FOOD DESERT AND HEALTH

Introduction to Programming for Public Policy: Final Project 12/4/2017

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QUESTION

- Does the access to healthy food in supermarkets improve health outcomes?
- Otherwise, do food deserts cause increased lifestyle diseases such as diabetes, obesity or hypertension?

DATASETS

Access to Food

- Grocery location and size
- Fast food restaurants location

CHICAGO DATA PORTAL

Other Explanation Variables

- Black/Hispanic rate
- Income
- Education attainment
- Poverty rate

United States Census Bureau

Healthcare Outcome

- Diabetes hospitalization

CHICAGO DATA PORTAL

Geometry

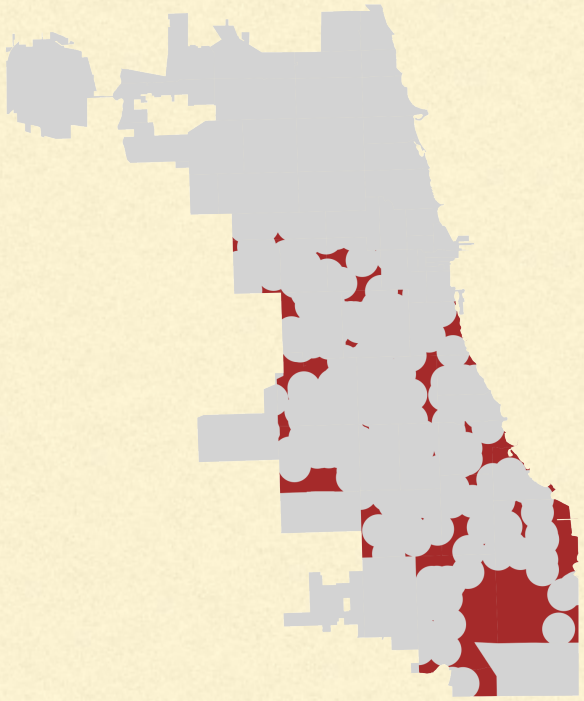
- Zip codes boundaries

CHICAGO DATA PORTAL

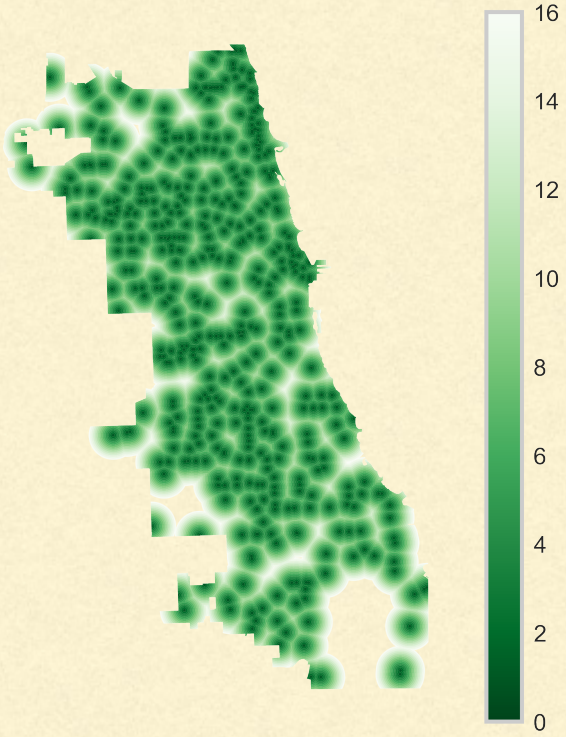
FOOD DESERTS IN CHICAGO

- "Food desert" definition: an area with a poverty rate of at least 20 percent and where at least a third of the population lives more than a mile from a supermarket or large grocery store

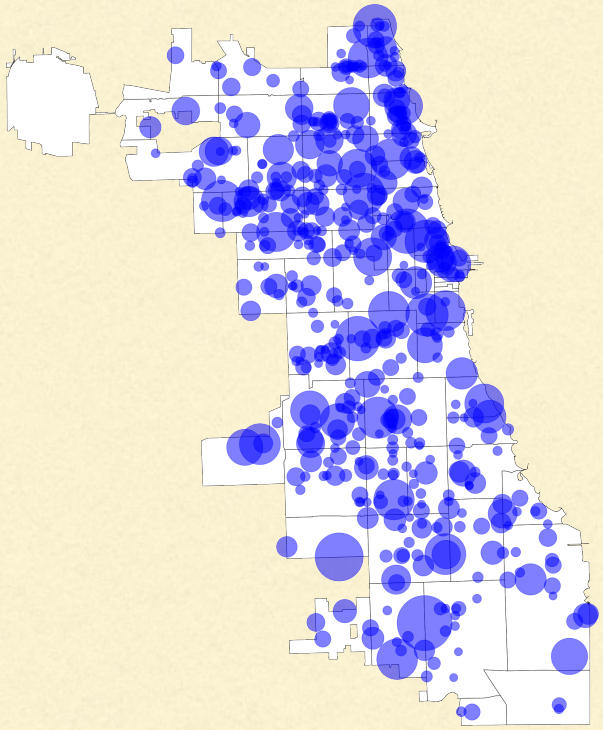
Food Desert (>1km from groceries & poverty rate > 20%) in Chicago



Distance from closest groceries (*100m)

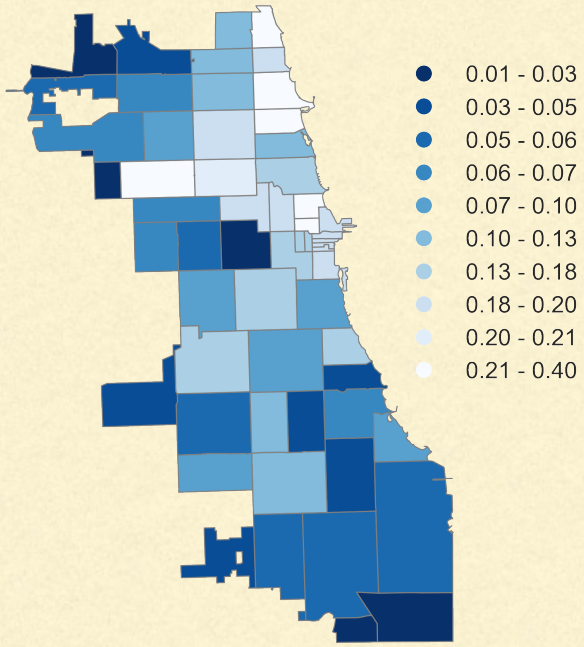


Grocery Stores by Relative Size (Square Feet)

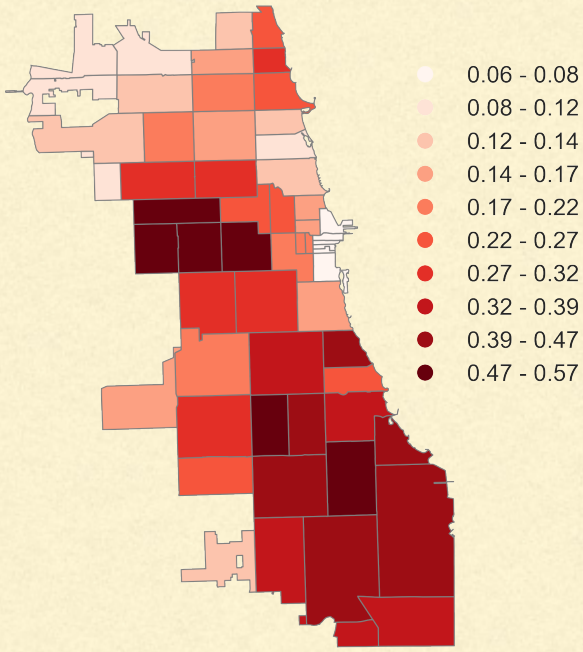


GROCERY DENSITY AND DIABETES HOSPITALIZATION RATES IN ZIP-CODE AREAS

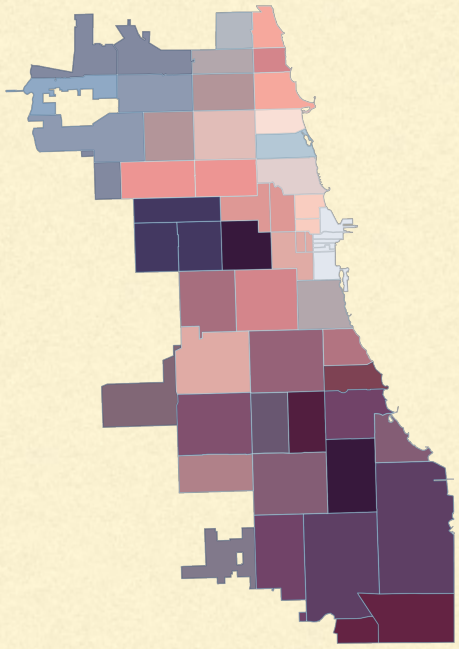
Grocery Store Square Feet per Square Mile



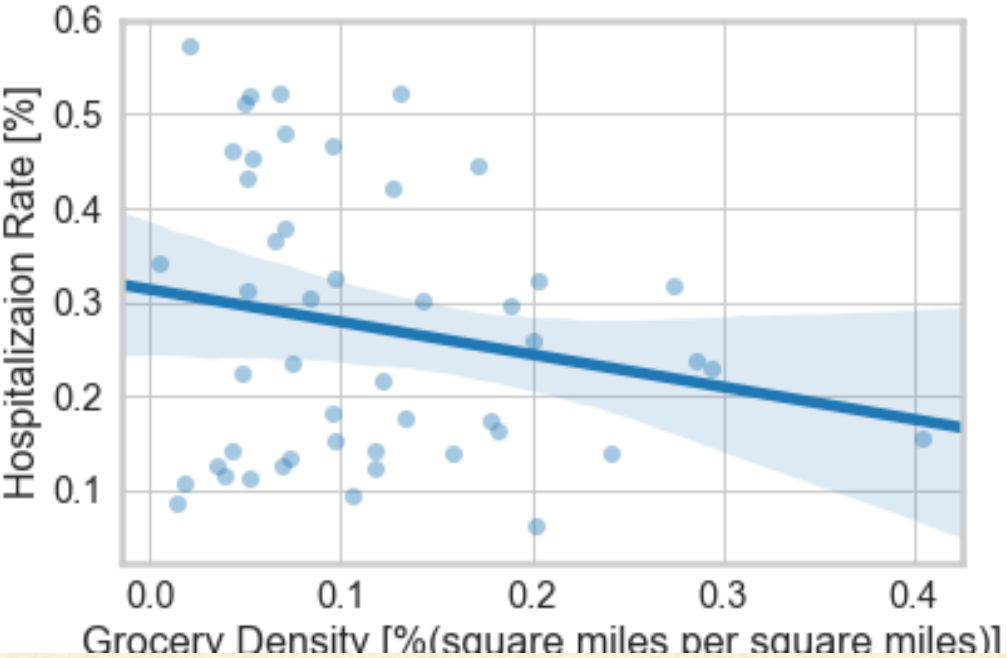
Diabetes Hospitalization Rates

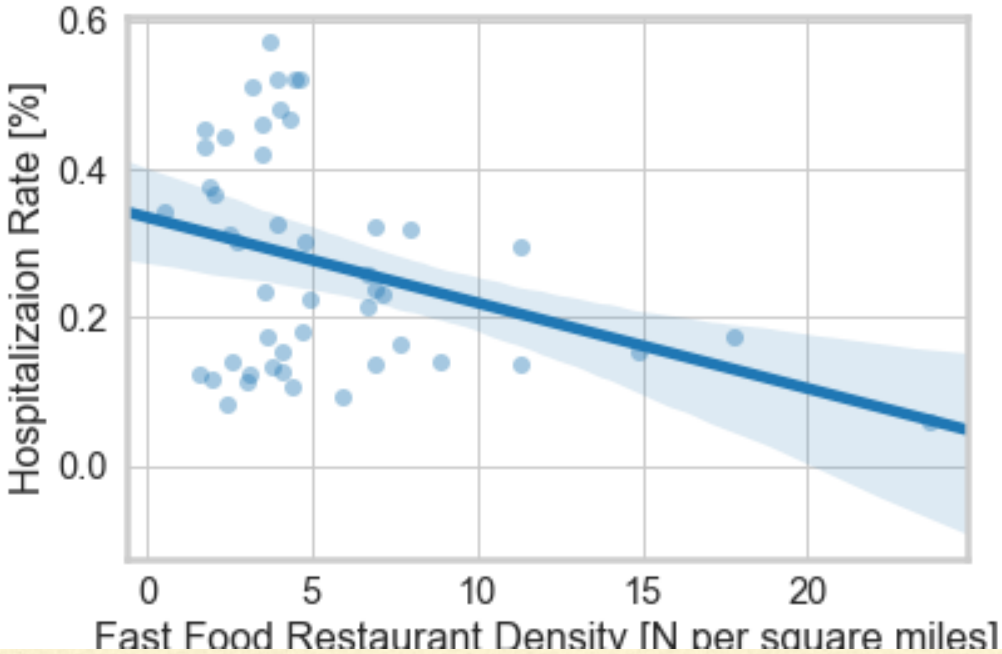


Grocery Store Square Feet per Square and Diabetes Hospitalization Rate



PLOTTING


Hospitalizaion Rate [%]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
0.2
0.3
0.4
Grocery Density [%(square miles per square miles)]


Hospitalizaion Rate [%]
0.6
0.4
0.2
0.0
0
5
10
15
20
Fast Food Restaurant Density [N per square miles]

OLS REGRESSION

Model:
H(hospitalization rate) =
α(intercept)
+β1*G(grocery density)
+β2*F(fast food restaurant density)
+β3*Income(mean income)
+β4*Black(black rate)
+β5*Hispanic(hispanic rate)

Dep. Variable:	H	**R-squared:**	0.845
Model:	OLS	**Adj. R-squared:**	0.827
Method:	Least Squares	**F-statistic:**	45.91
Date:	Fri, 01 Dec 2017	**Prob (F-statistic):**	5.90e-16
Time:	21:32:03	**Log-Likelihood:**	69.171
No. Observations:	48	**AIC:**	-126.3
Df Residuals:	42	**BIC:**	-115.1
Df Model:	5		
Covariance Type:	nonrobust		

	coef	**std err**	**t**	**P>|t|**	**[0.025**	**0.975]**
Intercept	0.1250	0.069	1.799	0.079	-0.015	0.265
G	0.1440	0.139	1.033	0.307	-0.137	0.425
F	0.0015	0.003	0.453	0.653	-0.005	0.008
Income	-6.832e-07	6.73e-07	-1.014	0.316	-2.04e-06	6.76e-07
Black	0.0039	0.001	7.665	0.000	0.003	0.005
Hispanic	0.0016	0.001	2.472	0.018	0.000	0.003

CONCLUSION AND LIMITATIONS

- We found weak but certain correlation between the grocery density and the diabetes hospitalization rate.
- Health outcomes seem to be associated with minority population rather than food accessibility and income level.
- Possible further research: tract level, other diseases (e.g. life expectancy or obesity), other cities (more samples)