

GIS for Decision Making in a Local Health Department Setting: A review of health center placement

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Jefferson County Department of Health

- Jefferson County

- Population 659,503
 - Black – 41.1%
 - White – 56.3%
 - Hispanic (any race) – 3.1%
- Med HH – 46, 305

- Birmingham, AL

- Population 210,422
 - Black - 71.9%
 - White - 23.9%
 - Hispanic (any race) - 3.9%
- Med HH – 32,630

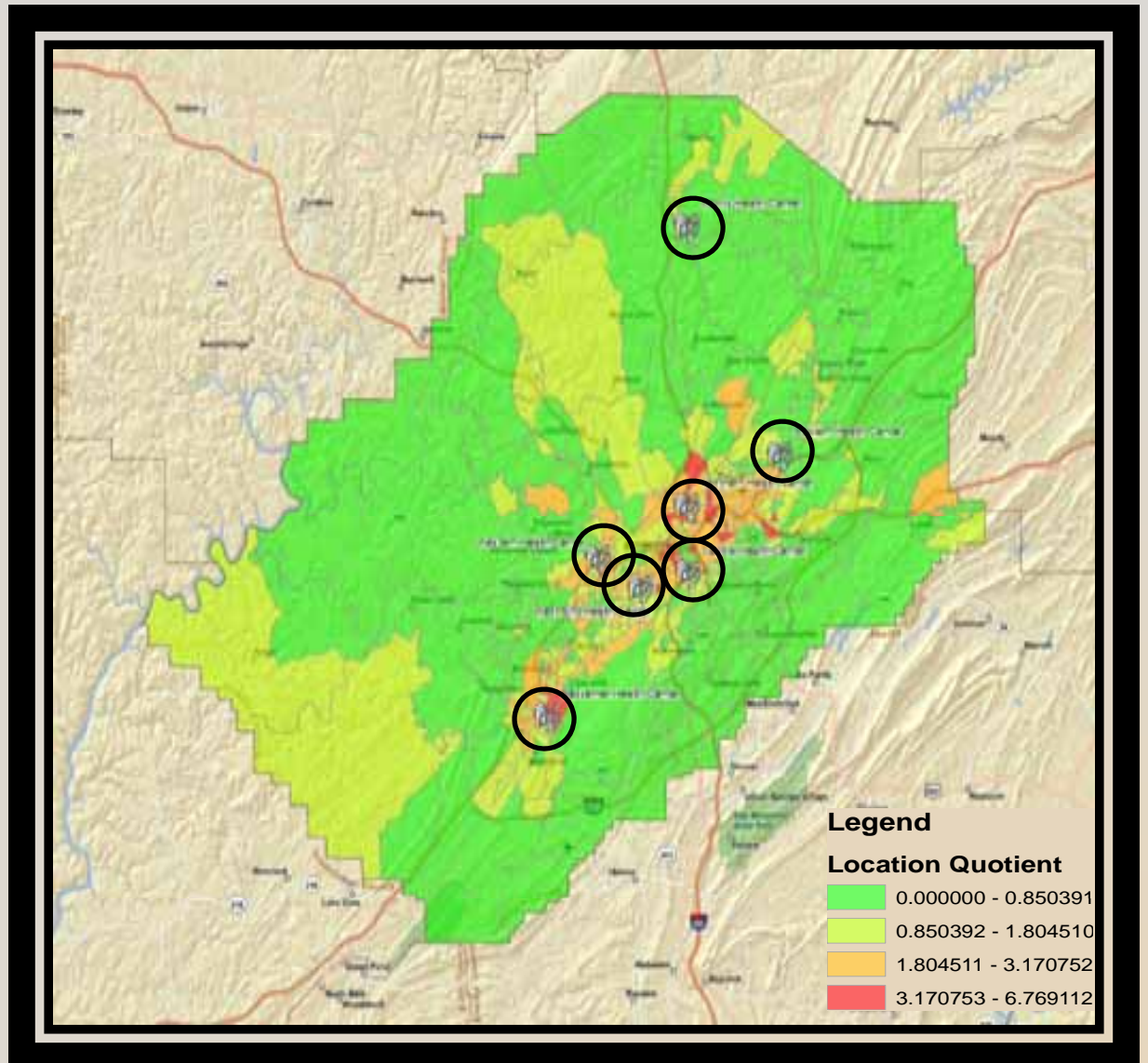
- JCDH Patient Population

- Population approx. @ 43, 133
 - Black – 78.8%
 - White – 19.7%
 - Hispanic (any race) - 12.4%
- Majority of patients use Medicaid, Medicare, AllKids, etc.



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- Location Quotient
 - Ratio of poverty concentration in Jefferson County compared to AL
- Seven Health Centers (HC)
 - Bessemer (BHC)
 - Western (WHC)
 - West End (WEHC)
 - Central (CHC)
 - Northern (NHC)
 - Eastern (EHC)
 - Morris (MHC)



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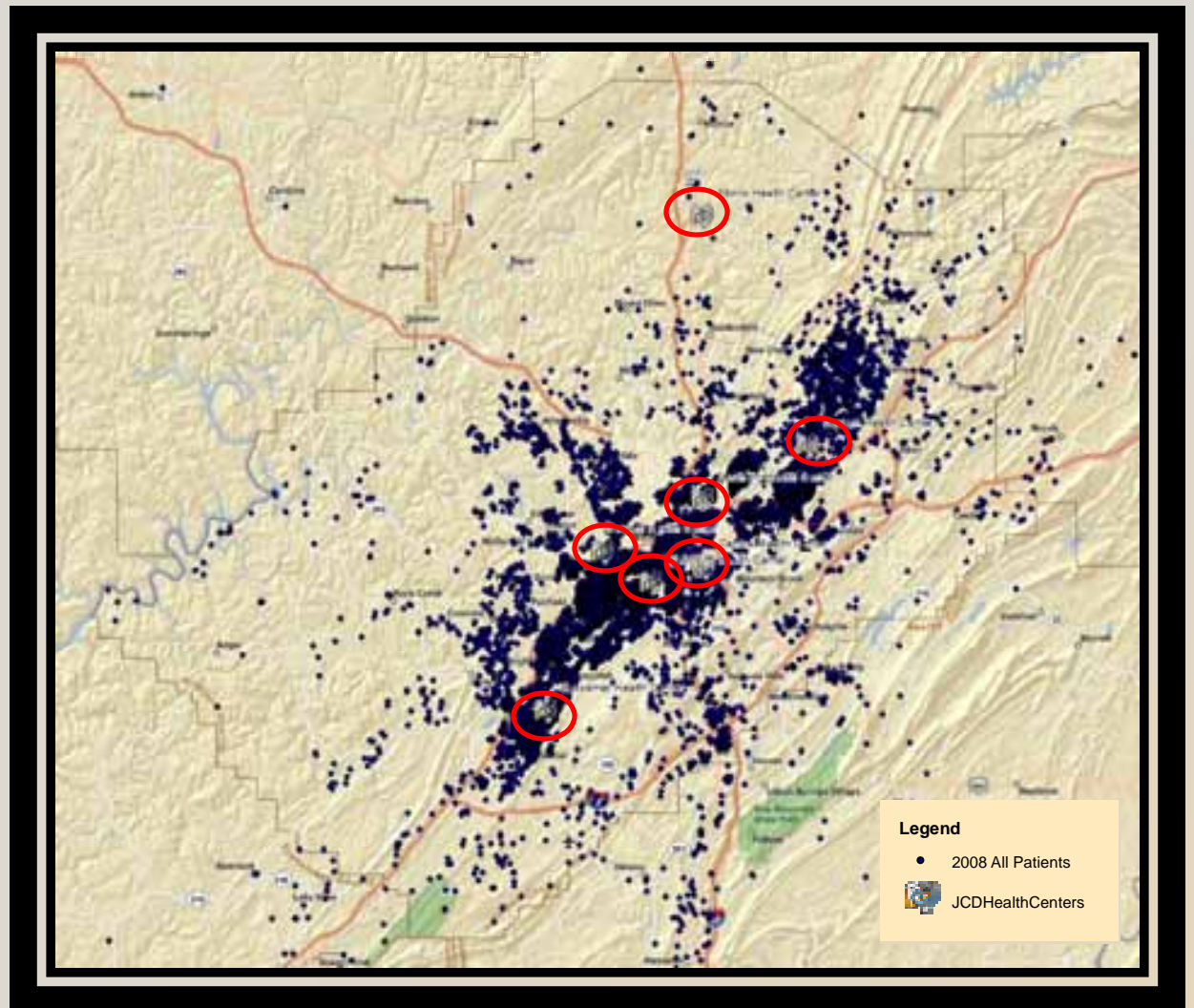
- JCDH operated seven health centers in 2008
 - 4 were running below capacity
 - Cost to operate was growing larger than income
- Patient population was declining
 - 14.4% between 2000 and 2008
- Shift in thought
 - turning away from neighborhood based health centers

GIS Questions

- Where do JCDH patients live and how far from their center of choice?
- What proportion of JCDH patients are served in a reasonable distance from a HC?
- What would center consolidation look like?

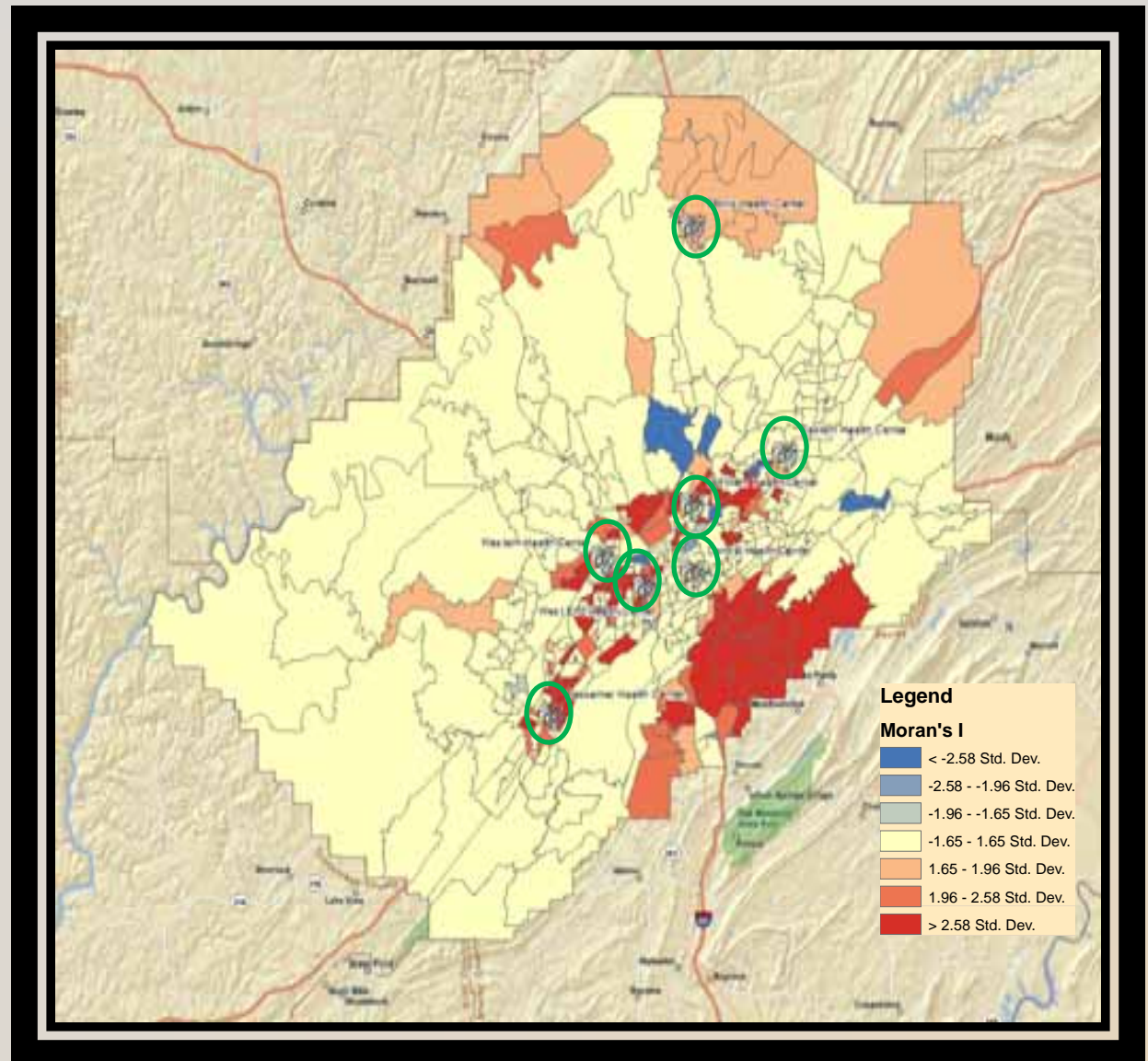
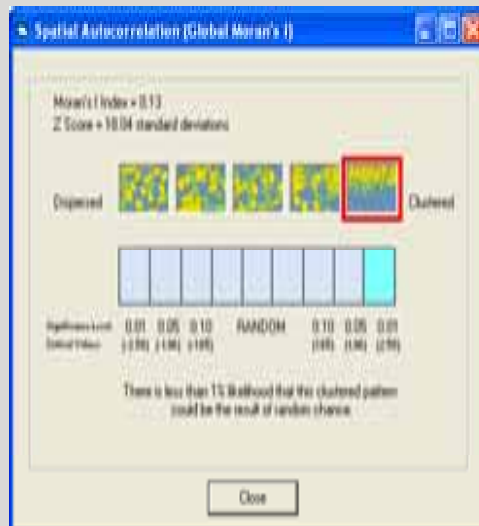
Where do JCDH patients live?

- Distance between points - distance between residence and health center of choice
- Some patients pass HC to reach their HC of choice
- Avg. distance ranged from 4.9 to 9.0 miles
- Overall patients, on average, drive 6 miles to a HC



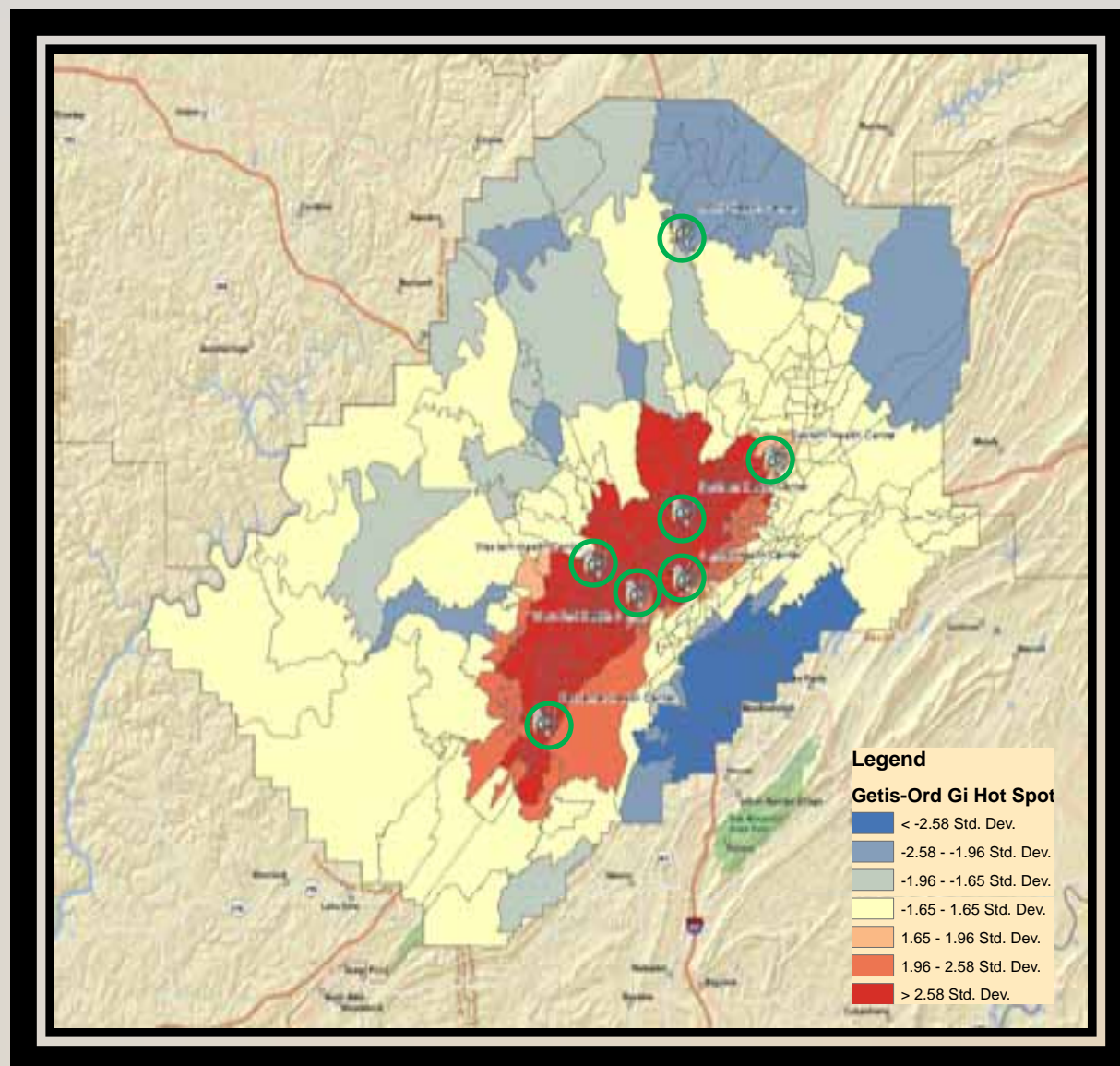
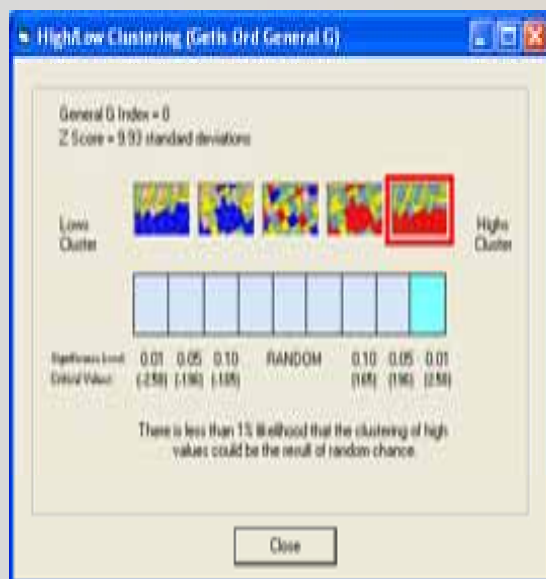
Where do JCDH patients live?

- Test for Spatial Autocorrelation
 - Percent of population that are JCDH patients



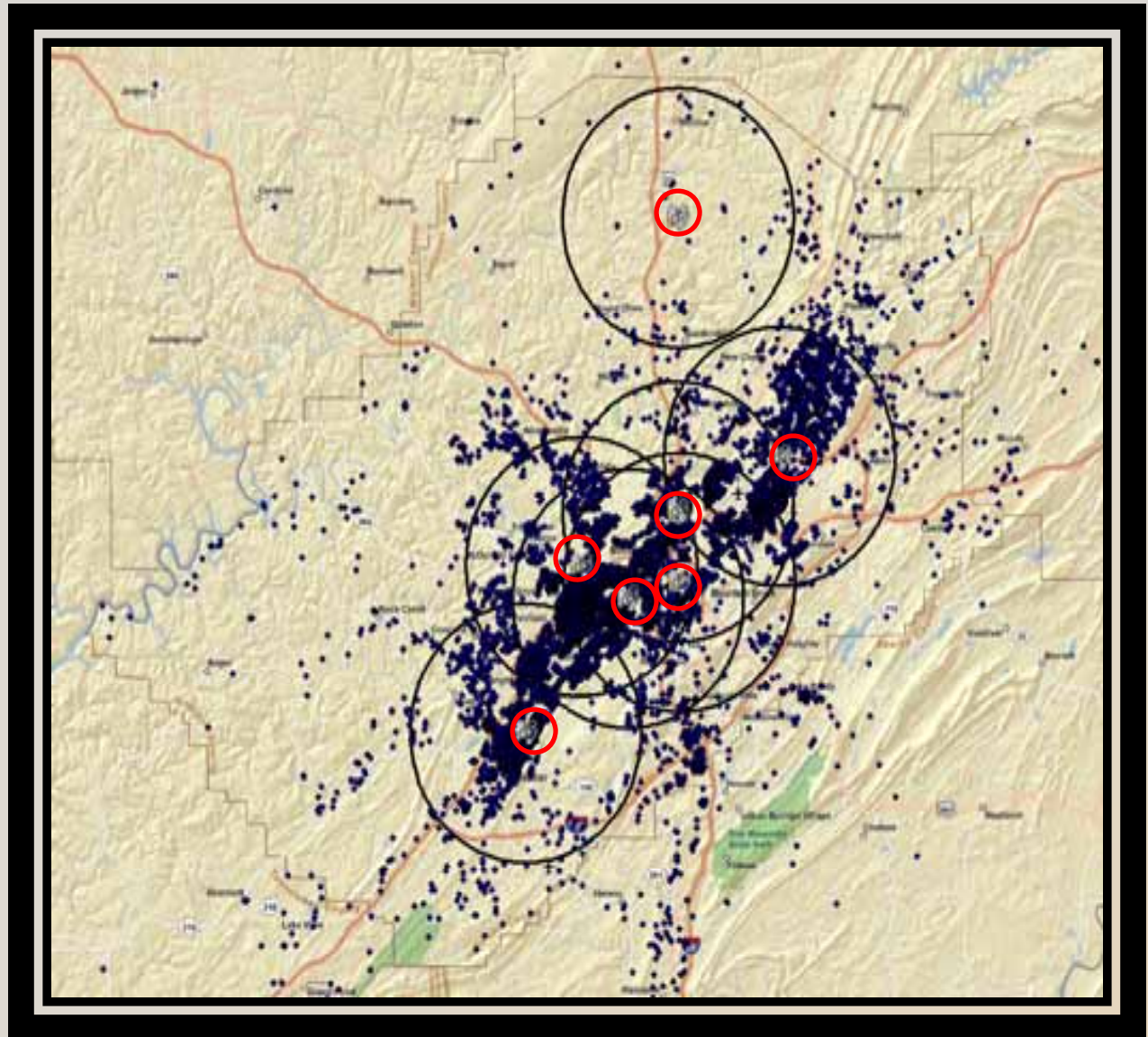
Where do JCDH patients live?

- Test for High/Low clustering
Percent of population
that are JCDH patients



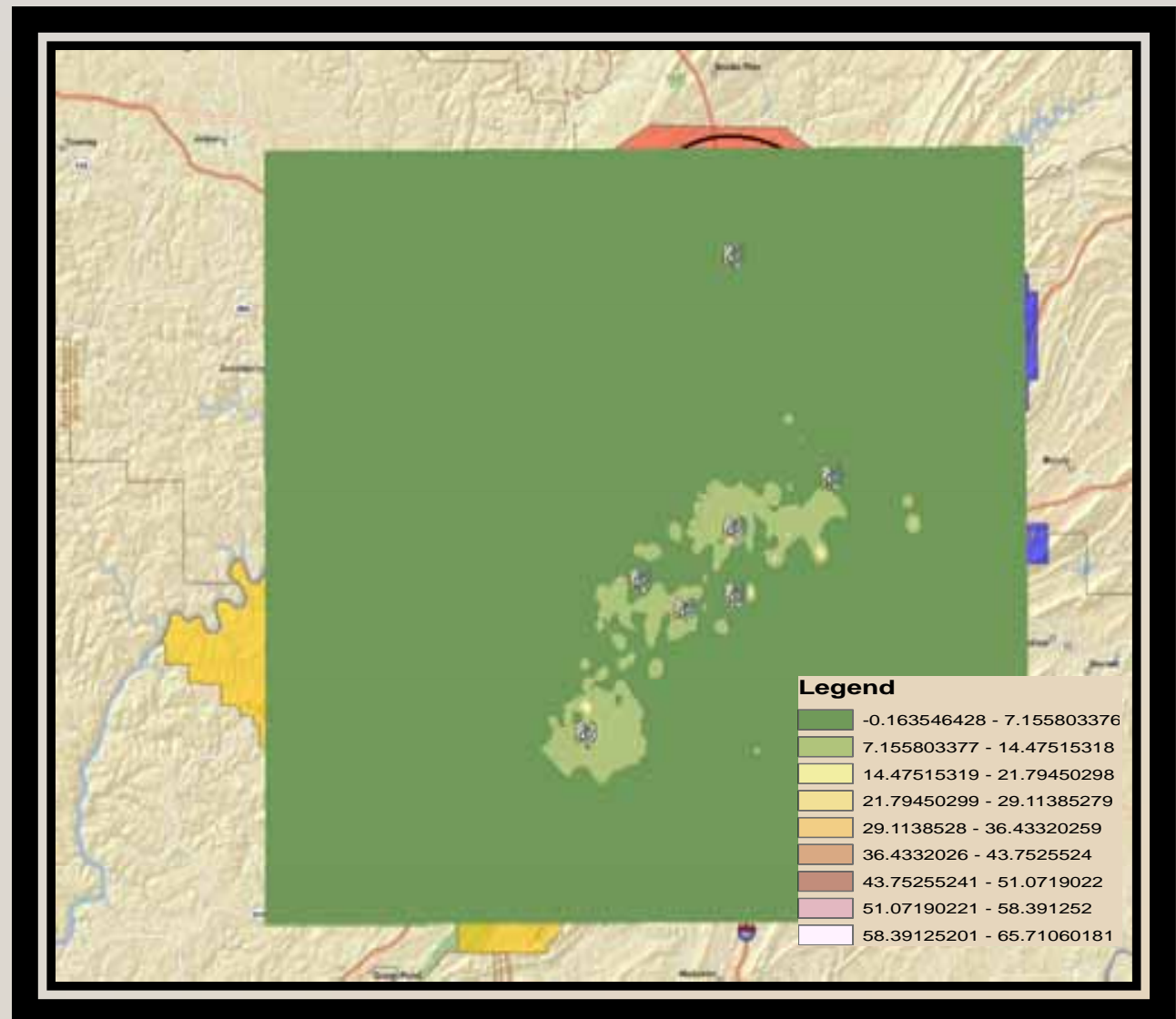
What proportion of JCDH patients are served?

- 6 mile radius around HC
- Seven HC, 84% of patients served in 6 miles of residence



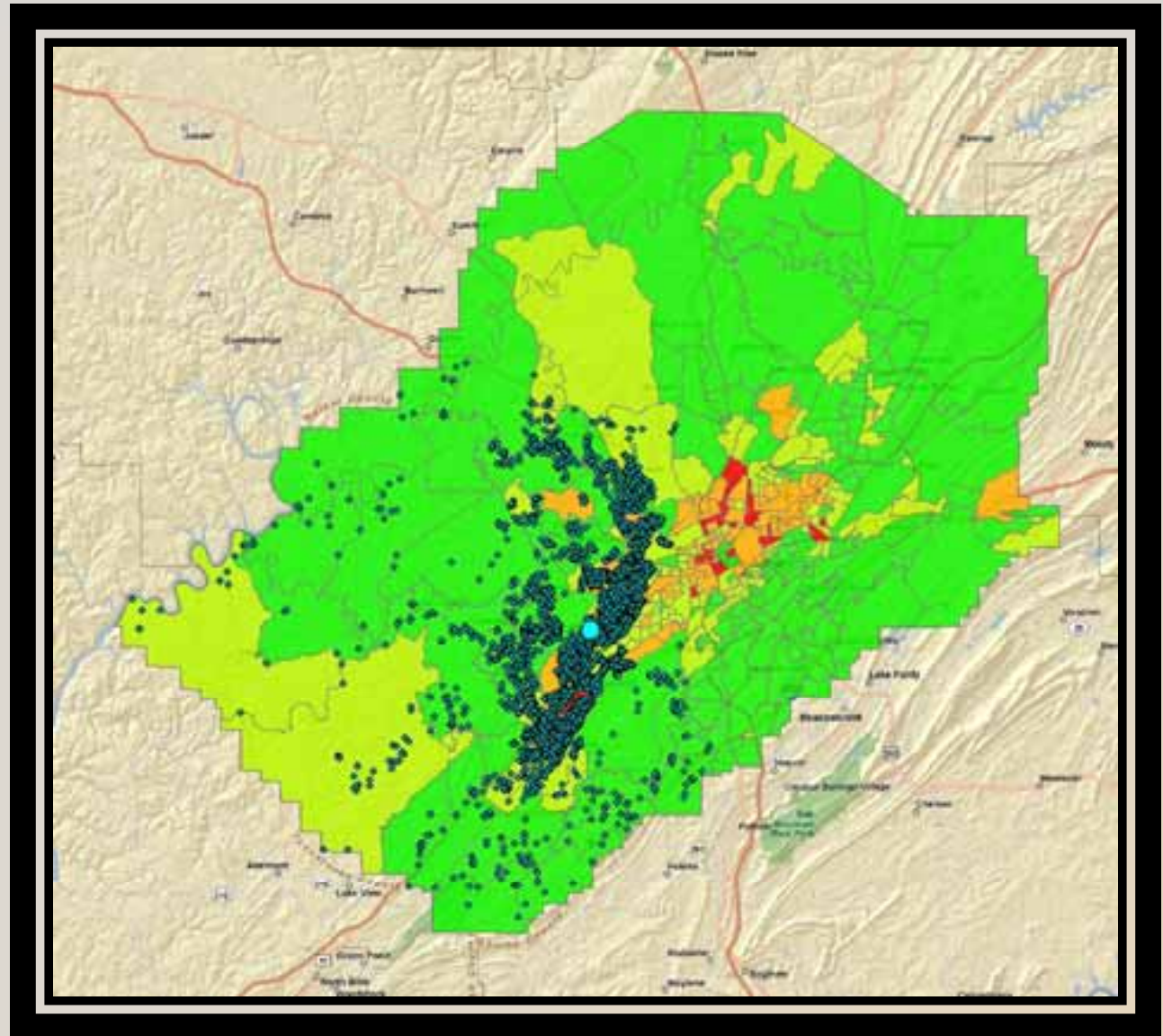
What would consolidation look like?

- Kriging Prediction
- Highlight areas for a HC facility based on current population



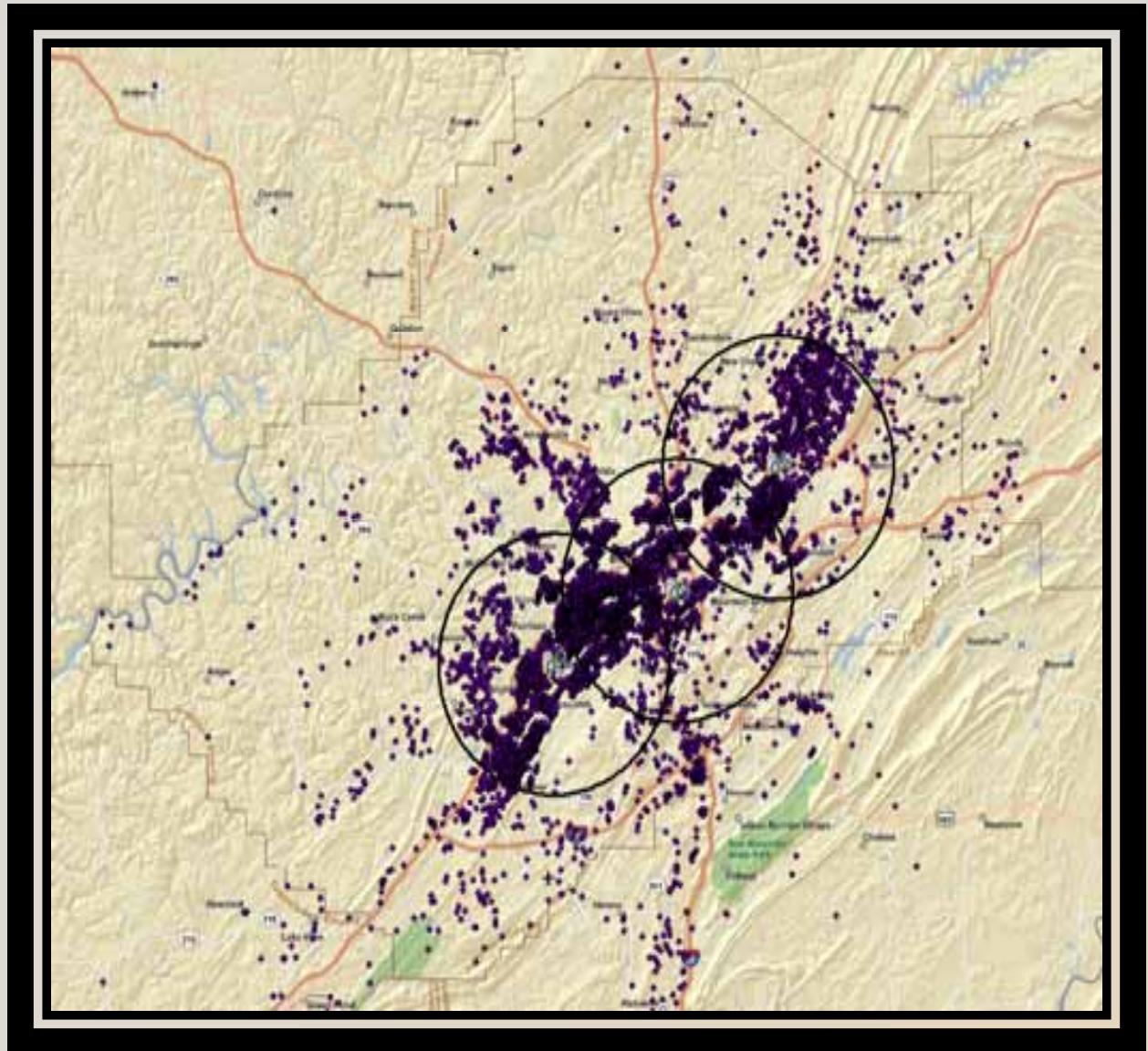
What would consolidation look like?

- Mean X,Y of western Jefferson County patients
- Central feature between BHC and WHC in the Fairfield/Midfield area



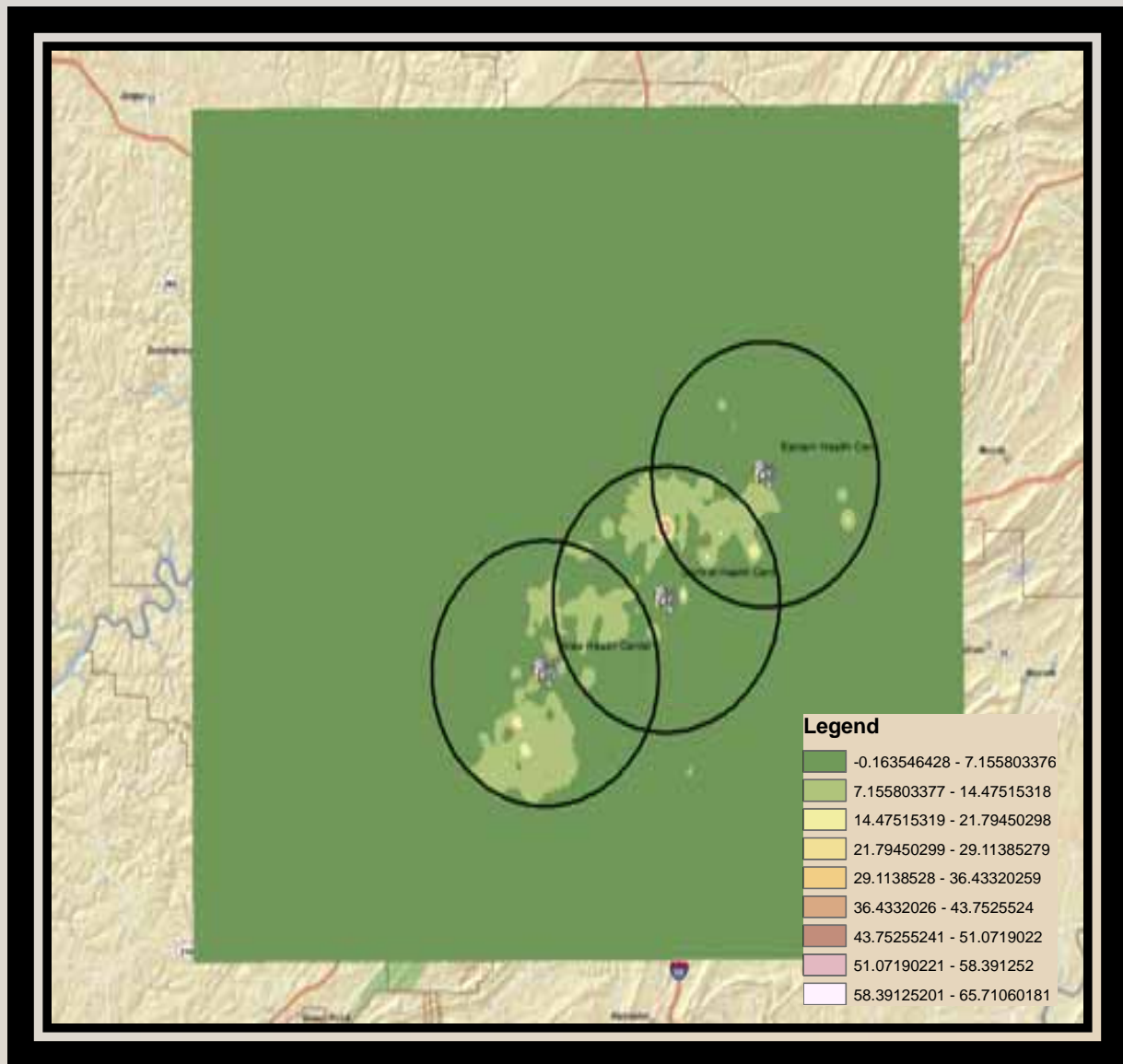
What would consolidation look like?

- 6 mile radius around HC
- Three HC, 81% of patients served in 6 miles of residence



What would consolidation look like?

- 3 HC - 6 mile radius encompass Kriging prediction areas



Summary

- JCDH centers located where patients live
- Patients clustered together
- A reduction in centers = 3% drop in coverage within 6 miles

Conclusions

- Administration considered the GIS results along with other research
- Scenario being debated
 - Close NHC
 - Keep MHC
 - Look for property in Midfield/Fairfield area to consolidate and replace WHC and BHC
 - Renovate CHC to accommodate WEHC
 - Keep EHC

Limitations

- Simple methodology
- Residence to HC
 - More advanced methods could yield different result such as Network Analyst
 - Patients may not travel from residence e.g. work, school
- Facility capacity and staff requirements need to be addressed
- Evaluate cost effectiveness

Literature Review

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Thank You



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Software used: ArcView 9.3