

Group Testing for Infectious Disease Detection

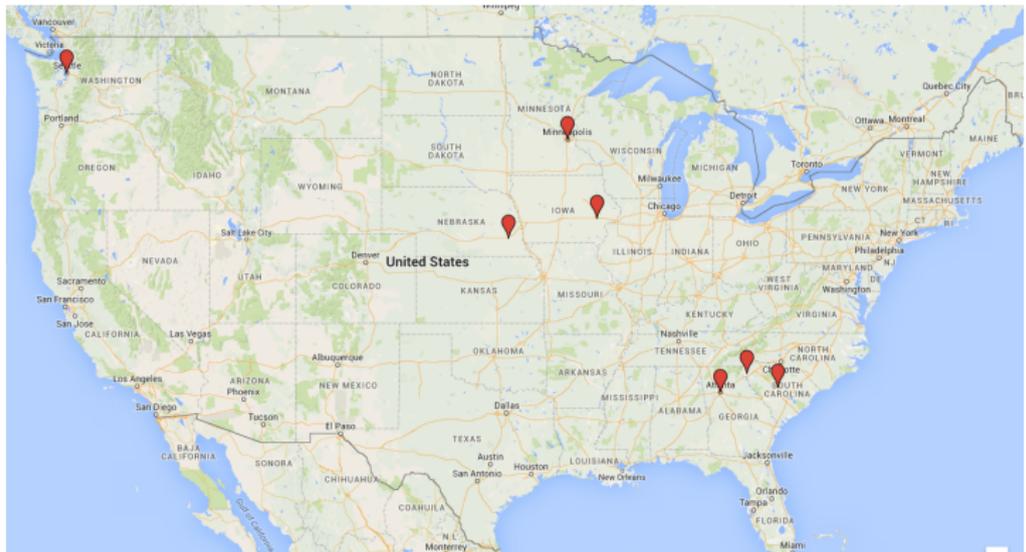
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- Nebraska Community Blood Bank
 - Screen donations for HIV, HBV, HCV
 - Pool specimens into groups of size 6
 - If group is **negative**, no one in the group has any of the diseases
 - If group is **positive**, at least one individual has at least one of the diseases
 - Retest individuals in **positive** testing groups
- Why test in this manner?
 - Very low disease prevalence
 - Fewer tests (save time and money) than with individual testing
- Uses
 - Identify who is positive/negative
 - Estimate probability of disease positivity – Overall prevalence or as function of covariates

- Interesting aspects for statisticians
 - Unobservable, correlated binary random variables
 - Responses observed are subject to measurement error
- NIH grant R01AI067373, 2007-2011
 - Principal Investigator
 - \$718K
 - Informative group testing

- NIH grant R01AI121351, 2016-2019
 - Preliminary research won the 2014 Outstanding Statistical Application Award given by the ASA (Tebbs, McMahan, and Bilder, *Biometrics*, 2013)
 - Feb. 2015 submission: Impact score = 25, Percentile = 29.0
 - Nov. 2015 resubmission: Impact score = 11, Percentile = 1.0
 - Funded this summer at \$1.128 million
 - Principal Investigator with collaborators located:



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