Urbana IDOT Statistics Committee Update

Prepared for Meeting on November 19, 2014

With apologies for getting this to the committee so late. Below is brief summary of what we've been doing and what we will do. As always, your feedback, comments and suggestions are incredibly helpful.

What we've done

Working with data from the 2010 census, we've produced population estimates weighted by the census block for the racial composition of the 130+ police geocodes.[1]

Figure 1 shows the estimated number of minorities living in each geocode.

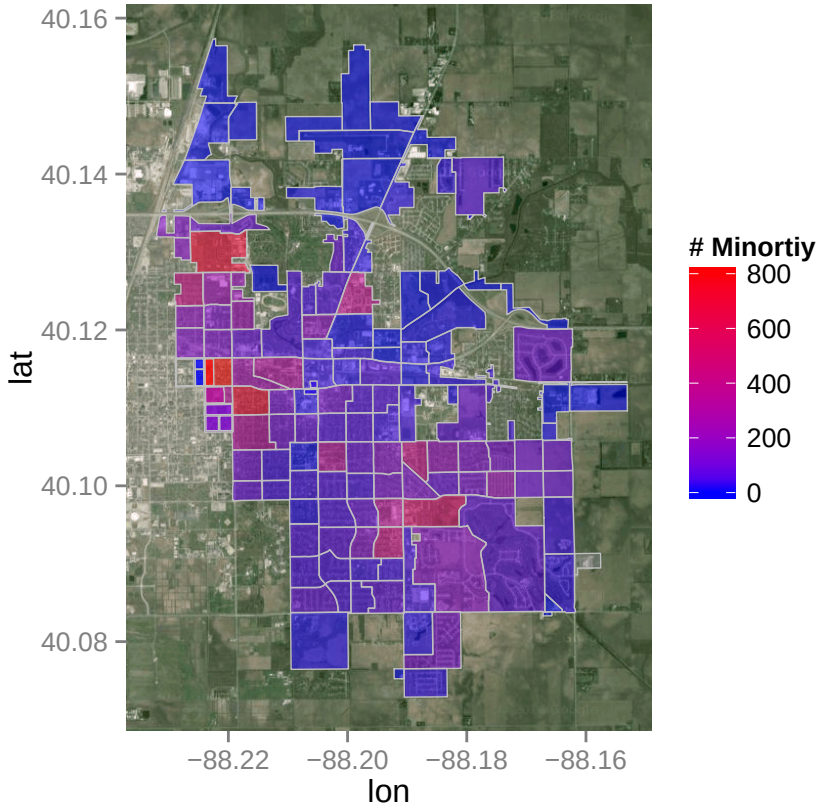

Figure 1: Minority Population by Geocode

Figure 2 shows the the total number of minority stops by geocode for the total 10 year period (2004-2013).

We can use information in Figure 1 and 2 to produce geocode-level measures of the IDOT disparity or relative risk of a minority being stopped based on the estimated minority population in each geocode. Spefically, for each geocode, i we calculate θ_i, a ratio of two proportions:

[1]Specifically, we overlayed the police geocode map onto the census block maps and then weighted populations for each block by the proportion of the blocks total area within the geocode. Consider a block with 10 people. If that block falls entirely within a geocode, all 10 are counted toward the estimated population of the geocode. If only half of the block falls within a geocode, that block would add 5 people to the estimate of the total population of that geocode.

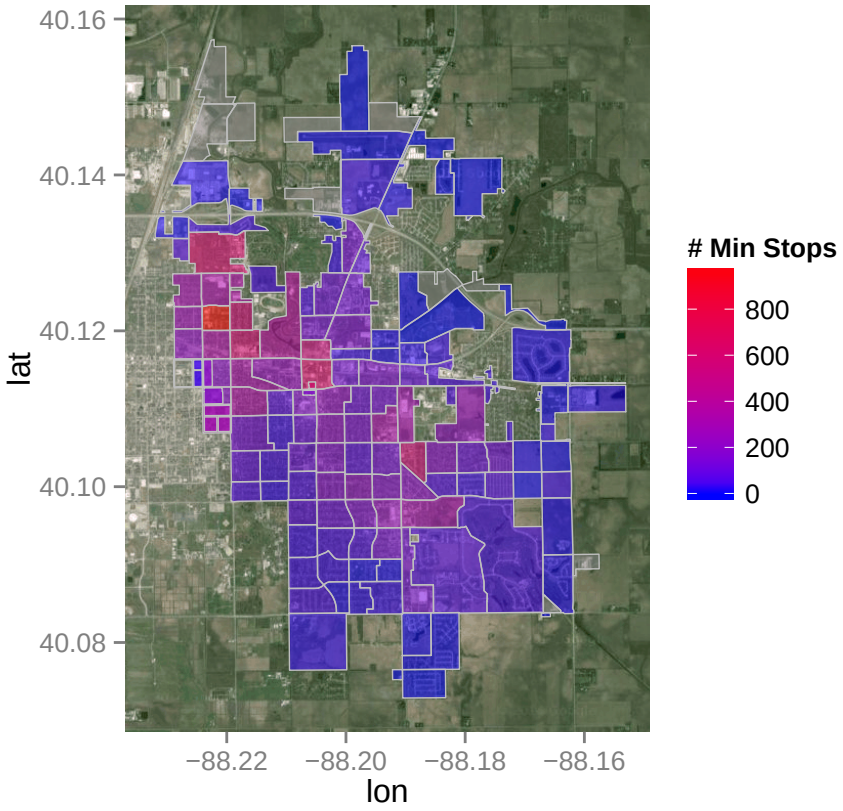

Figure 2: Minority Stops by Geocode

$$\theta_i = \frac{\frac{\text{Minority Stops}}{\text{Total Stops}}}{\frac{\text{Minority Population}}{\text{Total Population}}}$$

Figure 3 shows these estimates for each geocode, with blue being values below 1 (lower than expected risk of being stopped based on relative the proportion of minorities in the geocode's population), white being values close to 1 and red being values above 1 (more than expected risk). The same caveats about the IDOT measures apply to these, and note that when there few stops and/or small population in a geocode these estimates can be quite volatile. To capture this volatility, we also constructed confidence intervals for the point estimates, that reflect the uncertainty of estimates where their are relatively few stops or small populations. Figure 4 shows the geocodes with $\theta > 1$ (i.e. more than expected risk) whose 95-percent confidence intervals do not include 1.

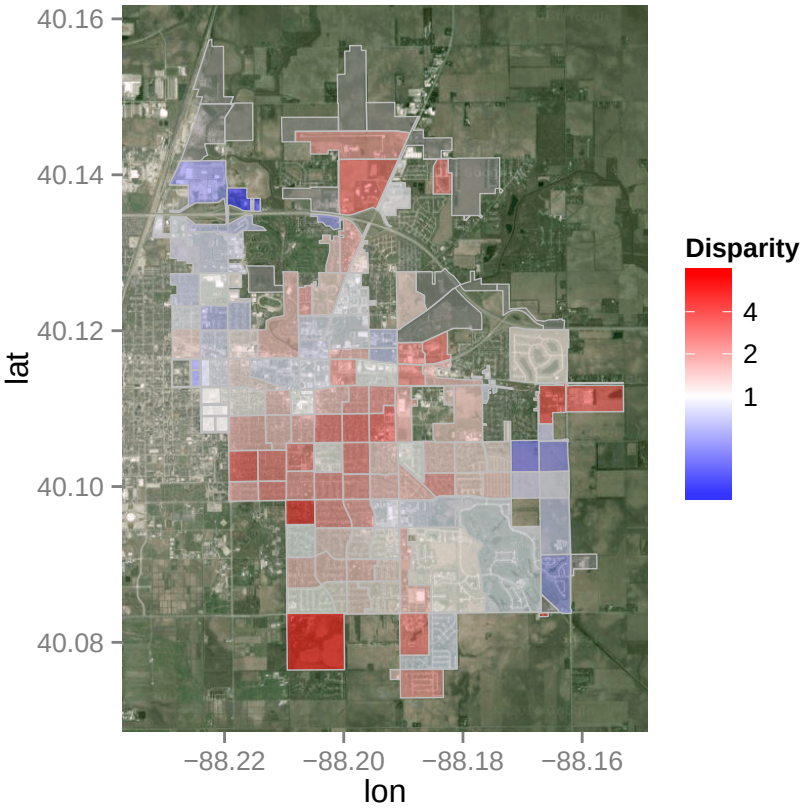

Figure 3: Disparity by Geocode

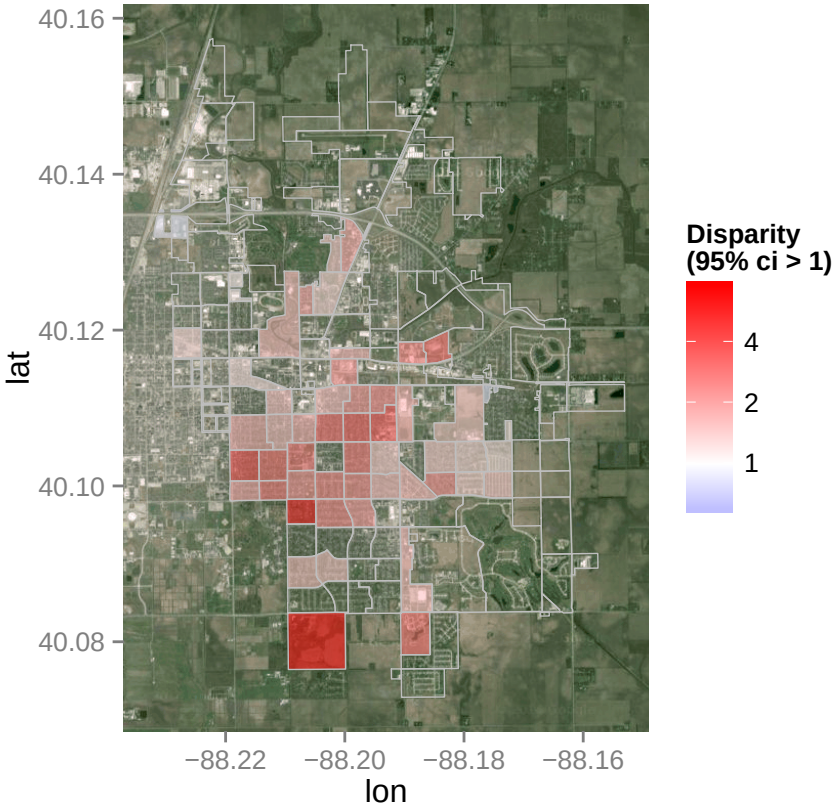

Figure 4: Disparities by Geocode (95% ci $>$ 1)

What we're still working on

IDOT data

There are lots of different visualizations we can produce. We can produce maps by ethnicity, and broken out by year. We can also look at other outcomes. For example Figure 5 shows the distribution of searches over the 10 year period.

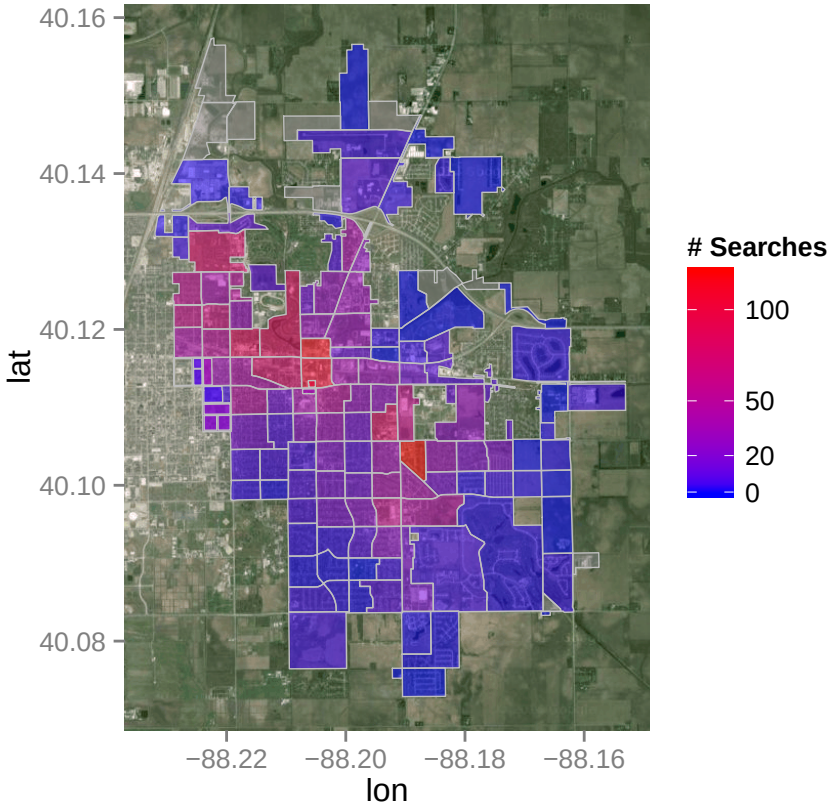

Figure 5: Searches by Geocode

Incorporating additional data

- Incorporating data on crime and calls for service.
- Comparing reason for stop versus the actually citations
- Looking at court data on the costs of stops

Tables

- We promise all the raw data be in nicely formatted tables before the next meeting.