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HEALTH

Examination of the built environment and prevalence of obesity:

Neighborhood characteristics, food purchasing venues, green space and distribution of body mass index in Pittsburgh, PA.

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Obesity is an epidemic in the United States

- **65% of the United States population is either overweight or obese**
- **Individuals unequally affected**
- **Limited research has been able to combine neighborhood level variables of the built and social environment, especially considering both diet (i.e. the food environment) and physical activity (i.e. green space environment) concurrently, alongside of individual-level health behavioral and obesity (BMI) data.**

Neighborhoods in the United States

- **Access to open space for physical activity and healthy food comprise two major pathways which link dimensions of the built environment to obesity**

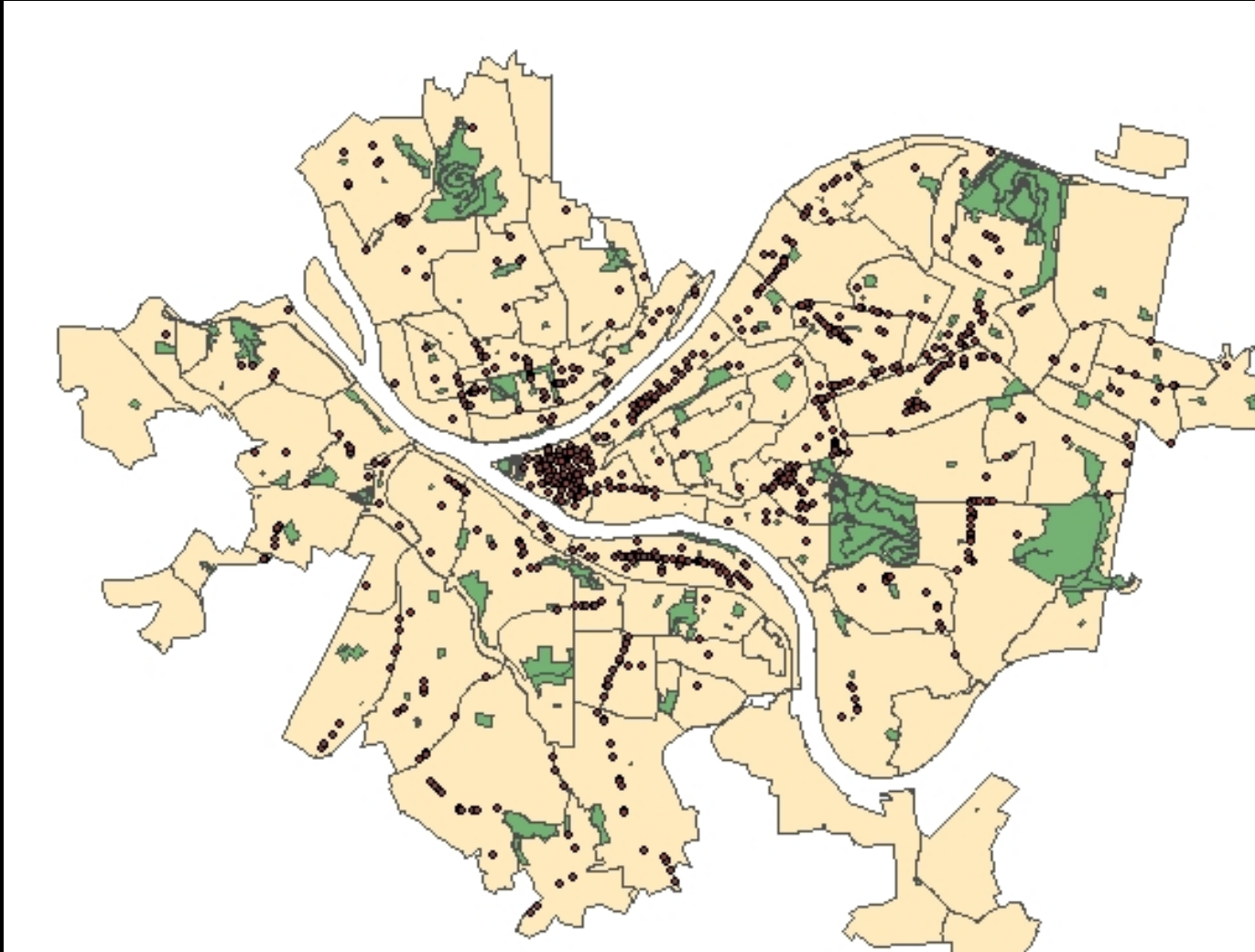


Individual level and Neighborhood Data

- **NEIGHBORHOOD LEVEL**
- **Socioeconomic and racial/ethnic composition of neighborhoods**
 - United States Census 2000
- **Food purchasing venues**
 - Allegheny County Health Department – Pittsburgh, PA
 - ReferenceUSA
- **Green space data**
 - Allegheny County Parks Department

- **INDIVIDUAL LEVEL**
- **Behavior Risk Surveillance System (BRFSS) Data**
 - BMI
 - Age
 - Sex
 - Race/Ethnicity

Pittsburgh, PA, its parks and food purchasing venues



Descriptive Statistics: BRFSS Data

Total	1335	
Male	430	32.2
Female	905	67.8
BMI		
18 – 24.9 (Normal)	503	41.1
25 – 29.9 (Overweight)	424	34.7
30+ (Obese)	296	24.2
Race/Ethnicity		
NH Black	335	25.1
NH White	884	66.2
Hispanic	41	3.1
Other	75	5.6

Descriptive Statistics: Pittsburgh Neighborhoods

Parks	183
Total acreage	2576.8
Median acreage	9.2
Food Purchasing Places	1798
Grocery Stores	143
Convenience Stores	168
Fast food places	182
Carry out, pizza and sandwiches	211
Limited service branch restaurants	117
Limited service single location restaurants	707
Specialty food stores	55
Candy and Confectionary	57
Coffee Shops	81

Multilevel models

- **5 models: BMI as a continuous outcome**
 - **Percent greenspace**
 - **Percent Black**
 - **Percent poverty**
 - **Median Income**
 - **Percent White**
- **Individual level covariates:**
 - **Age, sex, race/ethnicity**

Unadjusted Multilevel Models (adjusting for level one and level 2 variance)

	Intercept	Coefficient	p value
Proportion Green Space in Neighborhood	27.04	-0.28	0.036
Proportion Black in Neighborhood	27.13	0.18	<.0001
Proportion Poverty in Neighborhood	27.06	0.11	0.37
Median HH Income	27.10	-0.26	0.004
Proportion White	27.11	-0.164	.<.0001

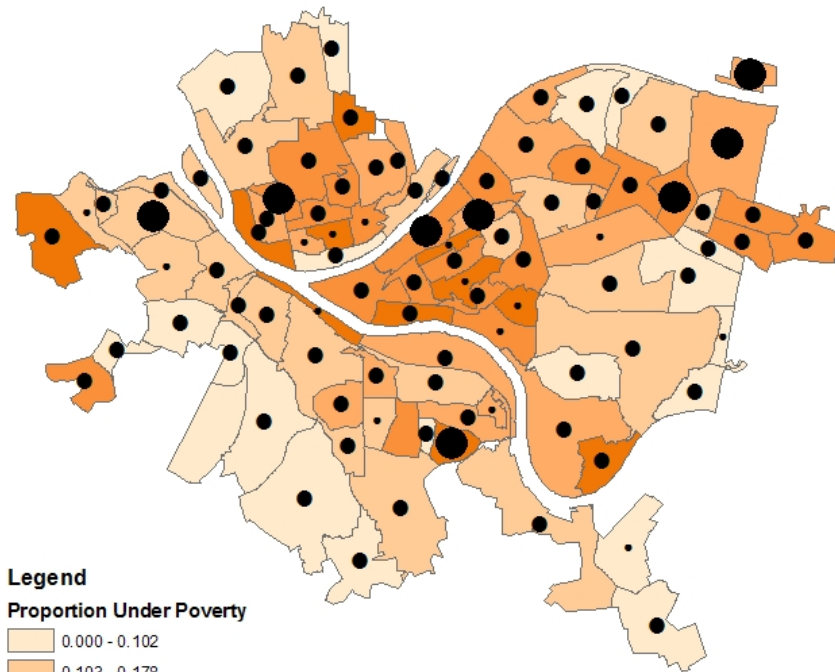
Multilevel Models Adjusting for Individual level Age, Sex and Race/ethnicity

	Intercept	Coefficient	p value
Proportion Green Space in Neighborhood	26.53	-0.235	0.057
Proportion Black in Neighborhood	26.54	0.017	0.74
Proportion Poverty in Neighborhood	26.48	-0.06	0.595
Median HH Income	26.60	-0.16	0.042
Proportion White	26.52	-0.0053	0.916

Density of green space and median neighborhood income matter for prevalence of obesity in Pittsburgh

- **In raw models (unadjusted):**
 - **All variables except for percent poverty are associated with BMI**
- **Adjusted models:**
 - **Neighborhood racial composition no longer significant**
 - **Percent green remains marginally significant**
 - **Median income is significant**

Pittsburgh, Pa: Neighborhood Proportion of the Population under Poverty and Average BMI per neighborhood



Legend

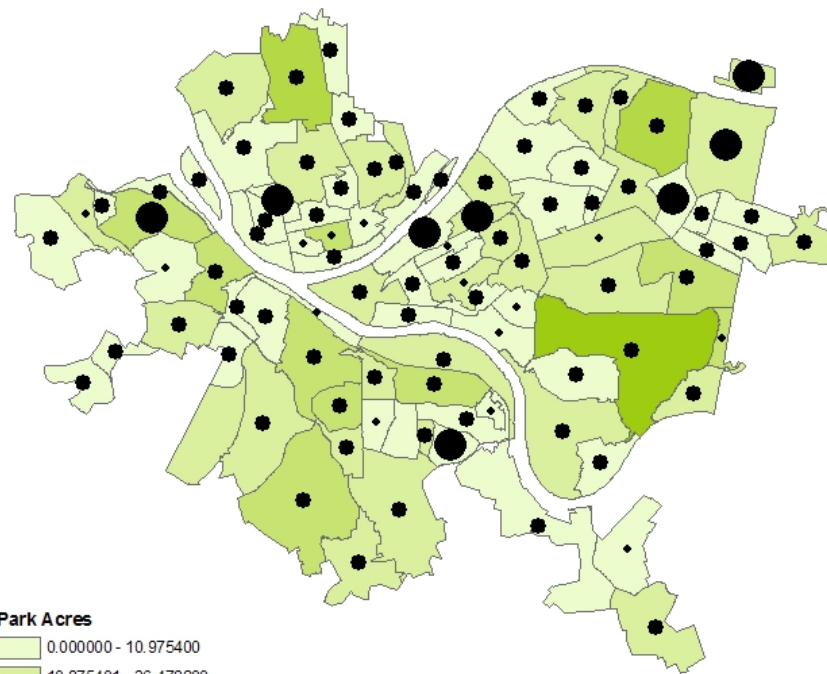
Proportion Under Poverty

- 0.000 - 0.102
- 0.103 - 0.178
- 0.179 - 0.260
- 0.261 - 0.406
- 0.407 - 0.701

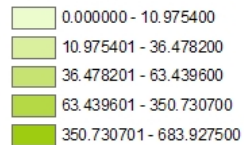
Average BMI

- 19.1349 - 24.9000
- 24.9001 - 29.9000
- 29.9001 - 40.0482

Pittsburgh, Pa: Neighborhood Park Acreage and Average BMI per neighborhood



Park Acres



Average BMI



Food Purchasing Data: presenting a challenge

- **Compiled food purchasing data from ReferenceUSA, which is a subsidiary of InfoUSA**
 - **Grocery Stores; Convenience Stores; Fast food places; Carry out, pizza and sandwiches; Limited service branch restaurants, Limited service single location restaurants, etc.**
- **Geocoded data, merged with neighborhood data**
- **In reviewing data, found misclassification of restaurants (fast food restaurants classified with higher end restaurants)**

Conclusions

- Capturing appropriate and relevant environmental variables is difficult.
- The SOCIAL and BUILT environment matter to health, and in particular – obesity.
- We need better and more systematic data collection that is available for use.

RAND's Center for Population Health and Health Disparities

- **Data Core**

<http://www.rand.org/health/centers/pophealth/data.html>

- **The CPHHD Data Core houses a large number of measures derived for a variety of substantive areas in several distinct data series including:**
 - **Cost-of-Living**
 - **Disability**
 - **Pollution**
 - **Population and Housing Characteristics**
 - **Segregation Indices**
 - **Street Connectivity**

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