

# Group Testing for Infectious Disease Detection

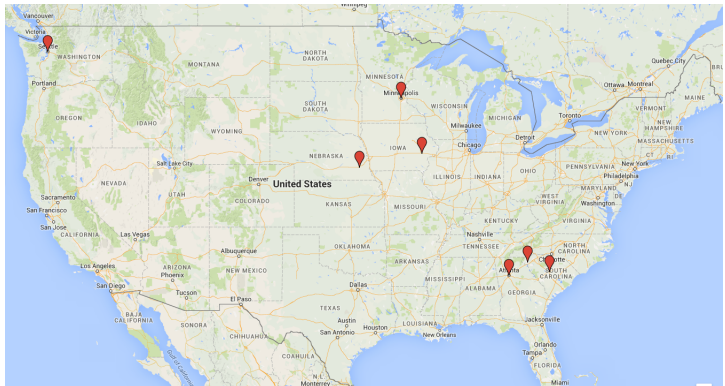
Christopher R. Bilder

University of Nebraska–Lincoln  
Department of Statistics  
[www.chrisbilder.com/grouptesting](http://www.chrisbilder.com/grouptesting)

- 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:



# Group Testing for Infectious Disease Detection

Christopher R. Bilder

University of Nebraska–Lincoln  
Department of Statistics  
[www.chrisbilder.com/grouptesting](http://www.chrisbilder.com/grouptesting)