

Association of the built environment with physical activity and adiposity in rural and urban children

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Objectives

- Define terms of discussion.
- Present evidence for rural/urban disparity in obesity and physical activity among youth.
- Present evidence for unique characteristics of rural existence related to physical activity/obesity.

Terms of discussion

- **PA correlates:** Factors that exhibit a positive or negative cross-sectional association with physical activity.
- **PA determinants:** Factors that predict changes in physical activity over time.
- **Intrapersonal factors:** Individual psychological beliefs and personal characteristics that enable or constrain physical activity participation.

Terms of discussion

- **Interpersonal factors:** Factors that arise through the interaction with others that enable or constrain physical activity participation.
- **Environmental factors:** Physical and social surroundings that encourage or discourage physical activity.
- **Built environment:** Man-made characteristics of the environment which have the potential to influence physical activity.

Obligatory warning

THIS PRESENTATION CONTAINS NO ANSWERS

Background

- In an effort to increase youth PA, PA correlates and determinants have been identified.¹
- Utilizing a socio-ecological approach, these factors have been examined at the intrapersonal, interpersonal and environmental levels.¹
- The vast majority of this research has been conducted in large urban areas with greater than 250,000 people.²
- Although nearly 50 million people live in rural America insufficient research has been conducted in rural areas.³

1-Baker EA, Brennan LK, Brownson R, Houseman RA. Measuring the determinants of physical activity in the community: Current and future directions. *Res Q Exerc Sport*. 2000;71(2 Suppl):146-158.

2-Giles-Corti B, Kelty SF, Zubrick SR, Villanueva KP. Encouraging Walking for Transport and Physical Activity in Children and Adolescents: How Important is the Built Environment? *Sports Medicine*. 2009;39(12):995-1009.

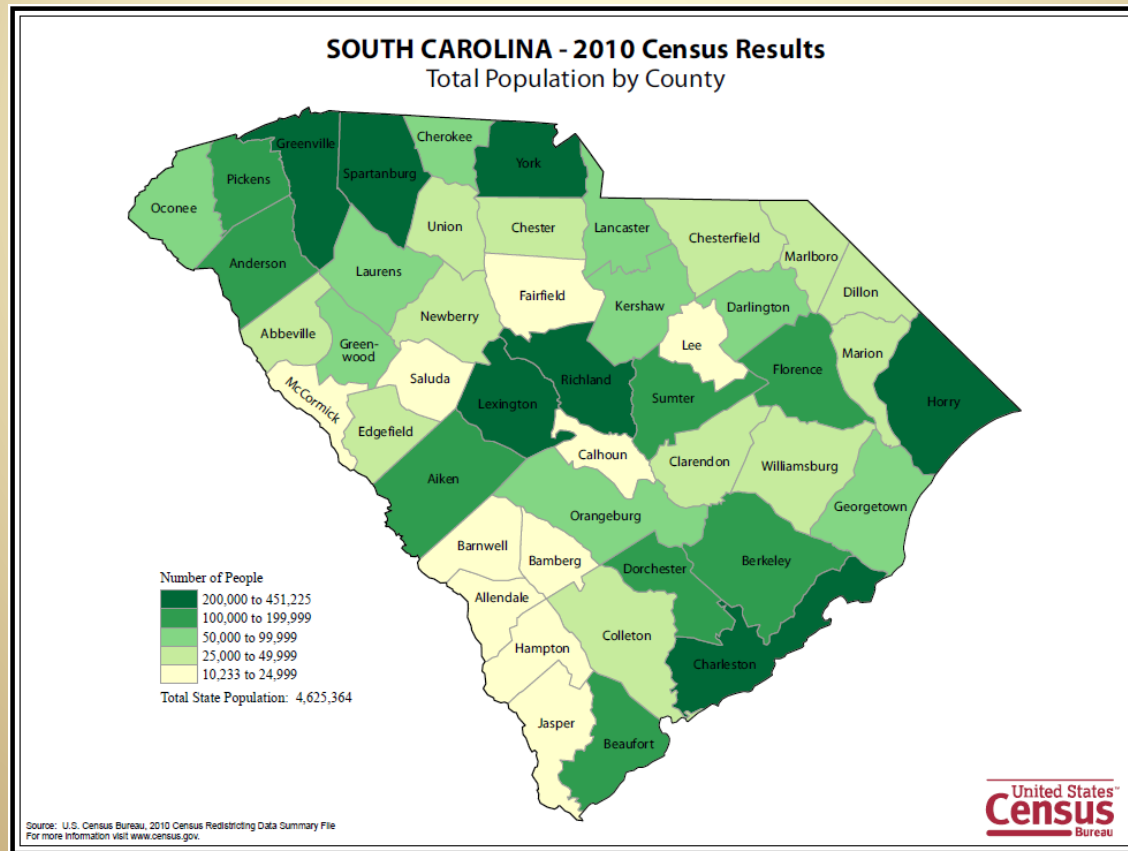
3-Yousefian A, Ziller E, Swartz J, Hartley D. Active Living for Rural Youth: Addressing Physical Inactivity in Rural Communities. *J Public Health Manag Pract*. 2009;15(3):223-231.

Questions of interest

- Do rural/urban disparities in obesity and physical activity exist among youth?
- Do characteristics exist which are unique to rural residence that are associated with physical activity/obesity?

Bigger Question

- What is “rural” as it relates to physical activity and the “built environment”?



Biggest question

- Is “built environment” a relevant concept in rural settings?



Do rural/urban disparities in overweight/obesity exist?

- In short: yes.
- In adults, obesity is highest in rural counties.⁷
- A higher prevalence of overweight/obesity is observed in rural youth.^{5,6}

5- Joens-Matre, R. R., Welk, G. J., Calabro, M. A., Russell, D. W., Nicklay, E., & Hensley, L. D. (2008). Rural-Urban Differences in Physical Activity, Physical Fitness, and Overweight Prevalence of Children. *Journal of Rural Health*, 24(1), 49-54.

6- Liu, J., Bennett, K. J., Harun, N., & Probst, J. C. (2008). Urban-Rural Differences in Overweight Status and Physical Inactivity Among US Children Aged 10-17 Years. *The Journal of Rural Health*, 24(4), 407-415.

7- Jackson, J. E., Doescher, M. P., Jerant, A. F., & Hart, L. G. (2005). A national study of obesity prevalence and trends by type of rural county. *Journal of Rural Health*, 21(2), 140-148.

Do rural/urban disparities in physical activity exist?

- In short: it depends on what you call rural.
- In adults, PA is highest in urban settings and physical inactivity highest in rural settings in the southeast.⁴
- In youth, PA is believed to be essentially equal across the rural/urban continuum.⁵
 - And maybe a little higher in rural.⁶

4- Martin, S. L., Kirkner, G. J., Mayo, K., Matthews, C. E., Durstine, J. L., & Hebert, J. R. (2005). Urban, rural, and regional variations in physical activity. *Journal of Rural Health, 21*(3), 239-244.

5- Joens-Matre, R. R., Welk, G. J., Calabro, M. A., Russell, D. W., Nicklay, E., & Hensley, L. D. (2008). Rural-Urban Differences in Physical Activity, Physical Fitness, and Overweight Prevalence of Children. *Journal of Rural Health, 24*(1), 49-54.

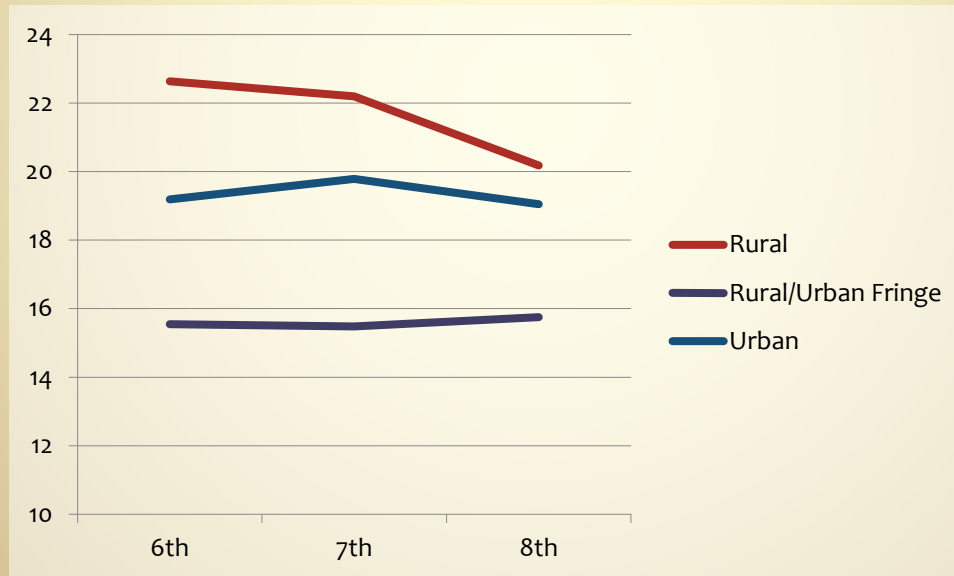
6- Liu, J., Bennett, K. J., Harun, N., & Probst, J. C. (2008). Urban-Rural Differences in Overweight Status and Physical Inactivity Among US Children Aged 10-17 Years. *The Journal of Rural Health, 24*(4), 407-415.

...but “it’s complicated”

- The relationship between ‘rurality’ and PA isn’t linear.
- Youth in the most rural areas tend to be the most active
 - But this disparity tends to disappear as they age.
- Youth in rural/urban fringe areas most at risk for insufficient activity.

Preliminary data

- Differences in MVPA per 8hrs between rural and urban youth in 6th to 8th grade youth (n=1203)



Reframing the question

- Not, “Do rural/urban disparities in physical activity exist among youth?” but “at what point do physical activity levels in rural youth fall below those of their urban counterparts.”

Do characteristics exist which are unique to rural residence that are associated with physical activity/obesity?

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- A sample of 1398 urban and 1290 rural Canadian adolescents.⁸

Results of Hierarchical Regression Analyses for Independent Variables and Moderate/Vigorous PA

Variables	Urban		Rural	
	β	Adjusted R ²	β	Adjusted R ²
Demographic		.079***		.028***
Gender	−0.99***		−.067*	
Psychological		.391***		.319***
Perception of physical ability	.075*		.209***	
Perception of health	.062*		—	
Self-efficacy	.170***		.091**	
Interest in organized group activities	.274***		.068*	
Interest in individual small-group activities	—		.116***	
Concern about gaining weight	−.055*		—	
Behavioral		.417***		.358***
Taking a physical education class	—		.154***	
Travel to school	.101***		—	
Use of recreation time for PA	.145***		.111***	
Hours per day doing part-time work	—		.066*	
Hours per day doing homework	—		.054*	
Social		.430***		.381***
Friends' PA	.085**		.121***	
Family PA	.082**		.096***	

Comparing urban/adjacent rural youth

- Physical activity measured via accelerometry
- Measured BMI
- Self-report enjoyment of PA, Safety, Walkable Destinations
- GIS used to determine proximity of walkable destinations (e.g., schools, stores)

Revisiting the question

- Do characteristics exist which are unique to rural residence that are associated with physical activity/obesity?
 - Tentative, yes.

Future directions

- Identify pivotal transition points in development of physical activity behaviors in rural youth.
- Develop appropriate metrics to measure relevant environmental correlates in rural settings.
- Identify unique barriers/solutions for physical activity promotion in rural youth.

Questions?