

Geographic distribution of freestanding birth centers in relation to Black populations in the contiguous United States

ABSTRACT

Birth centers produce significant improvements in maternal and infant health for all racial populations, including Black birthing people who are at the highest risk of adverse outcomes in the US. However, Black representation at birth centers is lower than that of the national Black childbearing population.

Their concrete access to this care is poorly understood, making the findings of a spatial analysis of birth centers in the US highly valuable. Applying **spatial analysis** methods to secondary data, I describe the spatial clustering of **freestanding birth centers in the US** in relation to where Black and White people reside. Birth center addresses were obtained from the American Association of Birth Centers and the Commission for the Accreditation of Birth Centers; and were geocoded using QGIS software (Version 3.12). County-level demographic data for the **contiguous US** was obtained from the 2017 American Community Survey. The sample for this study consists of 122 birth centers. Univariate analysis produced a Moran's I of 0.73, indicating strong **spatial autocorrelation** of birth centers in the US. Hot spots for birth centers do not overlap with areas that have higher densities of Black childbearing people. Geographic distribution of birth centers appears to be related to **racial segregation** in the US, as they are not likely to be located in areas with higher densities of Black people. Future research should also address state-level policies regarding birth center licensing and how this impacts access for Black childbearing populations seeking this type of care.

METHODS

1. Develop **maps** of the contiguous US illustrating the location of birth centers and the demographics of the surrounding areas at the county level.
2. Using GeoDa software (Version 1.14), apply a **local Moran's I** assessment to the sample of geocoded birth centers to determine the significance and direction of **spatial autocorrelation**.
3. Identify **hot spots**, or areas where a birth center's presence in a given county is significantly associated with other locations in neighboring counties.
4. Using GeoDa software, apply a **bivariate local Moran's I** assessment to determine the relationship between county-level concentrations of Black people and the presence of birth centers within that county, as well as neighboring areas.

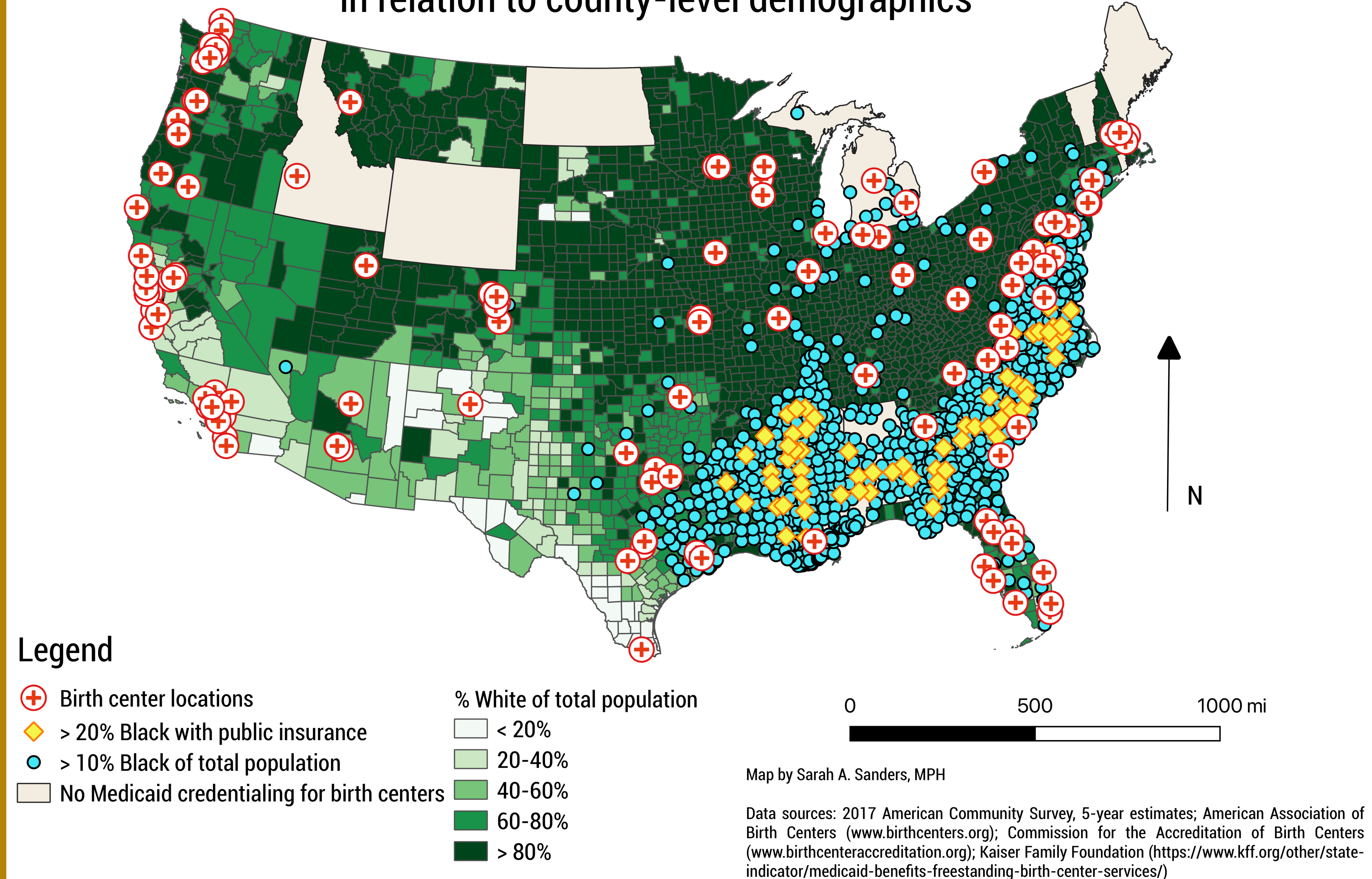
Table 1. Data sources for variables examined in present spatial analysis.

Data Source(s)	Variables	Utilization in Study
AABC website	Addresses for existing birth centers in the 48 contiguous United States	Geocoded using QGIS software (Version 3.12) to create a shapefile containing geographic coordinates for each center
CABC website	Black population proportion at the county level	
5-year ACS estimates (2017)	White population proportion at the county level Population proportion with Medicare/Medicaid at the county level	Data imported to QGIS shapefiles for map illustrations

AABC: American Association of Birth Centers
CABC: Commission for the Accreditation of Birth Centers

Birth center locations in the contiguous US in relation to county-level demographics

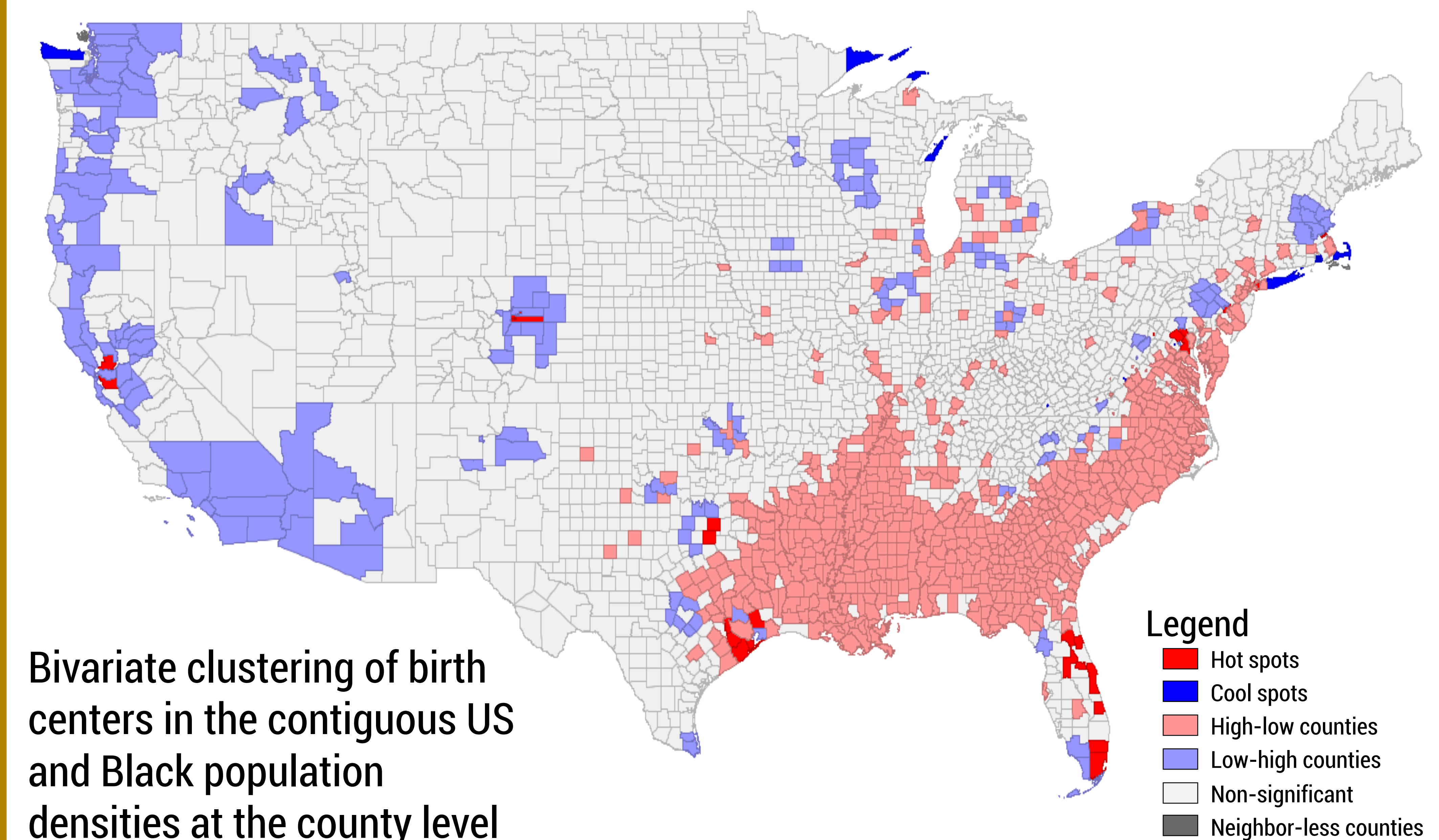
Figure 1



Legend

- Birth center locations
- > 20% Black with public insurance
- > 10% Black of total population
- No Medicaid credentialing for birth centers
- % White of total population
 - < 20%
 - 20-40%
 - 40-60%
 - 60-80%
 - > 80%

Figure 2



Bivariate clustering of birth centers in the contiguous US and Black population densities at the county level

FINDINGS

- 122 birth center addresses successfully geocoded (of 160 total facilities found on public websites)
- Birth center locations appear to mirror racial segregation patterns in the US. Black population density appears inversely related to the presence of birth centers (Figure 1)
- Nine states do not have licensing regulations for birth centers, preventing them from being able to accept Medicaid insurance (Figure 1)
 - Alabama and Mississippi have high concentrations of Black/African American people, including those with Medicaid insurance
- Univariate Moran's I (0.731) indicates positive spatial autocorrelation with significant pseudo p-value (p=0.001)
 - Queen matrix identified 30 birth center hot spot counties (p<0.05), with many concentrated in four US regions: eastern Texas, Minneapolis metro, mid-Atlantic, and Pacific Northwest.
- Bivariate local Moran's I (queen matrix) identified 27 counties as hot spots (Figure 2)
 - 11 counties identified as cool spots (low Black population density, low clustering of centers)
 - 724 counties identified as "high-low" (high Black population density, low clustering of centers)
 - 201 counties identified as "low-high" (low Black population density, high clustering of centers)
 - 214 counties did not produce a significant relationship (p>0.05); 3 neighbor-less counties

IMPLICATIONS

There is an imperative for increased technical support from professional and advocacy organizations for birth center clinicians in areas with higher population densities of Black people and low access to care.

Adoption of a universal policy regarding the licensing and credentialing of freestanding birth centers with Medicaid payors would greatly increase access for all childbearing people in the United States.

Future research is needed to address facility- and environmental-level factors associated with access to birth center care, particularly for populations with elevated social risks.