

# Geographic information systems demonstrate links between health and location

April 10 2012

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The neighborhoods in which children and adolescents live and spend their time play a role in whether or not they eat a healthy diet, get enough exercise or become obese, concludes a collection of studies in a special theme issue of the *American Journal of Preventive Medicine*.

Each of the six studies uses the latest concepts and methods in geographic information systems (GIS)-based research to determine how the [geographic location](#) affects [physical health](#). A study titled "Spatial Classification of Youth Physical Activity Patterns" shows, for example, that while rural youth get the largest proportion of their physical activity while at school, urban and suburban youth are most active when commuting. Not only does this finding suggest that the walk to school might be just as important to some children's health as is the [physical education](#) they receive as part of the school curriculum, it is also important given that adolescent [health behaviors](#) are predictive of behaviors in adults.

Another study by researchers in the United Kingdom concludes that adolescents in rural areas ate fast food more often when fast-food outlets were easily accessible, whereas the opposite was true for adolescents living in urban areas. The researchers, led by Lorna J. Fraser of the University of Leeds, conclude that although the need continues to exist for nutritional education regarding fast food, placing restrictions on the location of fast-food outlets may not decrease consumption of fast food in the same ways in all areas.

Brian E. Saelens and Lawrence D. Frank, along with their colleagues, authored two papers for the theme issue. "Obesogenic Neighborhood Environments, Child and Parent Obesity: The Neighborhood Impact on Kids Study" evaluated child and parent weight status across neighborhoods in Seattle and San Diego and ultimately found evidence that GIS-based definitions of obesogenic neighborhoods that consider both physical activity and the availability of healthy [food options](#) were strongly related to childhood obesity.

In a second study, the researchers used GIS-based measures to determine the 'walkability' and proximity to [healthy food](#) of certain neighborhoods in the San Diego and Seattle regions. The study recommends that such measures be used to study physical activity, nutrition and obesity outcomes.

In a paper titled "Obesogenic Environments in Youth: Concepts and Methods from a Longitudinal National Sample," Janne Boone-Heinonen and colleagues describe the challenges inherent to longitudinal neighborhood environment research, as well as the insights they gained and the advances and remaining gaps in study design. The researchers note that understanding which neighborhood environment features influence weight gain in various age groups is essential to effectively prevent and reduce childhood obesity.

Two commentaries included in the theme issue examine the ways that computer-based GIS systems—which transform geospatial data into visual representations of the real world—can help prevent childhood obesity. "Thinking About Place, Spatial Behavior, and Spatial Process in Childhood Obesity" by Stephen A. Matthews, outlines the content of the theme, concluding that although GIS is not a panacea, it "offers an important means of better understanding and dealing with some of the most pressing problems of our time, and provides valuable tools for researchers and policymakers alike."

The second commentary, providing a perspective from the Robert Wood Johnson Foundation, notes that while GIS is still in the relatively early stages of application in the field, it might one day enhance understanding of the complex and dynamic connections between people, their health and their physical and social environments.

**More information:** “The Role of the Geographic Information Systems Infrastructure in Childhood Obesity Prevention: Perspective from the Robert Wood Johnson Foundation,” by C.M. Torio ([doi: 10.1016/j.amepre.2012.02.003](https://doi.org/10.1016/j.amepre.2012.02.003)).

“Thinking About Place, Spatial Behavior, and Spatial Processes in Childhood Obesity,” by S.A. Matthews ([doi: 10.1016/j.amepre.2012.02.004](https://doi.org/10.1016/j.amepre.2012.02.004)).

“Obesogenic Environments in Youth Concepts and Methods from a Longitudinal National Sample,” by J. Boone-Heinonen and P. Gordon-Larsen ([doi: 10.1016/j.amepre.2012.02.005](https://doi.org/10.1016/j.amepre.2012.02.005)).

“Objective Assessment of Obesogenic Environments in Youth: Geographic Information System Methods and Spatial Findings from the Neighborhood Impact on Kids Study,” by L.D. Frank, B.E. Saelens, J. Chapman, J.F. Sallis, J. Kerr, and K. Glanz, S.C. Couch, V. Learnihan, C. Zhou, T. Colburn, and K.L. Cain ([doi: 10.1016/j.amepre.2012.02.006](https://doi.org/10.1016/j.amepre.2012.02.006)).

“Obesogenic Neighborhood Environments, Child and Parent Obesity: The Neighborhood Impact on Kids Study,” by B.E. Saelens, J.F. Sallis, L.D. Frank, S.C. Couch, C. Zhou, T. Colburn, K.L. Cain, MA, James Chapman, MSCE, Karen Glanz, PhD, MPH ([doi: 10.1016/j.amepre.2012.02.008](https://doi.org/10.1016/j.amepre.2012.02.008)).

“Patterns of Obesogenic Neighborhood Features and Adolescent Weight:

A Comparison of Statistical Approaches,” by M.M. Wall, N.I. Larson, A. Forsyth, D.C. Van Riper, D.J. Graham, M.T. Story, and D. Neumark-Sztainer ([doi: 10.1016/j.amepre.2012.02.009](https://doi.org/10.1016/j.amepre.2012.02.009)).

“Fast Food and Obesity: A Spatial Analysis in a Large United Kingdom Population of Children Aged 13–15,” by L.K. Fraser, G.P. Clarke, J.E. Cade, and K.L. Edwards ([doi: 10.1016/j.amepre.2012.02.007](https://doi.org/10.1016/j.amepre.2012.02.007)).

“Spatial Classification of Youth Physical Activity Patterns,” by D.G. Rainham, C.J. Bates, C.M. Blanchard, T.J. Dummer, S.F. Kirk, C.L. Shearer ([doi: 10.1016/j.amepre.2012.02.011](https://doi.org/10.1016/j.amepre.2012.02.011)).

Provided by Elsevier

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