

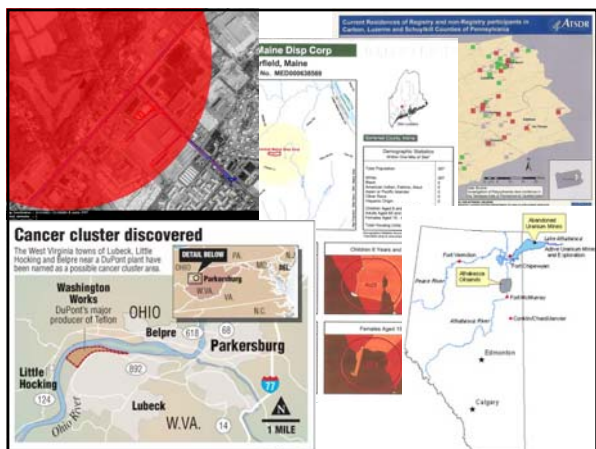
A Geographic Approach to Data Quality

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FCDS Annual Meeting 2009

Place Matters

- Disease and disease risks
 - Not random in physical space
- Incidence, mortality, treatment, and survival
 - Vary by geography
- GIS -- Exploratory
 - Map data, visualize relationships, generate hypotheses
- Spatial analysis – Statistical Approach
 - Relationships among place and health





Cancer cluster discovered
The West Virginia towns of Little Hocking and Belpre near a DuPont plant have been named in a possible cancer cluster area.

Washington Works
DuPont's major producer of Teflon

Little Hocking

Belpre

Parkersburg

Lubeck

W.VA.

Abandoned (Parkus 1916)

Geography of Cancer

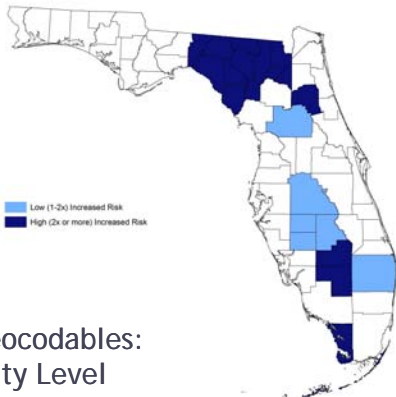
- Always will be geographic patterns that can be seen visually on a map
 - But are the differences real?
 - Are they statistically random?
 - Are they the result of bias?



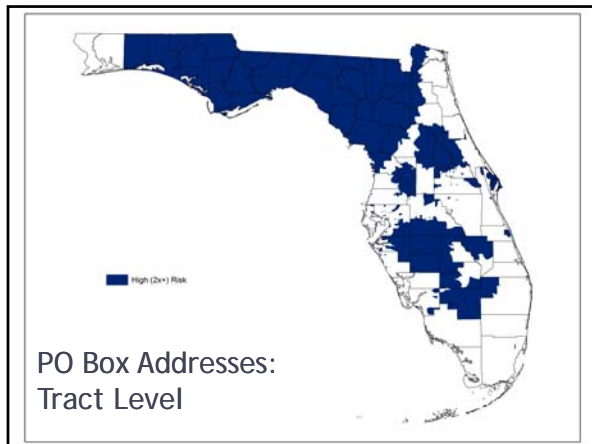
Clustering of Missing Data

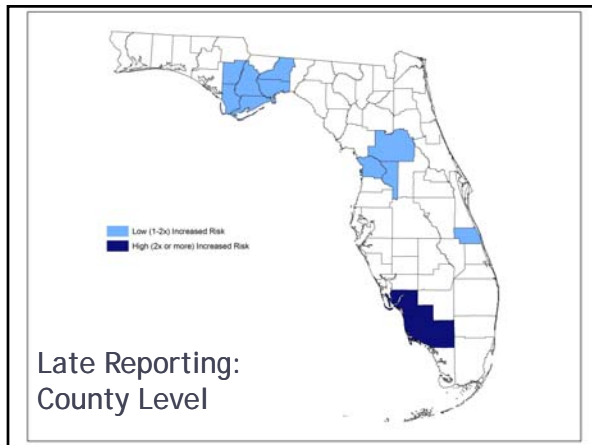
- Bernoulli method
 - Ratio of missing:non
 - Not a rate
- Different levels of geography/datasets
 - Determined by what is available
- Light blue
 - 1 -2 times the missing data than expected
- Dark blue
 - 2 or more times than expected

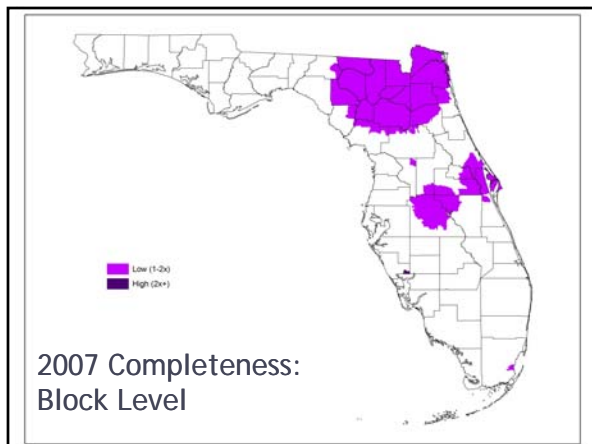


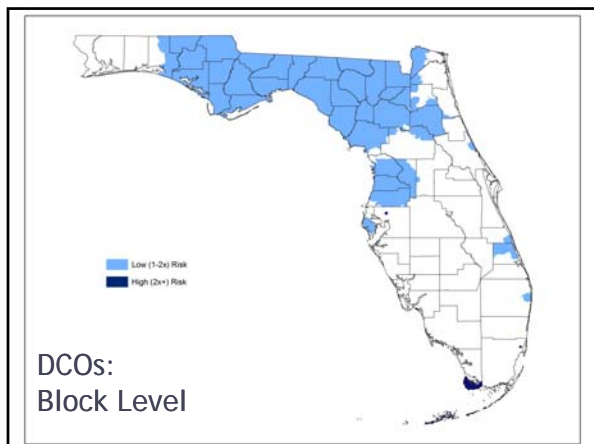


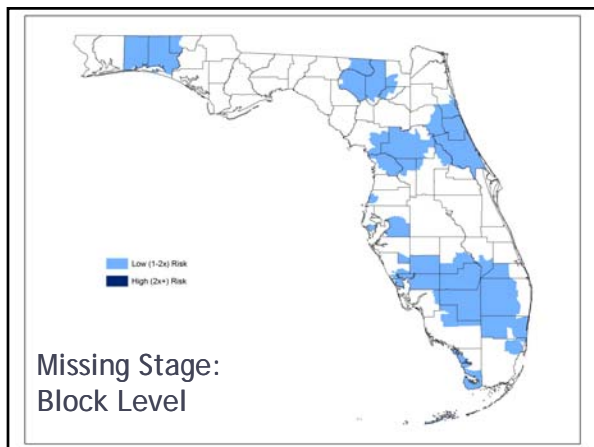
Ungeocodables:
County Level

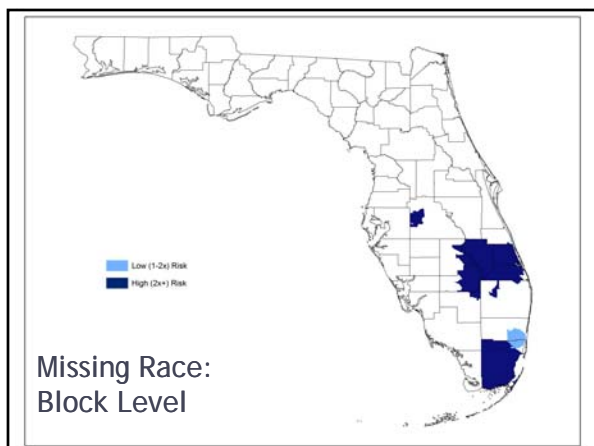


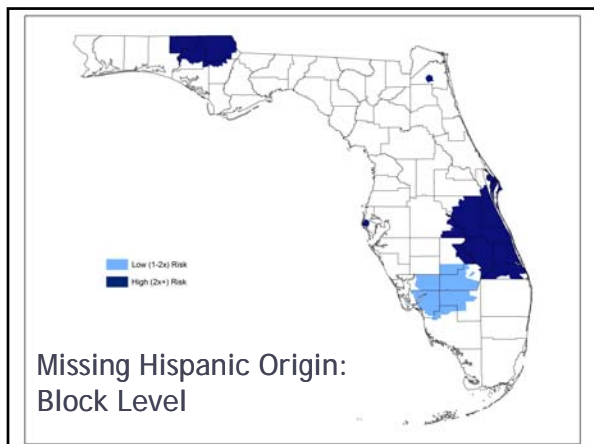














Missing Data in Cancer Registries

- Absence of clinical assessment
 - Hospital/Physician
 - Access
- Failure of surveillance systems to capture information
- Data collection differences
 - Hospital CTR
 - Central Registry
 - Non Reporting Physician
 - Demographic differences



Impact of Missing Data

- Random
 - Reduce the power of spatial analysis
 - Inconclusive or missed associations
- Systematic
 - Misclassification of exposure
 - Biased or incorrect results
- Same demographic risks for missing data
 - Why aren't maps similar?



Acknowledgements

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- Contents are responsibility of authors and do not represent views of FL DOH or CDC