Social Geography of Diagnosed and Undiagnosed STIs Among Young Adults in Baltimore, MD

Charles F. Turner,[1,2]* Susan M. Rogers,[1] James R. Chromy,[1] Anthony M. Roman,[3] William C. Miller,[4] and Sylvia Tan[1]

[1]RTI International, Washington DC/RTP, NC; [2]City University of New York; [3]University of Massachusetts-Boston,

[4]University of North Carolina at Chapel Hill, School of Medicine

1. Background

Geographic propinquity affects the number and types of sexual partners available as well as sexual network connections. Geographic location also affects the pervasiveness of STI screening and the availability of STI treatment. We are currently exploring the geographic clustering of diagnosed and undiagnosed STIs and their association with the sociodemographic characteristics of census tracts and neighborhoods. We report selected preliminary findings.

2. MSSP Surveys

The 2006-2009 Monitoring STIs Survey Program (MSSP) tracked trends in three STIs (trichomoniasis, chlamydia, gonorrhea) in probability samples of the population ages 15 to 35 in Baltimore, MD. The target population was English-speaking young adults between 15–35 years of age residing in households with landline telephones . Respondents completed a private telephone computer-assisted self interview (T-ACASI) and provided a mailed-in biospecimen for STI testing. 2,936 study participants reported on their previously diagnosed STIs and STI-risk behaviors, and 2,136 participants provided biospecimens for STI testing. **Undiagnosed** infections were identified using NAAT assays of urine samples or vaginal swabs. **Diagnosed** infections were identified by participants' self-reports of infections diagnosed by a health care provider in the past year. (Our analyses combine results for the three STIs measured in the MSSP --- Tv, Ct, CT).

3. Statistical Methods

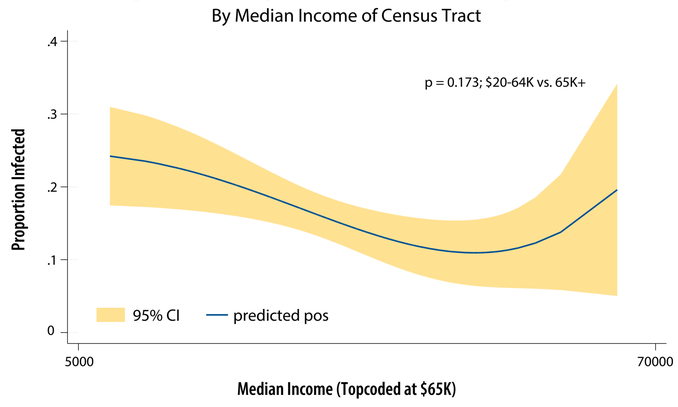
Survey weights were created to account for differing probabilities of selection and nonresponse (survey and specimen). Respondents' addresses were geocoded to the Census tract level and sociodemographic characteristics of tracts were appended to the respondents' data records. Weighted estimates of diagnosed and undiagnosed STI prevalence were calculated using: (1) respondents' reports of STDs diagnosed in past year, and (2) NAAT assay results to identify undiagnosed infections. Preliminary population-weighted analyses were performed using weighted fractional polynomial prediction plots. Confirmatory analyses were conducted using logistic regression and other svy procedures of STATA that can take account of the complex sample design of the MSSP.

4. Findings

The estimated prevalence of *undiagnosed* infections *appears* elevated among Black respondents living in Census tracts with high levels of median income.

While the fractional polynomial plot is suggestive (see **Figure 1**), formal tests indicate that we cannot reject the null hypothesis that undiagnosed infection levels were equivalent for Blacks residing in Census tracts with median household incomes of $30 to $64 thousand versus Blacks residing in Census tracts with median household income of $65+ thousand ($p = 0.173$). Given this result, the conservative conclusion is that undiagnosed infection prevalence neither rises nor falls for Census tracts with median incomes greater than $65 thousand (versus tracts with more moderate incomes.)

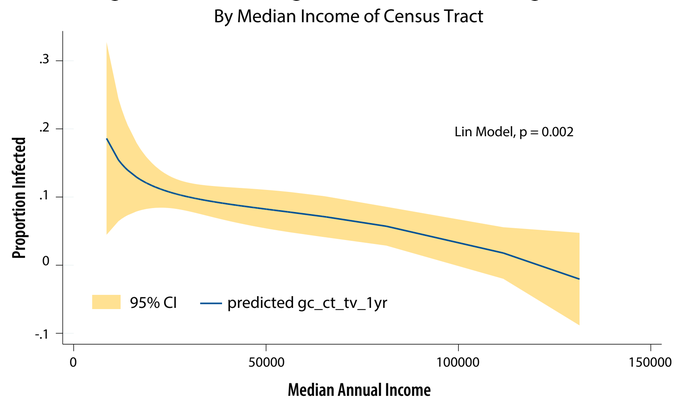
Figure 1: Undiagnosed Infections among Blacks
By Median Income of Census Tract



The estimated prevalence of *diagnosed* infections is elevated among Black respondents living in census tracts with low levels of median income.

The fractional polynomial plot shown in **Figure 2** illustrates the negative association between a Census tract's median income and the estimated prevalence of undiagnosed infection. Further analysis indicates that observed association is statistically significant ($p = 0.002$)

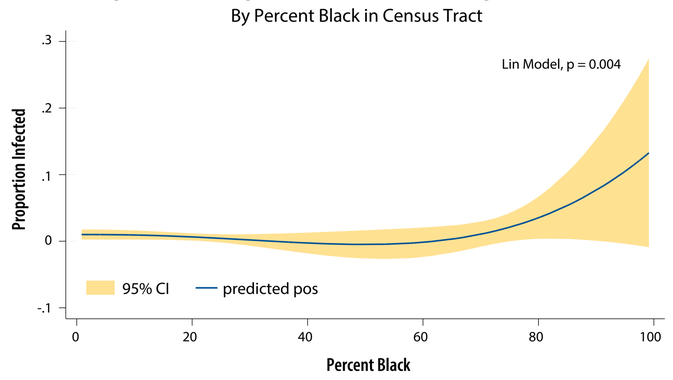
Figure 2: Annual Diagnosed Infections among Blacks
By Median Income of Census Tract



The estimated prevalence of *undiagnosed* infections among NonBlacks is highest among NonBlacks living in Census tracts with more than 80% Black residents.

The fractional polynomial plot shown in **Figure 3** illustrates this association. Subsequent logistic regression analysis finds that non-Blacks living in such Census tracts have a significantly ($p = 0.001$) higher prevalence of undiagnosed infections.

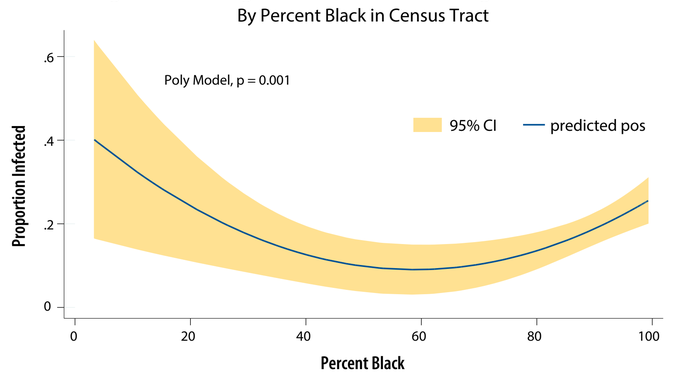
Figure 3: Undiagnosed Infections among NonBlacks
By Percent Black in Census Tract



The estimated prevalence of *undiagnosed* infection *among Black women* has a curvilinear relationship with the percentage of residents in a Census tract who are Black. (Higher infection prevalences are found in Census tracts with lower and higher proportions of Black residents.)

The fractional polynomial plot shown in **Figure 4** illustrates this association. Subsequent logistic regression found that there is a significant ($p = 0.001$) curvilinear component in logistic regression models of the prevalence of undiagnosed infections among NonBlacks as a function of the percent black in a Census tract.

Figure 4: Undiagnosed Infections among Black Females
By Percent Black in Census Tract



5. Conclusion

Initial results led us to speculate that inadequate screening resources may be targeted on Black respondents residing in wealthier neighborhoods — resulting in an elevated prevalence of undiagnosed infection in this subpopulation. A closer examination finds that the result shown Fig. 1 is visually suggestive but not statistically convincing ($p = 0.173$). Other results were consistent with our preliminary conclusions.

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More Information

***Presenting author:** Charles F. Turner
917.243.4806
CFTurner@PopEpi.org

RTI International
3040 E. Cornwallis Road
Research Triangle Park, NC 27709

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