Understanding stop and search decisions

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Search process

Officer's options: {no search, Asian search, Black search, White search}

Multinomial logit:

$$\log \frac{P(y = \text{Black})}{P(y = \text{no search})} = X_{\text{area, officer}}\beta$$

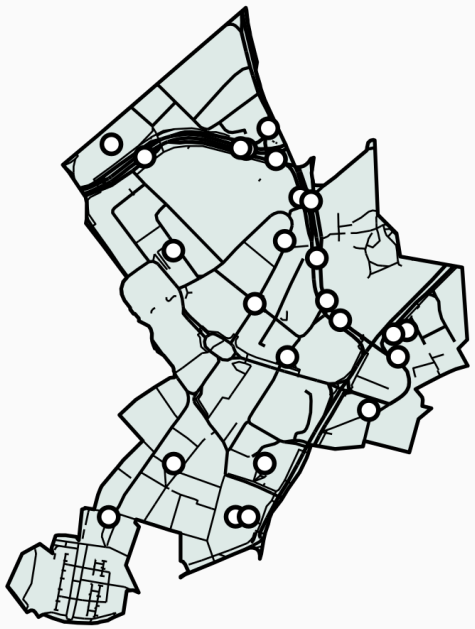
The problem

We never have the counterfactual of "officer in an area but no search"

An idea: we could use other data as approximation

↳ example: traffic accidents

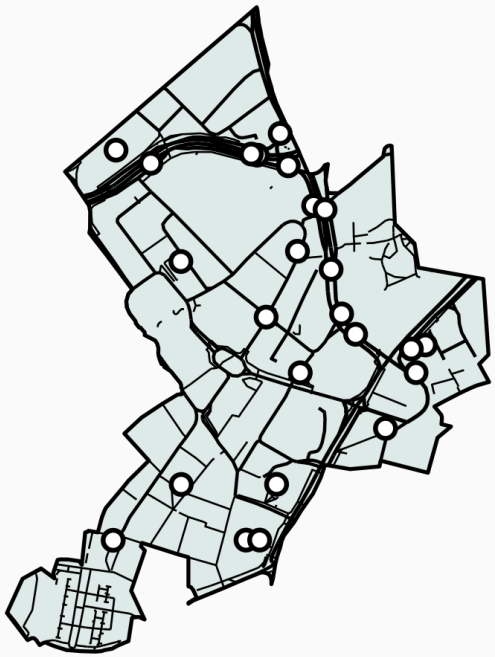
↳ officer was at least in the area

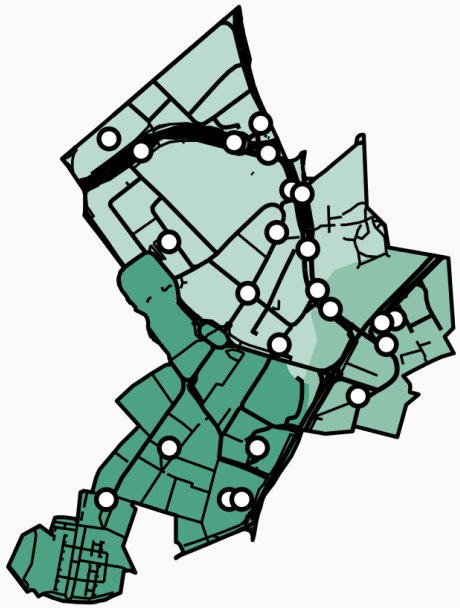


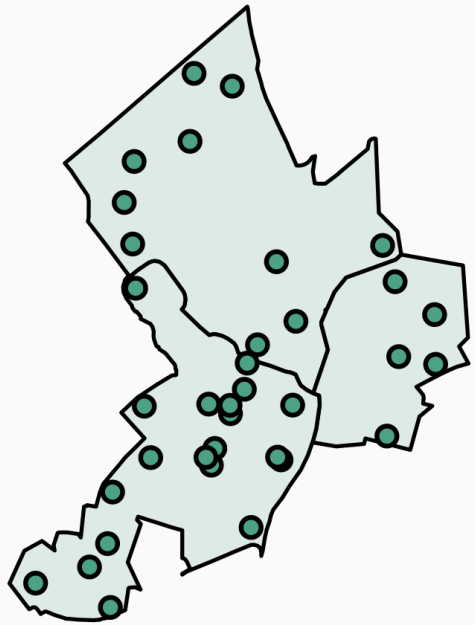
But that data is spatially biased!

A solution: Officers are koalas

De-bias input data using spatial Log Gaussian-Cox process predictions (Renner et al., 2015)



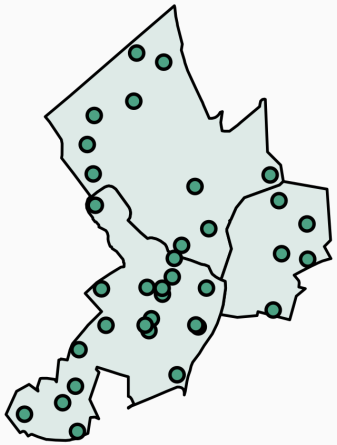




1. take biased input
2. specify sources of bias
3. adjust and predict

Now what?

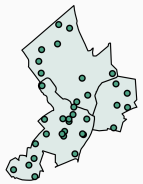
1. Predictions as counterfactual



$\rightarrow$ adjusted for over- and under-counting bias

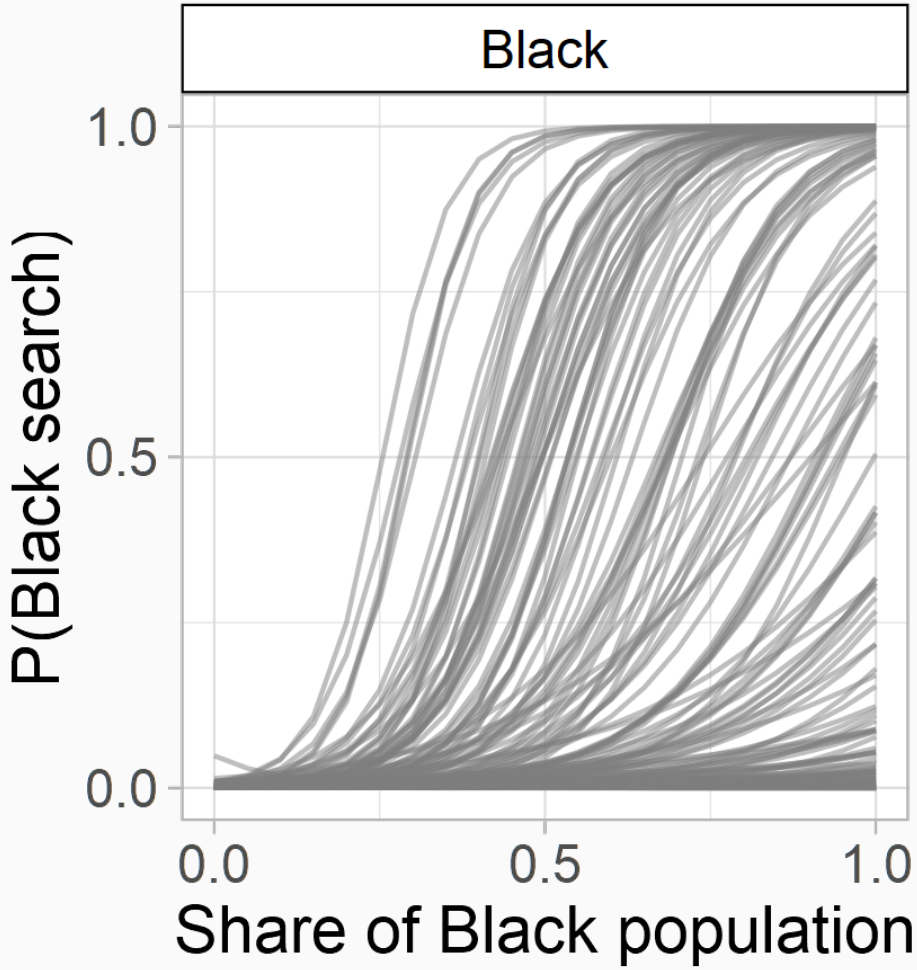
2. We use that as input in our model of interest

$$\log \frac{P(y = Black)}{P\left(y = \right.} = X_{\text{area, officer}}\beta$$



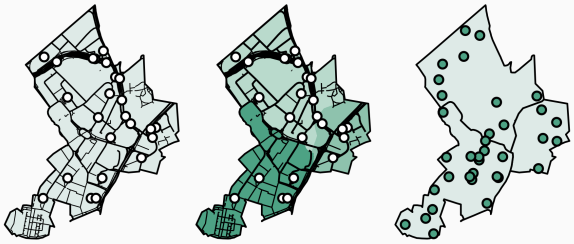
$$\left.\right)$$

Why bother?


Black
1.0
0.5
0.0
P(Black search)
0.0
0.5
1.0
Share of Black population

Wrapping up

- A new methodology to understand decisions with a spatial attribute
- from spatially biased approximations to counterfactuals

↳ 

↳ $$\log \frac{P(y = Black)}{P\left(y = \right)} = X_{\text{area, officer}}\beta$$

- provides a window into a decision-making black box