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Estimating the Depth of the Navy Recruiting Market

Buttrey, Sam

Monterey, California. Naval Postgraduate School

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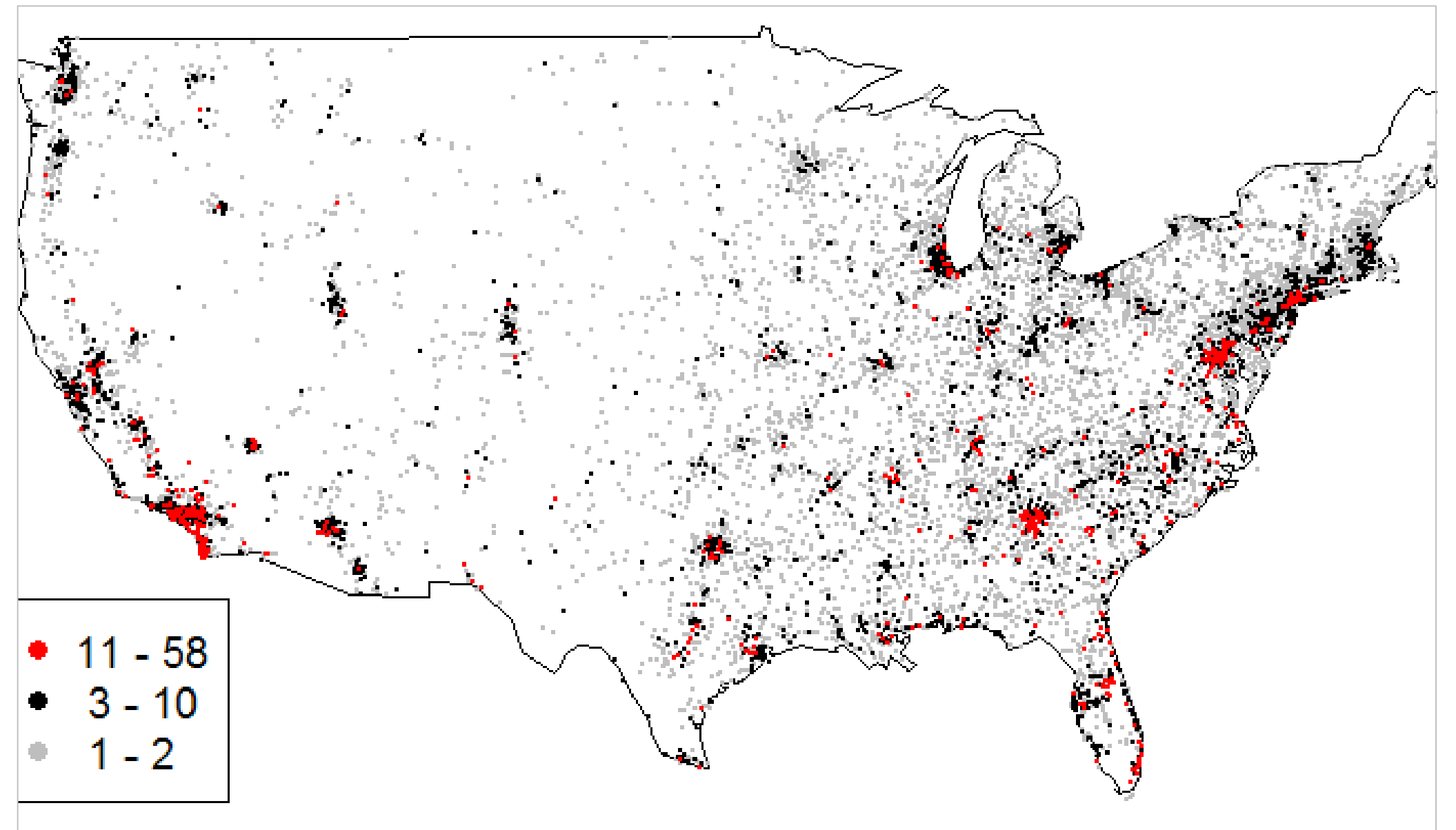
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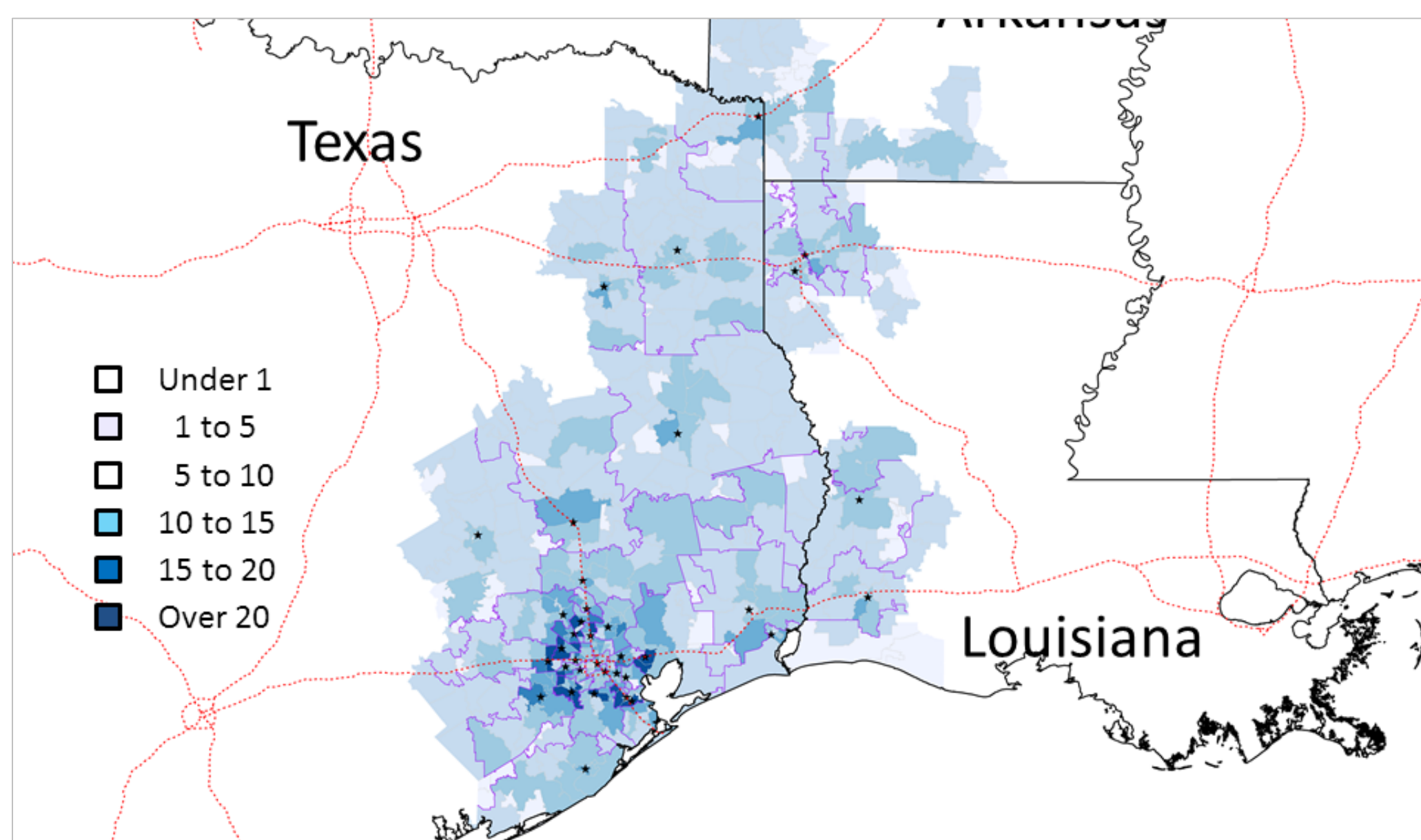
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Eligibility and Propensity

- Different regions of the country have young people with different rates of *eligibility* (qualifying for service) and *propensity* (interest in joining)
- These depend on factors relating to health, demographics, access to higher education, access to non-military employment, and so on
- Accurate models of eligibility and propensity will allow Recruiting Command to operate more efficiently



National-level leads by Zip code centroid



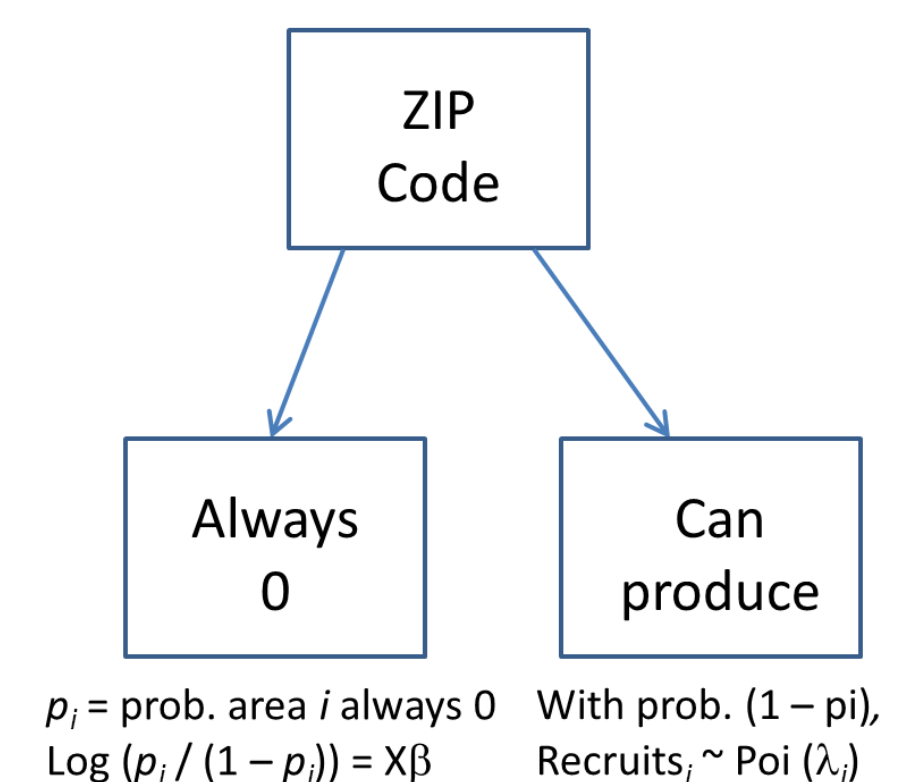
Market Depth (accounting for population and propensity)
example: Naval Recruiting District Houston

Chicken and Egg

- Areas with lots of recruits have lots of recruiters assigned there, and areas of with lots of recruiters assigned naturally produce lots of recruits
- We looked at national-level “leads” (like web site visits, calls to 1-800-USA-NAVY) as a proxy for propensity
- We acquired and merged open-source county- or Zip-level data on hundreds of factors to use as predictors

Zip Codes With No Recruits

- Many zip codes produce no recruits
- Some of these will never produce recruits because they have no residents (universities, PO boxes)
- Others could produce recruits but in fact do not
- Ignoring this problem causes over-dispersion in the usual Poisson generalized linear model
- The zero-inflated Poisson models unproductive Zips in a first stage, and Poisson counts for recruits in a second



Conclusions

- Our models work better than the alternatives but tend to under-predict recruits in highly populated areas
- Rather than one national model we should fit separate models in separate regions