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The association between county political inclination and obesity: Results from the 2012 presidential election in the United States

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Abstract

Objective—We examined whether stable, county-level, voter preferences were significantly associated with county-level obesity prevalence using data from the 2012 US Presidential election. County voting preference for the 2012 Republican Party presidential candidate was used as a proxy for voter endorsement of personal responsibility approaches to reducing population obesity risk versus approaches featuring government-sponsored, multi-sectoral efforts like those recommended by the Centers for Disease Control Centers for Disease Control (CDC, 2009).

Method—Cartographic visualization and spatial analysis were used to evaluate the geographic clustering of obesity prevalence rates by county, and county-level support for the Republican Party candidate in the 2012 U.S. presidential election. The spatial analysis informed the spatial econometric approach employed to model the relationship between political preferences and other covariates with obesity prevalence.

Results—After controlling for poverty rate, percent African American and Latino populations, educational attainment, and spatial autocorrelation in the error term, we found that higher county-level obesity prevalence rates were associated with higher levels of support for the 2012 Republican Party presidential candidate.

Conclusion—Future public health efforts to understand and reduce obesity risk may benefit from increased surveillance of this and similar linkages between political preferences and health risks.

Keywords

Obesity; Politics; Voting; Spatial analysis; Spatial econometrics

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Conflict of interest

The authors declare that there are no conflicts of interests.

Introduction

As the cost of the obesity epidemic continues to rise in the United States, political measures and government responses to the epidemic have been increasing (Cawley and Liu, 2008). The *2010 Dietary Guidelines for Americans* (U.S. Department of Agriculture (USDA), 2010), the nation's consensus scientific pronouncement on optimal nutrition, concluded: "Although individual behavior change is critical, a truly effective and sustainable improvement in the Nation's health will require a multi-sectoral approach … to improve the food and physical activity environment." The multi-sectoral approach includes nutrition and physical activity policies implemented in schools, workplaces, community parks, and neighborhoods. Republicans have generally opposed the multi-sectoral approach to reducing obesity risk, instead preferring a personal responsibility approach. For instance, support for the Institute of Medicine recommendations (Stallings et al., 2010), such as restricting calorie-rich and nutrient-poor foods in schools, has been observed more frequently in states with Democratic governors and legislatures than in states with Republican ones (Cawley and Liu, 2008). Further, a 2011 random sample survey of U.S. state legislators showed that Democratic party affiliation was a strong correlate of support ($R^2 = 0.44$) for CDC recommended community intervention strategies to prevent obesity in the U.S., and that the obesity status of legislators was unrelated to support for the CDC's recommendations (Welch et al., 2012).

For several years and presidential election cycles, Democrats and Republicans have differed in political philosophy and views about what role government should play with regard to promoting behaviors identified by science as associated with reduced obesity risk. For instance, the 2008 Democratic party platform stated, "We will ensure that Americans can benefit from healthy environments that allow them to pursue healthy choices" (Democratic National Committee, 2008), and in 2012 the Democrats reiterated, "We will continue to invest in our public health infrastructure — ensuring that we are able to … support community-based efforts to prevent disease" (Democratic National Committee, 2012). By contrast, the 2012 Republican platform stated, "When approximately 80% of healthcare costs are related to lifestyle – smoking, obesity, substance abuse – far greater emphasis has to be put upon personal responsibility for health maintenance", which echoed their 2008 platform that noted, "We can reduce demand for medical care by fostering personal responsibility within a culture of wellness" (Republican National Committee, 2012, 2008).

The USDA's seven MyPlate messages (USDA, 2011) represent a distillation of the consensus nutrition science vetted by the Advisory Committee for the Dietary Guidelines for Americans. Public health initiatives designed to increase adherence to these seven recommendations have been generally opposed by Republicans. These initiatives include restaurant menu labeling, taxes on sugar sweetened beverages, size restrictions on soda beverage containers, reduced provision of pizzas in the National School Lunch Program (NSLP), and reduced sodium levels in NSLP menu items. Comprehensive, multi-sectoral policy approaches to weight control are working and are beginning to yield success (Centers for Disease Control, CDC, 2013). To encourage further discussion about the role and influence of political ideology on promoting or opposing recognized strategies for reducing obesity risk, we conducted a preliminary examination of the association between political

inclination and obesity prevalence across all U.S. counties. We examined this relationship using county-level obesity prevalence estimates and presidential election data, geographic visualization techniques and spatial econometrics.

Methods

The outcome measure for our analyses was the 2009 age-adjusted county-level prevalence estimate for the percentage of adults who were obese (body mass index N 30). This estimate was based on self-reported weight and height obtained from the CDC's Behavioral Risk Factor Survey System (BRFSS). As an ongoing, state-based telephone survey using random-digit dialing of adults in the US, the BRFSS monitors the prevalence of key health behaviors and characteristics (Centers for Disease Control, CDC, 2006).

The county-specific percentage of votes obtained by the 2012 Republican Party candidate, Mitt Romney, was used as a proxy for 'local political inclination', which we defined as established and stable county-level voter preferences. Correlation analyses indicated that county-level support for the 2012 Republican presidential candidate closely followed patterns of support for the Republican presidential candidates in 2008 ($R^2 = 0.93$) and 2004 ($R^2 = 0.85$). Counties are the smallest political unit for which the data used in this study were available, and also have the advantage of near universal coverage across the US. Pre-compiled and freely accessible county-level election data from the 2012 US Presidential contest were downloaded from a large circulation newspaper (Guardian newspaper, 2012a). Based on previous research, we included county-level poverty rate estimates, percent African American and Latino/Hispanic population, and educational attainment (i.e., high school diploma or less only) as covariates (Boardman et al., 2005). Poverty and demographic data were obtained from the U.S. Census Bureau (2012).

Responding to calls to increase awareness about the link between the local environment and healthy behaviors (Institute of Medicine (IOM), 2009), we explored visually the association between obesity prevalence and the local political environment by creating a cartogram of the U.S. based on 2009 county-level obesity rates, and overlaying 2012 levels of support for the Republican presidential candidate using ArcGIS (version 9.3). A cartogram is a map that draws units of analysis (e.g., counties) in proportion to, in this case, the obesity rate of the specified county (Gastner and Newman, 2004; Houle et al., 2009). The distortions visible in a cartogram result from this rescaling even as the integrity of the original geographic boundaries is maintained.

We used the OpenGeoDa (version 1.0.1) spatial analysis software to assess formally levels of spatial autocorrelation in obesity prevalence rates across the US, and to control for spatial effects in our regression model (Anselin et al., 2005). The geographic clustering of variables used in a regression model violates the assumption of independence of observations. Failure to account for the presence of spatial autocorrelation in such models can lead to biased or inefficient parameter estimates (Ward and Gleditsch, 2008).

Results

The cartogram illustrates that obesity rates are lowest in the western US and higher across the mid-western, southern and southeastern regions of the country (Fig. 1). Visual correlations between countylevel obesity rate estimates and voter preferences are neither pronounced nor definitive. Both high (i.e., red hues) and low (i.e., blue hues) levels of support for the 2012 Republican Party presidential candidate can be found within states with both high and low obesity rates (e.g., Mississippi, Idaho).

The Moran's I test for spatial autocorrelation confirmed that county level obesity rates are geographically clustered in a non-random fashion (Moran's $I = 0.60$, $p < 0.01$). In other words, obesity rates in one county are significantly correlated with rates in neighboring counties. Diagnostic tests also indicated that our model needed to control for spatial autocorrelation in the error term. We therefore estimated a spatial error regression model that included a term, λ (lambda), used to control for spatial autocorrelation (Ward and Gleditsch, 2008). The λ term was calculated using a spatial weights matrix that summarized the geographic relationships between neighboring counties.

Results from the spatial error model show that there is a modest positive association between county-level support for the 2012 Republican presidential candidate and county-level obesity prevalence. Specifically, holding other covariates constant, a 1% increase in county-level support for the Republican candidate corresponds to a 0.02% increase in age-adjusted obesity rates. Though small, this linkage is statistically significant even after including potential confounders as covariates and controlling for spatial autocorrelation in the error term (Table 1).

Conclusion

Our results suggest that county-level obesity risk may be positively associated with established, county-level, voter preferences for Republican candidates who are more likely to emphasize a personal responsibility approach to reducing obesity risk than their Democrat counterparts, and who may downplay the role that government policies could play, despite the scientific consensus that a multi-sectoral approach is effective (U.S. Department of Agriculture, USDA, 2010). Conversely, county-level obesity risk may be negatively associated with stable, county-level, voter preferences for Democratic candidates whose political philosophy are likely to support multi-sectoral approaches to reducing obesity risk similar to those recommended by the CDC (Centers for Disease Control, CDC, 2009). Future decisions, regulations and policies about how to address and control the obesity epidemic will necessarily involve government intervention (Crammond et al., 2013), because they involve workplace, school, marketing and agricultural policies, none of which individuals can control by themselves. While the politics around choosing strategies to combat obesity will continue to be debated in the US, the consequences and implications of such interventions and policies will be applicable internationally. The politics around obesity reduction, and more generally, the politics around food production and marketing will become more salient as the global food industry continues to consolidate, food preferences and demands change, and local food availability is altered.

We acknowledge limitations to this analysis. First, as with all ecological analyses, our results may not be corroborated by results of individual-level analyses. Second, obesity is influenced by a range of factors and complex mechanisms not fully captured by our data. There are many possible causal pathways between county-level voter preferences, obesity rates, and the obesity-promoting or restricting environments in those counties, only some of which were explored here. Third, the obesity prevalence data were based on self-reported height and weight, which are known to be biased. Fourth, county-level presidential voter preferences are imprecise proxies for voter support or opposition to government-sponsored multi-sectoral interventions. Future research should employ more direct assessment of what we call “political inclination”. Fifth, despite using spatial econometrics, estimating a single model for the US may conceal significant local and regional variations in parameter estimates.

As societies in the developed world mobilize resources to stem the obesity epidemic and its predictable downstream consequence of higher health care costs, more policies are being adopted through legislative support and action (Hersey et al., 2010; Welch et al., 2012). It is plausible, as evidenced by this first-pass examination of the association between county-level voter preferences and obesity risk prevalence, that there is a link between the political philosophy of locally elected officials and the obesity risk of their constituents. This link merits more attention by researchers and more discussion by policy makers. The United States lags behind other countries, such as the United Kingdom (UK), in adopting such multi-sectoral strategies as: advertising policies designed to protect children from junk food marketing, manufacturing policies designed to reduce sodium in the food supply, environmental policies designed to ensure public access to parks and recreational resources, and agricultural policies designed to incentivize the purchase of fresh produce and reduce demand for low-nutrient, high-calorie food products. The 2011 UK adult obesity prevalence was 24.8%, which was 5% lower than its 2010 rate of 26.2 (Guardian newspaper, 2012b). By contrast, the U.S. obesity rate of 35.6% has not declined (Flegal et al., 2012). It should not be entirely surprising that counties may experience higher obesity risk when there is consistently greater, local electoral support for candidates who tend to oppose multisectoral strategies compared to counties where there is consistently greater support for candidates who promote multi-sectoral policies to combat obesity.

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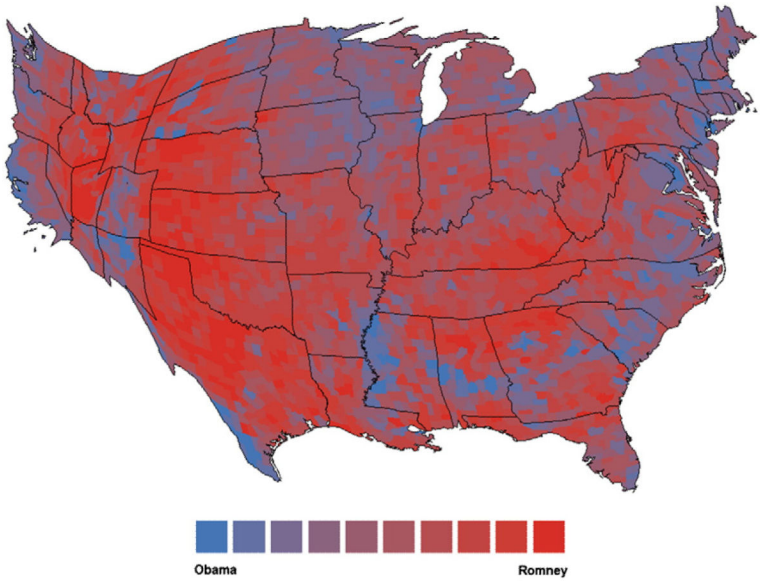

Fig. 1.

Cartogram of county-level age-adjusted adult obesity prevalence rates (%) and support for Mitt Romney in the 2012 U.S. presidential election. The size of each county is rescaled and redrawn according to its obesity prevalence rate. Counties are shaded according to levels of support for Mitt Romney (i.e., reds) or Barack Obama (i.e., blues).

Table 1

Predictors of county-level age-adjusted adult obesity prevalence rates for contiguous U.S. (N = 3109).

	Beta	Standard error
Constant	18.232	
Poverty rate (%)	0.173**	0.01
African American (%)	0.090**	0.007
Latino/Hispanic (%)	0.001	0.001
Educational attainment (high school or less only) (%)	0.195**	0.009
2012 Republican Party candidate vote (%)	0.023**	0.005
λ (the control for spatial clustering in the error term)	0.663**	0.017

a. Statistical significance for parameter estimates represented as:

b. Log likelihood: −7392.7 v.−7905.0 for OLS without spatial error term.

c. To test the robustness of the model, key “swing” states (i.e., FL, NC, IN, CO, VA) were removed and the model re-estimated. Results from the sensitivity analysis (unreported) were consistent in magnitude, direction and significance with those reported in Table 1.

** $p < 0.01$.