

# Residential Segregation, the White-Black Income Gap, and White-Black Disparities in Premature Mortality

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# Outline of Talk

- What is residential segregation?
- How might segregation affect health?
- Previous evidence
- Our ongoing work
- Conclusions

# What Is Residential Segregation?

- Residential segregation is the degree to which two or more groups live separately from one another, in different parts of the urban environment
- There are five dimensions of segregation, but most studies of health effects focus on “evenness”:
  - Evenness: The degree to which minority members are distributed so they are overrepresented in some areas and underrepresented in others

# Measuring Evenness: Index of Dissimilarity

Most widely used measure of evenness is  $D$ , the index of dissimilarity:

$$D = \sum_{i=1}^n \frac{t_i |p_i - P|}{2TP(1 - P)}$$

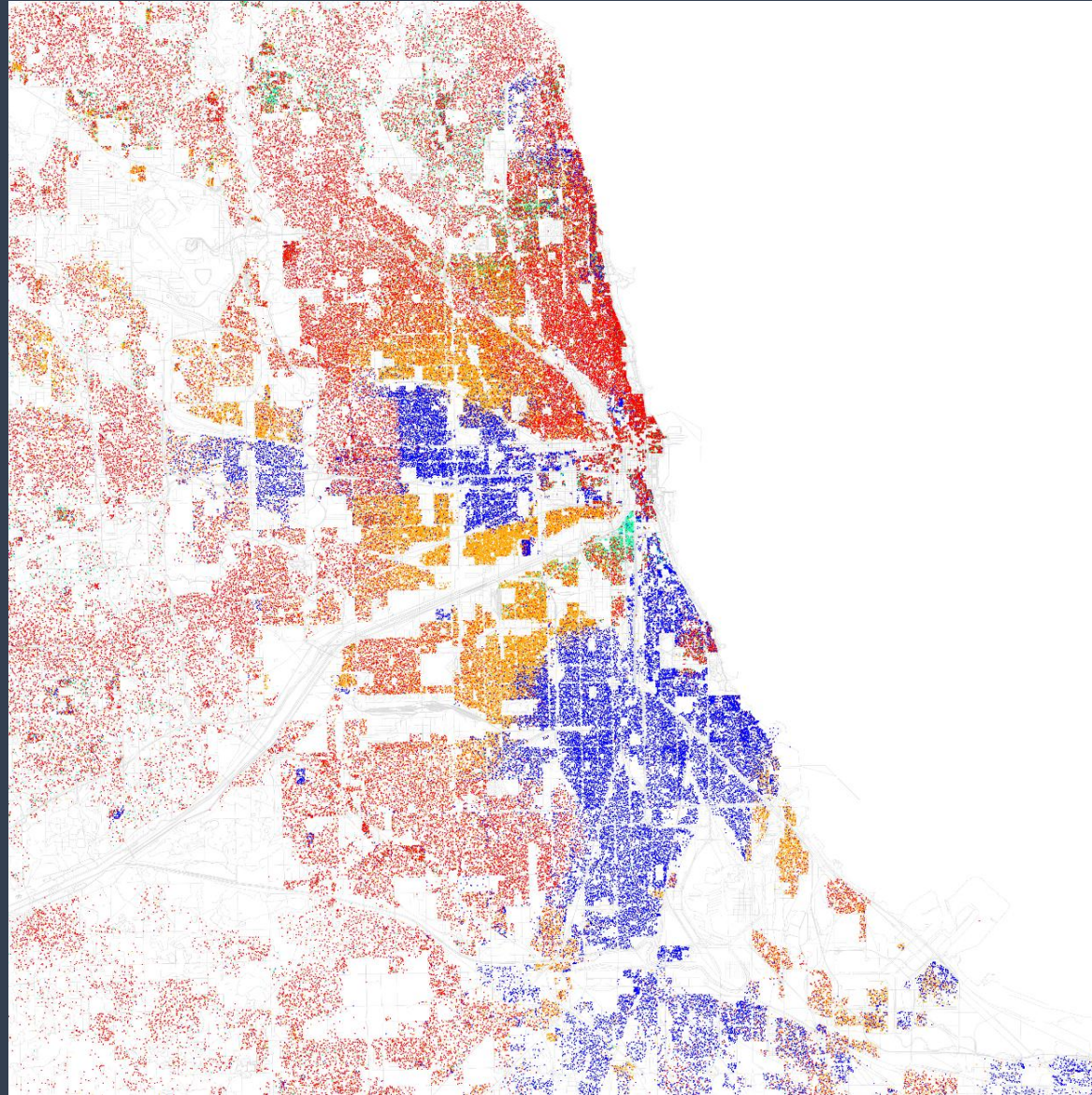
where  $t_i$  and  $p_i$  are the total population and minority proportion of areal unit  $i$ , and  $T$  and  $P$  are the total population and minority proportion of the whole metropolitan area, which is divided into  $n$  areas units.

- $D$  varies between 0 and 1.

# Segregation Map of Chicago, 2010

$D = .72$

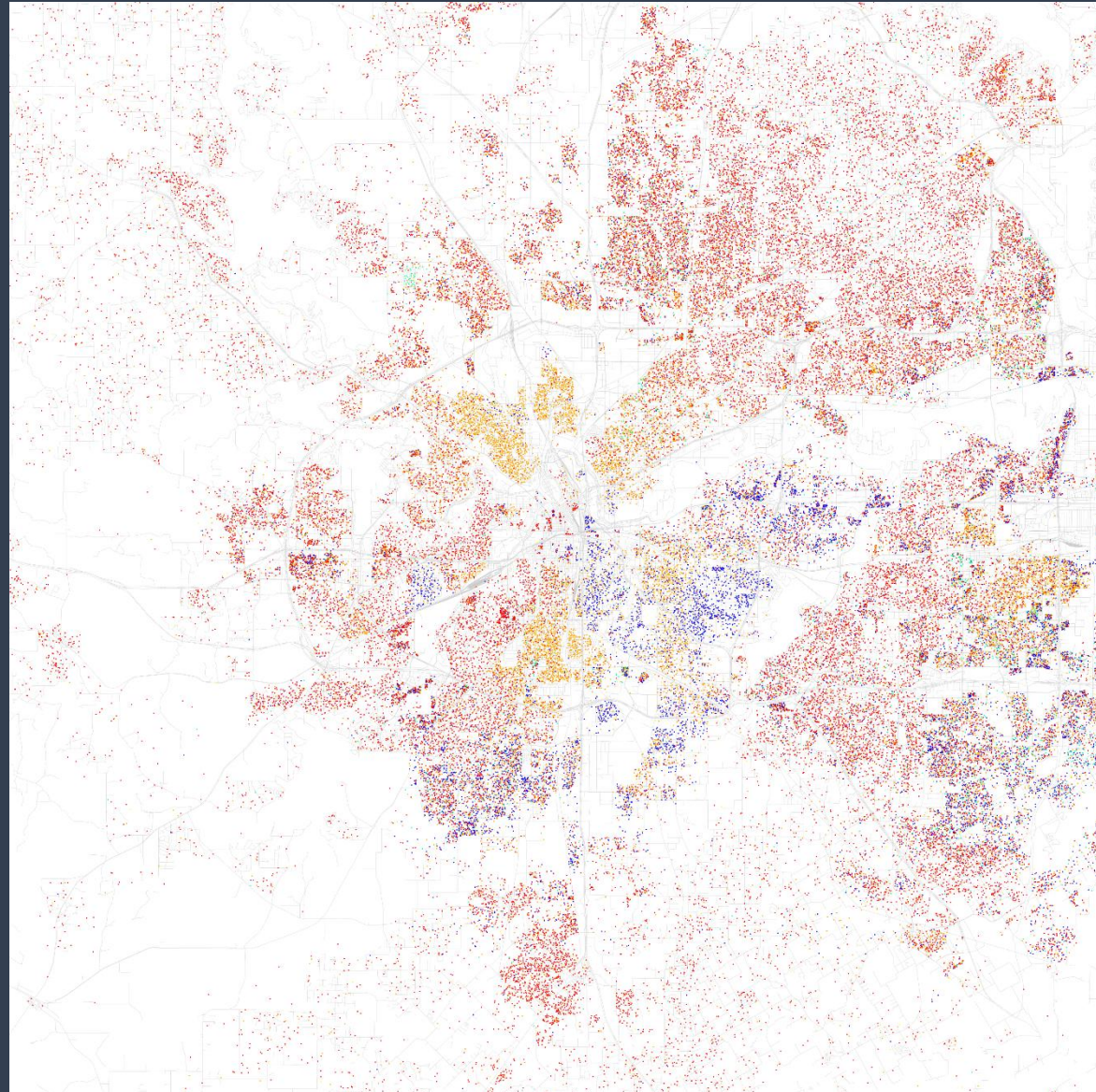
- Black
- White
- Hispanic
- Asian
- Other



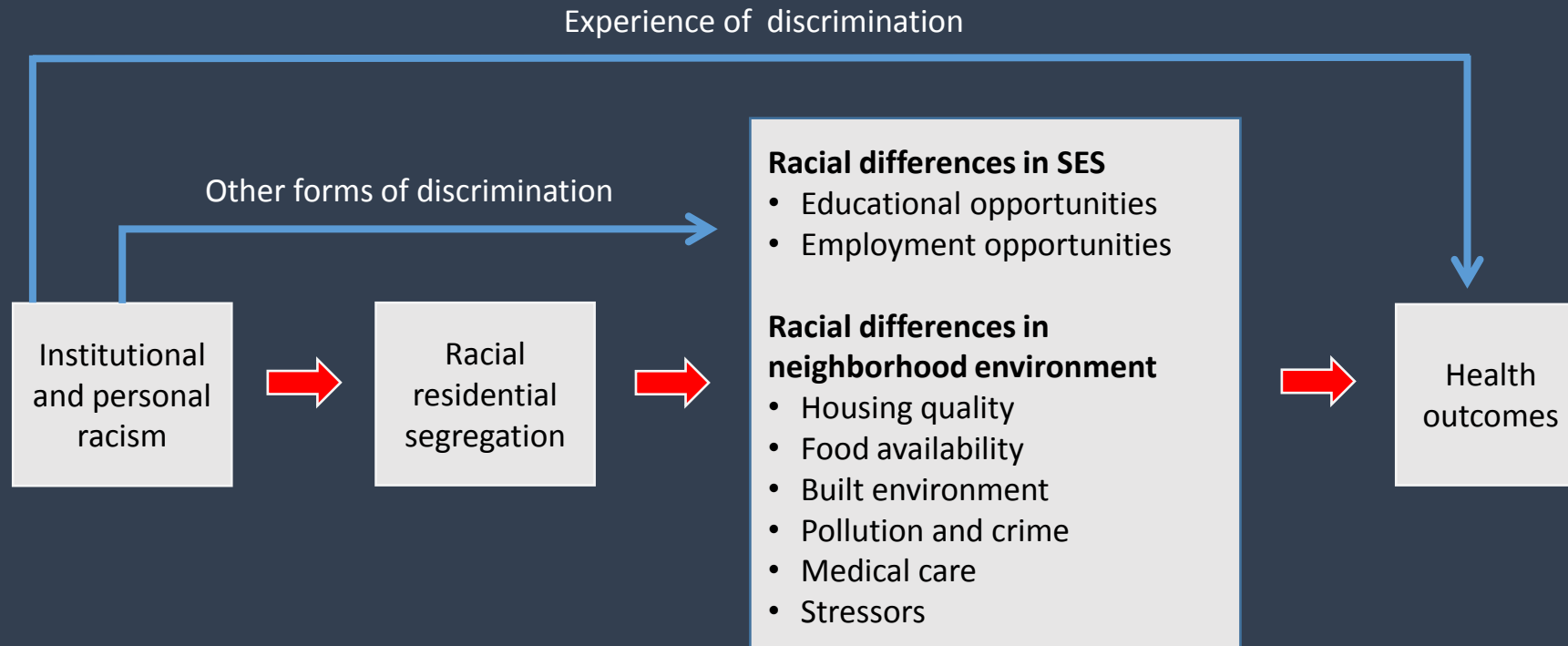
# Segregation Map of Charlotte, 2010

$D = .47$

- Black
- White
- Hispanic
- Asian
- Other



# How Might Segregation Affect Health?



# Previous Evidence

Studies have used evenness and isolation measures of segregation to find an association of higher segregation with worse health outcomes:

- All-cause mortality
- Heart disease, stroke, and cancer mortality
- Hypertension prevalence
- Self-rated health
- Infant mortality

Other studies have found an association of higher segregation with larger black-white disparities in income.



# Our Ongoing Work

- Examines bivariate associations among residential segregation, income, and survival for blacks and whites across 121 metropolitan areas in the United States.
- Assesses how much of the association between residential segregation and black-white disparities in survival is explained by racial gaps in income and other socioeconomic factors.
- Contributions:
  - Recent data (2009-2013)
  - Premature mortality: Probability of surviving from age 35 to age 75
  - Gender-specific analyses

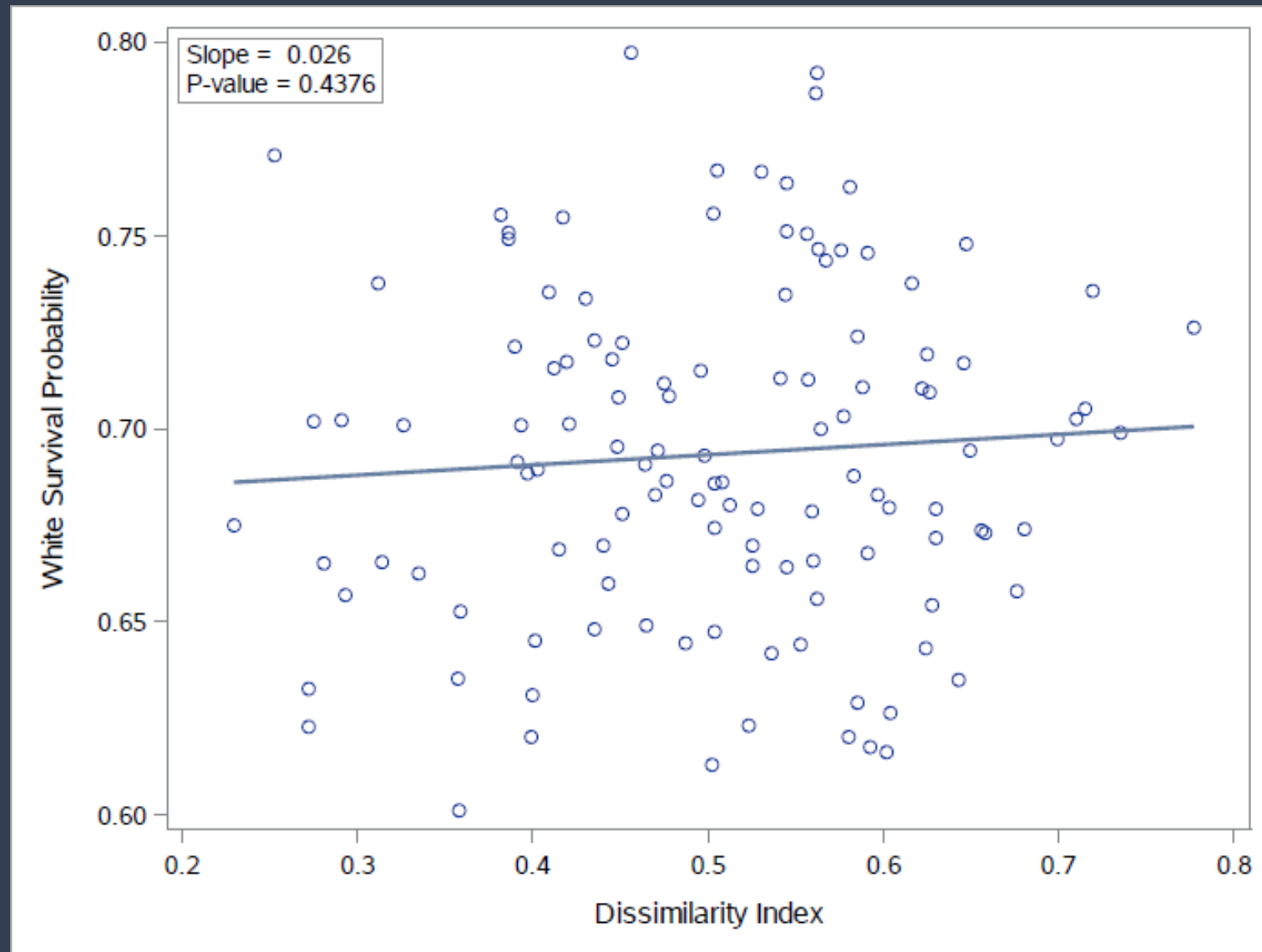
# Descriptive Data: Probability of Surviving From Age 35 to 75

|         | White population | Black population |
|---------|------------------|------------------|
| Men     | 0.63             | 0.50             |
| Women   | 0.75             | 0.66             |
| Overall | 0.69             | 0.59             |

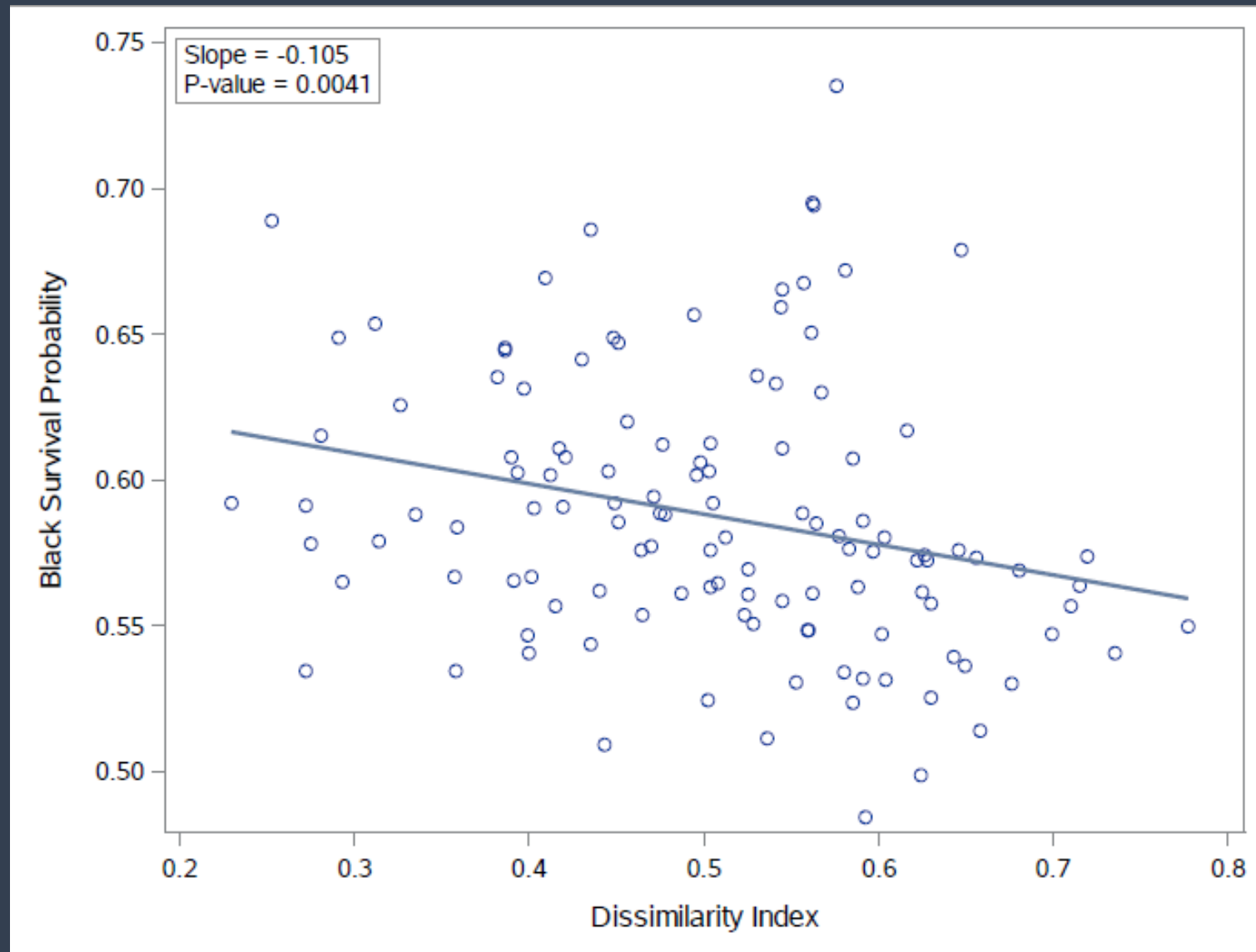
# Descriptive Data: Median Household Income and Poverty Rate

|                                    | White population | Black population |
|------------------------------------|------------------|------------------|
| Median household income (\$1,000s) | 57.9             | 33.7             |
| Percent living in poverty          | 11.9             | 29.0             |

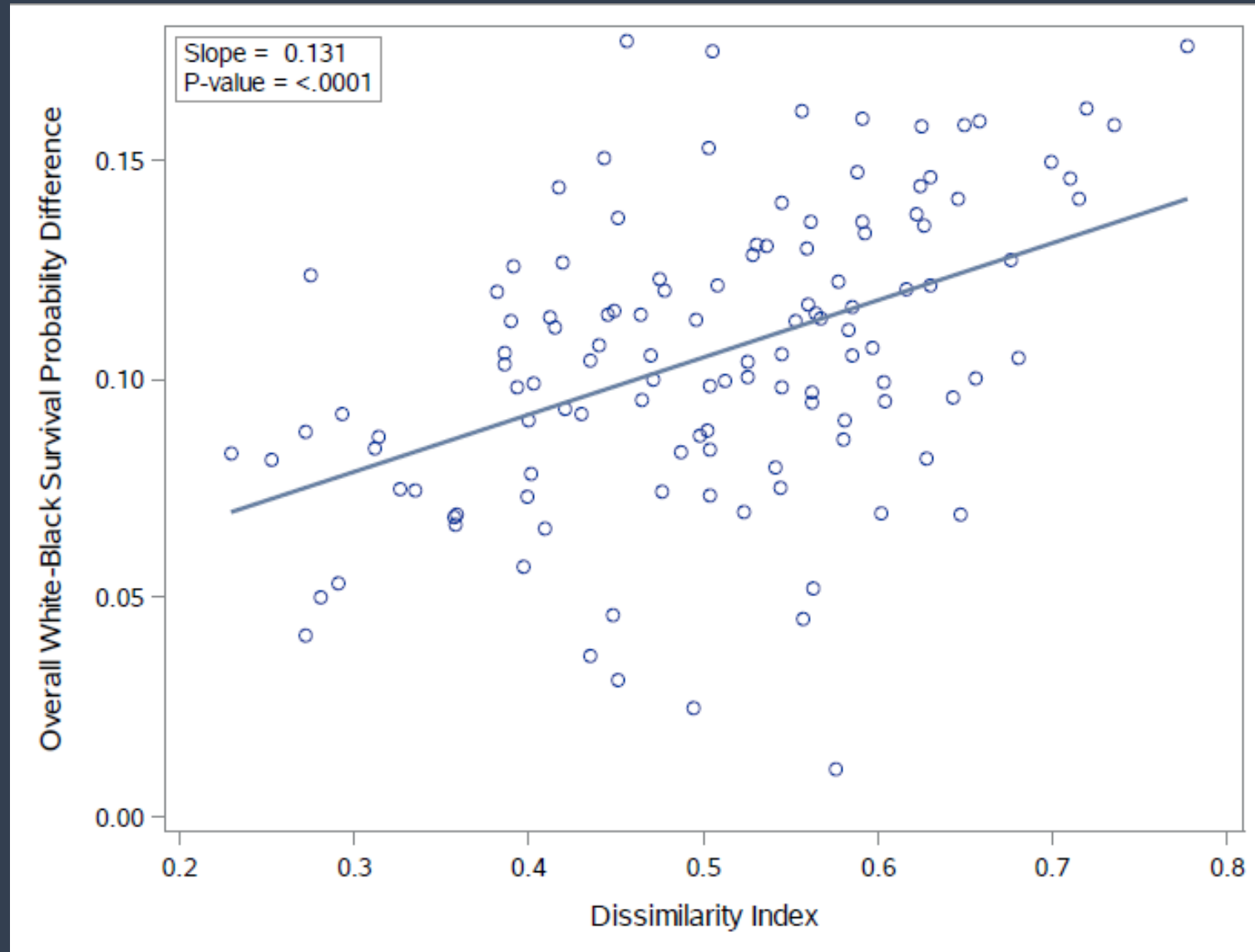
# Survival vs. Segregation, Whites



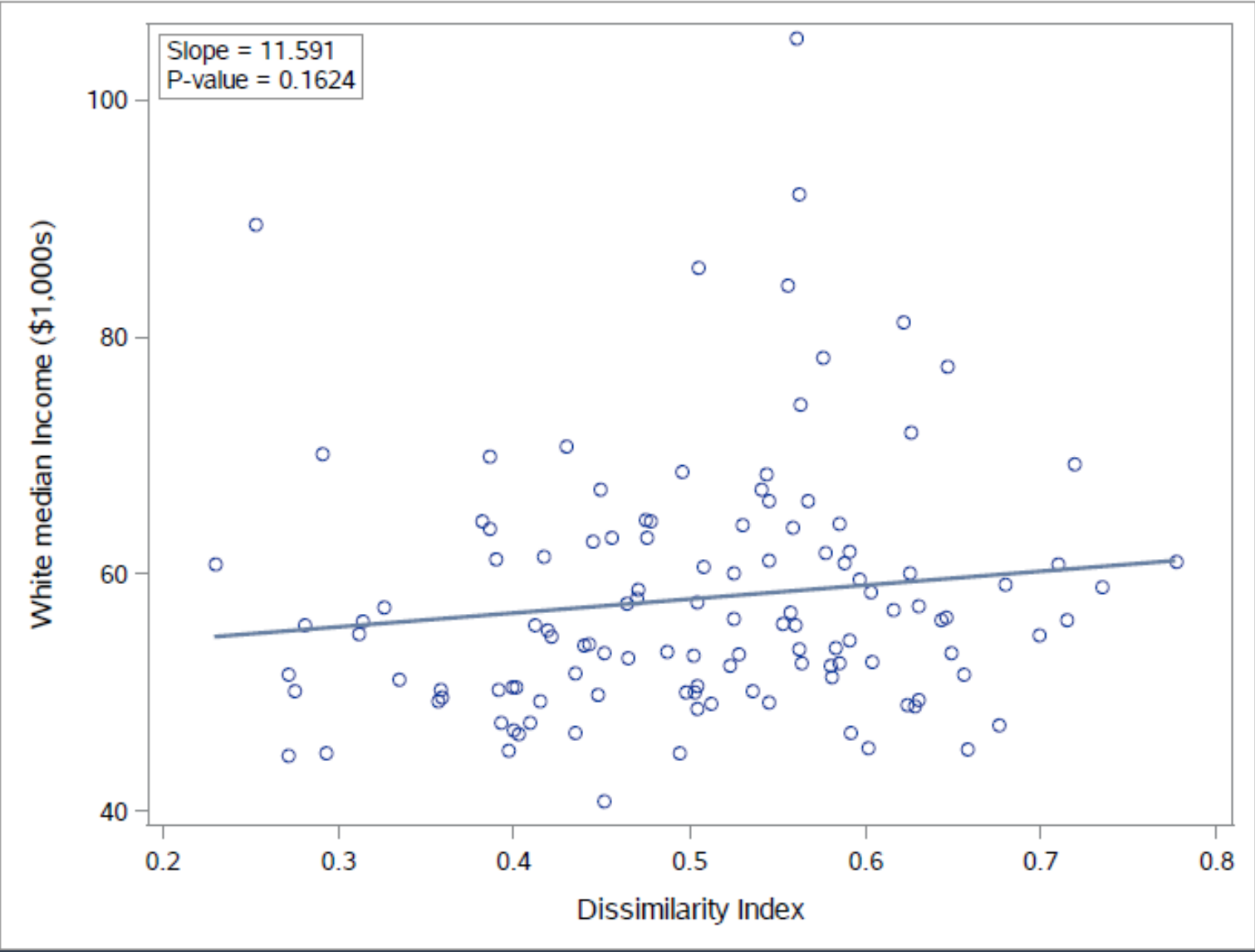
# Survival vs. Segregation, Blacks



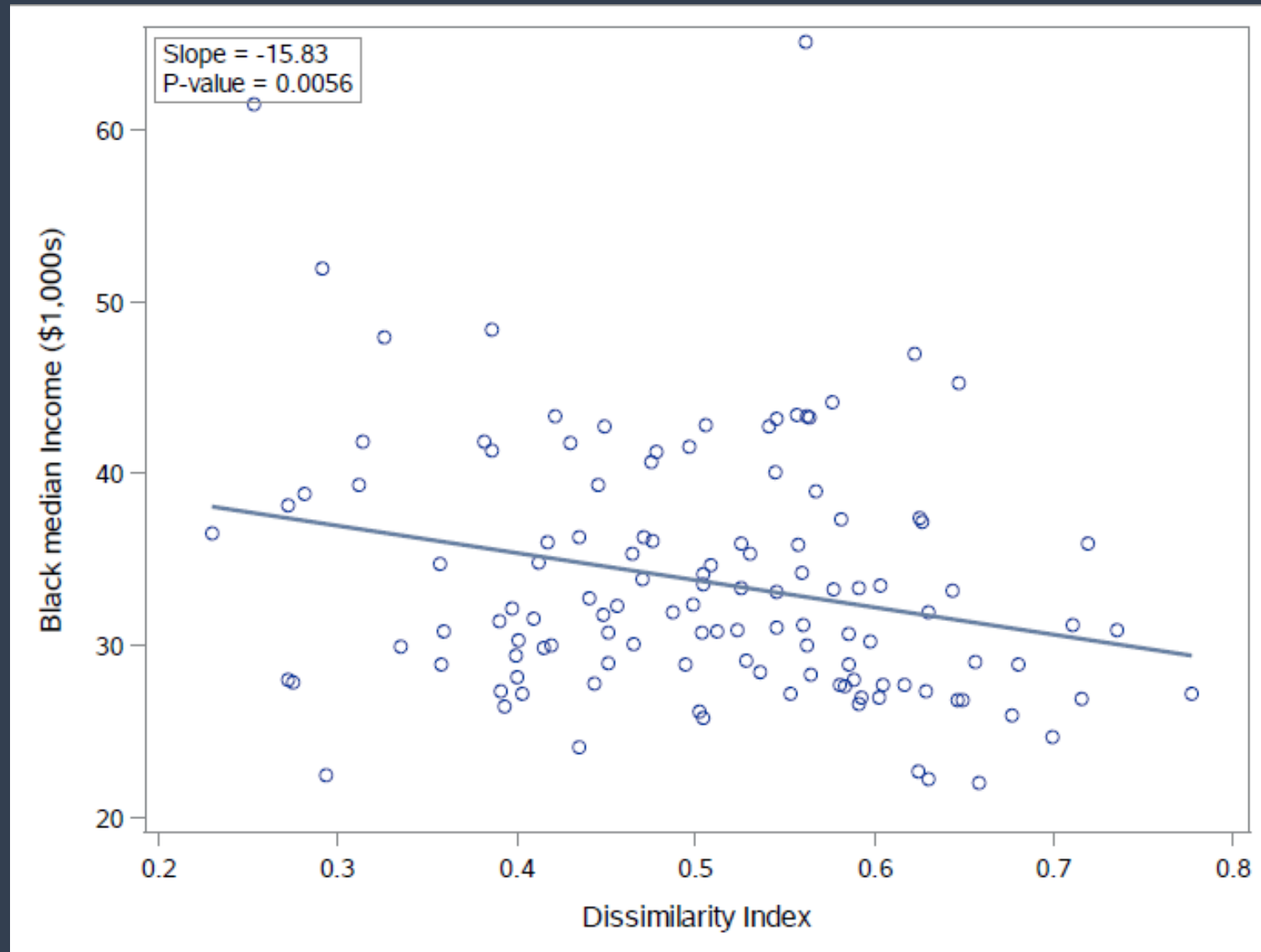
# Racial Gap in Survival vs. Segregation



# Household Income vs. Segregation, Whites

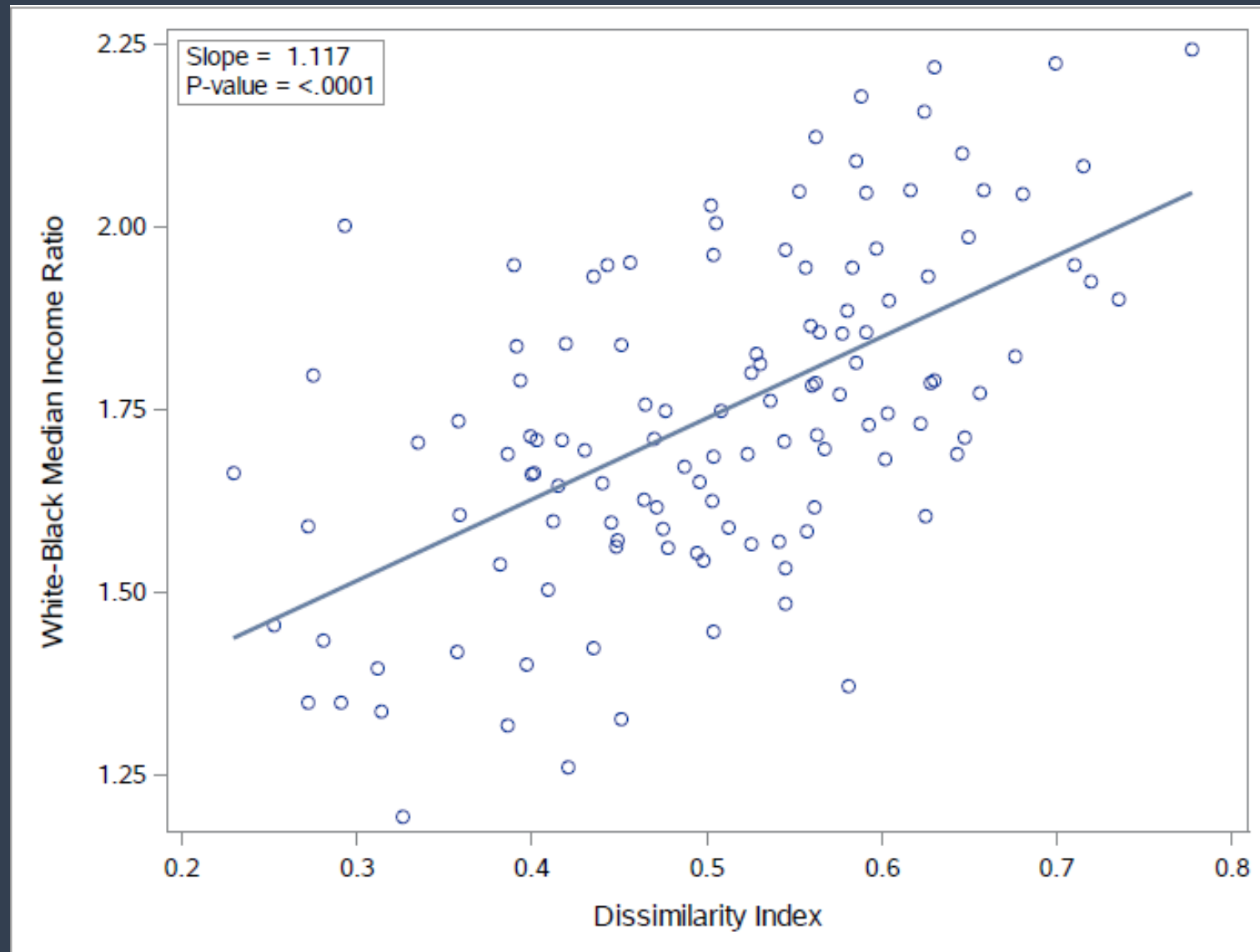


# Household Income vs. Segregation, Blacks

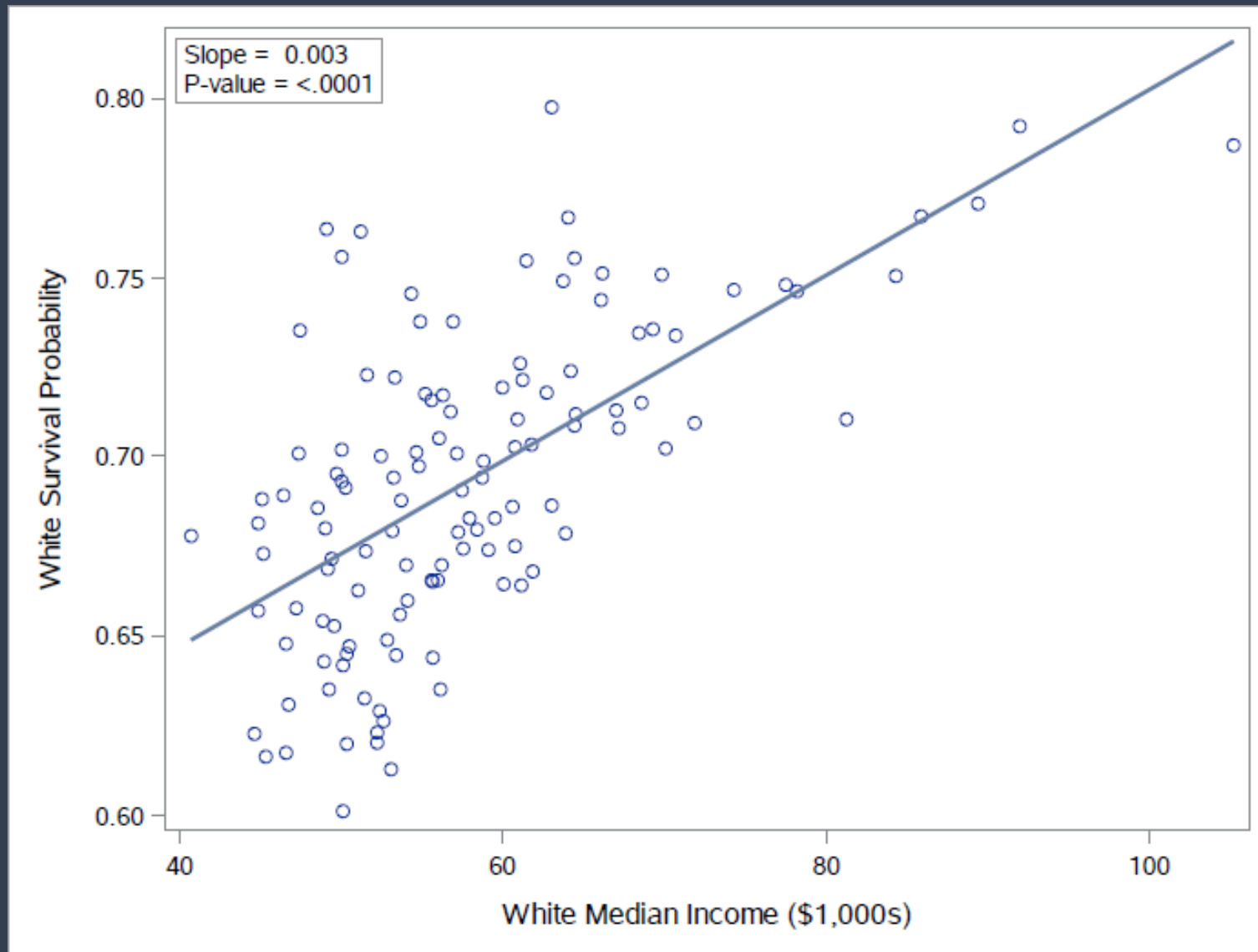




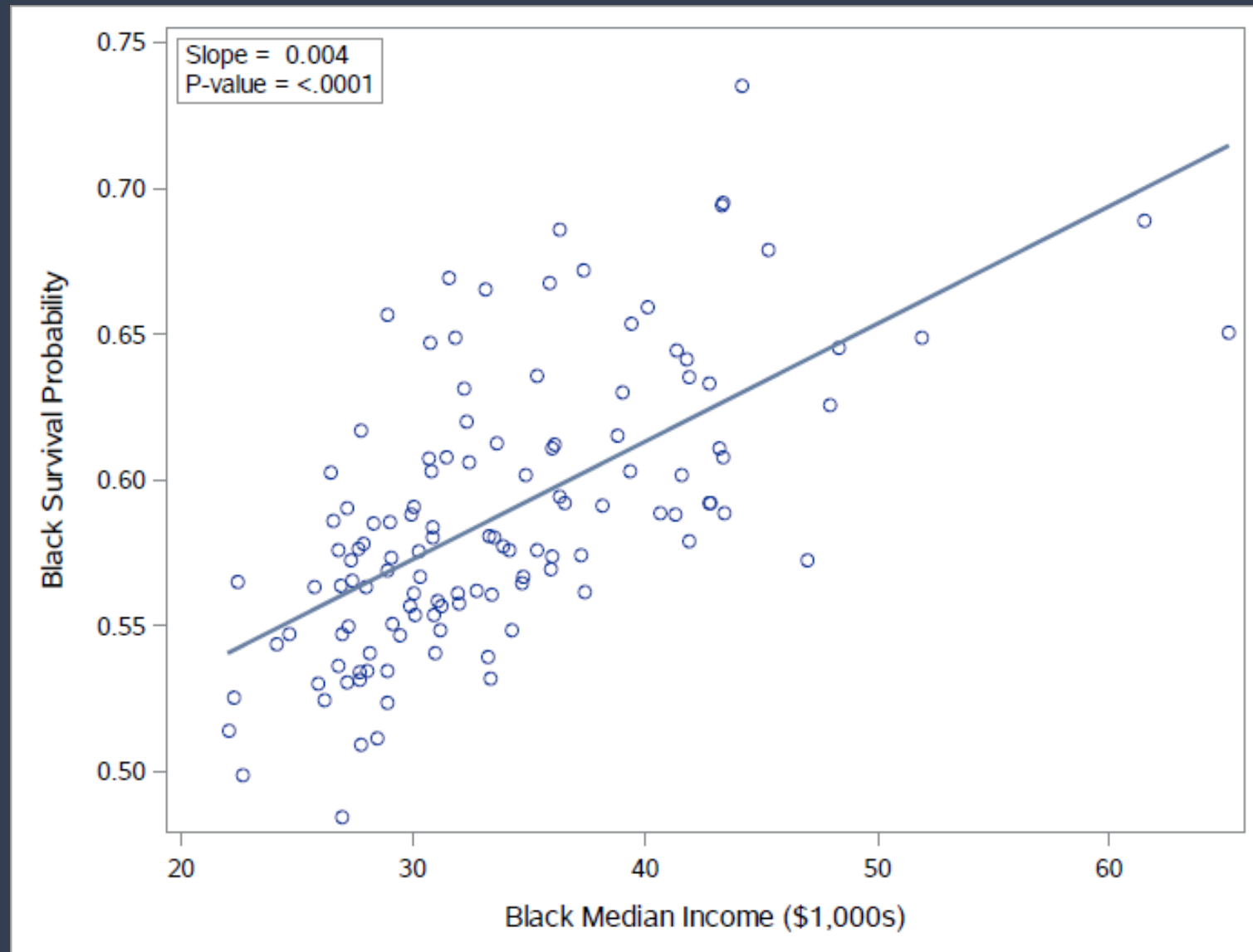
# Racial Gap in Household Income vs. Segregation



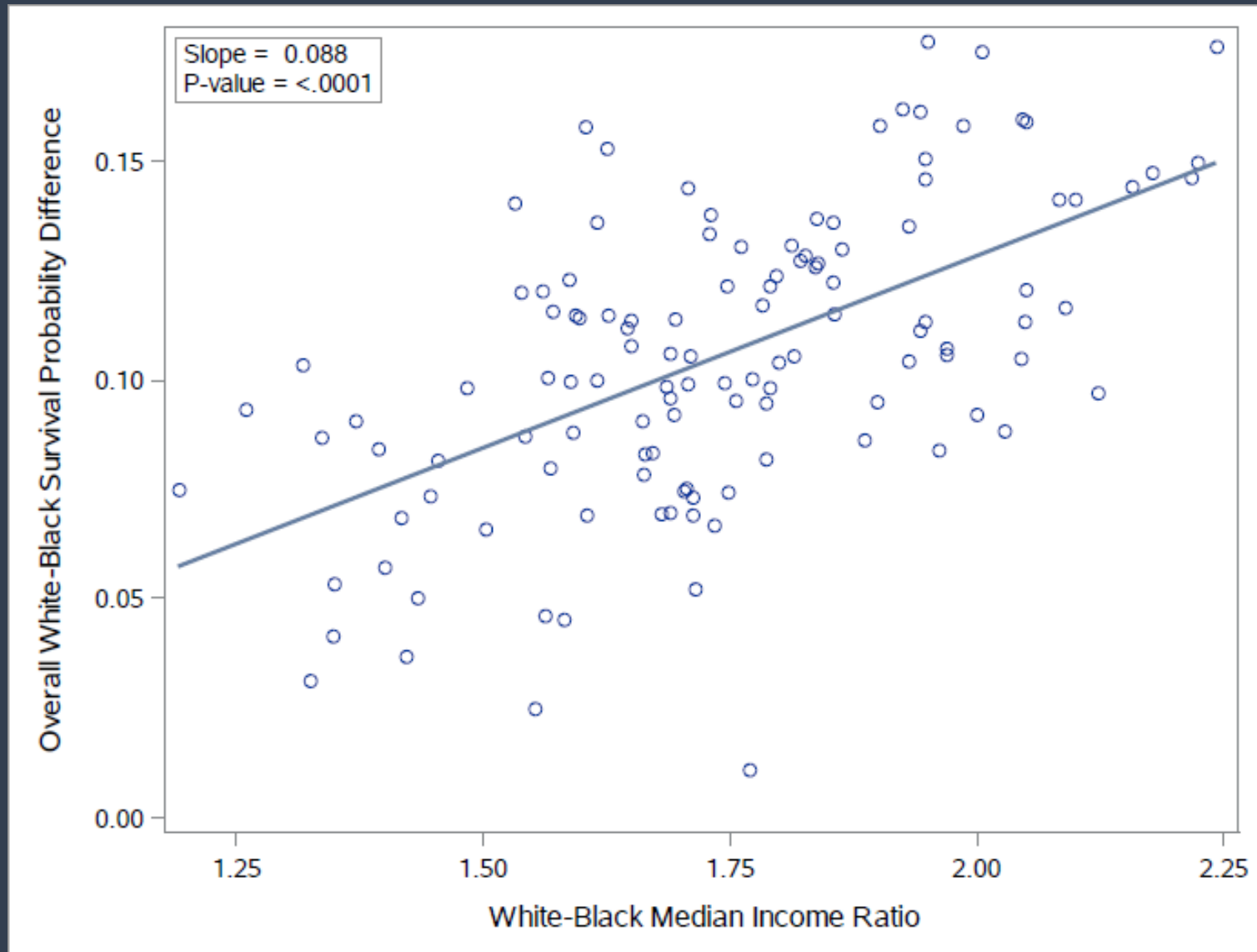
# Survival vs. Household Income, Whites



# Survival vs. Household Income, Blacks



# Racial Gap in Survival vs. Gap in Household Income



# Adjusted Results

|   | Change in White-Black Gap in Survival<br>for a 1.0 Increase in Dissimilarity Index |        |         |
|---|--|--------|---------|
|   | Men  | Women  | Overall |
| Model 1: Unadjusted   | .18***   | .09*** | .13***  |
| Model 2: Adjusted for percentage black population, race-specific socioeconomic index, health insurance coverage, and census region. | .09***   | .05*   | .07**   |

\* P<.10

\*\*P<.05

\*\*\*P<.01

# Conclusions

- White men and women have a much higher probability than their black peers of surviving from age 35 to age 75
- Segregation is associated with the racial gap in survival
  - The probability of survival is unassociated with segregation among whites, but declines with increasing segregation among blacks
- Segregation is associated with the racial gap in household income
  - Household income is unassociated with segregation among whites, but declines with increasing segregation among blacks

# Conclusions (cont.)

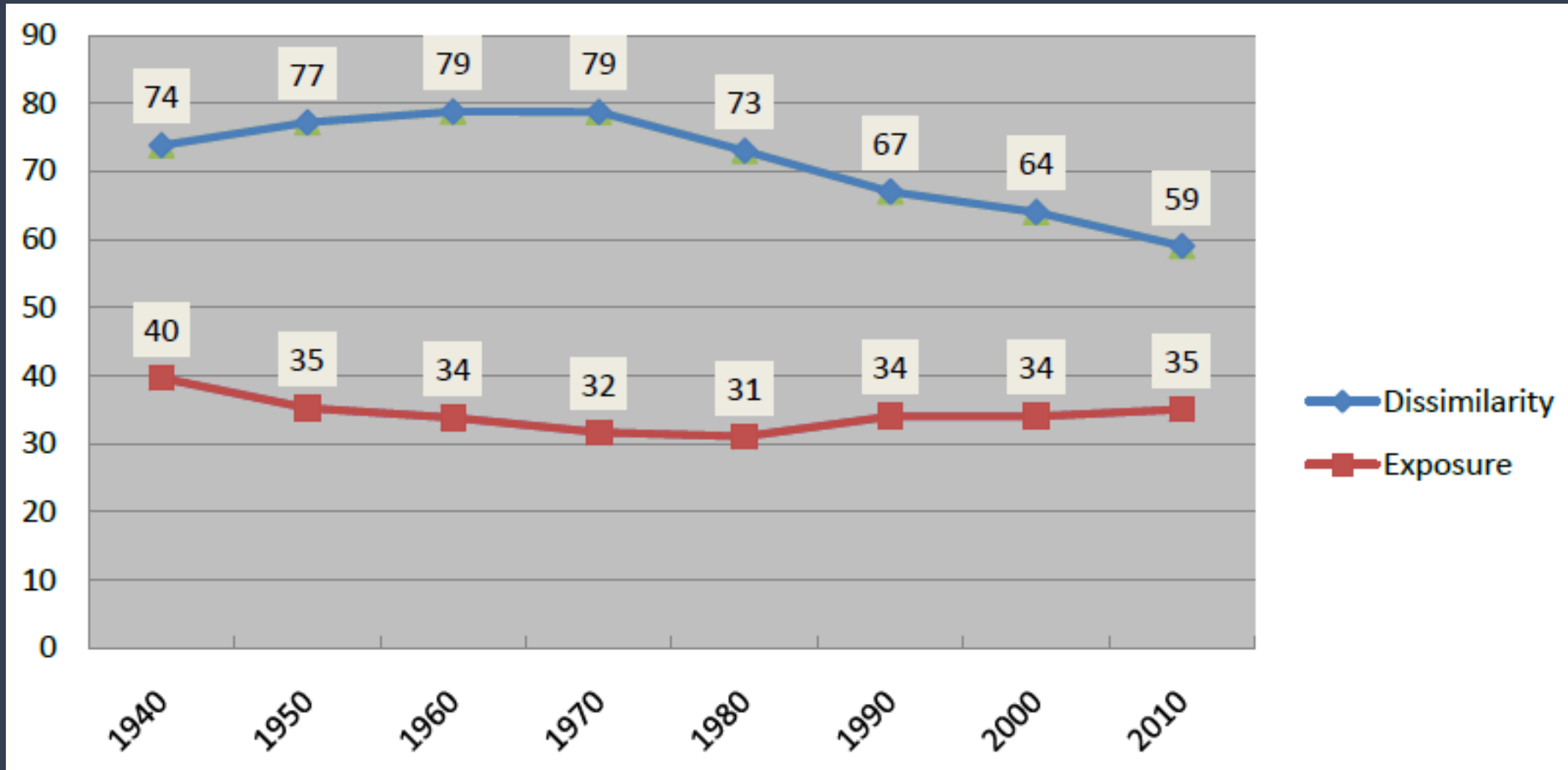
- Household income is associated with survival
  - The probability of survival rises with increasing household income among both whites and blacks
- However, the racial gap in socioeconomic status explains only about one-half of the effect size of segregation on the racial gap in survival
  - This is consistent with the notion that segregation may affect white-black disparities in health through a variety of pathways, likely related to constrained opportunities of many types for African Americans

Thank you!





# Black-White Segregation Trends, 1940-2010



# Data Sources

- CDC Wonder Mortality Data (2009-2013)
  - Reports data by gender and race for 5-year and 10-year age groups
  - Suppresses data for any gender/race/age group with fewer than 10 deaths
- Manhattan Institute 2012 Report on Segregation
- 2010 Census
- 2009-2013 American Community Survey

# Study Variables

## Outcome:

- Race-specific probability of survival from age 35 to age 75 in the metro area

## Explanatory variables:

- Dissimilarity index for the metro area
- Percent of population black in the metro area
- Race-specific socioeconomic characteristics in the metro area
  - Median household income
  - Percent of population below the poverty line
  - Percent of population age 25 or older without a high school diploma
  - Percent of households with a female head
  - Percent of males age 16 or older who are unemployed
  - SES index constructed from these five variables
  - Percent of population ages 18-64 without health insurance
  - Census region indicators

# Regression Model

We stacked the data to create a white observation and a black observation for each metro area and estimated the following two-equation model:

$$Y_{w,m} = \alpha_w + \beta_w D_m + \gamma_w P_m + \theta_w X_{w,m} + \varphi_w C_m$$

$$Y_{b,m} = \alpha_b + \beta_b D_m + \gamma_b P_m + \theta_b X_{b,m} + \varphi_b C_m$$

- $Y$  is probability of survival from age 35 to age 75
- $D$  is dissimilarity index
- $P$  is percent of the population black
- $X$  is vector of race-specific socioeconomic characteristics
- $C$  is a vector of indicators for census region

We used the sandwich estimator to correct standard errors for heteroskedascity and for clustering within metro areas.

Key estimate:  $\beta_w - \beta_b$