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Facilitating Fresh: State Laws Supporting School Gardens Are Associated With Use of Garden-Grown Produce in School Nutrition Services Programs

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Abstract

Objective: To examine whether state laws are associated with the presence of school gardens and the use of garden-grown produce in school nutrition services programs.

Design: Nationally representative data from the School Health Policies and Practices Study 2014 were combined with objectively coded state law data regarding school gardens.

Main Outcome Measures: Outcomes were: (1) the presence of a school garden at each school (n = 419 schools), and (2) the use of garden-grown items in the school nutrition services program.

Analysis: Multivariate logistic regression was used to examine each outcome. Contextual covariates included school level, size, locale, US Census region, student race/ethnic composition, and percentage of students eligible for free and reduced-priced meals.

Results: State law was not significantly associated with whether schools had a garden, but it was associated with whether schools used garden-grown items in nutrition services programs (odds ratio, 4.21; $P < .05$). Adjusted prevalence of using garden-grown items in nutrition services programs was 15.4% among schools in states with a supportive law, vs 4.4% among schools in states with no law.

Conclusions and Implications: State laws that support school gardens may facilitate the use of garden-grown items in school nutrition service programs. Additional research is needed regarding the types of messaging that might be most effective for motivating school administrators

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SUPPLEMENTARY DATA

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CONFLICT OF INTEREST

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to appreciate the value of school gardens. In addition, another area for further research pertains to scaling garden programs for broader reach.

Keywords

garden; school; policy; lunch; fruit; vegetable; farm-to-school

INTRODUCTION

Adequate consumption of fruit and vegetables (FV) is a crucial aspect of a healthful diet.[1] However, for most children in the US, daily FV intake is below optimal levels.[2] Because of the crucial impact of the early years in establishing lifelong dietary preferences,[3] promoting healthy habits among children and adolescents is essential. Improving FV access and intake also has important implications for addressing health disparities: Children from lower-income families are disproportionately affected by preventable diseases associated with dietary inadequacies.[4] Among adults, youth, and children, dietary inadequacies are often associated with community-level environmental factors such as limited access to fresh FV.[5]

School gardens are a promising and potentially innovative strategy for increasing access to healthful food options and for addressing factors associated with dietary behaviors such as nutrition knowledge and preferences for FV.[6–8] Research documents the potential of school garden programs and associated cooking programs to improve the willingness of students to taste new vegetables.[6,9] Several studies examine how school gardens can be used to complement nutrition education programs, which provide students with important content knowledge about healthy dietary habits. The use of garden-enhanced nutrition education curricula can improve students' nutrition knowledge[10] as well as behavioral outcomes such as FV consumption.[11] An increasing volume of research in recent years demonstrated the value of school gardens not only for dietary outcomes but also for several additional outcomes such as science learning[12,13] and increased physical activity.[14] Despite grassroots enthusiasm for gardening, including efforts such as the garden in every school movement in California that began in 1995, a review of the research on school gardens noted that questions remain about exactly how to promote the adoption and sustainability of these programs.[15]

A trend that overlaps considerably with school garden programming is the farm to school (FTS) movement, which seeks to incorporate fresh, locally grown food into schools. As of 2014, 42% of districts across the country had at least 1 school that participated in FTS activities.[16] Although many variations exist among the structure and types of activities involved in FTS programs, they often include multiple strategies such as classroom nutrition education, farm tours, food tastings, and school gardens. School gardens were often a key element of FTS programs, and gardens were more common where a broader FTS program operated at the school.[17]

Thus far, however, few studies examined the incorporation of FV grown in a school garden into school nutrition programs, as a comprehensive integration of garden programming into broader aspects of the school environment. A recent study of a garden-based intervention in

5 middle schools included a cafeteria component, in which locally grown vegetables were incorporated into meals. Students who were exposed to multiple programming elements (eg, taste tests, farm visits, cafeteria components) had higher consumption of FV, increased self-efficacy and knowledge, and lower preferences for unhealthy foods.[18] However, it is unclear to what extent the garden-grown items were incorporated into meals or whether the cafeteria component instead represented more of an FTS sourcing approach. Encouragingly, 1 of the few studies thus far to examine the use of garden-grown FV in school meals found positive results for student dietary outcomes. In 2012, a small-scale study among 370 students at 1 high school assessed the impact of incorporating school-grown leafy greens into salads served in the school lunch meal, and found an increase in student selection of salad from 2% to 10%;on average, students ate two thirds of salad servings that they took.[19]

Although national prevalence estimates on the incorporation of garden-grown items into school meals are limited, recent data provide insights into whether schools are using such practices. The 2014 Farm to School Census assessed the types of FTS activities conducted in more than 12,000 districts across the country and found that 44% of school districts had at least 1 school with a garden; among those districts, 23% served garden-grown products in the cafeteria. In other words, approximately 10% of districts had schools in which garden-grown items were used in meals. The only other large-scale source of information from across the country regarding the use of FV grown in school gardens in a school nutrition program was the School Health Policies and Practices Study (SHPPS). This recurring survey, conducted by the Centers for Disease Control and Prevention (CDC), periodically gathers information in nationally representative samples of schools. School-level data from 2014 indicated that only 5.5% of schools used garden-grown food in school nutrition services programs.[20]

Although research has not yet conclusively shown the benefits of serving garden-grown FV in school meals, the literature on this topic is growing, and given preliminary evidence documenting increases in salad bar selection and consumption when students are served school-grown vegetables,[19] taken together with other benefits of school gardens and broader FTS programs for improving student knowledge, attitudes, and behaviors, this school-level practice deserves continued attention. There is still much to be learned about how to facilitate the school-level practice of using garden-grown items in school food programs, but supportive policies may be a crucial factor. As of the 2013–2014 school year, 14% of school districts across the country addressed school gardens in their well ness policies.[21] Importantly, previous work showed that FTS-related laws at the state level were associated with higher prevalence of school-level FTS programming[22] and with the important outcome of increased student access to FV in school meals.[23] The current study was conducted to examine the association between state laws and 2 school-level practices: having a school garden, and serving garden-grown foods in school nutrition services programs.

METHODS

This analysis linked data on school practices that were gathered through the CDC's SHPPS with state-level legal analysis conducted as part of the National Wellness Policy Study at

the University of Illinois at Chicago. Both data sources and their relevant measures are described subsequently.

School-Level Data

The SHPPS is a national survey conducted periodically by the CDC to assess school health policies and practices at the state, district, school, and classroom levels. This project used school-level data gathered between February and June, 2014. A brief description of methods is provided here, with extensive details available elsewhere.[20] A 2-stage sample design was used to generate a nationally representative sample of elementary, middle, and high schools. All public, private, and state-administered schools in the US, containing kindergarten through grade 12, were eligible for sampling. In each school, the principal or other school contact identified the most knowledgeable respondent for each questionnaire. Trained interviewers visited each school to conduct computer-assisted personal interviews. Seven school-level questionnaires were administered; this research used data gathered from the school nutrition services and healthy and safe school environment questionnaires. Participation rates for these questionnaires were 69% and 71%, respectively, of eligible schools. Nonparticipating schools either did not participate in the overall study or did not complete any questions on the particular questionnaire. The School Health Policies and Practices Study was reviewed by an institutional review board at the CDC and was determined to be exempt under federal regulation 45 CFR 46.101 (b)[20]

Respondents to the healthy and safe school environment questionnaire (most commonly school principals or other school administrators) were asked, ‘‘Does your school have a school food garden?’’ Response options were yes or no. Respondents to the school nutrition services questionnaire (most commonly school food service managers) were asked, ‘‘Does your school nutrition services program use any food grown in a school garden?’’ Responses were coded as yes vs no, or that the school did not have a school garden.

Analyses also included contextual covariates related to school characteristics. Locale and region were sourced from the National Center for Education Statistics (NCES). Locale was collapsed to 4 levels based on NCES coding (urban, suburban, township, and rural). Other variables (student race/ethnic composition, student enrollment, and percentage of students eligible for free and reduced-priced lunches) were obtained from extant data that were collected by Market Data Retrieval and linked to the SHPPS data sets. Student race/ethnic composition was collapsed into 4 mutually exclusive and exhaustive categories: predominantly (≥66%) non-Hispanic white;majority (≥50%) non-Hispanic black;majority (≥50%) Hispanic; or other (diverse or other majority). Total student enrollment was categorized into 3 groups. Owing to differences in size by school level, elementary and middle schools had the same cutoffs (≤300, 301–500, and >500) and high schools had slightly different cutoffs (≤350, 351–800, and >800) to achieve comparable frequencies of larger, medium, and smaller schools across grade levels. The percentage of students eligible for free or reduced-price lunches was categorized into 3 groups (≤40%, >40% to <75%, and ≥75%). The 40% cutoff for free/reduced-price lunch eligibility was chosen to align with the school-level threshold for the Community Eligibility Provision;[24] 75% was the level used by NCES[25] to identify high-poverty schools.

Because the state law coding (described subsequently) counted only laws that were applicable to public school districts, all analyses were restricted to public schools. This reduced the eligible sample from 554 to 453 schools for the nutrition services questionnaire and from 586 to 461 schools for the healthy and safe school environment questionnaire. Missing data on the outcome variables and contextual covariates further reduced the sample to 411 schools for the nutrition services questionnaire and 419 schools for the environment questionnaire, in 43 states.

State-Level Data

The National Wellness Policy Study collects and analyzes state laws related to school and student health and wellness. 26 A comprehensive set of topics is examined for each state. The current analyses used 1 policy variable relevant to school practices: whether the state law addressed school gardens in which students participate.

Data collection strategy.—Codified state statutes and administrative regulations for each of the 50 states and the District of Columbia were compiled using subscription-based services, LexisNexis and Westlaw. Boolean key word searches and reviews of the indices and/or tables of contents of the codified laws for each state were conducted by trained attorneys and legal researchers using the state law databases from each commercial provider. State laws were defined to include the codified laws as well as any state health or nutrition education standards incorporated by reference into the codified law. Laws were deemed relevant if they were effective as of the day after Labor Day, 2013, which served as a proxy for the beginning of the 2013–2014 school year, to correspond with the SHPPS 2014 data. The existence of state laws was verified against publicly available secondary sources when possible.[27–29] All relevant state laws were reviewed and verified by 2 members of the research team.

Policy coding.—State laws were first evaluated for policy provisions addressing the presence of a school garden that allows for student participation. Policies requiring the existence of a school garden included language such as *shall, must*, or *require*. Policies suggesting the existence of a school garden included language such as *should, encourage*, or *try*. The laws also were evaluated to create 2 dichotomous variables for this analysis to determine whether state laws specifically mentioned funding for gardens, and whether food grown in gardens was allowed to be used in the school meal programs. Table 1 shows states with laws that addressed school gardens both nationally and in the analytic samples.

Data Analysis

The state law and SHPPS data were linked using state names rather than geocodes because SHPPS did not include measures such as Federal Information Processing Standards codes. Because some state laws were relevant only to certain grade levels (eg, elementary schools vs secondary schools), this linkage also accounted for grade-level applicability. Multivariate logistic regression analyses linked state laws with the 2 key outcomes: (1) the presence of a school garden, and (2) the use of food grown in the school garden in nutrition services programs. These regressions controlled for the contextual covariates described earlier and shown in Table 2. Link tests for model specification were conducted to ensure the models

were correctly specified. Specifically, the logistic regressions were recomputed with 2 covariates, the fitted values and the squared fitted values from the original regressions, and the model specification was rejected if the coefficient on the squared fitted values was statistically different from 0 (all models shown in the results section passed the link test). Analyses were conducted in Stata/SE statistical software (version 13.1;StataCorp LP, College Station, TX, 2013) using the *svy* command to account for the sample design.

RESULTS

Table 2 presents descriptive characteristics regarding the school sample. Owing to differing numbers of respondents to the 2 survey modules used in this project, the frequencies and percentages vary slightly. The schools varied in racial/ethnic composition and percentage of students eligible for free and reduced-priced meals, school sizes, and school levels. There were schools from various locales and across regions of the US.

The key predictor variable was the presence of state-level laws regarding school gardens in which students participated as a component of nutrition education. Notably, 3 of these 5 states (California, Nevada, and Washington) are located in the West census region. Therefore, in subsequent analyses, comparisons accounted for region as West vs non-West.

The first set of analyses examined factors associated with the presence or absence of a garden at each school. Overall, the unadjusted prevalence of schools having a garden was 19.1%. Potential variations in garden prevalence by school type were examined in the multivariate logistic regression analysis (Table 3) predicting presence of a school garden as the outcome. None of the contextual covariates were associated with school gardens, with the exception of medium size, which was associated with lower odds of having a school garden than large size. In other words, garden prevalence did not differ significantly across most of the subgroups used here to categorize schools. In addition, there was no significant association between the presence of a state-level law addressing school gardens and the prevalence of school gardens.

Because the presence of school gardens was previously associated with factors such as the availability of funding,[12] potential associations between garden prevalence and state laws that specifically mentioned funding for school gardens were also examined. However, such laws were not associated with the prevalence of gardens at the school level (data not shown).

Next, the use of garden-grown items in school nutrition services programs was examined (Table 4). Overall, the unadjusted prevalence of schools using garden-grown items in the school nutrition services program was 5.3%. Although the coding of state-level laws pertained more broadly to the presence of any language that was supportive of school garden programs, not specifically regarding the use of garden-grown items in meals, there was a significant and positive effect for state law on school-level practice. The adjusted prevalence estimates indicated the percentage of schools that used garden-grown items in school nutrition services programs, accounting for all other covariates in the model, and indicated that the prevalence of this practice was only 4.4% in states with no garden-related laws and 15.4% in states with such a law. There was also a significant region effect for this

outcome, indicating that the use of garden-grown food in school nutrition services programs was less common in the West than in other regions. Although it would have been ideal to compute models with state laws specifically mentioning the use of food grown in gardens in the meals programs, the frequency of such laws was so low that these models were not statistically possible.

DISCUSSION

This study examined school-level practices regarding garden programs across the US in 2014 and their associations with the potentially facilitating factor of supportive state laws. Many factors, including school and community context, and financial factors, can impact the successful development and maintenance of school garden programs.[15] The sustained use of a school garden often seems to be associated with the availability and engagement of committed staff or volunteers who have the knowledge, skills, and ongoing commitment to maintain such a project. For example, research regarding school garden programs in California found that 3 factors were significantly associated with whether schools applied for available funding for gardens: (1) whether they had an existing garden, (2) whether they had a garden coordinator, and (3) whether parent volunteers were engaged in the project.[30] It is likely that variable local-level and school-specific factors such as staff and parent engagement are crucial determinants of whether schools maintain a garden program, more so than any policy factors, as shown in the current analyses. However, the ways in which garden-grown items are actually used—that is, whether they are served in nutrition services programs—appears to be associated with policy factors. As shown here, state-level laws that support school gardens were associated with an increased prevalence of school-level use of garden-grown items in school nutrition services programs. A likely explanation for this is that such laws can alleviate potential apprehensions among school or district administrators about potential regulatory or legal issues involving food procurement or food safety. For example, Washington law notes:

> School districts may operate school gardens or farms, as appropriate, for the purpose of growing fruits and vegetables to be used for educational purposes and, where appropriate, to be offered to students through the district nutrition services meal and snack programs. All such foods used in the district's meal and snack programs shall meet appropriate safety standards.

Such issues are obviously of the utmost importance with regard to ensuring children's safety, and having garden-supportive laws at the state level may work to alleviate such potential barriers.

Because the establishment of school gardens appears to be very much a school-level (vs a district-level[21] or state-level) decision, an ongoing question of key importance involves identifying factors that support the creation and sustained use of such programs, and how such facilitators may be supported for greater reach of these programs. Work a decade ago in California, which was an early adopter of school gardens and associated programming, demonstrated that many school-level leaders supported garden programs to improve educational programming at schools: Among more than 4,000 school principals, 57% reported having a school garden, the most common reason for which was to use the

garden in academic instruction such as science, environmental studies, and nutrition.[31] Most principals believed the gardens to be effective for such purposes. However, the same survey found that 55% of principals did not perceive gardens to be effective for improving school meals.

These analyses used a large, nationally representative sample from states with varying policy provisions, which is a key strength and unique contribution of this work. However, it is also important to acknowledge several potential limitations. Using only 2 brief survey items limited the ability to examine details about the specific types of garden programs in each school and the extent of such programs. Garden plots can vary in size and in the types of items grown or the amount of produce supplied. They might also vary in the extent and frequency with which garden-sourced items are integrated into school meals. For example, 1 school may serve garden-grown tomatoes only 1 or 2 times during a school year, whereas another may serve salad greens on a daily basis during most months of the year. With the data used here, both would be considered as using garden-grown items in school nutrition services programs. In other words, the extent of student exposure to gardening opportunities and their ability to consume garden-grown produce are likely to vary widely across schools, and these analyses are unable to account for such variation.

As with any survey modality, the prevalence estimates could be affected by lack of accurate knowledge among the respondents, but it may be expected that most school administrators can accurately indicate whether their school has a garden. Biases such as social desirability and response biases always affect the use of surveys. Despite these challenges, the current study offers important information about the ways in which policy provisions at the state level may help to facilitate healthful practices at the school level through the use of garden-grown items in school nutrition services programs.

IMPLICATIONS FOR RESEARCH AND PRACTICE

With continuing recognition of the importance of good nutrition in childhood and adolescence as a basis for physical health and academic performance, school garden programs are a promising approach for these complementary goals. State-level laws that support school gardens are associated with an increased prevalence of school-level use of garden-grown items in school nutrition services programs. Using such strategies in school food-service programs therefore has the potential to promote a crucial outcome: increasing student consumption of vegetables.[19] Although the integration of garden-grown produce in school nutrition services programs is low in overall prevalence, because this practice can promote beneficial nutrition outcomes, the significant association with state-level laws is noteworthy.

Although integrating garden-grown items into school meals may not be effective from a purchasing or efficiency perspective, greater economies of scale may be obtained through bulk purchases from large-scale suppliers, and the excitement that is generated when students have a chance to eat what they have grown offers important benefits. However, an important issue for schools to consider pertains to obtaining guidance in best practices for safety regarding issues such as the management and timing of applying fertilizers and

pesticides, the safety of water sources, other potential bacterial contaminants, and issues involving storage and preservation of perishable items. These all raise potential liability and safety issues for school garden programs. Whereas appropriate practices can manage these issues, resources and technical assistance supports could help to ensure the safety not only of the students and staff working in the garden but also of those who consume the items grown in it.

Finally, because some principals do not perceive gardens to be effective for improving school meals, addressing the perceptions of school leaders may be important. Additional research is needed regarding the types of messaging that might be most effective for motivating school administrators to appreciate the value of school gardens. In addition, another area for further research pertains to scaling garden programs for broader reach; in other words, a better understanding is needed regarding what characteristics of schools, districts, and communities are associated with successful implementation of garden programs, and whether there are potential mechanisms for increasing readiness where it does not exist. The development of state-level laws that facilitate schools' ability to use garden-grown items in their nutrition services programs might be an important element of increasing the reach of such practices in schools across the nation.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Prevalence of State Laws on School Gardens Among 50 States and the District of Columbia in 2014, as Evaluated by the National Wellness Policy Study

	Nationwide		Among 43 States Contained in Analytic Samples		
Variable	**%**	**N**	**%**	**n**	**States**
State law addressing presence of school garden that allows for student participation					
None	84.3	43	88.4	38	
Recommended	13.7	7	11.6	5	**Alabama**, Alaska, **California, Iowa**, **Nevada**, Oregon, **Washington**
Required	2.0	1	0.0	0	District of Columbia
State law mentions funding for school gardens					
No	94.1	48	93.0	40	
Yes	5.9	3	7.0	3	**California, New Jersey, Washington**
State law specifies food grown in gardens may be used in school meals programs					
No	92.2	47	97.7	42	
Yes	7.8	4	2.3	1	Alaska, District of Columbia, Oregon, **Washington**

Notes: State laws were coded specifically by grade level, but the state laws listed here do not differ by grade. States shown in bold matched the analytic sample. Full text of laws for Alabama, California, Iowa, Nevada and Washington is provided in supplementary materials.

Table 2.

Demographic Characteristics and School Garden Practices of Nationally Representative Sample of Schools From 2014 School Health Policies and Practices Study

	Component of Survey			
	Healthy and Safe School Environment (n ¼ 419)		NutritionServices (n ¼ 411)	
Variables	**n**	**%**	**n**	**%**
Outcome variables				
School has school food garden	83	19.8		
School nutrition services program uses food grown in garden			24	5.8
Predictor variables				
State law regarding school gardens				
No law (referent)	361	86.2	358	87.1
Law	58	13.8	53	12.9
Grade level				
Elementary school	151	36.0	148	36.0
Middle school	124	29.6	121	29.4
High school	144	34.4	142	34.6
Student race/ethnic composition				
≥66% non-Hispanic white	159	38.0	159	38.7
≥50% non-Hispanic black	87	20.8	83	20.2
≥50% Hispanic	98	23.4	91	22.1
Other	75	17.9	78	19.0
Locale				
Urban	91	21.7	84	20.4
Suburban	145	34.6	142	34.6
Rural	134	32.0	134	32.6
Township	49	11.7	51	12.4
Socioeconomic status (based on free or reduced-price lunch eligibility)				
Higher (≤40% eligible)	168	40.1	166	40.4
Medium (>40% to <75% eligible)	167	39.9	167	40.6
Lower (≥75% eligible)	84	20.1	78	19.0
Size				
Larger	177	42.2	176	42.8
Medium	119	28.4	114	27.7
Smaller	123	29.4	121	29.4
Region				
West	81	19.3	77	18.7
Midwest	121	28.9	116	28.2
Northeast	66	15.8	63	15.3
South	151	36.0	155	37.7

Notes: Size was based on total student enrollment and varies by level: for elementary and middle school, small = ≤300 students; medium = 301–500 students; large = >500 students. For high school, small = ≤350 students; medium = 351–800 students; large = >800 students.

Table 3.

Results of Logistic Regression Model to Examine Factors Associated With Presence of School Garden at 419 Schools in 2014 School Health Policies and Practices Study

Variable	Odds Ratio	95% Confidence Interval	*P*	Adjusted Prevalence
State law regarding school gardens				
No law (referent)	1.00			18.7%
Law	1.17	0.43–3.22	.76	21.1%
Grade level				
Elementary school (referent)	1.00			
Middle school	1.34	0.64–2.78	.44	
High school	1.26	0.60–2.65	.54	
Student race/ethnic composition				
≥66% non-Hispanic white (referent)	1.00			
≥50% non-Hispanic black	1.10	0.52–2.35		
≥50% Hispanic	0.66	0.20–2.20		
Other	0.90	0.39–2.07		
Locale				
Urban (referent)	1.00			
Suburban	0.94	0.35–2.52	.90	
Rural	1.12	0.47–2.71	.79	
Township	0.86	0.28–2.65	.79	
Socioeconomic status (based on free or reduced-price lunch eligibility)				
Higher (≤40% eligible; referent)	1.00		.69	
Medium (>40% to <75% eligible)	0.87		.78	
Lower (≥75% eligible)	1.16			
Size				
Larger (referent)	1.00			
Medium	0.46	0.45–1.69	.05	
Smaller	0.76	0.43–3.12	.51	
Region				
Non-West (referent)	1.00			
West	1.48	0.62–3.57	.38	

Note: Size was based on total student enrollment and varied by level: for elementary and middle school, small = ≤300 students; medium = 301 to 500 students; large = >500 students. For high school, small= ≤350 students; medium = 351 to 800 students; large = >800 students.

Table 4.

Results of Logistic Regression Model to Examine Factors Associated With Use of School Garden-Grown Foods in School Nutrition Services Programs, in Nationally Representative Sample of 411 Schools From 2014 School Health Policies and Practices Survey

Variable	Odds Ratio	95% Confidence Interval	P	Adjusted Prevalence
State law regarding school gardens				
No law (referent)	1.00			4.4%
Law	4.21	1.31–13.54	.02	15.4%
Grade level				
Elementary school (referent)	1.00			
Middle school	1.29	0.45–3.73	.64	
High school	0.70	0.23–2.13	.53	
Student race/ethnic composition				
≥66% non-Hispanic white (referent)	1.00			
≥50% non-Hispanic black	0.45	0.06–3.21	.42	
≥50% Hispanic	1.84	0.48–6.98	.37	
Other	0.61	0.09–3.94	.60	
Locale				
Urban (referent)	1.00			
Suburban	1.38	0.22–8.58	.73	
Rural	1.52	0.28–8.22	.63	
Township	0.57	0.06–5.89	.64	
Socioeconomic status (based on free or reduced-price lunch eligibility)				
Higher (≤40% eligible; referent)	1.00			
Medium (>40% to <75% eligible)	1.18	0.34–4.08	.79	
Lower (≥75% eligible)	1.12	0.21–6.05	.90	
Size				
Larger (referent)	1.00			
Medium	1.25	0.34–4.67	.73	
Smaller	1.23	0.37–4.06	.73	
Region				
Non-West (referent)	1.00			
West	0.19	0.04–0.84	.03	

Notes: Size was based on total student enrollment and varied by level: for elementary and middle school, small = ≤300 students; medium = 301–500 students; large = >500 students. For high school, small= ≤350 students; medium = 351–800 students; large = >800 students.