

Immigrant Reproductive Health Disparities: A GIS Analysis

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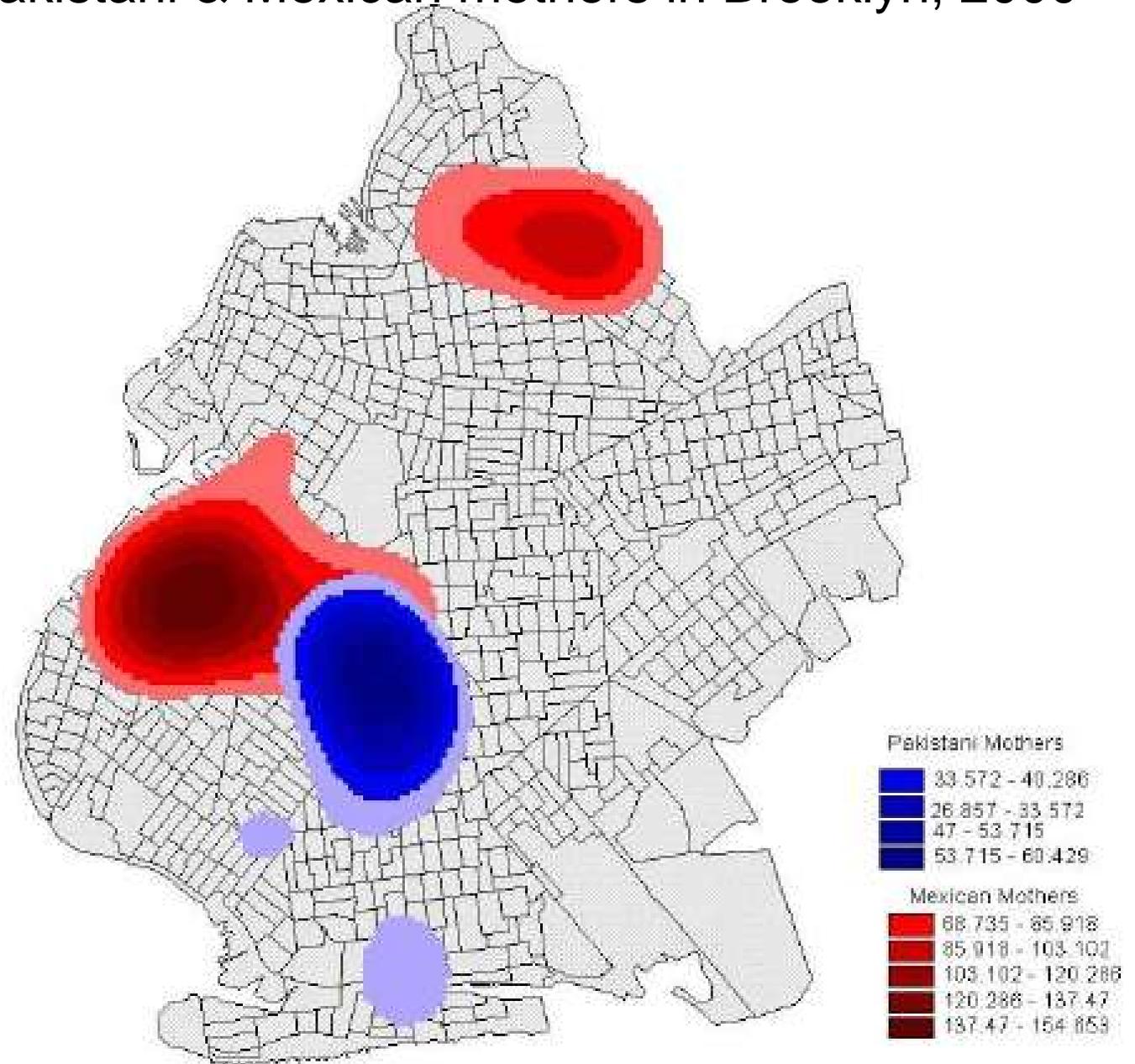
Why Immigrant Health Research Is Needed

- Immigrant population increasing
- “Healthy immigrant” myth
- Barriers to health and health care
 - Lack of insurance
 - Poor accessibility and availability of services
 - Language and cultural barriers
- Diversity of immigrant experiences
- Impacts of place context in host country on health

Maternal and Infant Health Among Immigrant Groups: NYC 2004

Country of Birth	% LBW	% Medicaid	% Late PNC
Bangladesh	12.6	77.9	11.5
Ecuador	5.5	78.2	9.2
Philippines	10.5	24.9	4.8
Jamaica	10.3	62.6	9.0
Mexico	5.7	89.1	8.3
Pakistan	9.8	70.1	9.7
Russia	5.7	18.4	2.3
NYC Total	8.8	51.7	5.8

Different immigrant groups have different residential geographies: Density of Pakistani & Mexican mothers in Brooklyn, 2000



Different residential geographies affect:

- Activity patterns & spaces



- ★ HOME
- ★ Mother's home
- Shopping
- ⊕ Work
- ⬠ Day Care

- Access to transportation
- Environmental exposures
- Access to services & resources

Ethnic Density Hypothesis

- Immigrant health tied to local group density
- Higher density implies social resources & services that are beneficial for health & coping
- Tested for mental health (Oster, Eschbach, Markides, & Goodwin, 2003; Neeleman & Wessely, 1999)

Ethnic Density Hypothesis Flowchart

DENSITY

Place-based social networks & support
Opportunities for social interaction
Appropriate/accessible services & resources
Social capital

Many ambiguities:

- Scale?
- Threshold?
- Processes?
- Segregation & health

HEALTH/WELLNESS

GIS Can Be Used To...

- Develop detailed measures of ethnic density
- Examine contextual neighborhood factors that also affect health outcomes

Kernel Estimation

$$\hat{\lambda}(s) = \sum_{d_i < \tau} 1/\tau k(d_i/\tau)$$

Where:

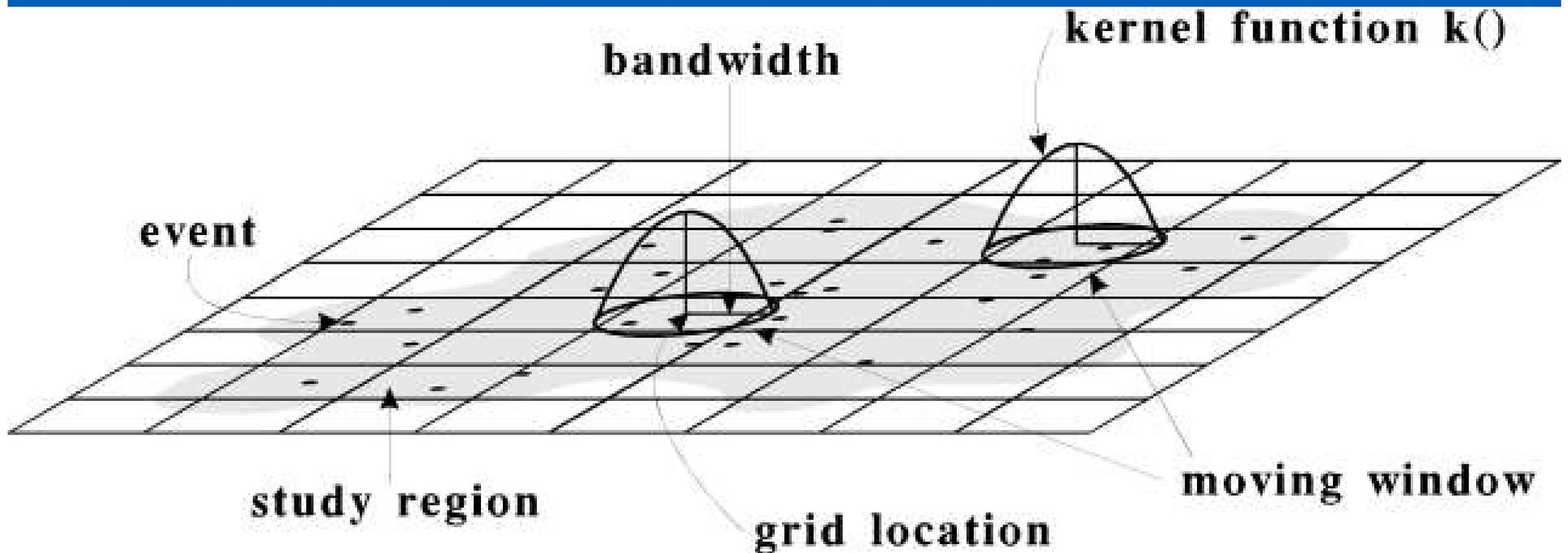
$\hat{\lambda}(s)$ = est. density at grid point s

d_i = distance from point i to grid point s

τ = bandwidth

$k()$ = kernel function

Schematic of Kernel Map

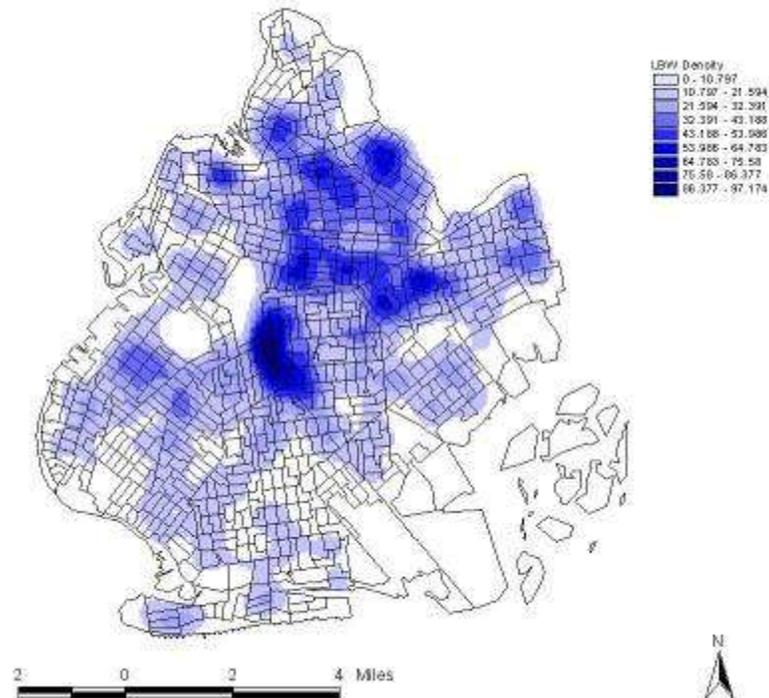


Low birthweight infants, Brooklyn



Low birthweight infants, Brooklyn

Kernel density map of low birthweight infants, 1.0-mile bandwidth



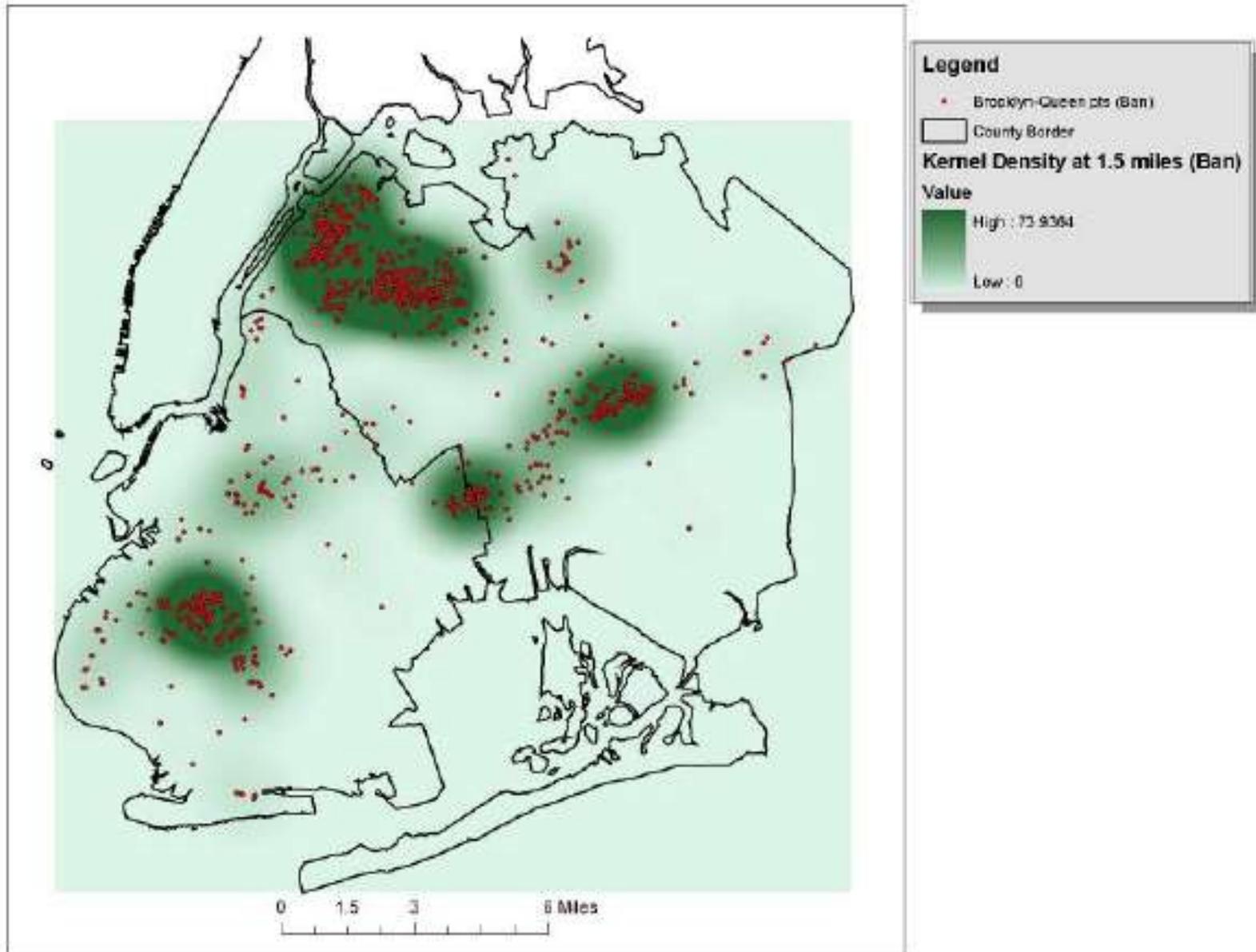
Why Bangladeshi Mothers?

- New immigrant group
- Vulnerability
- Health disparities

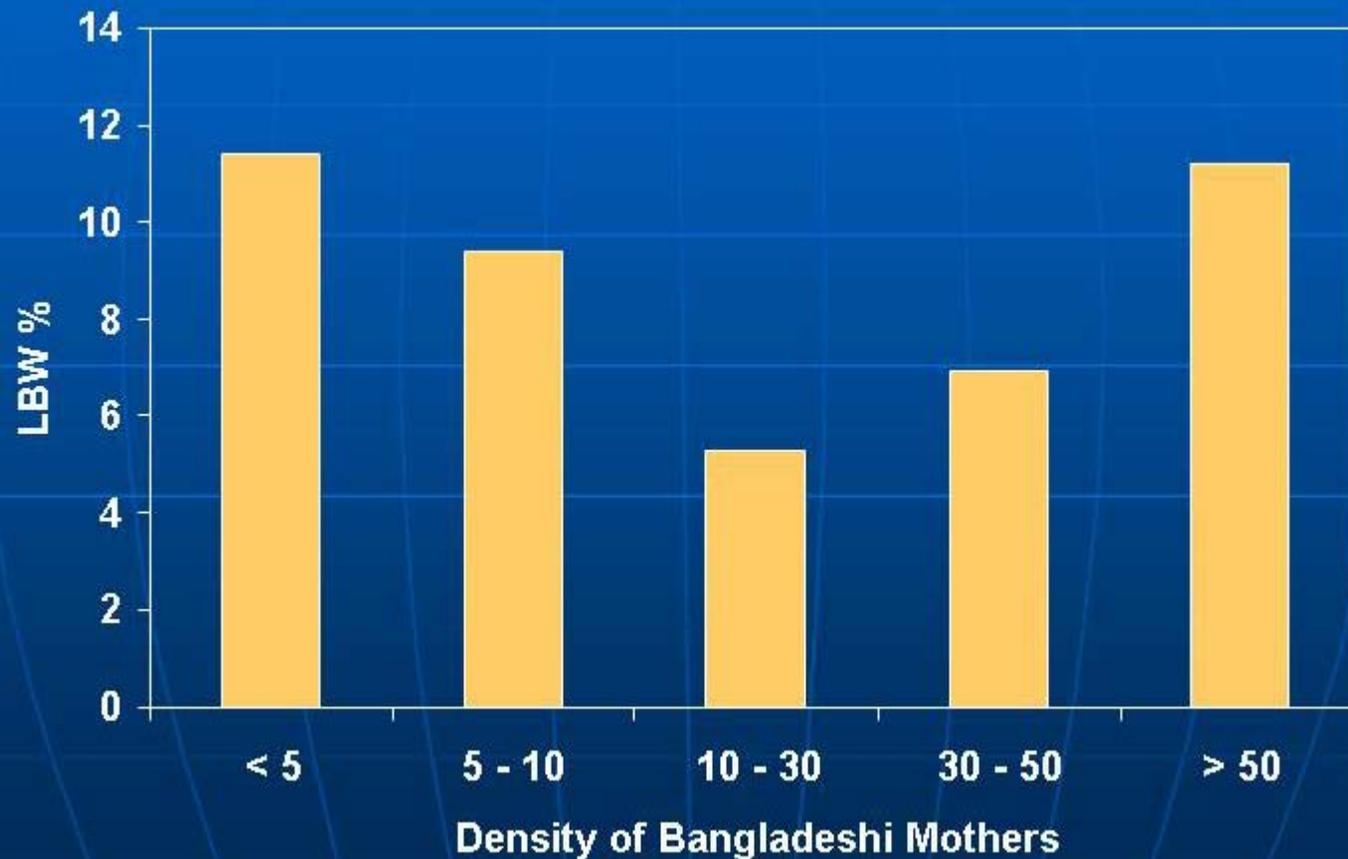
	Births	% foreign born	% late or no prenatal care	% mothers with LBW babies
Bangladeshi	1,541	99.5	10.0	11.4
NYC Total	122,725	52.3	5.7	9.0

*Data are from 2000.

Density of Bangladeshi Mothers in Brooklyn & Queens



LBW Is Associated with 'Ethnic Density'



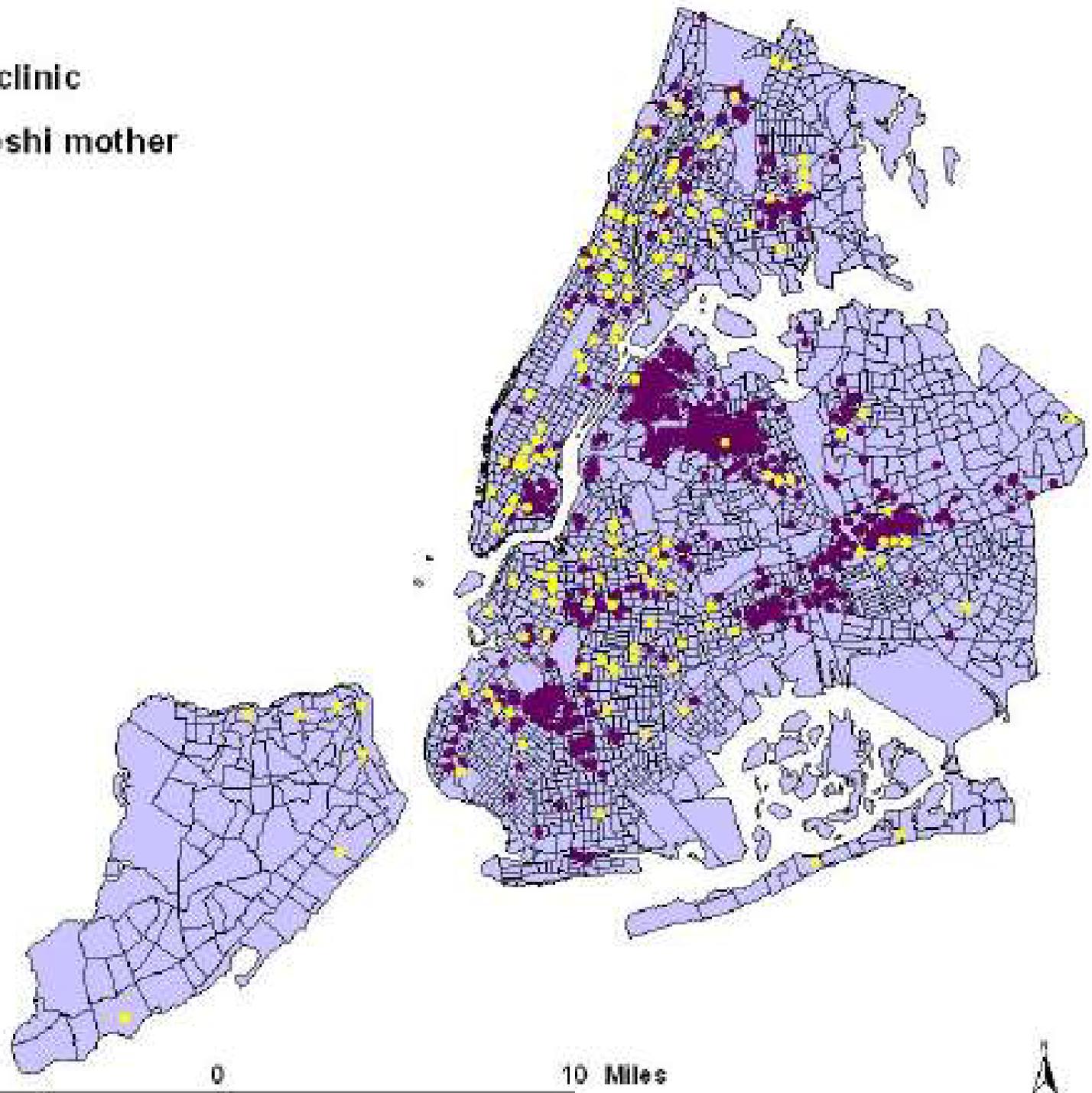
Logistic Model with High & Low Density Categories

	b	SE	p-value	Exp(b)
Marital	-.318	.261	.223	.728
High Sch.	-.110	.248	.658	.896
Priv. Ins.	-.109	.284	.703	1.115
Den. < 5	.548	.313	.080	1.730
Den. > 50	.512	.247	.016	1.808

Summary of Findings

- Combination of isolation & density/
concentration effects
 - Low-density areas – Isolation effect
 - Lack of social support networks & culturally appropriate services & resources
 - High-density areas
 - Deprivation?
 - Poor access to prenatal care?
- Health risks lowest for women living in “mixed” communities

- Prenatal clinic
- Bangladeshi mother



Current Research Directions

- Other immigrant groups
- Other health outcome measures
- Examine role of neighborhood-scale contextual factors, especially in high-density areas

In Conclusion

- Immigrant maternal and infant health outcomes vary over space
- GIS and spatial analysis tools are essential
 - Permit local-scale analyses
 - Mapping of “hidden” immigrant populations
 - Layering of social, environmental, and health service data

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