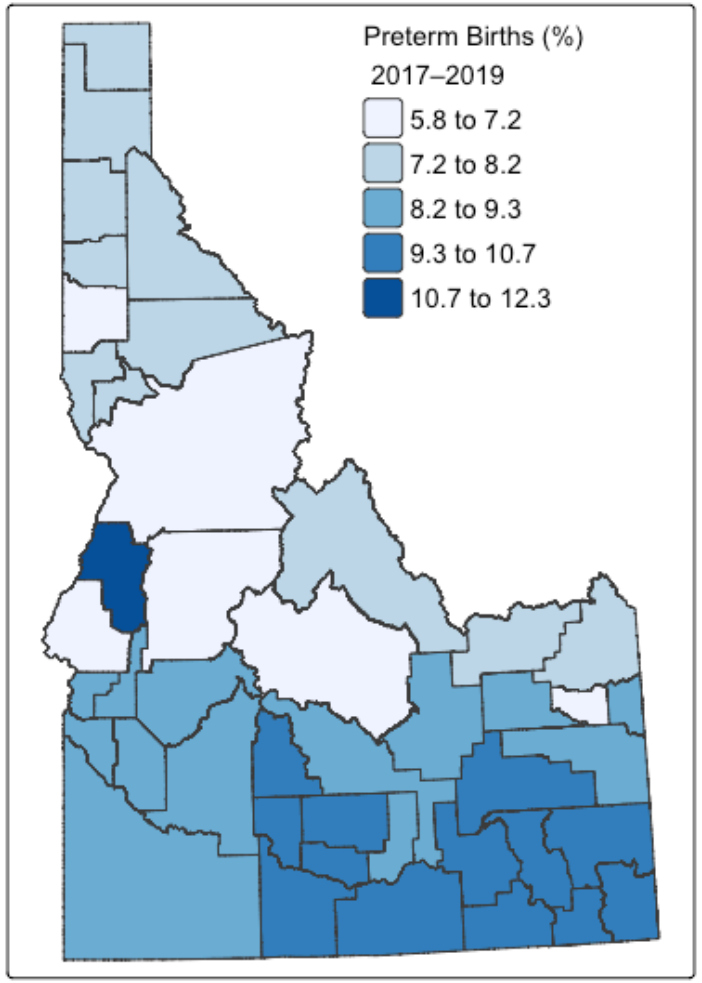


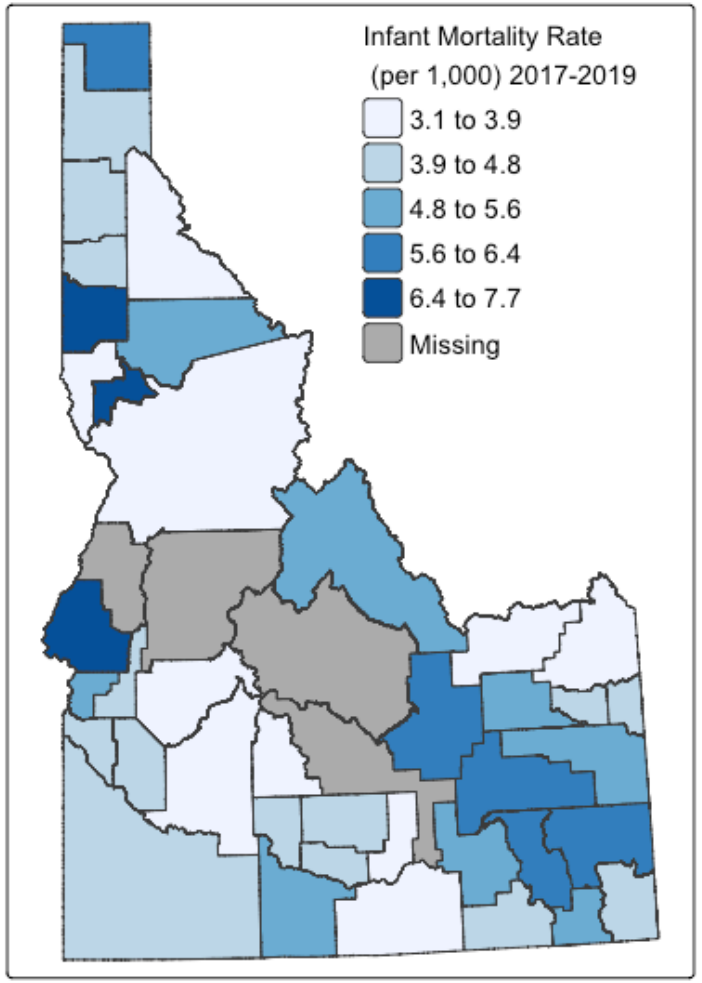


Source: [CDC HRSA Maternal and Infant Health Mapping Tool]

Mapping Birth Outcomes at the County Level







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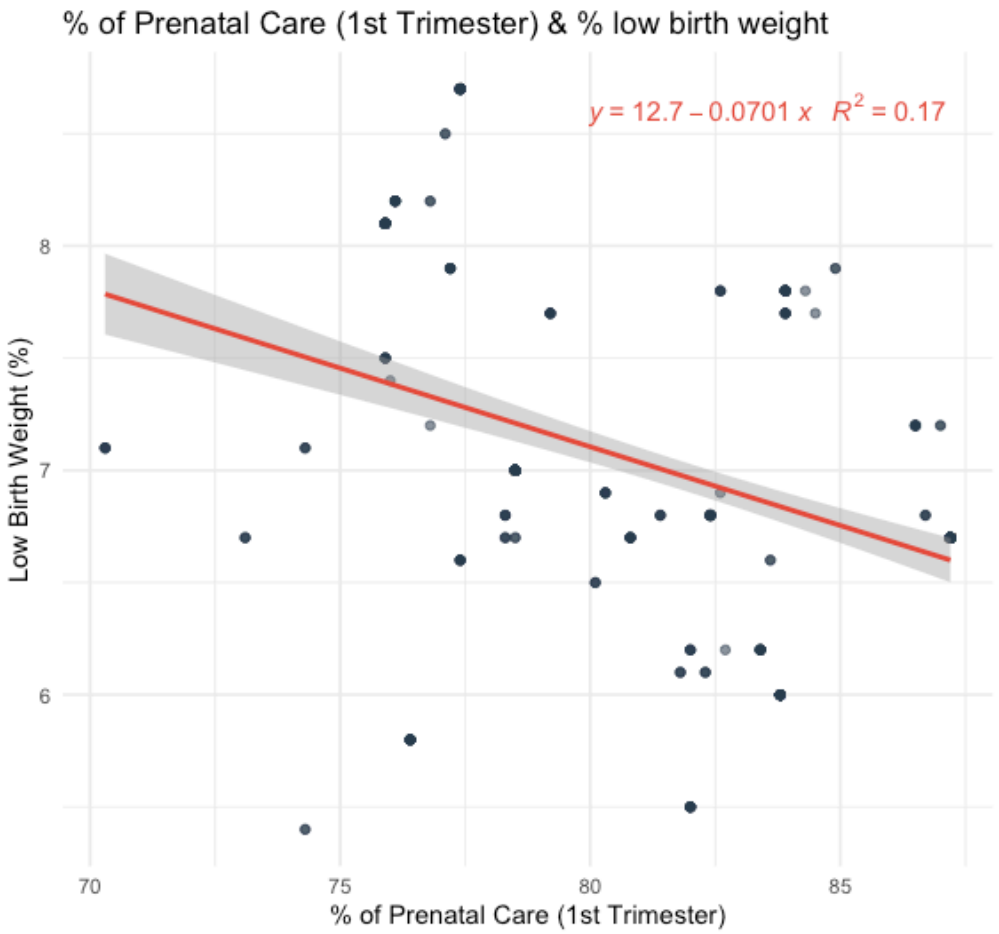
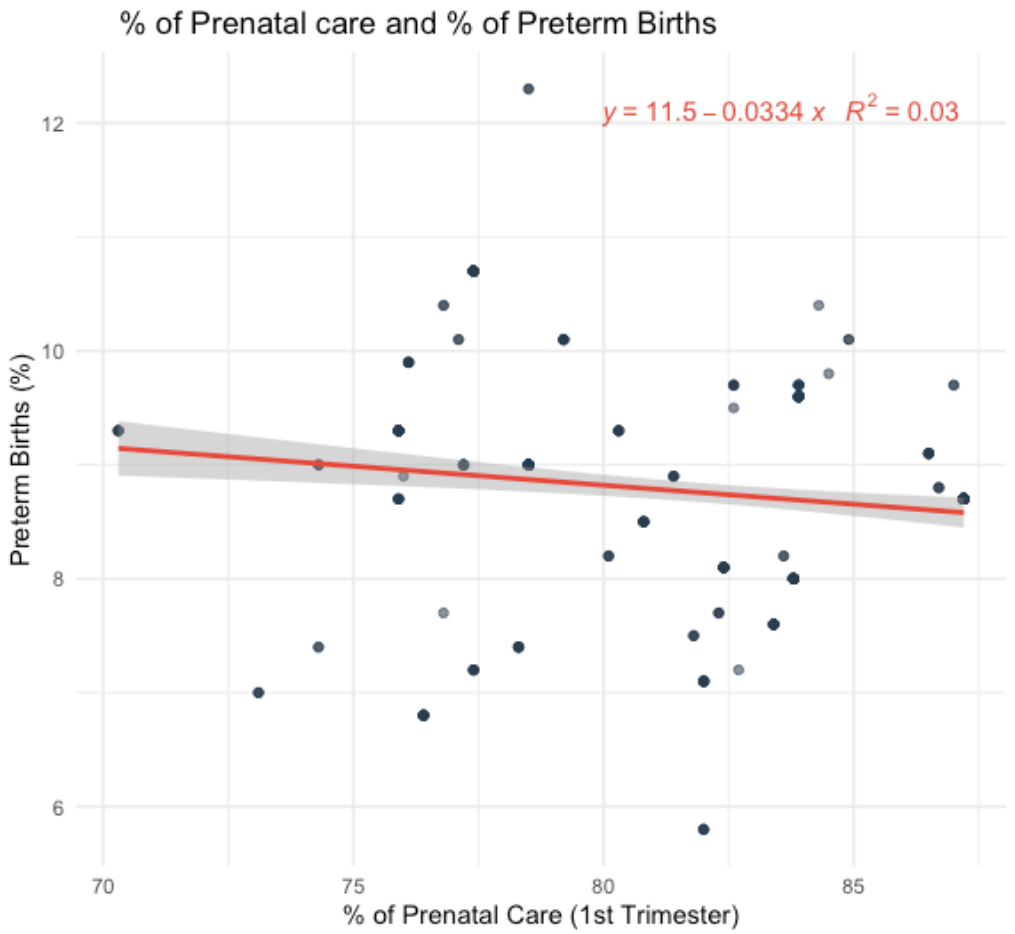
Association of Birth Outcomes with Prenatal Care at the County Level

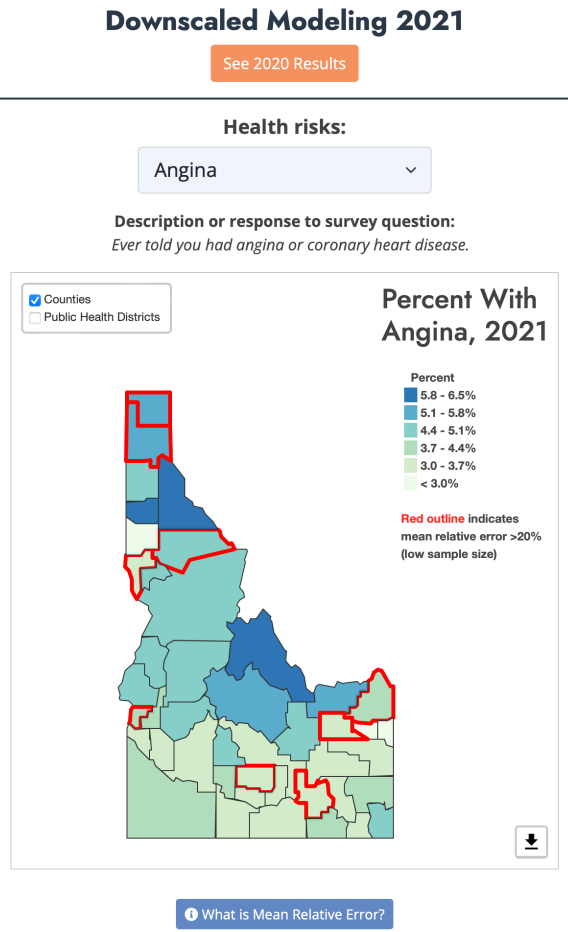


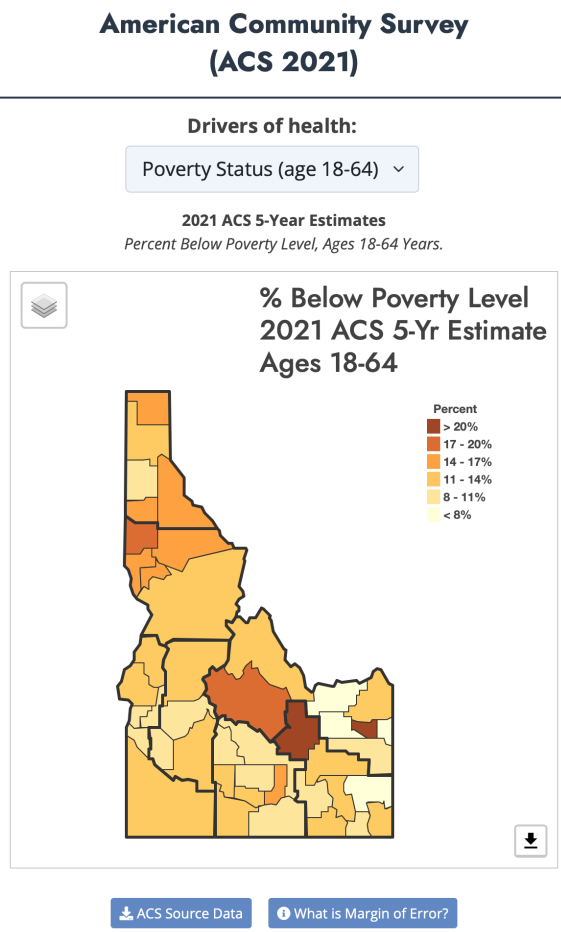


- Left: % of prenatal care in the 1st trimester -> low birth weight (%)
- Right: % of prenatal care in the 1st trimester-> preterm births(%)

Future Work

- Complete modeling analysis
- Gain insight from community stakeholders
- Re-evaluate model outcomes after input
- Integrate with https://modelingidahohealh.org





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Thank You!

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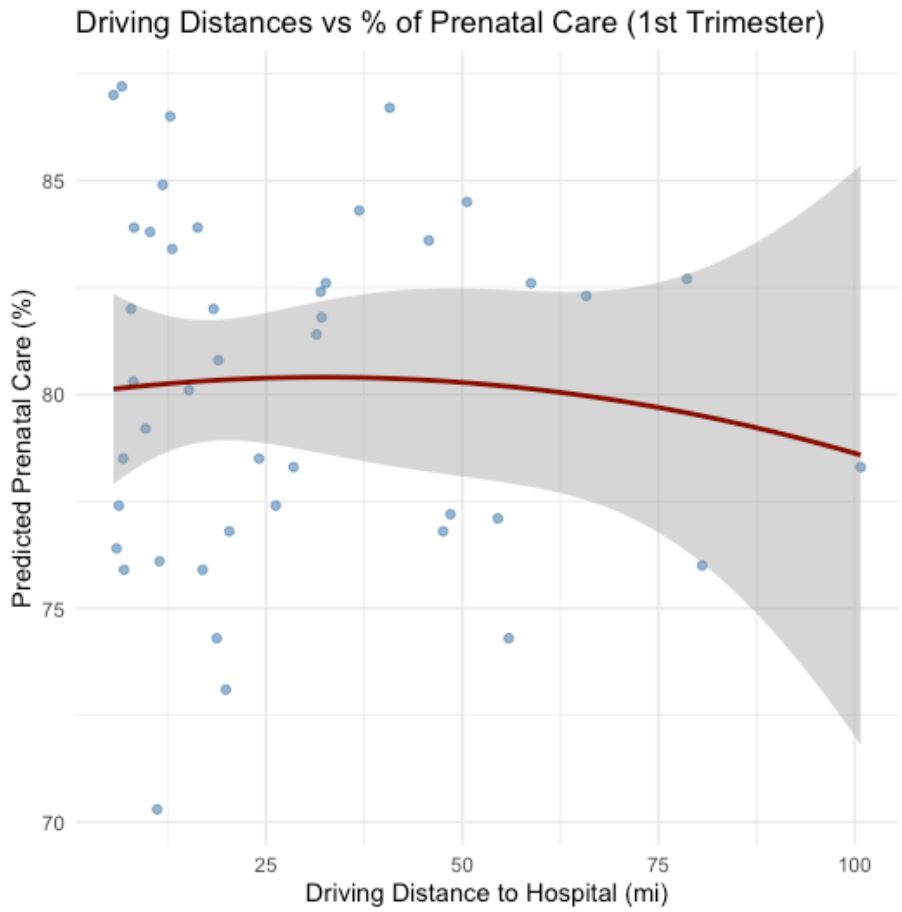
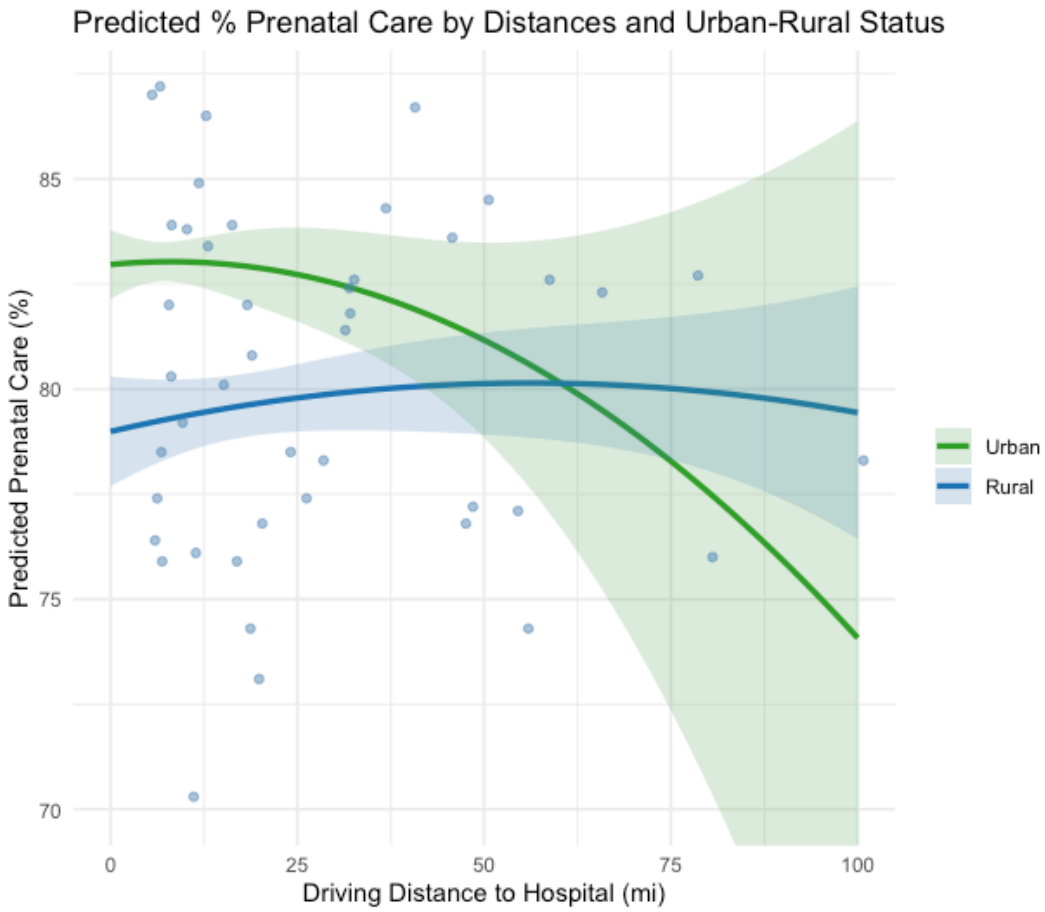
Discussion

Extra Slides

Association of Prenatal Care with Access to Birthing Hospitals at the Tract Level





- Left: Driving distances to the nearest birthing hospital & predicted % of prenatal care in the 1st trimester
- Right: Driving distances & predicted % of prenatal care in the 1st trimester (urban tracts vs. rural tracts)

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