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Association Between State Assistance on the Topic of Indoor Air Quality and School District-Level Policies That Promote Indoor Air Quality in Schools

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Abstract

Nationally representative data from the 2012 School Health Policies and Practices Study examined whether state assistance on indoor air quality (IAQ) was associated with district-level policies and practices related to IAQ and integrated pest management (IPM). Districts in states that provided assistance on IAQ were more likely than districts not in such states to (1) have an IAQ management program ($p < .001$); (2) require schools to conduct periodic inspections of the heating, ventilation, and air conditioning system ($p < .05$); of the building for cracks, leaks, or past water damage ($p < .01$); for mold ($p < .01$); for clutter that prevents effective cleaning and maintenance ($p < .05$); of the plumbing system ($p < .01$); and for condensation in and around school facilities ($p < .001$); (3) have an engine idling reduction program (< .001); (4) have a policy to purchase low-emitting products ($p < .05$); and (5) require IPM strategies ($p < .05$). Increasing the number of states that provide IAQ-related assistance to school districts and schools may improve school IAQ.

Keywords

environmental health/safety; policies/procedures; safety/injury prevention; best practices/practice guidelines

Introduction

The World Health Organization identifies the physical school environment as an “essential component of a health-promoting school” (Wargo, 2004, p. 1). Indoor air and environmental quality (IAQ/IEQ) are among several aspects of a school’s physical environment critical to ensuring the safety and health of students and staff. A recent U. S. Department of Education

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study found that when describing their school's permanent buildings (vs. temporary or portable buildings), almost one quarter of the respondents rated the overall condition of the school as fair (21%) or poor (3%; Alexander & Lewis, 2014). Nearly one in three rated their heating system (30%), air conditioning system (30%), ventilation/filtration system (30% each), and plumbing/lavatories (31%) as being in fair or poor condition (Alexander & Lewis, 2014).

An IAQ/IEQ management program is a set of activities meant to identify, prevent, and resolve problems that lead to poor IAQ/IEQ. Failure to address poor IAQ/IEQ can result in reduced student and staff concentration and productivity; poor health effects such as asthma episodes, nausea, headaches, and fatigue; and missed days at school (Daisy, Angell, & Apte, 2003; Lawrence Berkeley National Laboratory, 2013; Mendell & Heath, 2004; Shendell, Barnett, & Boese, 2004; Wargocki, 2008; U.S. Environmental Protection Agency [EPA], 2012a, 2013). Students and staff with asthma are particularly susceptible to poor IAQ/IEQ (U.S. EPA, 2010a). In the United States, approximately 7 million (or 1 in 10) children under the age of 18 years have asthma, making it one of the most prevalent chronic childhood diseases (Centers for Disease Control and Prevention [CDC], 2013) and a leading cause of school absenteeism due to a chronic condition (CDC, 2013; Mendell & Heath, 2004; Moonie, Sterling, Figgs, & Castro, 2006; U.S. EPA, 2010a). Asthma triggers, such as pests, mold, and dander from classroom pets or brought in on clothing from animals at home, are commonly found in schools and can be addressed with IAQ/IEQ programs (U.S. EPA, 2010a).

In an effort to provide school stakeholders and policy makers with best practices to promote IAQ/IEQ, Shendell, Barnett, and Boese (2004) reviewed about 300 scientific citations and identified 18 best practices related to moisture control, use of toxic substances, ventilation, source control, noise, and lighting. This work established that many of the best practices proposed by the authors were low cost and could result in long-term savings. An additional effort to help schools looking to adopt effective IAQ management practices comes from the U.S. EPA. EPA developed the *IAQ Tools for Schools* guidance materials (U.S. EPA, 2012b), a program found to be an "effective and practical intervention to address IEQ problems in schools" in the majority of one state's school districts in spite of limited resources (Foscue & Harvey, 2011).

The EPA's guidance identifies six of the most common issues, which if addressed with technical solutions will promote IAQ/IEQ in schools (Table 1; Lawrence Berkeley National Laboratory, 2014; U.S. EPA, 2010b). The six technical solutions address the heating, ventilation, and air conditioning (HVAC) system; moisture and mold; integrated pest management (IPM); cleaning and maintenance practices; materials selection; and source control (U.S. EPA, 2010b).

EPA's IAQ Tools for Schools guidance materials recommend schools create an IAQ team, which includes a health officer or school nurse (U.S. EPA, 2012b). School nurses are in a unique position to promote school IAQ. School nurses have the respect and trust of parents and school staff in health-related matters and have the expertise to collaborate with key decision makers and interdisciplinary experts to ensure schools are healthy and safe places

for learning and working (National Association of School Nurses [NASN], 2011, 2014). To that end, the School Nursing Scope and Standards of Practice addresses the important role of school nurses in promoting "health and safety, including a healthy environment" (American Nurses Association [ANA], 2011, p. 3) and suggests that all nurses "embrace the role of a leader in creating and sustaining a healthy work environment" (ANA, 2011, p. 9).

State-level health and education officials have a unique opportunity to provide districts and schools in their jurisdictions with practical information and assistance that can encourage health promoting policies and practices. This assistance can take a number of forms, such as model policies or other policy materials, technical assistance, and professional development.

A growing body of research shows that high-quality professional development improves teaching instruction and student achievement (Everett Jones, Brener, & McManus, 2004; Jaquith, Mindich, Wei, & Darling-Hammond, 2010; Yoon, Duncan, Scarloss, & Shapley, 2007). Likewise, school nursing practice improves when school nurses participate in educational activities to gain "knowledge and skills appropriate to the school nursing role … [and to expand] clinical knowledge, skills, and abilities, and judgment to enhance role performance by incorporating current research" (ANA, 2011, p. 52). Vought-O'Sullivan, Meehan, Havice, and Pruitt (2006) note that the educational background of school nurses can vary as a result of state and local requirements and that as a result continuing education is essential for nurses to build upon their prior training. No studies were identified that address whether offering professional development and other types of state-level assistance related to IAQ/IEQ was associated with promulgating school district ("district") or school level health-related policies and practices. School nurses, in collaboration with facilities management personnel, would be ideal targets for such assistance given school nurses' expertise in the health and academic impacts of poor IAQ/IEQ and facilities management personnel's technical expertise in solving IAQ/IEQ problems. The purpose of this study was to examine whether state assistance on IAQ was associated with district policies and practices that promote IAQ/IEQ.

Method

The School Health Policies and Practices Study (SHPPS) 2012 was conducted by the CDC during October 2011–August 2012. SHPPS 2012 data address aspects from all elements of the whole school, whole community, whole child model: health education; physical education and physical activity; nutrition environment and services; health services; counseling, psychological, and social services; social and emotional climate; physical environment; employee wellness; family engagement; and community involvement (ASCD & CDC, 2014). This report examined data from the state-level Healthy and Safe School Environment questionnaire and the district-level Healthy and Safe School Environment questionnaire's Module 2, which covered physical school environment content, and Module 4, which covered professional development content.

Sample and Survey Administration

A detailed description of the SHPPS 2012 methods has been published previously (Brener et al., 2013). Briefly, state- and district-level SHPPS 2006 questionnaires underwent a

question-by-question review to determine questionnaire content for 2012. New questions added for SHPPS 2012, and questions that were modified substantially from SHPPS 2006, were subjected to cognitive testing using telephone interviews. Then, draft questionnaires were sent to more than 350 reviewers from federal agencies, national associations, foundations, universities, and businesses nationwide with expertise in one or more topic areas addressed in the questionnaires (Brener et al., 2013). Appropriate revisions were made based on reviewer feedback.

At the state level, education agencies from all 50 states and the District of Columbia were invited to participate with a 100% response rate for each questionnaire and module. A nationally representative sample of public school districts (N = 1,057) was invited to participate. Eligible districts were those in operation during the time of recruitment and included regional supervisory unions in places where local school boards only provided funding and limited curriculum guidance. Nine districts were deemed ineligible (four had merged with another sampled district and five did not have their own student body), resulting in a total of 1,048 districts in the sample. State and sampled district education agencies were asked to identify respondents who were responsible for or most knowledgeable about the component covered within a questionnaire or module.

For Module 2, the response rate was 57.1% (n = 598) and for Module 4, the response rate was 60.1% (n = 630). The state-level respondents completed web-based self-administered questionnaires. Most (85.4%) of the district-level questionnaires also were completed via web-based self-administration; the remaining 14.6% were completed using self-administered paper-and-pencil questionnaires. State-level data were not weighted. At the district level, data were weighted to produce national estimates. The base district weight, or sampling weight, was computed as the inverse of the selection probability and adjusted for nonresponse using a simple ratio adjustment, computed as the ratio of weighted totals within weight adjustment classes. Further information about district weights for SHPPS data have been published previously (Brener et al., 2013). For this analysis, data from the state and district data files were merged. This allowed for estimates of district policies or practices stratified by the presence or absence of different types of state assistance. SHPPS 2012 was reviewed by the Institutional Review Boards at both CDC and ICF Macro, Inc., an ICF International Company (contractor engaged for SHPPS 2012) and determined to be exempt.

Measures

State assistance to districts and schools.—This analysis examined data from four questions that addressed types of state assistance to districts and schools on IAQ: (1) whether the state had developed, revised, or assisted in developing model policies, policy guidance, or other materials to inform district or school policy during the 2 years before the study on IAQ; (2) whether the state had distributed or provided to district or school staff model policies, policy guidance, or other materials to inform district or school policy during the 2 years before the study on IAQ; (3) whether the state had provided technical assistance (i.e., one-on-one, tailored guidance to meet the specific needs of the district or school that may be provided through phone, e-mail, Internet, or in-person meetings) to district or school staff during the 12 months before the study on IAQ; and (4) whether the state had provided

funding for professional development or offered professional development (e.g., workshops, conferences, continuing education, graduate courses, or any other kind of in-service) to districts or schools on how to implement school-wide policies and programs on IAQ. A state was considered to have provided assistance ("state assistance") on IAQ if it had provided one or more of the four types of assistance specific to IAQ. If none of the four types of assistance was provided, the state was considered to have not provided state assistance on IAQ.

District policies.—District-level questionnaires assessed many of the technical solutions identified as key to addressing IAQ/IEQ in schools (Lawrence Berkeley National Laboratory, 2014; U.S. EPA 2010b). In addition, district questionnaires assessed district training for custodial and maintenance staff as well as professional development for school faculty and staff.

At both the state and district levels, SHPPS questionnaires used the term "IAQ," not "IEQ." Therefore, when referencing data from an SHPPS question that included the term IAQ, data are described using only IAQ. When data are more generalizable to IAQ/IEQ generally, this broader term is used.

Analysis

District data were linked with state data allowing for an analysis of the association between district policies and practices related to IAQ/IEQ and state assistance to districts and schools on the topic of IAQ. This analysis was conducted using weighted data and with SUDAAN statistical software (version 11.0.1), which accounts for the complex sampling design at the district level. *t*-Tests were used to examine whether state assistance was associated with district-level policies, practices, and professional development activities. Differences were considered significant at $p < .05$.

Results

Overall, 65.3% of states had provided one or more types of assistance on IAQ. The percentage of districts with an IAQ management program was significantly greater among districts in states that had provided assistance on IAQ compared to districts in states that had not provided assistance on IAQ (61.3% vs. 34.2%; Table 2). Similarly, the percentage of districts with an IAQ management program that was based on EPA's *IAQ Tools for Schools* guidance was significantly greater among districts in states that had provided assistance on IAQ compared to districts in states that had not provided assistance on IAQ (50.6% vs. 27.3%).

Heating, Ventilation, and Air Conditioning

The percentage of districts with a policy requiring schools to conduct periodic inspections of the HVAC system was significantly greater among districts in states that had provided assistance on IAQ compared to districts in states that had not provided assistance on IAQ (82.1% vs. 74.6%).

Moisture and Mold

Districts in states that had provided assistance on IAQ were significantly more likely than districts in states that had not provided assistance on IAQ to require schools to conduct periodic inspections for condensation in and around the school facilities (64.3% vs. 49.6%); of the building foundation, walls, and roof for cracks, leaks, or past water damage (77.4% vs. 65.7%); for mold (77.0% vs. 65.7%); and of the plumbing system (75.3% vs. 63.5%).

Cleaning and Maintenance

The percentage of districts with a policy requiring schools to conduct periodic inspections for clutter prohibiting effective cleaning and maintenance was significantly greater among districts in states that had provided assistance on IAQ compared to districts in states that had not provided assistance on IAQ (75.6% vs. 66.1%).

Materials Selection

The percentage of districts with a policy requiring schools to purchase low-emitting products for use in and around the school was significantly greater among districts in states that had provided assistance on IAQ compared to districts in states that had not provided assistance on IAQ (41.2% vs. 30.8%).

Source Control

Districts in states that had provided assistance on IAQ were significantly more likely than districts in states that had not provided assistance on IAQ to have policies requiring schools be tested for radon (41.2% vs. 30.2%) and to have implemented an engine idling reduction program for school buses (62.6% vs. 41.8%), commercial vehicles (41.6% vs. 14.4%), and personal vehicles (28.5% vs. 7.0%).

Integrated Pest Management

Districts in states that had provided assistance on IAQ were significantly more likely than districts in states that had not provided assistance on IAQ to have policies that require implementing an IPM program where schools seal openings in walls, floors, doors, and windows with caulk or weather stripping (85.9% vs. 78.6%); repair cracks in pavement and sidewalks (77.5% vs. 68.6%); remove infested or diseased plants (84.6% vs. 72.1%); use spot treatments and baiting rather than widespread applications of pesticides (84.3% vs. 76.6%); and mark indoor and outdoor areas that have been treated with pesticides (63.3% vs. 45.7%). Further, districts in states that had provided assistance on IAQ were significantly more likely than districts in states that had not provided assistance on IAQ to require schools to notify staff, students, and families each time prior to the application of pesticides (53.9% vs. 35.6%).

Training and Professional Development

Districts in states that had provided assistance on IAQ were significantly more likely than districts in states that had not provided assistance on IAQ to provide funding for training or offer training to custodial or maintenance staff on how to address mold problems (71.1% vs. 56.0%), IAQ (63.9% vs. 45.7%), pest management practices that limit the use of pesticides

(65.6% vs. 52.5%), and green cleaning products and practices (71.0% vs. 55.0%; Table 3). Districts in states that had provided assistance on IAQ were also significantly more likely than districts in states that had not provided assistance on IAQ to provide funding for professional development or offer professional development for school faculty and staff on how to implement school-wide policies and programs related to IAQ (33.3% vs. 21.9%) and green cleaning products and practices (50.8% vs. 38.1%).

Discussion

The findings of this study document that state assistance on IAQ was associated with implementation of many district-level IAQ promoting policies and practices. For example, districts in a state that provided state assistance on IAQ were more likely to (1) have an IAQ management program, (2) require schools to conduct a variety of types of inspections, (3) have an engine idling reduction program, (4) have a policy to purchase low-emitting products, and (5) require IPM strategies. In some instances, state assistance was not associated with higher rates of policies and practices related to IAQ/IEQ and the adoption of those policies and practices that promote IAQ/IEQ was relatively low, suggesting all districts might benefit from more information on these topics. However, overall, these findings suggest the importance for states to provide districts and schools with model policies, technical assistance, and professional development.

A number of resources exist that can help states and districts develop content for professional development and support the implementation of health promoting policies and practices specific to the school physical environment. One such resource is EPA's *IAQ Tools for Schools Action Kit*, which addresses the technical solutions addressed in this study (U.S. EPA, 2010b, 2012b) and provides information specifically designed for the school health officer and school nurse (U.S. EPA, 2012b). Other resources include EPA's *Voluntary Guidelines for States: Development and Implementation of a School Environmental Health Program,* which can help states address environmental health challenges in K–12 schools (U.S. EPA, 2012c); EPA's *Model Pesticide Safety and IPM Guidance Policy for School Districts*, which provides recommendations for best management practices for the successful implementation of pesticide safety and IPM in K–12 schools (U.S. EPA, 2015); CDC's *Guidelines for School Health Programs to Prevent Tobacco Use and Addiction,* which addresses policy, education, family, and professional development strategies, as well as cessation supports, to prevent tobacco use among youth (CDC, 1994); and the National Association of State Boards of Education's *Fit, Healthy, and Ready to Learn* series (2015), which provides "scientific data, analysis, examples of state and local best practices, and evidence-based model policies that can be adapted by schools, districts, and states" (para. 1).

School nurses understand the many factors that affect the health of students (NASN, 2011). In particular, school nurses understand the health implications of poor IAQ, perhaps through first-hand experience with students presenting with health complaints related to poor IAQ, such as nausea, headache, and asthma symptoms caused by environmental triggers (Lawrence Berkeley National Laboratory, 2013; U.S. EPA, 2010a). Consistent with school nursing standards of practice (i.e., Standard 16: Environmental Health), school nurses, in collaboration with school or district level facilities management personnel, can reach out

to state education agencies to promote IAQ best practices, offer assistance related to IAQ issues, and advocate for state assistance on IAQ-related issues (ANA, 2011; NASN, 2011).

State assistance on IAQ may provide an efficient, low-cost means to keep current on IAQ-related issues in the school setting. School nurses have a “commitment to life-long learning” and “should continue to pursue professional development and continuing nursing education” (NASN, 2011, p. 1). In fact, evidence suggests that school nurses who participate in continuing education activities improve their self-perceived competence in areas addressed by the learning experience (Bullock, Libbus, Lewis, & Gayer, 2002). To promote widespread adoption of environmental health principles in the school setting, school nurses can advocate for state health and education agencies to provide more assistance to schools and districts to improve school IAQ throughout their state.

The results of this study should be evaluated in the context of some study limitations. First, district-level data show the promulgation of policies and are not a direct measure of practices that occur in schools. Thus, the extent to which IAQ-related district policies and practices measured in SHPPS were actually implemented in schools could not be evaluated. Second, these data do not measure the quality of state assistance or quality and enforcement of district policies. Third, at both the state and district levels, these data are based on self-report. At the district level, the data were not based on a content analysis of district policies, which because of the knowledge of the respondents and their interpretation of existing policies may have yielded different findings. Finally, the association between state assistance and district policies and practices might be explained by other variables not controlled for in this analysis.

Conclusion

These data suggested state assistance on IAQ is associated with implementation of many district-level IAQ/IEQ promoting policies and practices. Increases in the number of states providing IAQ-related assistance may result in increases in the number of districts with IAQ management programs and other policies and practices promoting IAQ/IEQ. Those increases in district-level IAQ/IEQ-related policies and practices may then result in healthier indoor environments in schools, improved student and staff performance, and better health outcomes for all children.

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Table 1.

The Framework for Effective School IAQ Management: Six Technical Solutions.[a]

Technical Solutions	Activities
Quality HVAC	• Inspect HVAC systems regularly; • Establish a maintenance plan; • Change filters regularly and ensure condensate pans are draining; • Provide outdoor air ventilation according to the ASHRAE standard or local code; • Clean air supply diffusers, return registers, and outside air intakes; and • Keep unit ventilators clear of books, papers, and other items
Control of moisture/mold	• Conduct routine moisture inspections, • Establish mold prevention and remediation plan, • Maintain indoor humidity levels between 30% and 60%, • Address moisture problems promptly, and • Dry wet areas within 24–48 hr.
Strong integrated pest management (IPM)	• Inspect and monitor for pests, • Establish an IPM plan, • Use spot treatments and baits, • Communicate with occupants prior to pesticide use, and • Mark indoor and outdoor areas treated with pesticides.
Effective cleaning and maintenance	• Conduct routine inspections of school environment, • Develop a preventative maintenance plan, • Train cleaning/maintenance staff on protocols, • Ensure material safety data sheets are available to staff, • Clean and remove dust with damp cloth, and • Vacuum using high-efficiency filters.
Smart materials selection	• Maintain products inventory, • Develop low-emitting products purchasing and use policies, • Use only formaldehyde-free materials, • Use only low-toxicity and low-emitting paint,

Technical Solutions	Activities
	• Select products based on product rating systems, and • Use least toxic cleaners possible (only those approved by the district).
Aggressive source control	• Conduct regular building walkthrough inspections, • Test for radon; mitigate if necessary, • Implement a hazardous materials plan (use, label, storage, and disposal), • Establish a school chemical management and inventory plan, • Implement smoke-free policies, • Establish an anti-idling school bus policy, • Use walk-off mats at building entrances, and • Conduct pollutant-releasing activities when school is unoccupied.

Note. IAQ = Indoor Air Quality; HVAC = heating, ventilation, and air conditioning. Adapted from U.S. Environmental Protection Agency (2012b).

Table 2.

District Policies Related to Indoor Air Quality (IAQ), by State Assistance to Districts and Schools on IAQ—School Health Policies and Practices Study, 2012.

	State Provided Assistance to Districts or Schools on Indoor Air Quality[a]		
	Yes (% [95% CI])	No (% [95% CI])	*p* Value
District policies			
District has IAQ management program	61.3 [55.0, 67.3]	34.2 [28.6, 40.3]	<.001
District has IAQ management program based on EPA's *Indoor Air Quality Tools for Schools*	50.6 [44.2, 57.1]	27.3 [22.0, 33.3]	<.001
HVAC			
District has policy that schools conduct periodic inspections of the HVAC system	82.1 [77.3, 86.1]	74.6 [69.1, 79.4]	.030
Mold and moisture			
District has policy that schools conduct periodic inspections:			
For condensation in and around the school facilities	64.3 [58.7, 69.4]	49.6 [44.0, 55.1]	<.001
Of the building foundation, walls, and roof for cracks, leaks, or past water damage	77.4 [72.5, 81.7]	65.7 [59.9, 71.1]	.002
For mold	77.0 [72.0, 81.3]	65.7 [59.9, 71.1]	.003
Of the plumbing system	75.3 [69.9, 80.0]	63.5 [57.9, 68.8]	.002
District has policy regarding how schools should address mold problems	58.0 [51.9, 63.8]	49.7 [43.7, 55.7]	.055
District has policy stating schools will respond to moisture-related issues, such as floods, leaks, or condensation within 48 hr or less	54.1 [48.2, 59.9]	47.1 [41.1, 53.3]	.108
Cleaning and maintenance			
District has policy that schools conduct periodic inspections for clutter that prevents effective cleaning and maintenance	75.6 [70.3, 80.2]	66.1 [60.0, 71.6]	.015
Materials selection			
District adopted a policy to purchase low-emitting products for use in and around the school and school grounds	41.2 [34.9, 47.8]	30.8 [25.0, 37.3]	.022
Source control			
District has policy requiring schools be tested for radon	41.2 [34.8, 47.9]	30.2 [24.5, 36.6]	.016
District had tobacco free schools policies[b]	67.9 [61.9, 73.4]	66.2 [59.7, 72.1]	.690
District implemented an engine idling reduction program for:			
School buses	62.6 [55.7, 68.9]	41.8 [35.1, 48.7]	<.001
Commercial vehicles, such as delivery trucks	41.6 [35.1, 48.3]	14.4 [10.5, 19.4]	<.001
Personal vehicles, such as cars	28.5 [23.3, 34.2]	7.0 [4.4, 10.9]	<.001
District approval required before teachers, administrative or custodial staff, or contractors may use the following products at a school in the district:			

	State Provided Assistance to Districts or Schools on Indoor Air Quality[a]		
	Yes (% [95% CI])	No (% [95% CI])	*p* Value
Cleaning and maintenance products, such as disinfectants, air fresheners, polishes, or waxes	71.7 [65.7, 76.9]	68.1 [62.0, 73.6]	.383
Pesticides	79.3 [74.1, 83.7]	75.1 [68.8, 80.5]	.277
Chemicals or other potentially hazardous materials used in science labs, vocational education, art, or other classes	77.7 [72.2, 82.3]	75.8 [70.0, 80.7]	.610
Integrated pest management (IPM)			
Schools in the district were required to conduct monthly campus-wide inspection for pests	43.3 [37.0, 49.9]	44.2 [38.0, 50.7]	.844
Schools in the district were required each time to notify staff, students, and families prior to the application of pesticides	53.9 [46.8, 60.9]	35.6 [29.0, 42.8]	<.001
IPM techniques required of schools within the district as follows:			
Seal openings in walls, floors, doors, and windows with caulk or weather stripping	85.9 [81.1, 89.6]	78.6 [73.6, 82.9]	.023
Keep vegetation, shrubs, and wood mulch at least one foot away from buildings to control pests	56.2 [49.9, 62.3]	52.9 [46.8, 58.8]	.454
Allow eating only in designated areas to control pests	56.3 [50.6, 61.8]	56.9 [50.9, 62.7]	.884
Store food waste in plastic, glass, or metal containers with tight lids so that it is inaccessible to pests	76.4 [71.0, 81.1]	71.7 [65.7, 76.9]	.214
Repair cracks in pavement and sidewalks	77.6 [72.1, 82.2]	68.6 [62.1, 74.5]	.29
Remove infested or diseased plants	84.6 [79.7, 88.5]	72.1 [66.2, 77.4]	.001
Use spot treatments and baiting rather than widespread applications of pesticides	84.3 [79.4, 88.1]	76.6 [70.7, 81.6]	.033
Mark indoor and outdoor areas that have been treated with pesticides	63.3 [56.5, 69.6]	45.7 [39.1, 52.4]	<.001
Store food in plastic, glass, or metal containers with tight lids so that it is inaccessible to pests	82.5 [77.5, 86.6]	79.0 [74.0, 83.2]	.280

Table 3.

District Training and Professional Development, by State Assistance to Districts and Schools on Indoor Air Quality (IAQ)—School Health Policies and Practices Study, 2012.

	State Provided Assistance to Districts or Schools on IAQ[a]		
	Yes (% [95% CI])	NO (% [95% CI])	*p* Value
During the 2 years before the study, district provided funding for or offered training to custodial or maintenance staff on			
Use of hazardous materials	82.9 [77.2, 87.3]	79.5 [73.9, 84.2]	.362
Labeling of hazardous materials	79.8 [74.0, 84.6]	78.1 [72.4, 82.9]	.652
Storage of hazardous materials	82.9 [77.0, 87.5]	82.6 [77.3, 86.8]	.938
Disposal of hazardous materials	83.6 [78.2, 87.9]	81.7 [76.2, 86.1]	.582
How to reduce the use of hazardous materials	76.9 [71.0, 81.9]	73.0 [67.2, 78.1]	.321
How to address mold problems	71.1 [65.5, 76.1]	56.0 [49.6, 62.3]	<.001
IAQ	63.9 [57.4, 69.9]	45.7 [39.5, 52.1]	<.001
Pest management practices that limit the use of pesticides	65.6 [59.0, 71.6]	52.5 [46.3, 58.7]	.004
Green cleaning products and practices	71.0 [64.0, 77.0]	55.0 [48.8, 61.0]	.001
During the 2 years before the study, district provided funding for or offered professional development for school faculty and staff on how to implement school-wide policies and programs related to			
IAQ	33.3 [27.7, 39.5]	21.9 [17.1, 27.7]	.005
Integrated pest management	43.9 [37.7, 50.4]	38.5 [31.9, 45.7]	.263
Green cleaning products and practices	50.8 [44.7, 56.9]	38.1 [31.7, 45.0]	.007
Radon testing and mitigation	24.9 [19.7, 30.8]	19.6 [15.4, 24.5]	.147

Note. CI = Confidence interval.

[a]State assistance included any of the following: (1) during the 2 years before the study, the state developed, revised, or assisted in developing model policies, policy guidance, or other materials to inform district or school policy on IAQ; (2) during the 2 years before the study, the state distributed or provided to district or school staff model policies, policy guidance, or other materials to inform district or school policy on IAQ; (3) during the 12 months before the study, the state provided technical assistance to district or school staff on IAQ; or (4) during the 2 years before the study, the state provided funding for or offered professional development to districts or schools on how to implement school-wide policies and programs related to IAQ.