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Improving our food and physical activity environments

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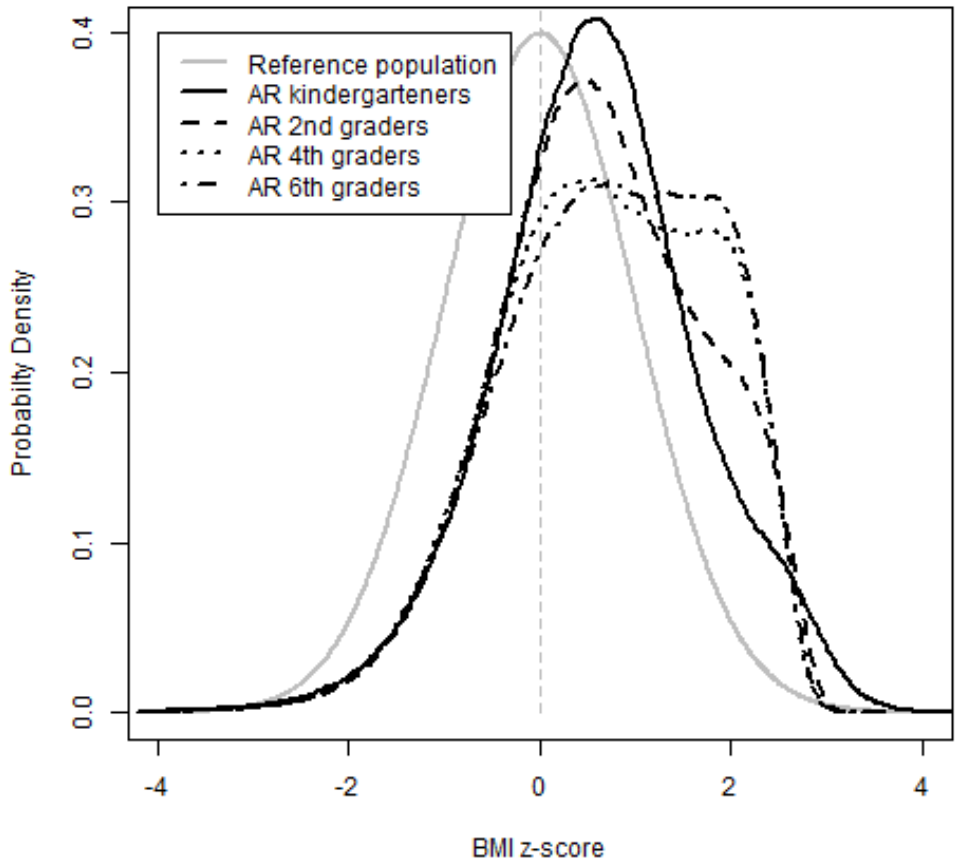
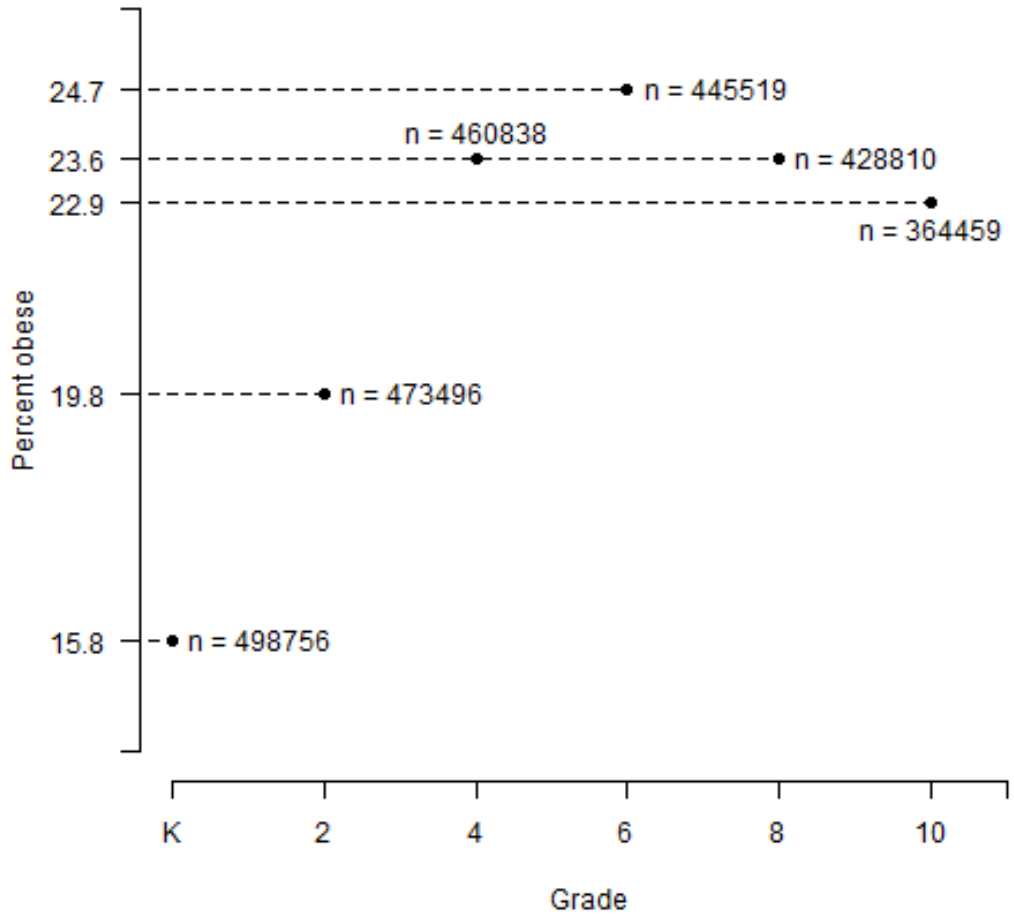
BMI by grade in the Arkansas BMI panel (2004-2019)





First the bad news …

- Based on our work it is hard to make the case that food environment meaningfully impacts childhood obesity in Arkansas (on average)
  - Fast-food restaurants
  - Food deserts
  - Dollar stores
  - Convenience stores
- These findings are consistent with the broader literature

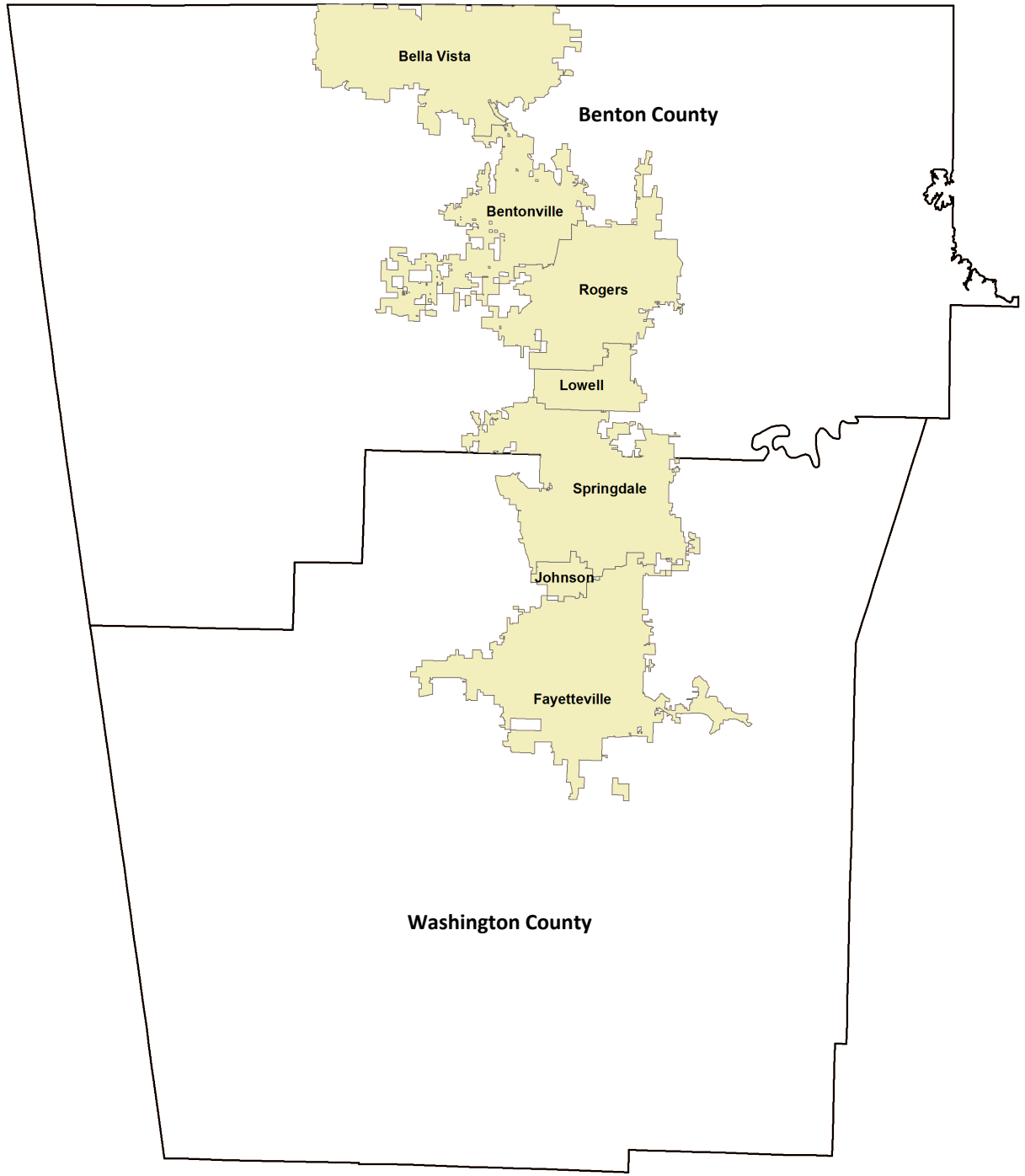
Does this mean the food environment doesn't matter? No!

- The food environment facilitates change*
  - Enabling of healthy preference learning
  - Facilitates expression of healthy preferences
  - Allows reassessment of healthy preferences
  - Creates virtuous feedback loops
- In future studies we will be looking at whether the effectiveness of interventions depends on food environment
- We are also looking at ways to improve poor food environments see: https://difang.shinyapps.io/classcasestudy/

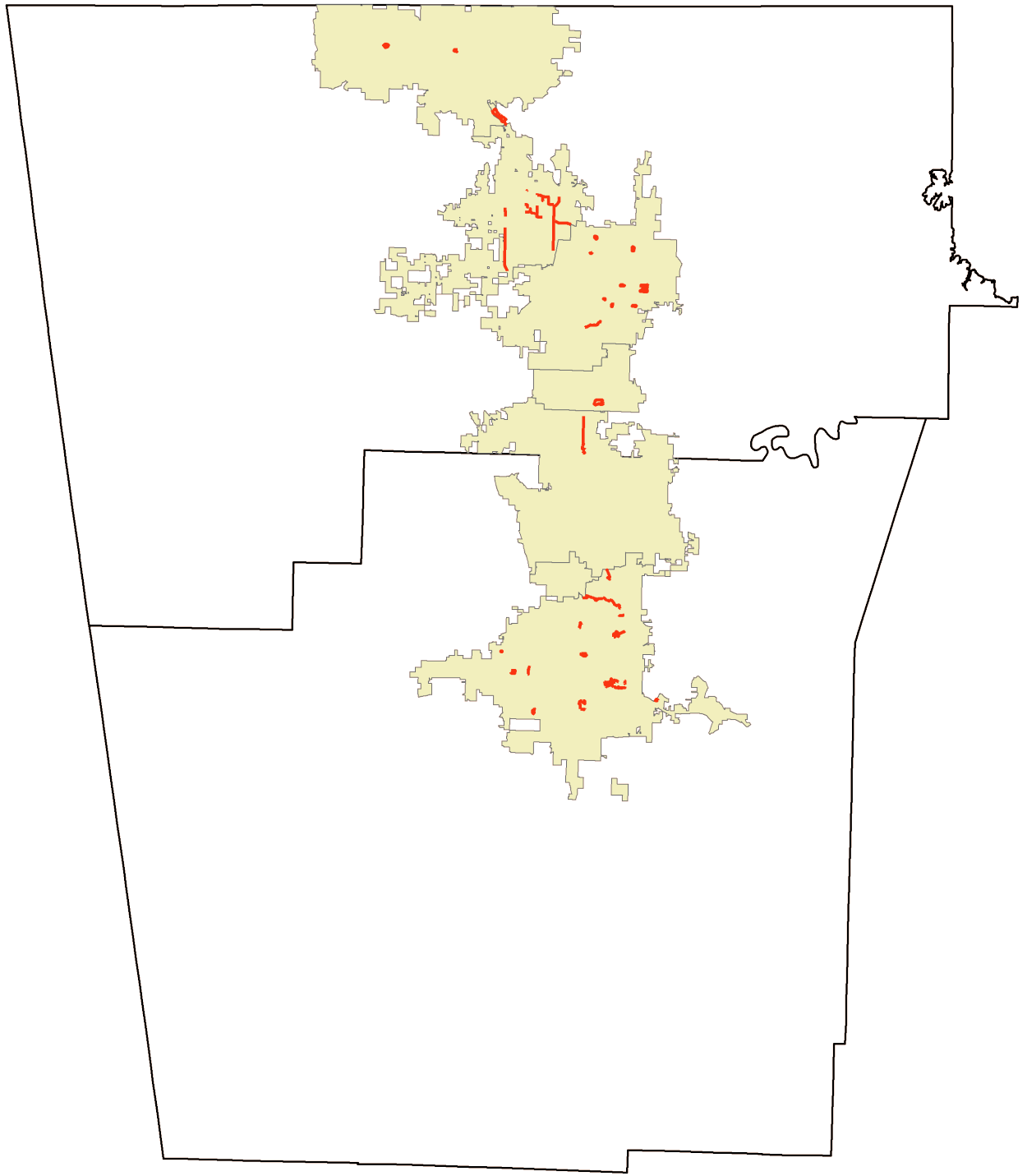
*Hawkes C, Smith TG, Jewell J, Wardle J, Hammond RA, Friel S, et al. Smart food policies for obesity prevention. The Lancet (British edition). 2015;385(9985):2410-21.

The good news!

- We are finding evidence that better physical activity environments matters
  - Kim, Bongkyun, Michael R. Thomsen, Rodolfo M. Nayga, Di Fang, and Anthony Goudie. 2019. ”Move More, Gain Less: Effect of a Recreational Trail System on Childhood BMI." *Contemporary Economic Policy*. https://doi.org/10.1111/coep.12448



Municipal boundaries

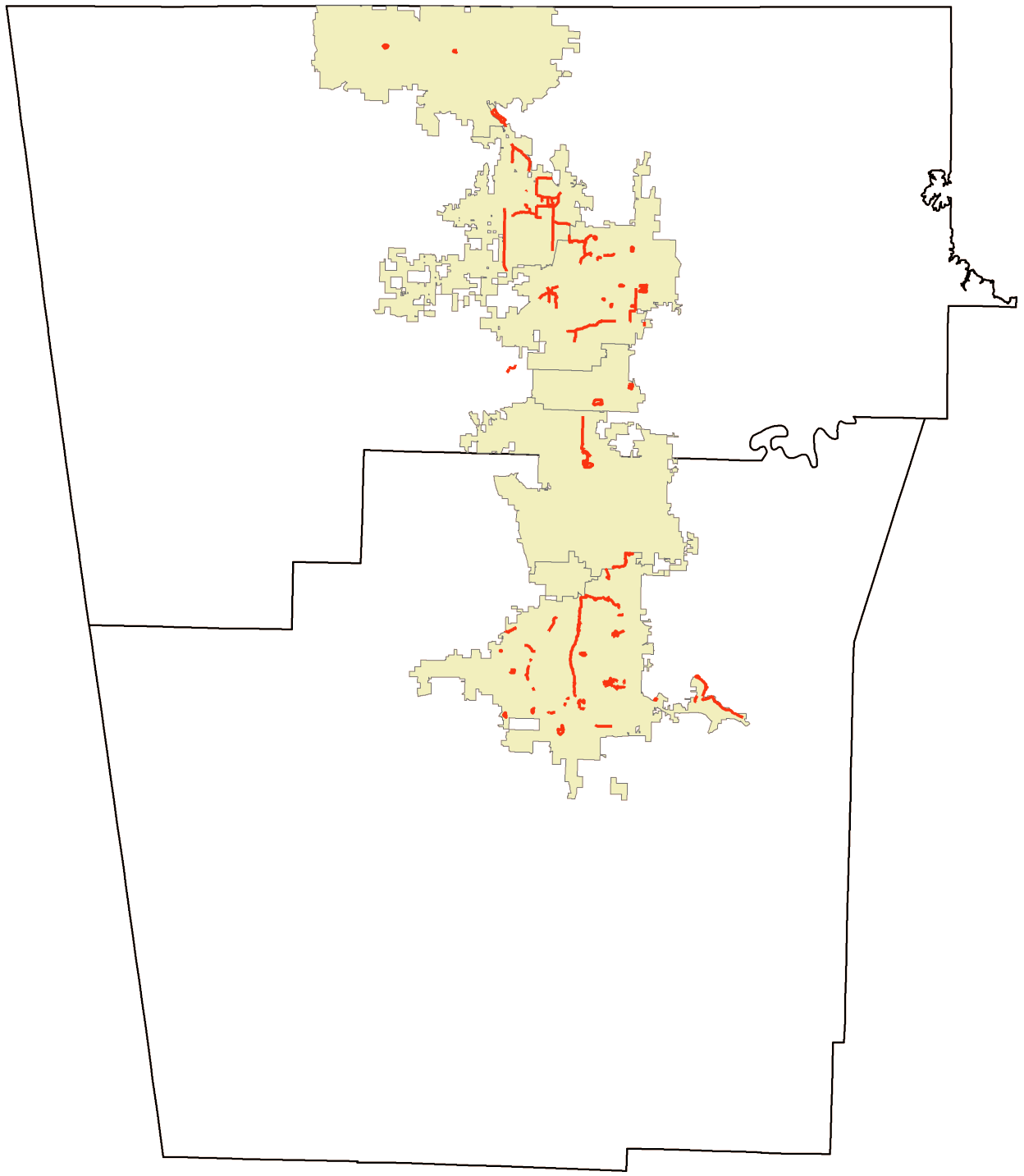


Year: 2004

Total Trail Length: 56.07 km

Municipal boundaries

Trail

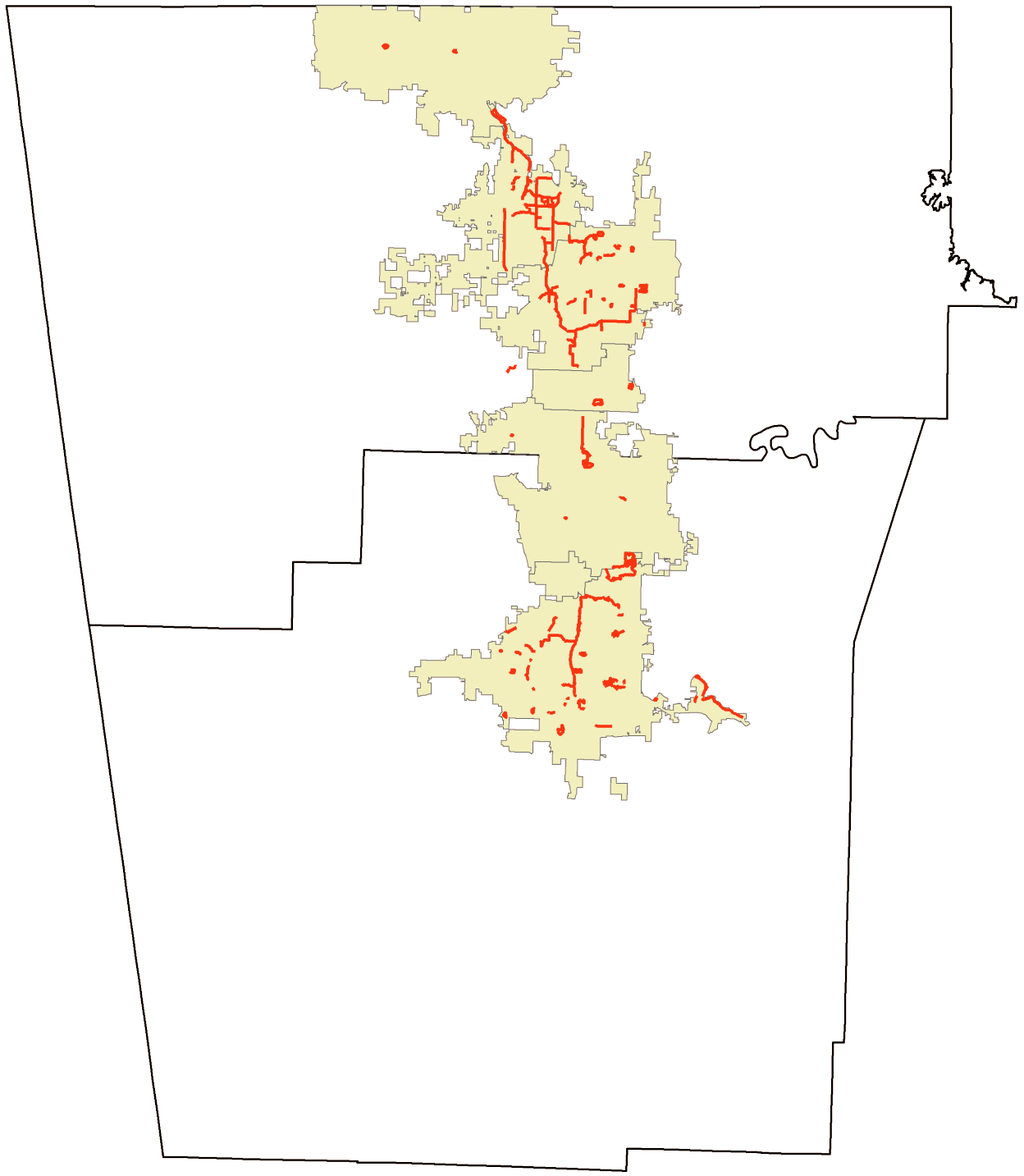


Year: 2009

Total Trail Length: 120.96 km

Municipal boundaries

Trail

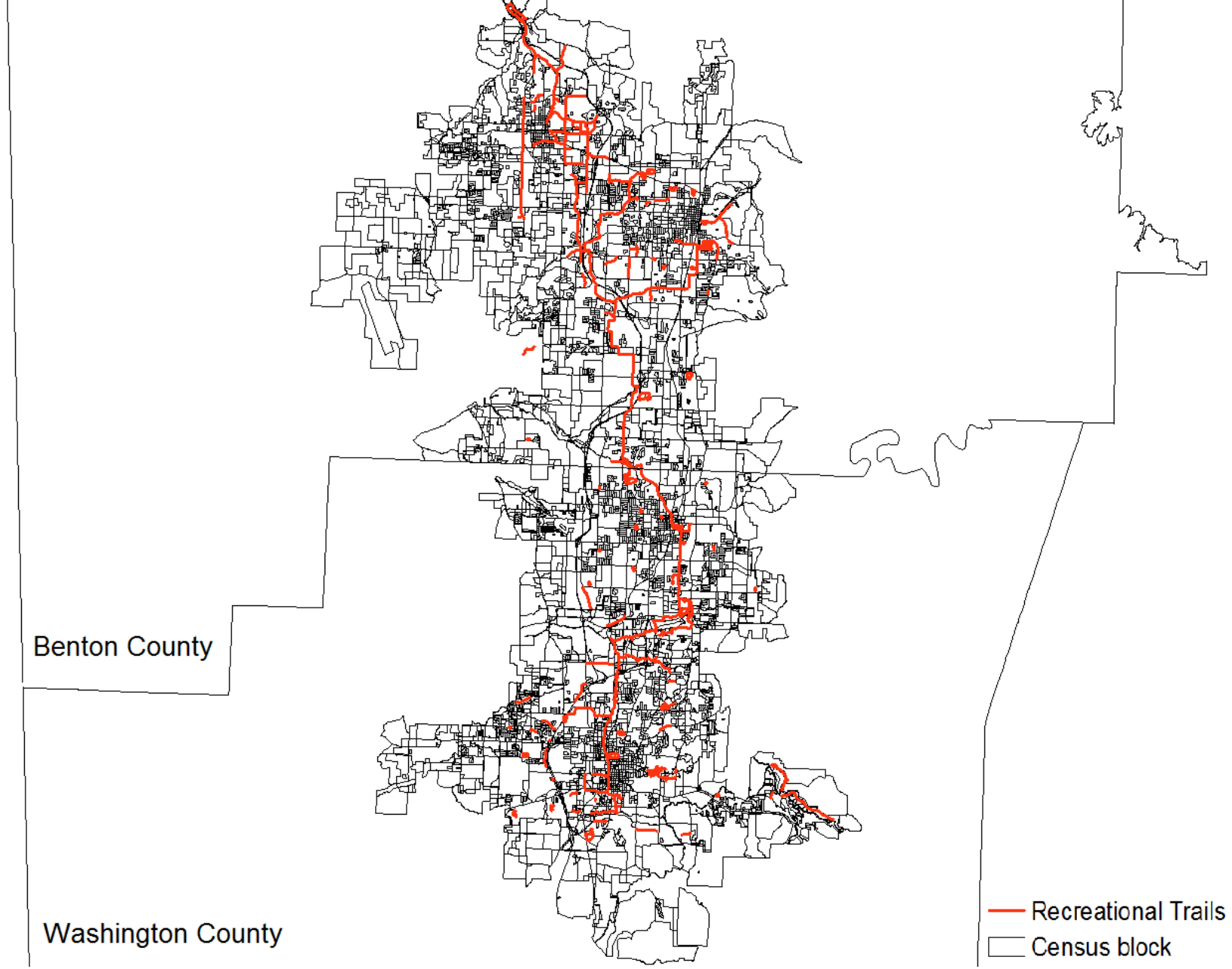


Year: 2014

Total Trail Length: 166.88 km

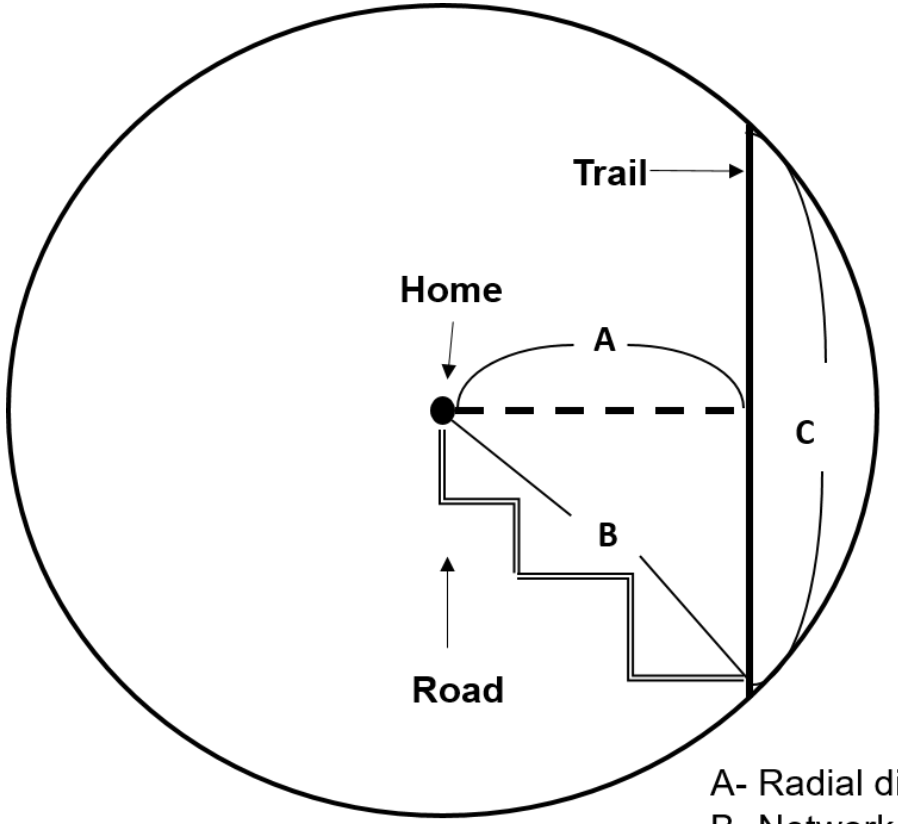
Municipal boundaries

Trail



Recreational Trails as of 2016

Measuring trail access



A- Radial distance
B- Network distance
C- Total trail length

Means of model variables (2004 – 2015)

Measure	Movers	Non-movers	All
BMI z-score	0.703	0.593	0.639
Indicator for overweight	0.180	0.170	0.174
Indicator for obese	0.212	0.178	0.192
Indicator for a trail within 1/2 mile of home using radial distance	0.282	0.291	0.288
Indicator for a trail within 1/2 mile of home using network distance	0.148	0.153	0.151
Indicator for greater than avg. length of trails within 1/2 mile of home	0.217	0.226	0.222
Indicator for male	0.515	0.514	0.515
Indicator for female	0.485	0.486	0.486
Indicator for Asian	0.080	0.057	0.066
Indicator for white	0.482	0.609	0.556
Indicator for African-American	0.053	0.029	0.039
Indicator for Hispanic	0.374	0.293	0.326
Indicator for other races	0.011	0.014	0.013
Age (years)	9.989	9.796	9.876
Indicator for free or reduced-price meals	0.641	0.421	0.513
N	76,198	107,302	183,500

Primary results: Dependent variable is BMI z-score. Trail access is measured by radial distances

	All	Non-movers	Movers
Model 1 (1/2 mile)	-0.0412***	-0.0545***	-0.0268
Model 2 (1/2, 2/3 and 1 mile)[a]	-0.0507***	-0.0634***	-0.0484**
N	183,500	107,302	76,198

Note: asterisks indicate significance *,**, and *** at the 10, 5 and 1 percent levels, respectively.

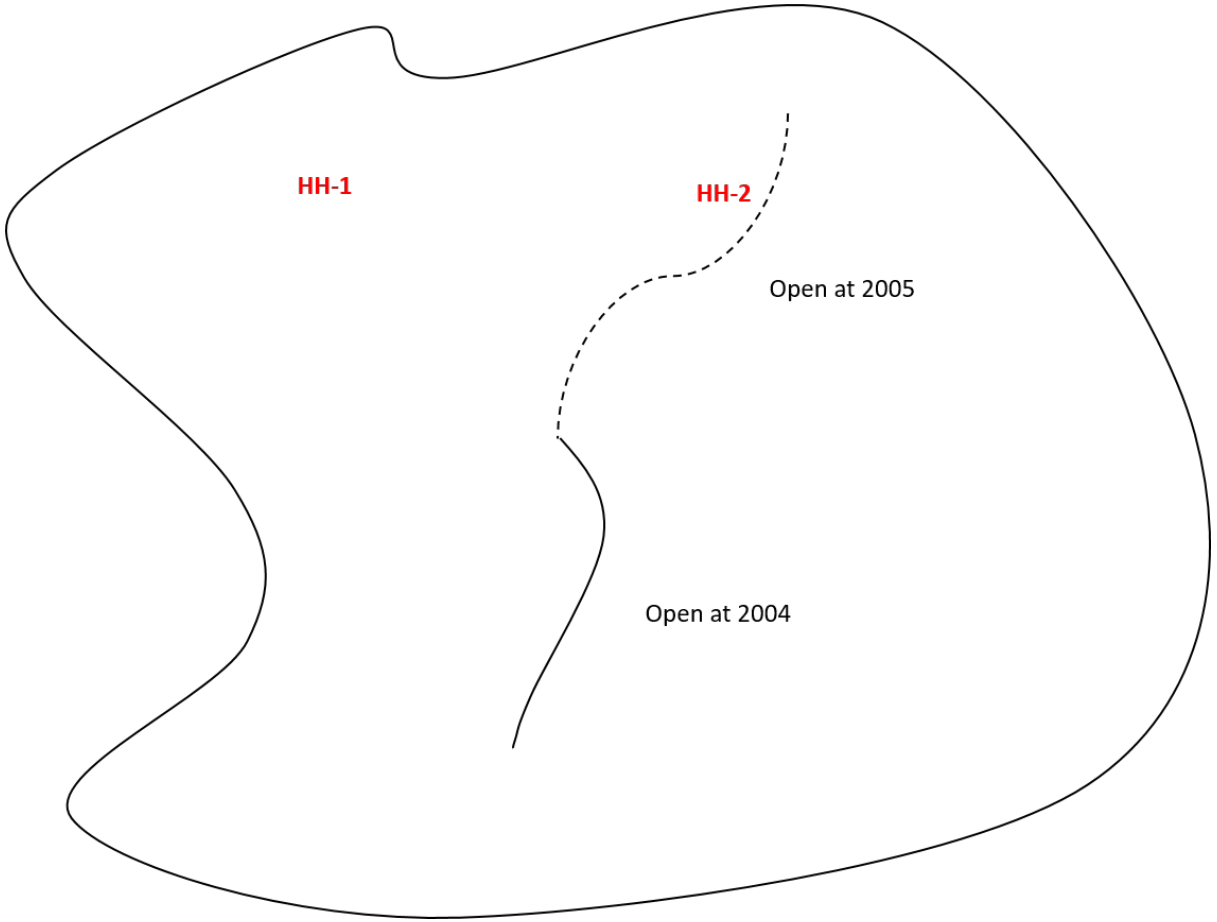
[a.] Impact reported is sum of coefficients from the 1/2, 2/3 and 1 mile trail indicators

Subsample results: Dependent variable is BMI z-score and trail access is measured by radial distances

Subsample	Estimate	N
Male	-0.0455***	94,416
Female	-0.0384**	89,084
Younger (K, 2, 4)	-0.0567***	102,804
Older (grades 6, 8, 10)	-0.0103	80,696
Free/reduced meals	-0.0622***	94,076
Full-price meals	-0.0228	89,424
White	-0.0327**	102,060
Hispanic	-0.0585**	59,869
Other Races	-0.0320	21,571
Exposure of 5+ years	-0.0711**	29,202
Exposure of < 5 years	-0.0325**	154,298

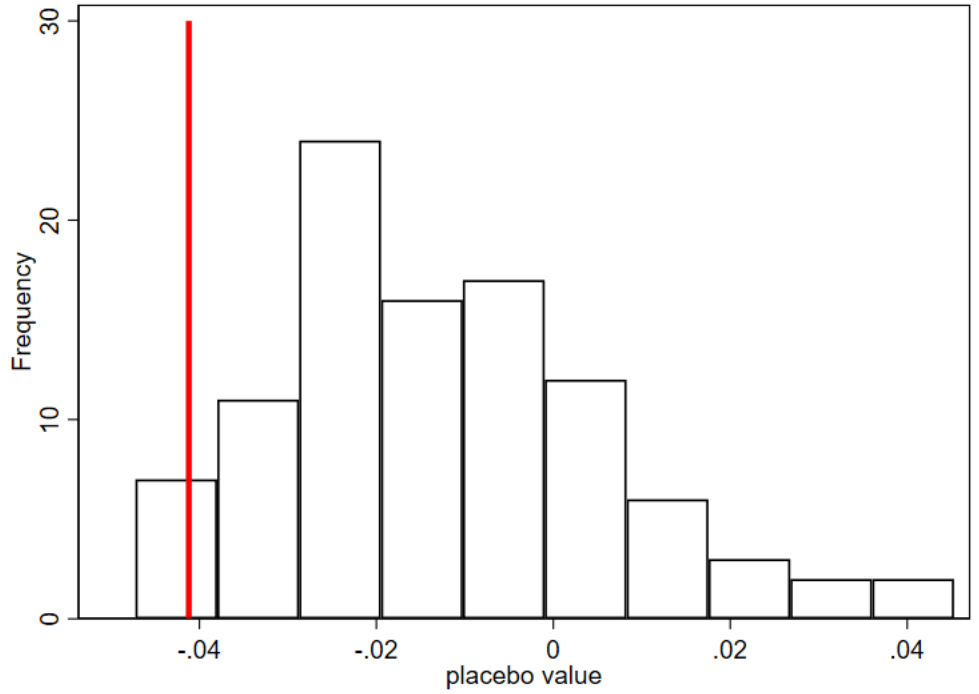
Note: asterisks indicate significance *,**, and *** at the 10, 5 and 1 percent levels, respectively.

Falsification test (a future trail should not affect someone's BMI today)



The estimated coefficient for proximity to future trails is −0.0194 (SE = 0.0333)

Permutation tests (100)



True trail locations have bigger (negative) impacts than all but five false trail locations. East/west permutations are shown but similar result for north/south permutations

Summary

- Key findings
  - Largest beneficial impacts of trails were for lower-income and Hispanic children
  - In terms of preventing excess weight gain, trails were more beneficial for younger rather than older children
- Why do trails make sense?
  - Using the trail is low cost (at the point of consumption)
  - Trails facilitate healthy choices without restricting other choices