

# The impact of neighborhood poverty on BMI trajectory

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## Acknowledgements



- Funding: Pediatric Endocrine Nursing Society Research Grant
- Collaborators: Sophia Day, MS; Kevin Konty, MS; Jesse Chittams, MS; Ryan Quinn, MPH

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## Outline



- Background
- Methods
- Results
- Clinical Implications

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## Neighborhood Poverty and Childhood Obesity



- 21% of children live in households below the Federal Poverty Level
- Literature review
  - Household poverty may impact obesity risk
    - Limited ability to afford healthy food or pay-to-play sports leagues
    - Barriers to accessing healthcare system
    - Limits on caregivers' ability to support healthy habits
  - Living in a high poverty neighborhood may also impact obesity risk
    - Less greenspace
    - Higher crime
    - Fewer healthy food options
    - Trauma and/or chronic stress
    - Poor sleep

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## Purpose



- To examine how change in neighborhood poverty impacts children's obesity risk and to discuss implications for clinical practice

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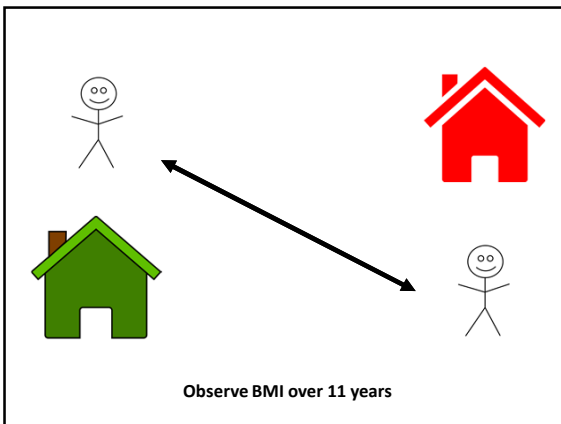
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### Methods: Data Sources



- New York City Fitnessgram 2006/2007-2016/2017
  - Demographics and body measures
- New York City Neighborhood Tabulation Area
  - Home neighborhood
- Census American Community Survey 2015
  - 5 year poverty estimates

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### Methods: Key Variables



- Demographics
  - Sex, age, race/ethnicity, grade, English language learner status, free/reduced lunch status
  - Height and weight: Measured by trained physical education teacher for calculation of BMI and BMI z-score ★
- Poverty
  - Percent of individuals below Federal Poverty Level in child's home neighborhood
  - Categorized into 6 groups based on methods developed for New York City

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### Methods: Analyses



- Descriptive statistics
- Univariate analyses
  - T-test, Wilcoxon rank sum, chi-square

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Methods: Analyses



- Propensity score application
  - Propensity score matching, propensity score weighting
- Univariate analyses
  - T-test, Wilcoxon rank sum, chi-square

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Methods: Analyses



- Piecewise linear random coefficient model
  - Total sample
  - By sex
  - By sex and developmental stage
- Sensitivity analyses
  - Multiple imputation

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Results: Demographics



- Total sample (n=2,477,771)
- With neighborhood poverty data (n=532,513)
- Moved to a different poverty neighborhood at data midpoint of 2010-2013 (n=37,544)
  - Moved to higher poverty (n=19,174)
  - Moved to lower poverty (n=18,370)

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CHARACTERISTIC	TOTAL SAMPLE (N=37544)	MOVED TO LOWER POVERTY (N=19174)	MOVED TO HIGHER POVERTY (N=18370)	P VALUE FOR DIFFERENCE
Age in months (mean [SD])	10.42±2.98	10.42±2.95	10.42±3.02	<0.01
Sex (n [percent])				
Male	18929 (50.42)	9465.69 (50.42)	9463.32 (50.42)	
Female	18615 (49.58)	9309.49 (49.58)	9305.5 (49.58)	0.99
Race/ethnicity (n [percent])				
Asian/Pacific Islander	4821.75 (12.84)	2414.03 (12.86)	2407.72 (12.83)	
Non-Hispanic black	12805.8 (34.11)	6403.16 (34.10)	6402.67 (34.11)	
Hispanic	15922.3 (42.41)	7960.95 (42.40)	7961.33 (42.42)	
Native American or Alaskan Indian	157070 (0.42)	78.88 (0.42)	78.82 (0.42)	
Non-Hispanic white	3761.76 (10.02)	1880.84 (10.82)	1880.91 (10.02)	
Other (missing/multiracial)	74.6779 (0.20)	37.31 (0.20)	37.36 (0.20)	0.99
Grade (n [percent])				
Elementary	21569 (57.45)	10789 (57.46)	10780 (57.43)	
Middle	11563 (30.80)	5781 (30.79)	5782 (30.81)	
High	4412 (11.75)	2205 (11.75)	2207 (11.76)	0.99
BMI (mean [SD])	20.05±4.97	20.05±4.93	20.05±5.01	<0.01
BMIz (mean [SD])	0.62±1.18	0.62±1.61	0.62±1.19	0.48
Eligible for free/reduced school means (n [percent])				
No	2891.55 (7.70)	1446.22 (7.70)	1445.33 (7.70)	
Yes	34652.50 (92.30)	17329 (92.30)	17323.5 (92.30)	0.99
English language learner (n [percent])				
No	31610.6 (84.20)	15806.6 (84.19)	15804 (84.20)	
Yes	5933.38 (15.80)	2968.58 (15.81)	2964.8 (15.80)	0.97

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Results


- BMI controlling for age and sex
  - Effect for youngest children  $\beta = -0.03$ ,  $p < 0.01$
- No effect on BMIz
- Sensitivity analysis
  - Consistent with multiple imputation
- Next steps
  - Multi-group two piece latent growth model

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Clinical Implications


- Consider the effects of neighborhood poverty (and other social determinants of health) when working with children to attain a healthy weight
  - Youngest children may be most susceptible to neighborhood effects

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Clinical Implications



- For children who live in poverty, consider connecting to resources to overcome barriers
  - Safe and free physical activity
  - Healthy and affordable food stores
  - Low cost recipes

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Clinical Implications



- Be careful about stigma
  - Non-judgmental body language and expressions
  - Careful word choice
  - Avoid making families feel singled out
- Consider other barriers related to poverty such as food insecurity
  - Connect with resources as needed

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Discussion



- If and how have you observed the impact of poverty (household or neighborhood) in your practice?
- Does your clinic have strategies in place to address poverty?
- Do you observe differing effects for younger children?

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Conclusions



- Nurses can play an important role in helping children - including children living in high poverty neighborhoods - to have a healthy body weight

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Thank you



- Questions?
  - [krista.schroeder@temple.edu](mailto:krista.schroeder@temple.edu)

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Resource List



American Academy of Pediatrics Curriculum on US Child Poverty: <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/CPTI/Pages/U-S-Child-Poverty-Curriculum.aspx>

American Academy of Pediatrics and Food Research & Action Center: Toolkit on Addressing Food Insecurity: <http://www.frac.org/wp-content/uploads/frac-aap-toolkit.pdf>

American Academy of Pediatrics Resources on Screening: <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/poverty/Pages/practice-tips.aspx>

American Academy of Pediatrics Social Determinants of Health: Screening Technical Assistance and Resource (STAR) Center: <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Screening/Pages/default.aspx>

SNAP: <https://www.fns.usda.gov/snap/apply>

WIC: <https://www.fns.usda.gov/wic/wic-how-apply>

National School Lunch Program: <https://www.fns.usda.gov/school-meals/applying-free-and-reduced-price-school-meals>

Children's Health Insurance Program: <https://www.insurekidsnow.gov/>

National Immigration Law Center: <https://www.nilc.org/>

State Unemployment Insurance Benefit: <http://workforcesecurity.doleta.gov/unemploy/ui/factsheet.asp>

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