Health Service Accessibility for Elderly Population in Portland

Sonoko Endo

GEOG 592

March 14, 2005

Research Question

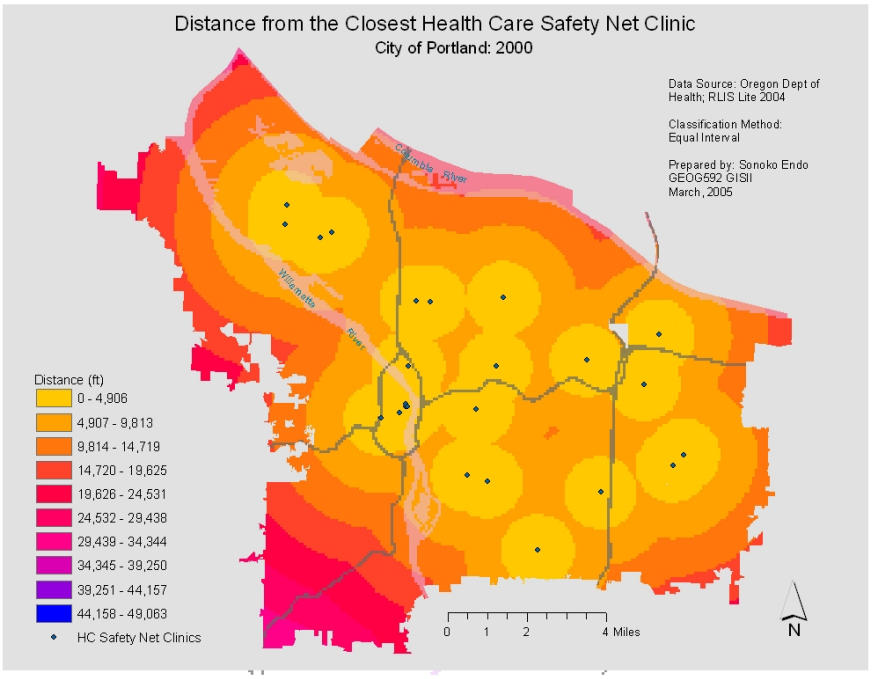
- Access to health service providers for Population 65 Years and Over
  - How GIS could be used to measure accessibility?
  - Any disparities among different socioeconomic groups?
  - Any underserved areas?

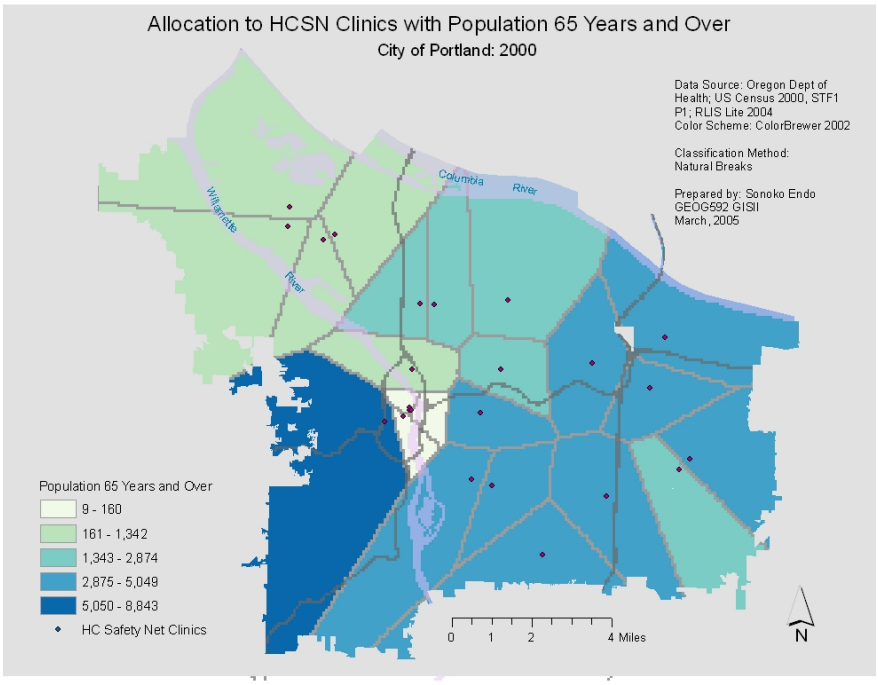
Data Sources

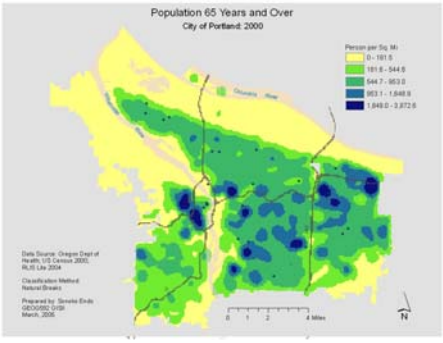
- Health Services Data (Health Care Safety Net Clinics): Oregon Dept of Health Services
- Demographic Data: US Census 2000
- GIS Data: RLIS Lite 2004
- Map Color Scheme: ColorBrewer 2004

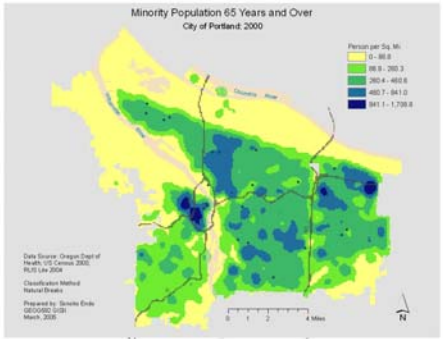
Methodology

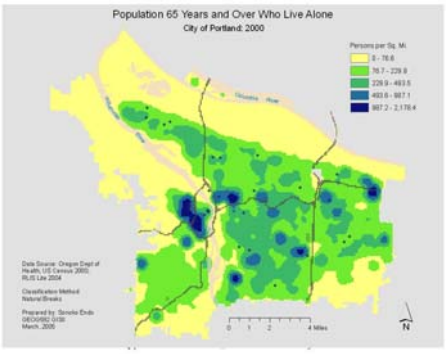
- List of Health Care Safety Net Clinics: input in spreadsheet & geocode
- Demographic Data: use dasymetric mapping technique to derive Portland data
- Use Distance Tool, Density Tool, and Raster Calculator to identify spatial patterns

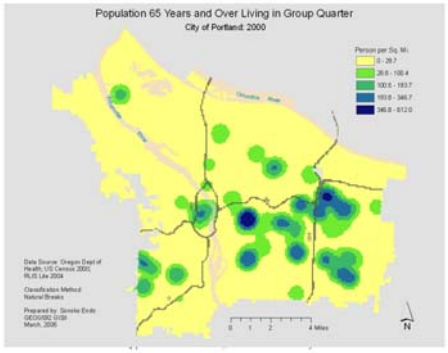

Distance from the Closest Health Care Safety Net Clinic
City of Portland: 2000
Data Source: Oregon Dept of Health; RLIS Lite 2004
Classification Method: Equal Interval
Prepared by: Sonoko Endo
GEOG592 GISII
March, 2005
Columbia River
Willamette River
Distance (ft)
0 - 4,906
4,907 - 9,813
9,814 - 14,719
14,720 - 19,625
19,626 - 24,531
24,532 - 29,438
29,439 - 34,344
34,345 - 39,250
39,251 - 44,157
44,158 - 49,063
HC Safety Net Clinics
0 1 2 4 Miles
N

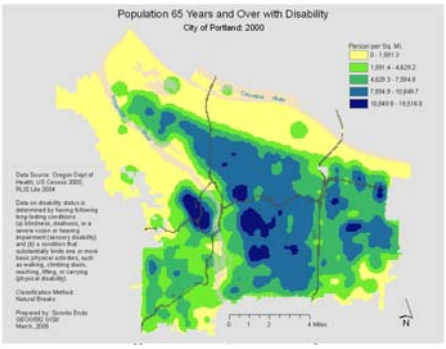

Allocation to HCSN Clinics with Population 65 Years and Over
City of Portland: 2000
Data Source: Oregon Dept of Health; US Census 2000, STF1 P1; RLIS Lite 2004
Color Scheme: ColorBrewer 2002
Classification Method: Natural Breaks
Prepared by: Sonoko Endo
GEOG592 GISII
March, 2005
Columbia River
Willamette River
Population 65 Years and Over
9 - 160
161 - 1,342
1,343 - 2,874
2,875 - 5,049
5,050 - 8,843
HC Safety Net Clinics
0 1 2 4 Miles
N

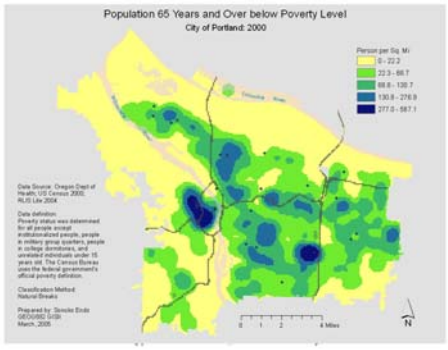


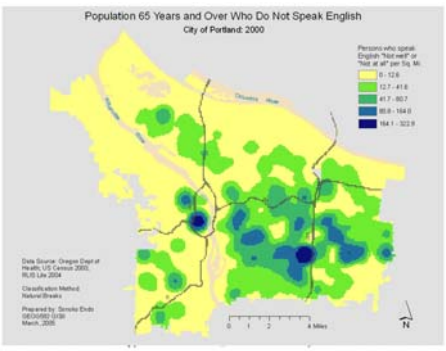










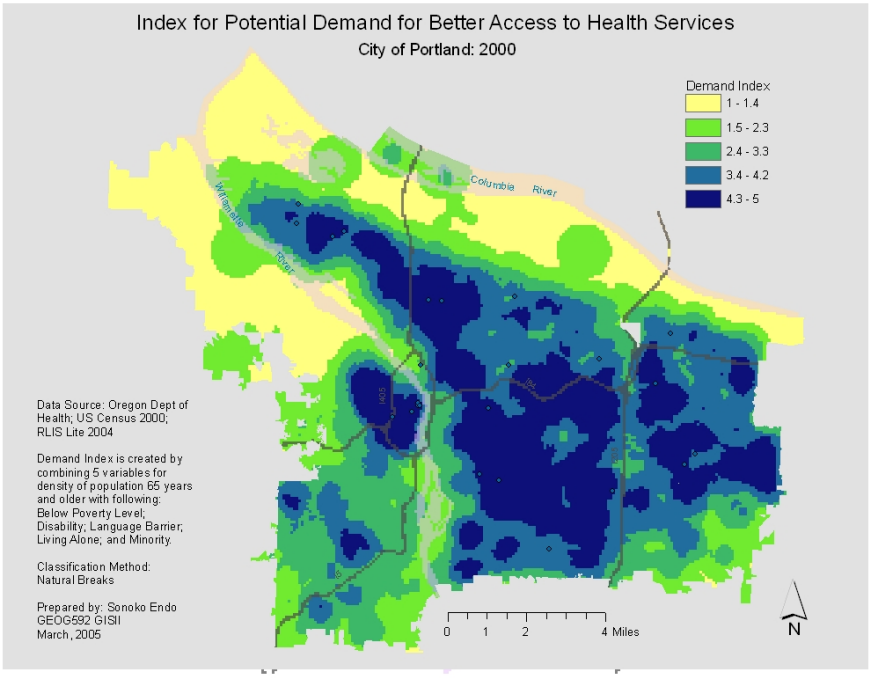


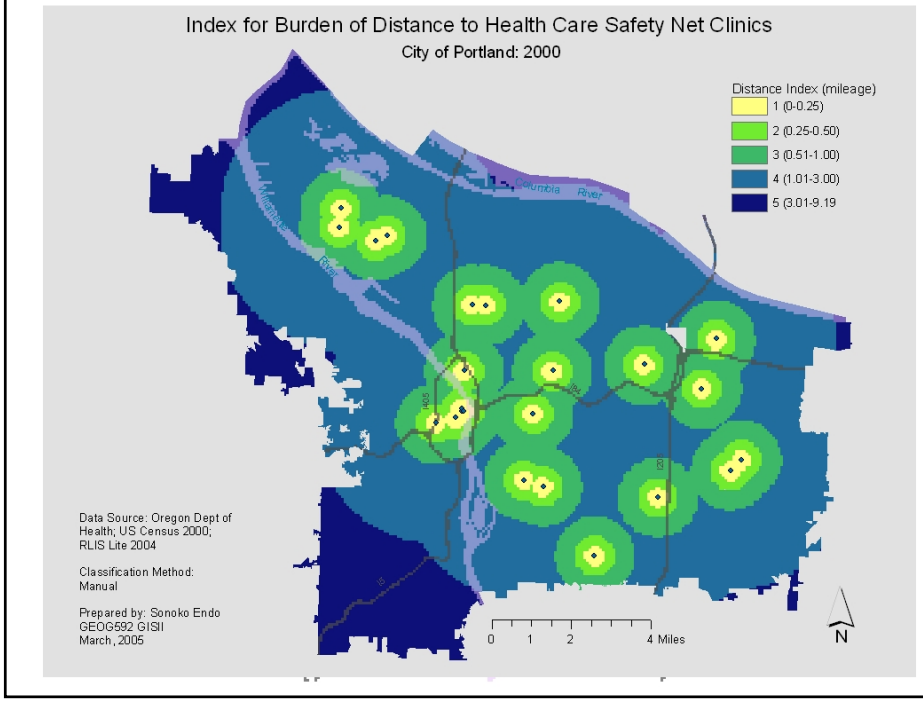
Key Driving Factors of Demand for Better Access:

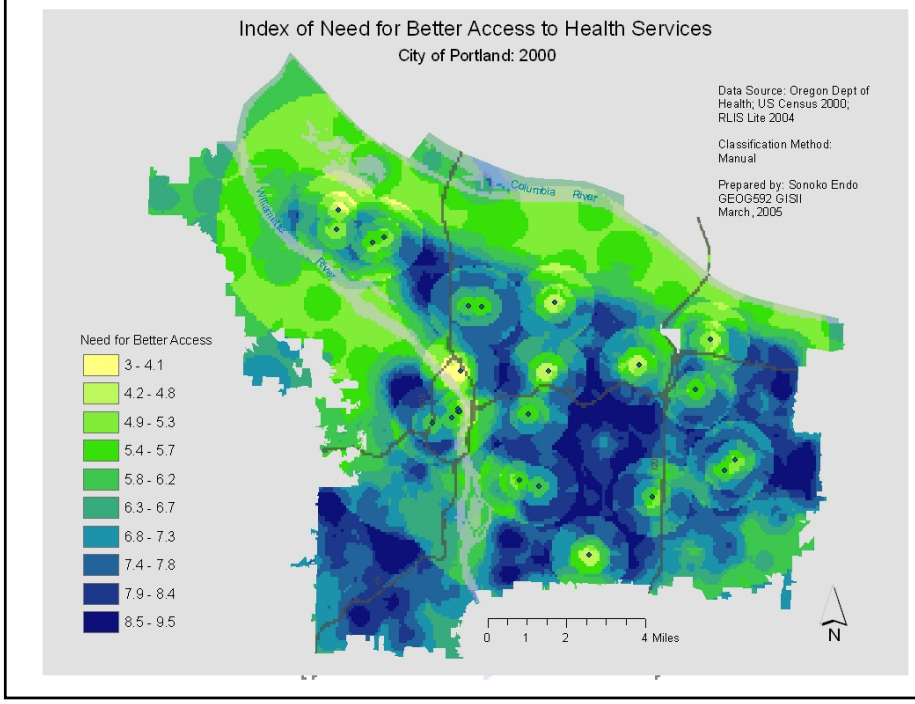
- Poverty
- Disability
- Language
- Live alone
- Minority

Raster Calculation Weighting Scheme

- Potential high demand area
  - Poverty: 0.3
  - Disability: 0.2
  - Language: 0.15
  - Live alone: 0.2
  - Minority: 0.15
- Potential underserved area
  - Demand: 1 ~ 5
  - Distance: 1 ~ 5




Index for Burden of Distance to Health Care Safety Net Clinics
City of Portland: 2000
Distance Index (mileage)
1 (0-0.25)
2 (0.25-0.50)
3 (0.51-1.00)
4 (1.01-3.00)
5 (3.01-9.19)
Columbia River
Willamette River
Data Source: Oregon Dept of Health; US Census 2000; RLIS Lite 2004
Classification Method: Manual
Prepared by: Sonoko Endo
GEOG592 GISII
March, 2005
0 1 2 4 Miles
N


Index of Need for Better Access to Health Services
City of Portland: 2000
Data Source: Oregon Dept of Health; US Census 2000; RLIS Lite 2004
Classification Method: Manual
Prepared by: Sonoko Endo
GEOG592 GISII
March, 2005
Need for Better Access
3 - 4.1
4.2 - 4.8
4.9 - 5.3
5.4 - 5.7
5.8 - 6.2
6.3 - 6.7
6.8 - 7.3
7.4 - 7.8
7.9 - 8.4
8.5 - 9.5
Columbia River
Willamette River
0 1 2 4 Miles
N

Conclusion

- Density and raster calculation could be used to create measures of accessibility.
- Separate analysis needed for different socioeconomic groups.
- Transportation network analysis should be incorporated to identify underserved areas.

Limitations

- Not all demographic data available at block level
- Availability of data on health services
- Consideration of network (transit & road)
- Accessibility in terms of time and financial cost
- Zero population area

Related & Future Research

- Capacity of health care providers
- Type and intensity of services
- Least cost path, ratio or density
- Allocation model has advantages over the ratio method if capacity data is available.

Bibliography

- Fulcher C, Kaukinen C. 2005. Mappping and Visualizing the Location HIV Service Providers: An Exploratory Spatial Analysis of Toronto Neighborhoods. *AIDS Care*. 17(3): 386-396
- Brabyn L, Gower P. 2004. Comparing Three GIS Techniques for Modelling Geographical Access to General Practitioners. *Cartographica*. 39(2): 41-49
- McLafferty S. L. 2003. GIS and Health Care. *The Annual Review of Public Health*. 24: 25-42