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Characteristics of Schools with Youth Sports Concussion Related Educational Policies and Practices

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Abstract

BACKGROUND: School policies and practices designed to educate athletes, parents, and coaches about youth sports concussions may be a way to reduce concussion risk and improve both the recognition and management of concussions.

METHODS: Nationally representative data from the 2014 School Health Policies and Practices Study (SHPPS) were used to assess associations between school demographic characteristics (eg, school level, metropolitan status, and school type) and school policies and practices addressing youth sports concussion-related education for athletes, parents, and coaches.

RESULTS: Overall, many schools had policies and practices that addressed youth sports concussion-related education for athletes, parents, and coaches. There was significant variability in the adoption of policies and practices by some school demographic characteristics. Middle schools, private schools, and urban schools were less likely to adopt many of the policies and practices than high schools, public schools, and rural schools, respectively. For other school characteristics, no consistent patterns of associations emerged.

CONCLUSIONS: These findings suggest that middle, private, and urban schools, in particular, are more likely to lack youth sports concussion related educational policies and practices and may need information or resources about the importance of education related to preventing, recognizing, and responding to concussions.

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Disclaimer: The findings and conclusions in this manuscript are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Human Subjects Approval Statement
SHPPS 2014 was reviewed by the Institutional Review Boards at both CDC and ICF International, the contractor who conducted fieldwork for SHPPS 2014, and determined to be exempt.

Team sports participation is popular among both middle school and high school students.[1, 2] Concussions among high school athletes are a public health concern because of the increased susceptibility and lengthier recovery times among high school athletes compared to college athletes.[3] Legislation to address concussion risk among young athletes has been enacted in all 50 states.[4] A common component of these state laws is the provision of youth sports concussion related education to athletes, coaches, and parents,[5] but many schools have their own policies and practices that address youth sports concussion-related education aimed at reducing concussion risk and enhancing recognition and management of youth sports concussions.

Knowledge about concussions among athletes and coaches varies by community-level characteristics.[6–8] For example, one study found that urban athletes scored lower on concussion knowledge tests than suburban athletes.[8] A study examining the implementation of a concussion education program for youth football coaches developed by USA football found that leagues in communities with greater poverty reported fewer coaches certified through the program than leagues in wealthier communities.[7] Even when state legislation specifically requires concussion education for athletes, parents, and coaches, it may not translate to equitable education across each of these groups due to financial reasons.[6] Chrisman and colleagues evaluated the implementation of youth sports concussion related legislation in the state of Washington and found that although 91% of the coaches were trained using more than one modality (eg, written, video, in-person), many coaches did not provide education beyond an information sheet to athletes and parents (30% and 58%, respectively).[6] This is important, as information sheets may not be the most effective approach to concussion education. For example, a study of the use of concussion information sheets among athletes found that 40% of respondents did not remember signing the acknowledgement form.[9] The authors of that study hypothesized that this may be a result of poor retention of the information about concussions more broadly because it was provided along with information about a number of other topics at the beginning of the season. The reason that many schools did not provide more options for educating athletes and parents in the Washington state study may have been a lack of funding for instituting an educational intervention beyond providing written materials.[6]

Although nationally representative data have been used previously to describe youth sports concussion-related educational policies and practices among schools,[10] systematic variation by school demographic characteristics has not been explored. Understanding whether some schools are less likely than others to have such policies and practices can inform public health efforts used by state and local public health organizations to promote school policies and practices that can aid in the identification and management of concussions. This study examined whether school demographic characteristics were associated with the following school-level youth sports concussion-related educational policies and practices: requiring the review and signature of a concussion information sheet; providing educational materials and sessions on preventing, recognizing, and responding to concussions; and requiring head coach training on how to prevent, recognize, and respond to concussions. These policies and practices are consistent with the training and educational requirements found in the legislation of many states.[5]

METHODS

Participants

This study examined data from the 2014 School Health Policies and Practices Study (SHPPS). SHPPS is a cross-sectional study conducted periodically by the Centers for Disease Control and Prevention (CDC) to examine school health policies and practices at the state, district, school, and classroom levels. SHPPS 2014 was conducted among elementary, middle, and high schools. A detailed description of the 2014 study methods has been published elsewhere,[10] but is summarized below.

Instrumentation

The outcomes of interest were derived from four questions used to assess youth sports concussion-related educational policies and practices in schools with interscholastic sports programs. The variable *required a reviewed and signed information sheet* was measured with the question, "How often does the interscholastic sports program at your school require student athletes and their parents to review and sign a concussion information sheet before participation?" Response options were "Never," "Rarely," "Sometimes," "Almost Always," and "Always." A dichotomous response option was created, "Almost Always or Always" vs. all other responses, to identify schools that required a reviewed and signed information sheet. The variable *provided educational materials* was measured with the question, "During the past 12 months, has your school provided educational materials to student athletes or their parents on preventing, recognizing, and responding to concussions?" The variable *provided educational sessions* was measured with the question, "During the past 12 months, has your school provided educational sessions to student athletes or their parents on preventing, recognizing, and responding to concussions?" The variable *required head coach to have training* was measured with the question, "Is a head coach at your school required to have training on how to prevent, recognize, and respond to concussions among student athletes?" The response options for questions addressing the provision of educational materials and sessions to student athletes and their parents, and the requirement that a head coach have training were "Yes" and "No."

Procedure

SHPPS 2014 was conducted from February through June 2014, and used seven questionnaires to examine ten components of school health. A two-stage sampling design was used to select a nationally representative sample of schools. All public, state-administered, Catholic, and non-Catholic private schools with any of grades K through 12 were eligible. Alternative schools, schools providing educational services to a "pull-out" population who were provided services at another eligible school, schools run by the Department of Defense or Bureau of Indian Education, and schools with fewer than 30 students were excluded. The number of sampled schools was 828. Eighty-nine percent of all questionnaire modules were completed via computer-assisted personal interviews; the remaining questionnaires were completed on paper.

Some questionnaires were divided into modules, grouping related items so schools could identify a respondent who was most knowledgeable about the items covered in each module.

This report examined data from the Interscholastic Sports Module within the Physical Education and Activity School Questionnaire. This module was most often completed by physical education teachers (41.2%), athletic directors (29.7%), and principals (7.9%). Some schools were ineligible to complete one or more questionnaires or modules because they did not have a program or service in place that addressed the topic or focus of the questionnaire or module. The response rate for the Interscholastic Sports module was 64%;among the 610 eligible schools, 390 participated. This analysis included only middle and high schools (N=334) that reported having an interscholastic sports program. Elementary schools were excluded because too few reported having interscholastic sports.

Data Analysis

Schools were classified by metropolitan status (urban, suburban, town, and rural) and school type (public [including state-administered schools] and private [Catholic and non-Catholic private schools]) based on data from the National Center for Education Statistics. In addition, SHPPS 2014 data were linked with extant data from the Market Data Retrieval database that contains information about individual U.S. schools, and is updated annually. This database was used to determine the percentage of students eligible for free or reduced-price meals (range: 0%–100%) and the percentage of non-white students (range: 0%–99%, hereafter “percentage of minority students”) for public schools. This information was not available for private schools. The percentage of students eligible for free or reduced-price meals was divided into tertiles based on the weighted data distribution such that the lowest tertile was 0% to 34%, the middle tertile was 35% to 61%, and the highest tertile was 62% to 100%. The percentage of minority students also was divided into tertiles based on the data distribution such that the lowest tertile was 0% to 8%, the middle tertile was 9% to 49%, and the highest tertile was 50% to 100%.

Data were weighted to produce national estimates and analyses were conducted using SUDAAN statistical software to account for the complex sampling design. Chi-square tests were used to examine whether school demographic characteristics were associated with youth sports concussion-related educational policies and practices in schools. When chi-square tests were significant for school demographic characteristics with more than two levels, t-tests were used for pairwise comparisons.

RESULTS

The sample was comprised of 54% middle schools and 46% high schools, with schools distributed across town (13.6%), rural (31.0%), suburban (27.1%), and urban (28.3%) locations. Three-fourths (75.6%) of schools were public schools. The majority of schools required a reviewed and signed information sheet (73.9%), provided educational materials (82.5%), provided educational sessions (58.6%), and required the head coach to have training (84.4%) (Table 1).

A significantly higher percentage of high schools compared to middle schools were likely to require a reviewed and signed information sheet (84.7% versus 64.3%), provide educational materials (91.9% versus 74.4%), provide educational sessions (71.9% versus 46.9%) and require that the head coach have training (94.6% versus 75.5%) (Table 2). Rural schools

(90.9%) were significantly more likely to require a reviewed and signed information sheet compared to suburban (63.1%) and urban schools (64.5%); rural schools (69.9%) were significantly more likely to provide educational sessions than urban schools (42.3%). Urban schools (64.5%) were significantly less likely to provide educational materials compared to suburban (82.9%), town (91.3%), and rural schools (94.1%), and urban schools (69.9%) were significantly less likely to require that the head coach have training than town (92.8%) and rural (94.2%) schools. Finally, a significantly higher percentage of public schools compared to private schools required a reviewed and signed information sheet (80.5% versus 53.0%), provided educational materials (86.0% versus 71.5%), and required head coach training (91.8% versus 60.3%).

Among public schools, a significantly higher percentage of schools in the lowest tertile (98.2%) of students eligible for free and reduced-price meals provided educational materials compared to schools in the middle tertile (86.8%) and the highest tertile (82.4%). Additionally, a significantly higher percentage of schools in the middle tertile (96.8%) of percentage of minority students provided educational materials compared to schools in the highest tertile (80.5%).

DISCUSSION

Using a nationally representative sample of schools, this study examined whether the adoption of policies and practices addressing youth sports concussion-related education was associated with school demographic characteristics. Although most schools required the review and signature of a concussion information sheet; provided educational materials on preventing, recognizing, and responding to concussions; and required head coach training on how to prevent, recognize, and respond to concussions, only slightly more than half (58%) provided educational sessions to athletes or their parents. This study also identified differences in some of these policies and practices by school level, metropolitan status, school type, percentage of students eligible for free or reduced-price meals, and percentage of minority students.

The finding that each of the youth sports concussion-related educational policies and practices examined in this study was significantly less prevalent among middle schools than high schools is concerning. Nearly all states have legislation that addresses providing information about youth sports concussions to parents and athletes. In general, these laws apply to both middle school and high school athletes.[9, 11] Further research could explore the reasons for the differences in policies and practices across school level.

The presence of youth sports concussion related educational policies and practices significantly varied by metropolitan status. Urban schools were significantly less likely than rural schools to have implemented each of the four youth sports concussion related educational policies and practices examined in this study. The finding that a significantly lower percentage of urban schools compared to suburban, town, and rural schools provided educational materials is consistent with the findings of another study which identified urban athletes as having lower knowledge about concussions than suburban athletes.[8] In contrast, these data showed no consistent or clear pattern in the utilization of youth sports

concussion-related educational policies and practices based on the percentage of students eligible for free or reduced-price meals or the percentage of minority students. Therefore, specific targeted messaging based on these characteristics may not be warranted.

SHPPS data show that private schools were less likely to have youth sports concussion related educational policies and practices than public schools. The findings may reflect the way state laws are written: in more than a third of states, the laws that address youth sports concussions apply only to public schools.[11] Understanding why youth sports concussion-related educational policies and practices are less common in private compared to public schools is important for those public health organizations and other stakeholders considering targeted messaging to inform concussion-prevention practices among private schools with interscholastic sports programs.

Limitations

This study has several limitations. First, although schools were asked for a respondent who was most knowledgeable about each questionnaire or module topic, there may have been a lack of knowledge among some respondents resulting in over reporting or underreporting about youth sports concussion-related school policies and practices. Additionally, SHPPS did not assess the quality of any policies or practices, such as details about coach training, how educational materials and sessions were delivered, or what information was included on the concussion information sheet reviewed and signed by students and their parents. Finally, data assessing student participation in contact sports and the prevalence of concussion among students participating in those sports was not available, and may have been associated with schools engaging in specific youth sports concussion related education policies and practices.

Conclusion

Although sports[12] and physical activity[13] are associated with many benefits to students, those who play on sports teams have a higher prevalence of concussions than students who do not play on sports teams.[14] Schools are in a unique position to reduce the public health, academic, and societal burden of concussions. One way schools can do so is to educate athletes, parents, and coaches about how to reduce the risk of concussions, and recognize and manage concussions. The findings of this report suggest that middle schools, urban schools and private schools, in particular, might benefit from targeted messaging about the importance of education related to preventing, recognizing, and responding to concussions.

IMPLICATIONS FOR SCHOOL HEALTH

The majority of schools always or almost always required the review and signature of a concussion information sheet (73.9%) and provided educational materials to athletes and parents on preventing, recognizing, and responding to concussions (82.5%). The finding that only 58.6% of schools used educational sessions to deliver youth sports concussion related information is important in the context of recent research about the relative effectiveness of specific forms of concussion education. Methods that require a ”captive audience” may yield positive outcomes;[15] whereas, passive concussion education, such as information sheets for

athletes and parents, may be less effective.[9] Further exploration of the most effective way to educate parents and athletes is warranted.

Coaches who have been trained are better at recognizing the signs and symptoms of concussion,[16] so it is encouraging that 84.4% of schools in this study required the head coach to have training on how to prevent, recognize, and respond to concussions among student athletes. It is important to note, however, that the level and type of training for coaches may vary in a way that was not measured by SHPPS. Although not a direct indicator of the content of school policies, in 2012, only 48% of states had laws that required coaches attend formal training.[17] Conversely, the rest of the state laws made education optional, required only receipt of an information sheet about concussion, did not specify educational requirements, or lacked any reference to coach education related to concussions.[17] At least one study suggests formal coach training related to concussions is uncommon.[18] That study found that among 71 high schools, only one-third had policies requiring formal education for coaches that addressed the recognition and management of concussion.

Legislation has been enacted in all 50 states to address youth sports concussion risk.[4] Although these laws address youth sports concussion-related education to athletes, coaches, and parents, they vary in their content and requirements about youth sports concussion-related education.[5] For example, some laws do not specify what athletes should be taught about concussion, and fewer than half of states require the inclusion of information about the risk of continuing to play after a concussion.[9] Additionally, as mentioned previously, not all states require education for coaches.[5, 18] Therefore, schools and school districts seeking to reduce concussion risks and improve response to concussions may consider developing policies and practices beyond what is outlined in the legislation.

Specific promising practices identified in the scientific literature that schools can consider:

1. Using interactive or in-person educational techniques[9, 15] when developing youth sports concussion-related educational programs for athletes, parents, and coaches.
2. The Centers for Disease Control and Prevention Guideline on the Diagnosis and Management of Mild Traumatic Brain Injury Among Children recommends that medical and school-based team staff counsel athletes and parents post-concussion about the process to gradually increase the intensity of academic activities without worsening concussion symptoms and to determine what accommodations are needed at school[19] Schools can consider partnering with a medical provider.
3. The Guideline also recommends that health care professionals provide clear follow up instructions, including how to return to play, sports, recreation, and school to the family.[19] Schools can consider implementing a process by which these instructions are conveyed to relevant school personal, such as coaches.

REFERENCES

1. National Federation of State High School Associations. Annual report 2016–17. National Federation of State High School Associations, Indianapolis, IN; 2017.
2. Fox CK, Barr-Anderson D, Neumark-Sztainer D, Wall M. Physical activity and sports team participation: Associations with academic outcomes in middle school and high school students. J of Sch Health. 2010; 80(1): 31–37. [PubMed: 20051088]
3. Covassin T, Elbin R, Harris W, Parker T, Kontos A. The role of age and sex in symptoms, neurocognitive performance, and postural stability in athletes after concussion. Am J Sports Med. 2012; 40(6): 1303–1312. [PubMed: 22539534]
4. Harvey HH, Koller DL, Lowrey KM. The four stages of youth sports TBI policymaking: engagement, enactment, research, and reform. J Law Med Ethics. 2015; 43(1_suppl): 87–90.
5. Harvey HH. Reducing traumatic brain injuries in youth sports: youth sports traumatic brain injury state laws, January 2009–December 2012. Am J Public Health. 2013; 103(7): 1249–1254. [PubMed: 23678903]
6. Chrisman S, Schiff M, Chung S, Herring S, Rivara F. Implementation of concussion legislation and extent of concussion education for athletes, parents, and coaches in Washington state. Am J Sports Med. 2014; 42(5): 1190–1196. [PubMed: 24510067]
7. Kroshus E, Kerr Z, Lee JGL. Community-level inequalities in concussion education of youth football coaches. Am J Prev Med. 2017; 52(4): 476–482. [PubMed: 28209280]
8. Wallace J, Covassin T, Nogle S, Gould D, Kovan J. Concussion knowledge and reporting behavior differences between high school athletes at urban and suburban high schools. J of Sch Health. 2017; 87(9): 665–674. [PubMed: 28766322]
9. Baugh CM, Kroshus E, Bourlas AP, Perry KI. Requiring athletes to acknowledge receipt of concussion-related information and responsibility to report symptoms: a study of the prevalence, variation, and possible improvements. J Law Med Ethics. 2014; 42(3): 297–313. [PubMed: 25264088]
10. Centers for Disease Control and Prevention. Results from the school health policies and practices study 2014. In: National Center for HIV/AIDS VH, STD, and TB Prevention, Division of Adolescent and School Health, ed. U.S. Department of Health and Human Services; 2015.
11. Potteiger K, Potteiger AJ, Pitney W, Wright PM. An Examination of Concussion Legislation in the United States. Internet Journal of Allied Health Sciences and Practice. 2018; 16(2).
12. Eime R, Young J, Harvey J, Charity M, Payne W. A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. Int J Behav Nutr Phys Act. 2013; 10(1): 98. [PubMed: 23945179]
13. Janssen I, LeBlanc A. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. Int J Behav Nutr Phys Act. 2010; 7(1): 40. [PubMed: 20459784]
14. DePadilla L, Miller G, Jones S, Peterson A, Breiding M. Self-reported concussions from playing a sport or being physically active among high school students — United States, 2017. MMWR Morb Mortal Wkly Rep. 2018; 67: 682–685. [PubMed: 29927909]
15. Mrazik M, Dennison C, Brooks B, Yeates K, Babul S, Naidu D. A qualitative review of sports concussion education: prime time for evidence-based knowledge translation. Br J Sports Med. 2015; 49(24): 1548–1553. [PubMed: 26307498]
16. Valovich McLeod TC, Schwartz C, Bay RC. Sports-related concussion misunderstandings among youth coaches. Clin J Sport Med. 2007; 17(2): 140–142. [PubMed: 17414483]
17. Tomei KL, Doe C, Prestigiacomo CJ, Gandhi CD. Comparative analysis of state-level concussion legislation and review of current practices in concussion. Neurosurg Focus. 2012; 33(6): E11.
18. Coxe K, Hamilton K, Harvey HH, Xiang J, Ramirez MR, Yang J. Consistency and variation in school-level youth sports traumatic brain injury policy content. J Adolesc Health. 2017.
19. Lumba-Brown A, Yeates KO, K. S, et al. CDC guideline on the diagnosis and management of mild traumatic brain injury among children. JAMA Pediatr. 2018.

Table 1:

Sample Description [ab] — School Health Policies and Practices Study (SHPPS), 2014

Characteristic	Unweighted N (weighted %)
School level (N=334)	
Middle	155 (54.0)
High	179 (46.0)
Metropolitan status (N=334)	
Urban	90 (28.3)
Suburban	91 (27.1)
Town	43 (13.6)
Rural	110 (31.0)
School type (N=334)	
Public	281 (75.6)
Private	53 (24.4)
Percentage of students eligible for free or reduced-price meals (N=243)	
Lowest tertile	81 (32.3)
Middle tertile	81 (33.8)
Highest tertile	81 (33.9)
Percentage of minority students (N=234)	
Lowest tertile	69 (31.3)
Middle tertile	87 (34.6)
Highest tertile	78 (34.2)

Note: The percentage of students eligible for free or reduced-price meals in each school was divided into tertiles based on the weighted sample distribution where lowest=0%-33%, middle=34%-60%, and highest=61%-100%.The percentage of minority students in each school was divided into tertiles based on the weighted sample distribution where lowest=1%-10%, middle=11%-50%, and highest=51%-100%. Both were available for public schools only.

[a] Among the 84.8% of middle schools and 94.1% of high schools with an interscholastic sports program.

[b] Unweighted sample sizes and weighted percentages are presented. Weighted percentages may not total 100% due to rounding.

Table 2:

Percentage of Middle and High Schools in which the Interscholastic Sports Program Engaged in Specific Youth Sports Concussion-Related Educational Policies and Practices[a] by School Demographic Characteristics —SHPPS 2014

	Required a reviewed and signed information sheet	Provided educational materials	Provided educational sessions	Required head coach to have training
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Total	73.9 (67.3–79.5)	82.5 (77.1–86.9)	58.6 (51.9–64.9)	84.4 (78.6–88.8)
School level				
Middle	64.3 (55.3–72.4)	74.4 (65.5–81.6)	46.9 (38.3–55.8)	75.5 (66.3–82.8)
High	84.7 (74.9–91.2)	91.9 (86.7–95.2)	71.9 (63.3–79.2)	94.6 (88.6–97.5)
p-value[b]	0.00	0.00	0.00	0.00
Metropolitan status				
Urban	64.5 (51.8–75.5)	64.5 (52.4–75.0)	42.3 (30.0–55.6)	69.9 (55.8–81.0)
Suburban	63.1 (49.8–74.6)	82.9 (68.9–91.4)	59.3 (47.3–70.3)	83.4 (70.8–91.3)
Town	72.6 (45.8–89.3)	91.3 (76.4–97.2)	63.8 (43.9–79.8)	92.8 (75.8–98.2)
Rural	90.9 (82.9–95.4)	94.1 (87.6–97.3)	69.9 (58.3–79.4)	94.2 (86.5–97.6)
p-value	0.00[c]	0.00[d]	0.02[e]	0.01[f]
School type				
Public	80.5 (74.5–85.4)	86.0 (80.7–90.0)	59.8 (52.7–66.6)	91.8 (87.0–94.9)
Private	53.0 (37.2–68.1)	71.5 (57.0–82.6)	54.5 (39.3–68.9)	60.3 (44.7–74.0)
p-value	0.00	0.04	0.53	0.00
Percentage of students eligible for free or reduced-price meals				
Lowest tertile	87.9 (78.3–93.6)	98.2 (91.8–99.6)	69.3 (57.4–79.0)	98.0 (91.5–99.5)
Middle tertile	82.7 (71.5–90.1)	86.8 (76.8–92.9)	57.1 (44.3–69.1)	91.7 (82.5–96.2)
Highest tertile	78.2 (66.9–86.4)	82.4 (71.9–89.5)	60.3 (49.0–70.6)	90.7 (79.3–96.2)
p-value	0.31	0.00[g]	0.28	0.08
Percentage of minority students				
Lowest tertile	91.5 (82.2–96.2)	89.7 (79.8–95.1)	66.5 (51.8–78.6)	96.4 (88.7–98.9)
Middle tertile	78.4 (66.7–86.8)	96.8 (89.0–99.1)	59.6 (47.2–70.9)	97.2 (88.6–99.4)

		Required a reviewed and signed information sheet		Provided educational materials		Provided educational sessions		Required head coach to have training
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)
Highest tertile		81.7 (70.0–89.6)		80.5 (68.9–88.5)		64.5 (51.0–76.0)		87.8 (76.4–94.1)
p-value		0.07		0.01[h]		0.76		0.16

Note: The percentage of students eligible for free or reduced-price meals in each school was divided into tertiles based on the weighted sample distribution where lowest=0%-33%, middle=34%-60%, and highest=61%-100%.The percentage of minority students in each school was divided into tertiles based on the weighted sample distribution where lowest=1%-10%, middle=11%-50%, and highest=51%-100%. Both were available for public schools only. CI=Confidence Interval

[a]Among the 84.8% of middle schools and 94.1% of high schools with an interscholastic sports program.

[b]Chi-square tests were used to examine differences in policies and practices by school demographic characteristics. T-tests were used for pairwise comparisons when a significant chi-square was identified.

[c]Percentage among rural schools is significantly higher than among urban and suburban schools.

[d]Percentage among urban schools is significantly lower than among suburban, town, and rural schools.

[e]Percentage among rural schools is significantly higher than among urban schools.

[f]Percentage among urban schools is significantly lower than among town and rural schools.

[g]Percentage among schools in the lowest tertile of students eligible for free or reduced-price meals is significantly higher than among schools in the middle and highest tertiles.

[h]Percentage among schools in the middle tertile of percentage of minority students is significantly higher than among schools in the highest tertile.