Mapping Racial and Socio-Environmental Inequalities in Birth Outcomes

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Research funded by the KU Institute for Policy & Social Research. Special thanks to Professors Shirley Hill and Mary Zimmerman, of the Department of Sociology, for use of their data, and to Xan Wedel, PRI, for GIS instruction.
Neighborhood Environments & Health

- Neighborhood environments shape health
  - Exposure to adverse conditions
  - Access to resources

- The effects of poor birth outcomes
  - Infant mortality
  - Long-term developmental and health problems

- How do neighborhood environments affect birth outcomes?
  - Does race/ethnicity matter?
Data, Wyandotte County

- 2000 US Census: Neighborhood Socio-Environmental Conditions
  - Concentrations of unemployment, poverty, single-parent homes, owner-occupied housing, high school education, race (Black, Hispanic, White)
  - Overall neighborhood risk rank

  - Percent low-weight and pre-term births (total and by mother’s race)

- Unit of analysis, neighborhood (block group)
Mapping Residential Segregation

Wyandotte County, Kansas, Population by Race: Hispanic

Percent Population Hispanic

- < 0.25%
- 0.25% - 0.49%
- 0.50% - 0.75%
- 0.75% -
- missing

Data from US Census Bureau 2010
Mapping Residential Segregation

Wyandotte County, Kansas, Population by Race: White

Percent Population White
- < 0.25%
- 0.250 - 0.499
- 0.500 - 0.749
- 0.750 +
- missing

Data from US Census Bureau 2020
Mapping Residential Segregation

Wyandotte County, Kansas, Population by Race: Black
Mapping Poor Birth Outcomes

Socio-Environmental Risk & Low-weight Births

Overall Risk Rank
- Missing
- 1 - Greatest Risk
- 2
- 3
- 4 - Least Risk

Number Low-weight Births
- 1
- 5
- 10

Data from U.S. Census Bureau 2000
Mapping Birth Outcomes by Race

Socio-Environmental Risk & Hispanic Low-weight Births

Proportion Unemployed

- Missing
- 1 - Greatest Risk
- 2
- 3
- 4 - Least Risk

Number White Low-weight Births

1 Dot = 1

Risk data: HISPLOBW

Data from US Census Bureau 2000
Mapping Birth Outcomes by Race

Socio-Environmental Risk & Hispanic, & White Low-weight Births

Data from US Census Bureau 2000
Mapping Birth Outcomes by Race

Socio-Environmental Risk & Hispanic, White, & Black Low-weight Births

Data from US Census Bureau 2000
Statistical Results

- Analysis of Variance
  - Riskiest neighborhoods have on average 2.2% more low-weight babies ($t =2.163, p<.05$)
  - Hispanics have significantly better birth outcomes
    - 3.8% less than blacks ($t=3.285, p<.001$)
    - 2.4% less than whites ($t=2.907, p<.05$)

- Regression Analysis
  - Concentration of single-parent homes, proportion population black, and unemployment, significant predictors of total low-weight births (explain 14-16% of variance)
  - Concentration of single-parent homes most significant predictor of proportion low-weight births to white mothers (but this measure does not explain a significant proportion of the model variance)
Conclusions

- Birth outcomes vary considerably by neighborhood and by race of mother
- The effects of individual risk factors also vary by race of mother
- Possible unobserved variables
  - Measures of social capital may be important
  - Measures of proximity and ease of access to services
- GIS application
  - Identifying at-risk neighborhoods
  - Locate service providers to maximize service usage
  - Focus limited state and federal resources