Rural Disparities in the Distribution of Policies that Support Healthy Eating in US Secondary Schools

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ABSTRACT
The distribution of food and nutrition policies and practices from 28 US states representing 6,732 secondary schools was evaluated using data from the 2008 School Health Profiles principal survey. School policies and practices evaluated were: availability of low-nutrient, energy-dense (LNED) snacks/drinks; use of healthy eating strategies; banning food marketing; availability of fruits and vegetables; and food package sizes. For each school, school-level demographic characteristics (percentage of students enrolled in free/reduced-price meals, minority enrollment, and geographic location) were also evaluated. Schools in small town/rural locations had significantly fewer policies that support healthy eating strategies and ban food marketing, and were less likely to serve fruits and vegetables at school celebrations, have fruits and vegetables available in vending or school stores, and limit serving-size packages. Schools serving the highest percentage of minority students consistently reported the same or better school food environments. However, schools serving the highest percentage of low-income students had varied results: vending and LNED vending policies were consistently better and fruit and vegetable availability–related policies were consistently worse. Disparities in the distribution of policies and practices that promote healthy school food environments seem most pronounced in small town/rural schools. The data also support the need for continued reinforcement and the potential for expansion of these efforts in urban and suburban areas and schools with highest minority enrollment.
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THE CHILD NUTRITION AND WIC REAUTHORIZATION Act of 2004 (CNRA 2004), a major federal legislative milestone to address childhood obesity, included a mandate to school districts participating in the school meal program to establish and implement policies addressing nutrition at school by the start of the 2006-2007 school year. Evaluating the effectiveness of these school nutrition policies is a nationwide priority.[1] Research suggests that school food environments, especially competitive foods, contribute excess energy to children's diets.[2,3] Estimates show that low-nutrient, energy-dense (LNED) competitive foods provide 171 kcal/day to the diets of middle school students and 219 kcal/day to high school students.[4] Although evidence of the impact on student body mass index remains mixed,[5] a few studies suggest inverse associations between youth overweight and school food environments when mandated by states[6] and whether strong district wellness policies[7] and local school policies and practices are in place.[8,9]

Monitoring the distribution of school food policies and practices and evaluating effectiveness through a health disparities lens is important.[10] Minority and low-socioeconomic groups are disproportionately affected by excess weight at all ages.[11] Obesity rates among rural youth are as much as 50% higher compared with their urban counterparts.[12-14] Although recent (2001-2008) evidence suggests a leveling off of obesity prevalence among white students, it also points to a worsening disparity among nonwhite students, especially for severe obesity.[15] Descriptive evaluations considering school obesity prevention policies and disparities have identified differences by geographic region of the country (eg, southern states)[16] and across schools by poverty status and geographic location (eg, schools in rural communities).[17,18] Two evaluation studies report more favorable behavioral outcomes for minority students with stronger state mandates for competitive foods in schools.[19,20] Evidence-based recommendations directed at competitive foods that aim to reverse the obesity trajectory include: (a) establishing nutrition standards for competitive foods available at school,[21] (b) incorporating collaborative strategies to encourage healthy eating at school,[22] and (c) banning advertising and marketing of LNED foods to youth in schools.[21,23] The extent that the adoption of these recommendations is evenly distributed across US schools is not known. The goal of this study was to compare the distribution of food and nutrition–related policies and practices across US middle and junior/senior high schools (6th to 12th grade) by geographic location, minority enrollment, and free/reduced-price school meal enrollment after implementation of the 2004 CNRA in 2006. This inquiry is especially relevant as schools prepare to respond to the Healthy, Hunger-Free Kids Act of 2010, which focuses on competitive foods sold at school with a rolling implementation timeline beginning 2012-2020.[24]

METHODS

Dependent Variables and Source

The dependent variables for this cross-sectional study were school-level food and nutrition–related policy and practice questions collected as part of the 2008 School Health Profiles Principal Survey (Profiles), a surveillance tool sponsored by the Centers for Disease Control and Prevention (CDC), which has good validity and reliability.[25] Profiles include a biennial survey of public school principals of middle and junior/senior high schools collected by state education and health agencies. School response rates for individual states for 2008 ranged from 70% to 93%.[26] Most states give the CDC permission to share their de-identified dataset. For this study, states were individually contacted and asked to share their school *identified* data sets for the purpose of linking the school-level demographic data (geographic location, minority enrollment, free/reduced-priced meal enrollment).

Data Collection

An e-mail letter of invitation was sent to all 50 states' Profiles coordinators from the principal investigator explaining the study purpose and requesting access to their existing 2008 school-level policy data. A signed data use agreement detailing data confidentiality was also included. State Profiles administrators (ie, Department of Education, Department of Health) had varying comfort levels with data-sharing, ranging from accepting the terms of agreement, to requiring additional paperwork, to engaging in an iterative process with the project data manager that accomplished the data linking without divulging school identifying data. Total contacts (ie, emails, phone calls) to state agencies to share and transfer their states' Profiles data ranged from 1 to 35 with an average of 10. Fifty-six percent of states (n=28) contacted agreed to share their datasets. A map of the participating states is available at the project website (http://z.umn.edu/schoolnutrition). Seven states did not respond to multiple requests to participate (14%); eight refused to participate (16%), citing change in leadership, concerns that sharing the identified datasets violated agreements with participating schools, or inability to locate data due to staff turnover and loss of positions. Seven states (14%) sent de-identified data, which could not be used.

State nonresponse bias was assessed using publicly available state-level policy and practice data from the nonparticipating states. The absolute differences between participating and nonparticipating states in the median weighted percentage of schools reporting each nutrition policy item were less than 5% for all but two items. The two items were "allowed students to purchase non-fried vegetables" (20% vs 28%) and "collected suggestions on food preferences" (45% vs 55%). Altogether, these results suggest similar nutrition policy implementation for participating and nonparticipating states.

Scale Development

Food and nutrition–related policy and practice items from the Profiles principal survey were identified and grouped to represent three domains: availability of LNED snacks and drinks, engaging in healthy eating strategies, and marketing of LNED snacks and drinks. Four other policy and practice items were evaluated individually.

Availability of LNED snacks and drinks. Ten items were identified and included whether the following were available for purchase in vending machines or school stores (VMSS): chocolate candy, candy, salty snacks not low in fat, cookies, cakes, crackers not low in fat, ice cream not low in fat, 2% or whole milk, frozen water ices or slushes that do not contain juice, soda pop or fruit drinks that are not 100% juice, sport drinks, and caffeinated foods or beverages. Responses were coded as yes=1, no=0. The summated scale score represented the total number of LNED snacks and drinks available for purchase. Cronbach's α for this scale was .80. Schools without VMSS were excluded from this analysis.

Healthy eating strategies. Five items were identified and included whether the following strategies were used: strategic pricing of healthy snacks and drinks lower in cost and/or LNED snacks and drinks higher in cost, suggestions collected from students and families, calorie information provided to students/families, student taste-testing of new products, and student visits to the cafeteria for learning. Responses were coded as yes=1, no=0. The summated scale score represented the total number of implemented healthy eating strategies. Cronbach's α for this scale was .61.

Marketing of LNED snacks and drinks. Four items were identified and included whether the school prohibits advertisements for candy, fast food, or soft drinks in (1) school building (yes/no), (2) on school grounds (yes/no), (3) on school buses (yes/no), (4) in school publications (yes/no). Responses were coded as yes=1, no=0. The summated scale score represented the total number of banned marketing practices. Cronbach's α for this scale was .89.

Other policy/practice items not included in the scales. Four additional items were examined separately: fruits and/or vegetables available at school celebrations (almost always or always, rarely, or never), any VMSS availability (yes or no), fruits and/or vegetables available for purchase from VMSS (yes or no), and limited package/serving size of items sold in VMSS (yes or no).

Independent Variables and Sources

The independent variables for this study were school-level demographic variables: geographic location (town/rural, urban, suburban), percentage minority enrollment (ie, defined as racial and ethnic minorities), and free/reduced-price school meal enrollment. The source of the independent variables was the National Center for Education Statistics Public Elementary/Secondary School Universe Survey (NCES), which is publicly available and updated annually.[27]

Twelve NCES-defined geographic designations were combined into three locations for easiest interpretation: city (n=1,232 schools, 18.3%), suburban (n=1,467, 21.8%), and town/rural (n=4,033, 59.9%). The number of minority students for each school was calculated by subtracting the number of white non-Hispanic students enrolled from the total student enrollment and then dividing by the total student enrollment to calculate percentage minority enrollment. Similarly, the number of students enrolled in the free/reduced-price meal program was divided by the total student enrollment to calculate percent free/reduced-price meal enrollment.