Kalamazoo County reflects national and statewide birth disparity trends, with infant mortality rates 2.5 to 3 times higher among blacks compared to whites. Racial health disparities have been shown to vary widely across communities throughout the nation, and are thought to be closely linked to a community's racial segregation. Geographic Information Systems (GIS) is useful in both illustrating and analyzing geographic distributions of social phenomena, such as racial segregation and birth outcomes.

The purpose of this study was to define racially segregated neighborhoods in Kalamazoo County and examine the association of race and racial segregation with birth outcomes at the individual maternal level as well as at the neighborhood level.

### RESULTS: Distribution of Black Residents Across Kalamazoo County Census Tracts

#### RESULTS: Comparison of Disproportionate Black Tracts with Disproportionate White Tracts

#### RESULTS: Mapping Birth Outcomes

**METHODS**

**Design:** This was a secondary data analysis of Kalamazoo County 2008 birth certificate database. Access and permission to use the data was provided by the Michigan Department of Community Health, Division for Vital Records and Health Data Development to the principal investigator.

**Sample:** The population of Kalamazoo County live births 2008, stratified by maternal race (Black and White).

**Data Collection:**
- Birth Records: Variables in the birth dataset used in this analysis included maternal address, demographics (age, race, education, marital status, Medicaid paid birth), maternal health indicators (obesity, prenatal weight gain, diabetes, sexually transmitted infection (STI)), health behaviors (smoking, alcohol consumption) healthcare access/utilization (1st trimester prenatal care, WIC enrollment) and birth outcomes (infant death within 1st year, very low birthweight (VLBW), low birthweight (LBW) and prematurity (>37 weeks gestation).
- Census Data: The Kalamazoo County shapefile containing 2010 census tract boundaries was downloaded from the Michigan Geographic Data Library (MGDL).
- Census Tract Characteristics: Census tract characteristics were downloaded from the Michigan 2010 Census Planning website (www.cridata.org.htc) and included population, housing units, vacant units, owner-occupied units, percent in racial categories and percent in age categories.

**Analysis:** Data analysis was conducted using SPSS 18 and GIS analysis was conducted using ArcGIS 10.0.

- Birth records were geocoded using maternal address, were linked to census tract through a spatial join within ArcGIS and the resulting attribute table was then exported for statistical analysis.
- Pearson chi square and correlation were conducted for the bivariate analysis of race (Black/White) and the remaining covariates. Logistic regression modeling was then completed at the individual level and linear regression at the tract level for each of the four birth outcome variables (death, VLBW, LBW and prematurity). Statistical significance was two-tailed at the .05 level.

### RESULTS: Multivariate

**Key Findings**

- Wide variation in racial composition across neighborhoods. Census tracts within Kalamazoo county ranged from 0.1% to 85.4% Black residents, with an average of 10.5% Black residents.

- Nearly three-quarters of Black births were to women residing in disproportionately Black tracts. Segregated neighborhoods that are disproportionately Black characterized by decay and disadvantage. Significantly higher housing vacancies, renter-occupied housing and poverty rates, significantly lower High School graduation rates, early initiation of prenatal care, adequate level of prenatal care.

- Neighborhood racial segregation was not directly associated with prematurity.

- At the neighborhood level, percent of Black residents was not significantly associated with the percent of premature births, once neighborhood characteristics were taken into account. At the individual maternal level, whether a woman lived in a segregated neighborhood (with disproportionately Black residents) was unrelated to whether or not she delivered prematurely. Maternal race, however, at the individual level was a strong predictor of premature delivery: Being of Black race increased the odds of a premature delivery nearly two-fold, even after other key risk factors were taken into account.

### Study Limitations

- May not have captured key neighborhood characteristics (safety, access to food, environmental hazards).
- Census tract divisions may not align with important neighborhood boundaries.

### Conclusions

- Race matters. But it appears to matter more at the individual than the neighborhood level, at least as measured by racial segregation and density.

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### REFERENCES

- Michigan Department of Community Health, Division for Vital Records & Health Data Development, Live Birth File & Death File