

Healthy Food Zoning and the Neighborhood Food Environment: Can Permitted-Use Zoning Promote Healthier Communities?

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Zoning as an intervention?

- ▶ Zoning can permit or prohibit different types of food outlets
 - Supermarkets
 - Grocery stores
 - Farmers markets
 - Fast food restaurants
- ▶ Zoning code reforms have been promoted as a tool to improve neighborhood food access



Food deserts

- ▶ Neighborhoods in which residents do not have close, affordable access to healthy foods
- ▶ Major policy target in recent years
 - Healthy Food Financing Initiative - \$400 million federal program to bring healthy food outlets into underserved areas
- ▶ Debate over success
 - “Food deserts” vs “food swamps”

Why Los Angeles' Fast Food Ban Did Nothing To Check Obesity

MARCH 20, 2015 3:20 PM ET



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support comes from:

Better Than Before
Gutkin Robin



Why giving people easy access to a supermarket doesn't improve their health

Updated by Julia Belluz on December 22, 2015, 9:30 a.m. ET [@juliaoftoronto](#) [julia.belluz@voxmedia.com](#)

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Focusing too much on trees?

- ▶ Past studies tended to focus on specific types of outlets (usually out of necessity)



- ▶ We've repeatedly learned that no "silver bullet" can reduce obesity

Focus on the forest instead?

- ▶ More encouraging evidence has been observed when using comprehensive zoning measures
- ▶ **Our objective:**
 - *Estimate the association between comprehensive zoning measures and comprehensive measures of the neighborhood food environment – including both absolute and relative measures*

Data source – BTG-COMP

- ▶ Bridging the Gap Community Obesity Measures Project



- ▶ 468 communities sampled in 2010-12
- ▶ Data on permitted use zoning and retail food outlets – e.g., supermarkets, grocery stores, convenience stores (n=8793 stores)

Policy measures

- ▶ Healthy food zoning
 - Raw count of the types of healthy food outlets that were permitted
- ▶ Modified retail food zoning index (MRFZI)
 - Proportion of all permitted use zoning for healthy food outlets



Environmental measures

▶ Outlets

- Healthy outlet density
- Proportion of outlets that were healthy

▶ Products sold within outlets

- Fresh fruits/vegetables
- Total fruits/vegetables
- Ratio of “healthy” to “unhealthy” items

Statistical analysis

- ▶ General linear regression
- ▶ Adjusted for race/ethnicity, median household income, Census region, urbanicity, and year
- ▶ Tested for non-linear trends by including a quadratic term
 - Quadratic term retained when $p < .05$

Results: outlet density (absolute)

	Healthy store density		
	AME*	SE	p
Healthy food zoning	0.06	0.03	.02
Household income	0.23	0.06	<.001
Racial/ethnic majority			
<i>Non-Hispanic White</i>	-	-	-
<i>Non-Hispanic Black</i>	0.13	0.07	.06
<i>Hispanic</i>	0.45	0.23	.04
<i>Mixed</i>	0.11	0.05	.02

*AME = Average marginal effect

Results: outlet density (relative)

	Proportion of healthy outlets		
	AME*	SE	p
MRFZI (linear)	0.08	0.04	.05
MRFZI (quadratic)	-0.002	0.001	.005
Household income	2.51	0.68	<.001
Racial/ethnic majority			
<i>Non-Hispanic White</i>	-	-	-
<i>Non-Hispanic Black</i>	-0.19	0.65	.77
<i>Hispanic</i>	-1.80	0.77	.02
<i>Mixed</i>	-1.04	0.51	.04

*AME = Average marginal effect

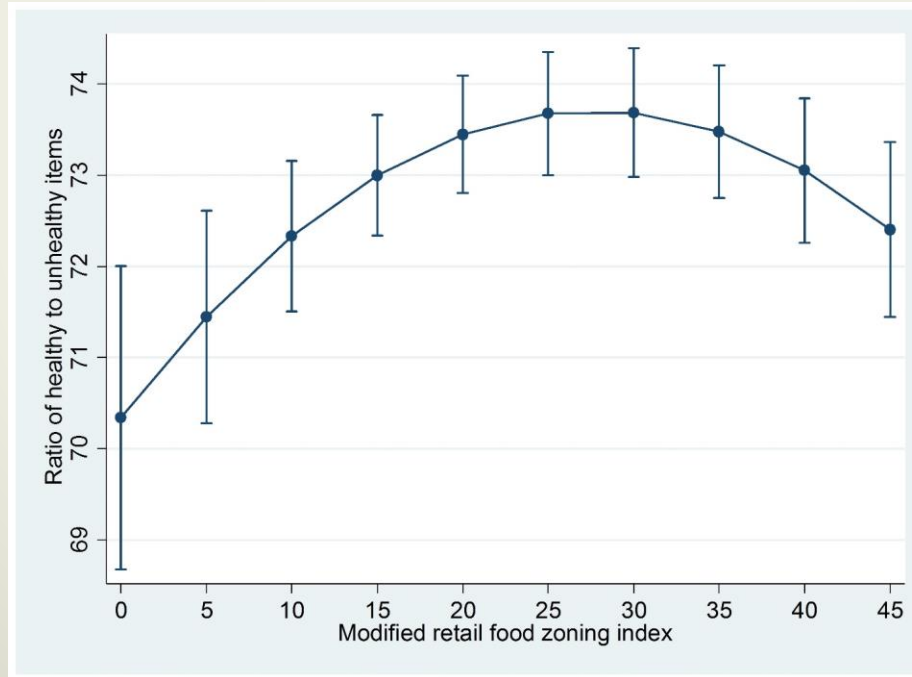
Results: products within stores

	Fresh fruits & vegetables		
	AME*	SE	p
MRFZI (linear)	0.01	0.01	.36
MRFZI (quadratic)	-	-	-
Total fruits & vegetables			
MRFZI (linear)	0.01	0.02	.34
MRFZI (quadratic)	-	-	-
“Healthy” / “unhealthy”			
MRFZI (linear)	0.24	0.06	.001
MRFZI (quadratic)	-0.004	0.001	.001

*AME = Average marginal effect

Example of non-linear trends

- ▶ Adjusted mean ratio of “healthy” to “unhealthy” formulations, by MRFZI score:



Summary

- ▶ In terms of retail outlets, zoning was associated with a healthier neighborhood food environment
- ▶ In terms of food items, zoning was associated with healthier product formulations but not fruit/vegetable access
- ▶ Even “statistically significant” effect sizes were modest – primarily in areas with lower zoning scores

Strengths & Limitations

▶ STRENGTHS

- Objective, comprehensive policy and environmental data
- Large, national sample

▶ LIMITATIONS

- Cross-sectional; no behavioral outcomes
- Focused primarily on retail stores, not restaurants
- Sample represented 8th-12th grade students

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Questions?

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