

Early Impact of the Federally Mandated Local Wellness Policy on Physical Activity in Rural, Low-Income Elementary Schools in Colorado

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ABSTRACT

The What's Working project described the initial impact of the United States' federally mandated Local Wellness Policy in rural, low-income elementary schools located in Colorado. Before and after the Local Wellness Policy mandate went into effect, a survey about school features related to nutrition and physical activity was sent to a random sample of 45 rural elementary schools (i.e., schools located outside of urban areas), in which at least 40% of students qualified for free or reduced-cost lunch. Overall, opportunities for physical activity did not change after the policy went into effect: although time in physical education increased by 14 min per week ($P=0.10$), time for recess decreased by roughly 19 min per week ($P=0.10$). Policies supporting student participation in physical education and recess (an unstructured time during school hours when students are allowed to play outside) did not change. The researchers coded Local Wellness Policies and found them to have weak wording that produced minimal impact. Content analysis of key informant interviews suggested several barriers to the impact of the Local Wellness Policies: (1) competing pressures facing school districts, (2) lack of resources devoted to the Local Wellness Policy, (3) principals' lack of knowledge about the policy, and (4) lack of accountability mechanisms to ensure policy implementation. Financial resources and more effective communication about Local Wellness Policies among school districts and principals are needed to elevate the importance of and increase

opportunities for physical activity in rural, low-income Colorado elementary schools.

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INTRODUCTION

In response to the childhood obesity epidemic, the US government issued a mandate, under the Child Nutrition and Women Infants and Children Reauthorization Act of 2004, requiring school districts participating in the National School Lunch Program to create a Local Wellness Policy by June 2006 (1). The intent of the Local Wellness Policy was to address childhood obesity by increasing opportunities for healthy eating and physical activity. To be in compliance, school districts needed to establish goals for nutrition education, physical activity, and other school-based activities; establish nutrition guidelines for all foods available on the school campus; and assure that the US Secretary of Agriculture's guidelines for federally reimbursable school meals were being met. Although the federal mandate included some physical activity requirements, it placed more emphasis on nutrition. Each district had to involve members from the entire school community in creating the Local Wellness Policy (e.g., parents, students, teachers, administrators, food service representatives, and the public). Finally, districts were instructed to have an evaluation plan in place to assess policy implementation.

In Colorado, school districts were informed of the Local Wellness Policy via several mechanisms. Colorado State Bill 05-81, passed on 6 April 2005, encouraged school boards to adopt a wellness policy meeting the federally mandated guidelines (2). In addition, several state-level organizations provided technical assistance to school districts to help them comply with the federal mandate. In conjunction with the Colorado School Nutrition Association and the Colorado Department of Education, the Colorado Association of School Boards created and disseminated a model wellness policy. The Colorado Physical Activity and Nutrition Program School Site Taskforce/Colorado Action for Healthy Kids team, in coordination with the Colorado Department of Education, created a wellness policy implementation guide based on the state bill and federal

requirements (3). This guide was distributed and training was offered to all Colorado school food service personnel, health coordinators, nurses, physical education teachers, and school health teams.

Because the Local Wellness Policy has only been in effect since June 2006, little is known about its impact on student opportunities for physical activity. A recent study in Utah found that 78% of school districts complied with the mandate to put a Local Wellness Policy in place (4). Findings suggested that, although some districts' policies contained strong language (e.g., "schools must"), this frequently referred to requirements already in place at the state level. It was uncommon for school districts to mandate a new health practice not already required by the state school board. Thus, the study authors anticipated weak impact of the Local Wellness Policy.

The goals of the current study were to describe (1) changes in school-level policies related to physical activity before and after Local Wellness Policy implementation, as well as the amount of physical education and recess offered to elementary school students in low-income, rural regions of Colorado; (2) the relationship between those trends and principals' familiarity with their districts' Local Wellness Policy, as well as comprehensiveness and strength of Local Wellness Policy wording; and (3) barriers related to Local Wellness Policy implementation and potential strategies to overcome those barriers.

DATA AND METHODS

Study sample: A random sample of 45 rural Colorado elementary schools in which at least 40% of students qualified for free or reduced-cost lunch was chosen in fall 2005. The sample included a total of 40 school districts (one district had four schools; two districts each had two schools).

School Environment and Policy Survey: To track school-level environment and policy features related to healthy eating and physical activity, the Rocky Mountain Prevention Research Center created the School Environment and Policy Survey. Items were selected from CDC's School Health Index (5), the Michigan Healthy School Assessment Tool (6), and the School Health Policies and Programs Study (7) and modified to detect change over time. The

School Environment and Policy Survey is a three-module questionnaire designed to assess and track changes in physical activity and nutrition features of a school (e.g., number of minutes of recess per week, minutes of physical education, playground features, total number of fruit and vegetable offerings at breakfast and lunch, presence of a school health team, familiarity with Local Wellness Policy and other state or federal mandates). In addition, school principals were asked to categorize the presence and enforcement of policies on physical activity and nutrition content of items sold in schools as follows:

- (1) No policy exists, written or unwritten.
- (2) There is an *unwritten* policy that is *always or almost always* enforced.
- (3) Written policy exists but is never or almost never enforced.
- (4) Written policy exists and is sometimes enforced.
- (5) Written policy exists and is always or almost always enforced.

Response options 2–5 were collapsed into a “written or unwritten policy exists” category. Principals completed Module 1, “Elementary School Policies and Factors Related to Physical Activity and Food”; Foodservice Managers completed Module 2, “Nutrition Services”; and Physical Education Teachers completed Module 3, “Physical Education and Other Physical Activity Programs.” School personnel completed the School Environment and Policy Survey once in fall 2005, 1 year before the Local Wellness Policy went into effect, and twice after the Local Wellness Policy went into effect: fall 2006 and fall 2007. The baseline survey (in fall 2005) was implemented 8 months before the deadline for districts to have a Local Wellness Policy in place, and 6 months after Colorado passed bill 05-81, which encouraged school boards to adopt the federally mandated wellness policy. The “Dillman Method” (8) was used in all years to optimize survey response rates: each school received reminder phone calls before and after the survey mailing; the mailing included a \$50 gift card to Target retail stores. Study authors are validating the School Environment and Policy Survey instrument by comparing the self-reported measures to their own direct observations. Initial findings suggest minimal reporting bias. For example, independent observers found that minutes spent in physical education classes were less than 1 min shorter on average than the duration reported

by physical education teachers on the survey. Additional analyses of the validation study are currently underway.

Coding Local Wellness Policies: A tool developed by a group of grantees from the Robert Wood Johnson Foundation's Healthy Eating Research Program (9) was used to code Local Wellness Policies. The coding tool contained 96 items, organized into seven subsections (e.g., nutrition education, physical education). The contents of the Local Wellness Policy were coded both for comprehensiveness (how many different topic areas the policy covered) and strength (the degree to which the policy language was specific and required action). Each item in a subsection received a score, and an overall score was computed for each subsection and the entire policy. For example, the physical education section contained 17 items, such as "addresses physical education curriculum for each grade level" and "addresses time per week of physical education for elementary school." The "time per week of physical education for elementary school" was coded in the following manner: (0) not mentioned; (1) specifies number of times per week without duration; specifies total amount of physical education, but it is less than 150 min per week; or suggests that schools follow National Association of Sports and Physical Education standards; and (2) specifies 150 min per week or more of physical education; or requires schools to follow National Association of Sports and Physical Education standards. Comprehensiveness scores were averaged for each subsection (calculated by summing the number of items mentioned in a subsection and dividing by the number of possible items in the subsection). Strength scores were calculated by summing the number of items in a subsection containing strong wording such as "require" or "mandate" and dividing by the number of possible items in the subsection. The entire policy and each subsection received strength and comprehensiveness scores ranging from 0 to 1. Local Wellness Policies were obtained from 32 of the 40 school districts in the sample. School-level demographics in the 32 districts whose policies were coded did not differ significantly from demographics in the 8 districts that did not furnish their Local Wellness Policy. Two reviewers independently rated each policy statement (inter-rater agreement = 85%), then met to reach 100% agreement on ratings.

Key informant interviews of district-level personnel and principals: In fall 2006, 18 of the 45 schools were randomly selected to participate in key informant interviews with principals and the district-level person responsible for the Local Wellness Policy. Thirteen schools agreed to participate and were compensated \$300 each. Drs. Belansky and Cutforth conducted the interviews between January and May 2007. Principals were asked about pressing issues facing schools, importance and ranking of nutrition and physical activity given those issues, familiarity with the Local Wellness Policy, degree of school-level Local Wellness Policy implementation, and barriers or facilitators related to policy implementation and enforcement. District-level personnel were asked to describe how their districts responded to the Local Wellness Policy mandate, including steps taken to develop the policy, level of principal involvement, and amount of resources given to schools for policy implementation.

The strengths of the What's Working project included a random sample of rural, low-income Colorado schools and a mixed-methods data collection approach that included quantitative and qualitative strategies. A potential limitation of this study is the reliance on self-reported data from physical education teachers and principals.

School-level demographic characteristics: Table 1 shows school-level demographic characteristics and participation rates for each phase of the research project. Among the 45 schools in the random sample, students receiving free or reduced lunch rates ranged from 40% to 82%; student body ethnicity ranged from 0% to 72% Hispanic; and the number of students ranged from 28 to 546. Survey response rates ranged from 71% to 91% across the 3 years; demographic characteristics of schools remained similar.

RESULTS

School Environment and Policy trends related to physical activity: The first set of analyses examined whether school-level environment and policy features changed once the Local Wellness Policy went into effect. These analyses considered policies and practices reported at the school level by principals and physical education teachers, but did not take into account the specific content of the Local Wellness

Table 1: Rural random sample school participation rates and demographic characteristics

	School Environment and Policy Survey (SEPS)				Key informant interviews	
	Random sample (N=45)	Schools completing SEPS in fall 2005 (n=32)	Schools completing SEPS in fall 2006 (n=41)	Schools completing SEPS in fall 2007 (n=38)	Key informant random sample (N=18)	Schools participating in winter 2007 key informant interviews (n=13)
Participation rates (%)	NA	71	91	84	NA	72
Mean (s.d.) % students receiving free/reduced lunch	54.4 (10.5)	55.2 (9.6)	54.4 (10.6)	54.8 (11.1)	54.8 (12.4)	57.0 (13.7)
Mean (s.d.) % Hispanic	27.0 (21.5)	24.8 (21.2)	28.7 (22.1)	29.5 (22.0)	28.8 (21.5)	35.8 (20.9)
Mean (s.d.) number of students per school	204.1 (144.7)	218.1 (157.4)	214.3 (149.1)	211.5 (144.2)	214.4 (150.6)	244.2 (156.1)

NA: not applicable.

Policy. To test for trends with a binary variable, the Generalized Estimating Equations with a logit link was used. In the case of a continuous variable, the General Linear Mixed Model was used. Both types of analyses used a random-effects model that allowed for an unbalanced design. Because district Local Wellness Policies went into effect at different times, the main test of Local Wellness Policy impact was the 2005–2006 school year vs. 2007–2008.

Table 2 shows trends in physical education (reported by physical education teachers) and recess (reported by principals) before and after implementation of Local Wellness Policies, as measured by the School Environment and Policy Survey. The number of minutes spent in physical education each week increased by a mean of 14. This 2005 vs. 2007 difference approached significance ($b = 14.2$; $P < 0.10$). The number of principals who required their teachers to allow students to participate in physical education despite bad classroom behavior, missed work, or other activities did not increase after the Local Wellness Policies went into effect.

Reported time spent in recess decreased by 3.8 min per day (19 min per week) from 2005 to 2007. This difference approached significance ($P < 0.10$). The number of principals requiring teachers to allow students to participate in recess despite bad classroom behavior, missed work, or other activities did not increase after the Local Wellness Policy went into effect, nor did opportunities for engaging in organized recess activities.

The next set of analyses investigated both the principal's familiarity with the district Local Wellness Policy and specific contents of the policy, as they related to trends in physical activity.

Relationship between principals' familiarity with the Local Wellness Policy and trends in physical activity: In the School Environment and Policy Survey, principals provided information about familiarity with the Local Wellness Policy. In fall 2006, 53% of principals reported that they had read their districts' Local Wellness Policy. Among principals surveyed 1 year later, 47% reported having read the policy. Schools with principals who were familiar with the Local Wellness Policy did not report significantly greater increases in minutes spent in physical education than schools whose principals were unfamiliar with the Local Wellness Policy (15.8 vs. 6.17; $P = 0.6$ for interaction effect). Nor was the change in daily recess time significantly different in schools where principals

Table 2: Trends in school-level physical activity features in rural, low-income Colorado elementary schools, self-reported by principals and physical education teachers in the School Environment and Policy Survey

	Fall 2005 (before LWP)	Fall 2007 (after LWP)	2005 vs. 2007, P-value
<i>Physical education (PE)</i>			
Weekly PE minutes for fifth graders	N=29	N=37	
Mean (s.d.)	102.7 (51.7)	119.9 (67.4)	0.1
Range	45–240	50–315	
PE school-level policies*			
<i>Prohibits classroom teachers from withholding PE class as a punishment</i>	N=31	N=38	
No school policy exists			
Written or unwritten school policy exists	45.2%	36.8%	0.5
<i>Prohibits classroom teachers from withholding PE class to make up missed instructional time, class work, or tests in other subjects</i>	54.8%	63.2%	
No school policy exists	N=31	N=38	
Written or unwritten school policy exists	41.9%	50.0%	0.4
<i>Prohibits replacement of PE class with other activities</i>	58.1%	50.0%	
No school policy exists	N=31	N=38	
Written or unwritten school policy exists	54.8%	50.0%	0.7
	45.2%	50.0%	
<i>Recess</i>			
Daily recess minutes for fifth graders	N=31	N=37	
N, mean (s.d.)	36.9 (11.1)	33.1 (11.4)	0.10

Table 2 (continued)

	Fall 2005 (before LWP)	Fall 2007 (after LWP)	2005 vs. 2007, P-value
Recess practices			
How often do teachers or recess monitors set up games and activities during recess?	N=31	N=38	
Sometimes	54.8%	55.3%	0.4
Never	45.2%	44.7%	
Recess school-level policies*			
Offers daily opportunities for unstructured physical activity, such as recess, for at least 20 min	N=31	N=38	
No school policy exists	9.7%	15.8%	0.4
Written or unwritten school policy exists	90.3%	84.2%	
Prohibits classroom teachers from withholding recess as a punishment	N=31	N=38	
No school policy exists	90.3%	79.0%	0.3
Written or unwritten school policy exists	9.7%	21.0%	
Prohibits classroom teachers from withholding recess to make up missed instructional time, class work, or tests in other subjects	N=31	N=38	
No school policy exists	96.8%	89.5%	0.3
Written or unwritten school policy exists	3.2%	10.5%	

*These school policies refer to guidelines established by the principal in the school building. These policies do not refer to what is or is not included in the district-level Local Wellness Policy.
LWP: Local Wellness Policy.

were familiar with the Local Wellness Policy compared with schools where principals were not familiar with the Local Wellness Policy (6.5 min decrease vs. 0.2 min increase, respectively; $P=0.3$ for interaction effect).

Relationship between comprehensiveness and strength of the Local Wellness Policy and trends in physical activity: District Local Wellness Policies were coded for comprehensiveness and strength of wording for both nutrition and physical activity (Table 3). On average, Local Wellness Policies addressed just under half (0.49) of the 96 items included in the coding scheme. The physical education section had the lowest score, addressing only 0.31 of the 17 items, meaning that, on average, Local Wellness Policies included 5 of the possible 17 items related to physical education. The most commonly addressed physical education areas included curriculum, competency assessment, and annual health assessment. However, areas such as

Table 3: Strength and comprehensiveness of Local Wellness Policies in rural, low-income school districts in Colorado (N=32)

<i>Policy subsection</i>	<i>Comprehensiveness* mean (s.d.)</i>	<i>Strength of wording† mean (s.d.)</i>
Nutrition education	0.70 (0.20)	0.22 (0.13)
USDA standards for meals	0.37 (0.13)	0.11 (0.09)
Nutrition guidelines	0.47 (0.15)	0.06 (0.10)
Physical education	0.31 (0.18)	0.03 (0.08)
Physical activity	0.51 (0.14)	0.28 (0.15)
Communication & promotion	0.61 (0.18)	0.31 (0.18)
Evaluation	0.75 (0.23)	0.30 (0.13)
Total for rural schools	0.49 (0.11)	0.15 (0.07)
Total for CASB model policy	0.65 (NA)	0.22 (NA)

*The comprehensiveness score refers to how many different topic areas were covered by the policy on average. In the Total row, for example, 0 would indicate that none of the 96 items were mentioned in the policy, 0.5 would mean that half of the items were mentioned, and 1.0 would indicate all 96 items were included.

†The strength of wording score refers to the average number of items in which the wording is specific and gives clear directions (e.g., “require”, “must”, “mandate”). 0 would indicate none of the items mentioned were worded strongly, 0.5 would indicate half of the items had strong wording, and 1.0 would indicate all items mentioned were strongly worded.

USDA: United States Department of Agriculture; CASB: Colorado Association of School Boards.

teacher–student ratios and safe and adequate equipment were rarely or never addressed. Local Wellness Policies had low “strength” scores in all dimensions and particularly in nutrition guidelines and physical education, indicating that policies did not include strong wording such as “require” or “mandate.” It was more common to see wording such as, “The goal of providing more opportunities for physical activity shall be accomplished by encouraging opportunities for physical activity during the school day through daily recess periods ...” Weak wording such as “encouraging” is not surprising, considering that the model policy provided by the Colorado Association of School Boards only contained strong wording for 19 of the possible 96 items.

Because of low scores on strength of wording and low variability, descriptive analyses are only presented for comprehensiveness (i.e., whether the Local Wellness Policy covers length or frequency of physical education and recess activity). Table 4 describes average weekly physical education minutes as reported by the physical education teacher and average daily recess minutes as reported by the principal, before and after the Local Wellness Policy went into effect. Analyses are limited to schools that reported before-and-after data ($N = 24$ for physical education minutes; $N = 25$ for recess minutes). These means are presented by whether the district’s Local Wellness Policy contained language about the quantity of these physical activity opportunities. As can be seen in Table 4, schools whose districts mentioned physical education quantity in their Local Wellness Policy had no change in physical education minutes over time (98.2 min per week vs. 98.4 min per week), whereas schools whose districts did *not* mention physical education quantity increased their physical education time by 18 min by week. This change was in the unexpected direction. All schools decreased amount of recess time, whether or not recess quantity was included in the Local Wellness Policy. However, the decrease was greater in schools whose districts mentioned recess quantity (–4.5 min per day vs. –2.5 min per day). This change was also in the unexpected direction. The limited sample size provided insufficient power to determine whether these differences were statistically significant.

The next set of analyses used data from key informant interviews to identify the processes districts used to create their Local Wellness

Table 4: Relationship between wording of Local Wellness Policies and school-reported physical education and recess minutes

	Mean (s.d.)					
	physical education minutes (weekly) reported in SEPS			recess minutes (daily) reported in SEPS		
	2005	2007	Difference (2005 vs. 2007)	2005	2007	Difference (2005 vs. 2007)
LWP contains language about this content area	N=7 98.2 (60.6)	N=7 98.4 (50.0)	N=7 0.1 (32.1)	N=19 37.9 (11.0)	N=19 33.4 (10.4)	N=19 -4.5 (14.2)
LWP does not contain language about this content area	N=17 110.3 (51.6)	N=17 128.3 (73.0)	N=17 18.0 (45.9)	N=6 38.3 (12.9)	N=6 35.8 (9.7)	N=6 -2.5 (10.8)
Total	N=24 106.8 (53.3)	N=24 119.6 (67.4)	N=24 12.8 (42.5)	N=25 38.0 (11.2)	N=25 34.0 (10.1)	N=25 -4.0 (13.3)

LWP: Local Wellness Policy; N: number of schools; SEPS: School Environment and Policy Survey.

Policies as well as barriers to policy implementation. In total, 13 schools from 12 districts were included in this sub-sample. Drs. Belansky and Cutforth conducted interviews with nine district-level Local Wellness Policy contacts and 13 elementary school principals. All interviews were audiotaped and transcribed for analysis. The interviewers used the constant comparison method (10), once individually and once collectively, to discuss and record emerging patterns and themes.

Processes used to develop Local Wellness Policies: Districts varied with respect to how they developed their Local Wellness Policies. Three districts assembled a committee of diverse individuals from within and outside the school system (e.g., school nurse, physical education teacher, school board member, parent, local physician, public health nurse, and community nutritionist). This inclusive approach, which was able to use committee members' interest and expertise in school wellness, generally resulted in more comprehensive Local Wellness Policies as measured by strength/comprehensiveness scores. Interestingly, the types of changes reported by districts that used this approach pertained only to nutrition. For example, one school provided non-food rewards for good behavior, replaced their vending machine's unhealthy drinks with milk, fruit juices, and low-calorie sports drinks, and planned to include nutrition issues in parent education initiatives. Six districts developed their policies only with input from individuals within the school system (teacher, parent, school board member, and food service director). With one exception – a school whose nurse served as a champion and advocated for more nutritious lunches and fundraisers and the inclusion of wellness content in the curriculum – the policy changes were minor (e.g., shut off the soda vending machine during school hours, survey staff and students about school lunches) and the resulting strength/comprehensiveness scores tended to be lower. Finally, the remaining three districts relied on one lead person to draft the Local Wellness Policy. These policies also tended to have minimal impact in the school (e.g., not using candy for fundraisers) and resulted in correspondingly low strength/comprehensiveness scores.

Barriers related to Local Wellness Policy implementation: The analysis indicated that local schools carried out little or no

implementation of the Local Wellness Policy for the reasons described as follows.

1. *Competing pressures:* The Local Wellness Policy was one of numerous directives that school districts received during the 2005–2006 school year and joined several other major pressures and priorities. These included raising students' academic achievement, training teachers to implement a state-wide reading program, meeting the needs of students for whom English is a second language, formulating a crisis plan in the wake of recent shootings in schools, aligning curriculum with state standards, increasing student mobility within and between districts, addressing turnover of administrative staff, and recruiting new teachers. Each principal typically talked about two or three of these issues as areas of concern in his or her school. Interviewees frequently mentioned "No Child Left Behind," a US federal law aimed at improving academic performance via accountability standards (11). As one superintendent explained, "What we continue to hear is 'No Child Left Behind.' I haven't heard 'Don't leave fat kids behind.' It's about keeping kids academically fit. That's foremost on our minds." Superintendents' response to the federal mandate was that "this is one more thing to do."

2. *Lack of resources devoted to the Local Wellness Policy:* Communities surrounding these rural school districts were facing economic decline. Limited employment opportunities resulted in families moving away. Declining enrollment meant that most of the schools were experiencing financial instability because they receive a fixed amount of money per student enrolled. According to one principal, "Each kid who walks out the door walks out with \$5,000–7,000 [per year]." The fact that the Local Wellness Policy was an unfunded mandate, combined with budgets that were already strained, meant that none of the districts had the financial resources to implement the Local Wellness Policy. Consequently, as one principal stated, "Right now it's a policy in a book. It's hard to put in place with no time, resources, and materials."

3. *Principals' unfamiliarity with the Local Wellness Policy:* In the majority of schools, principals were unfamiliar with the contents of the Local Wellness Policy. Some recalled hearing about it and had read it at one time; others had never read it and could not describe

the contents. Principals often said the Local Wellness Policy was one of 50 policies distributed that year, usually during a district-level administration meeting. Typically, the policy was handed out to be filed in a policy notebook, but was not discussed in any detail.

Despite the competing pressures mentioned above and the abundance of new policies, principals in a minority of schools were familiar with their Local Wellness Policy. They were able to recall specifics of the policy and describe examples of how it was being implemented. One principal said, "It's occurring; it's not just a document sent to the State (of Colorado) and filed on a shelf." These principals also acknowledged that physical activity and nutrition were not high on their schools' lists of priorities. However, what distinguished this minority of schools and resulted in the Local Wellness Policy being more of a "living" document was the presence of a "champion" (a supporter of the policy) in the school who reminded staff about the Local Wellness Policy and ensured its influence on school decisions and processes.

4. *Lack of accountability mechanisms:* Districts did not have accountability mechanisms in place to ensure adherence to the policy. Priorities were clearly focused on No Child Left Behind and improving academic achievement. One superintendent stated, "There's no inspection or reporting involved in the Local Wellness Policy, no 'teeth' involved, nobody's watching to see if we've done it or not. There's a higher financial loss with No Child Left Behind compared to the Local Wellness Policy. So we'll focus on No Child Left Behind."

CONCLUSIONS

The Local Wellness Policy was intended to address childhood obesity by increasing opportunities for physical activity and healthy eating in US schools. In low-income, rural Colorado, time spent in physical activity has not increased in elementary schools; in fact, it appears to have had a net decrease of 5 min per week. After the Local Wellness Policy went into effect, physical education increased by 14 min per week, whereas recess decreased by 19 min; these changes, however, were not statistically significant, in part because of small sample size. School policies on physical activity opportunities, such as prohibiting

classroom teachers from punishing students by withholding recess, also did not significantly change after Local Wellness Policies went into effect. Approximately half of elementary school principals reported being familiar with their districts' Local Wellness Policies, but familiarity was not related to an increase in minutes spent in physical education or recess. Although this study did not have sufficient power to test the relationship between Local Wellness Policy contents and change in physical activity opportunities over time, our data suggest that schools whose districts did *not* mention length or frequency of physical education and/or recess in their Local Wellness Policy had more physical activity opportunities than schools whose districts did include this language. These trends, which are in the reverse direction of the federal mandate's intent, require further study.

Together, these findings suggest minimal impact of the Local Wellness Policy on school-level practices. The most likely explanation for null findings came from interviews conducted with principals. They reported being focused on priorities such as academic achievement and No Child Left Behind, which reduced attention and value given to other school issues. Principals and district personnel also revealed several key barriers to Local Wellness Policy implementation, including weak policy language (also confirmed in this study's coding of Local Wellness Policies), competing priorities, principals' lack of knowledge about the Local Wellness Policy, lack of financial resources for implementation, and a lack of accountability mechanisms.

The Colorado Association of School Boards has significant reach and influence among Colorado schools, particularly rural schools with few resources to put toward policy development. The language and tone of the model Local Wellness Policy provided by the Colorado Association of School Boards had influence on the final policy statement that school districts adopted. The template was relatively comprehensive, but the wording was weak. School districts taking a "minimalist" approach and adopting the model policy did not necessarily bring stakeholders together. This may have led to missed opportunities to identify people to champion the policy development effort and/or become invested in a policy tailored to unique community needs. This suggests that, in the future, the public health community along with state- and district-level physical and

health education coordinators, teachers, and parents should work more closely with organizations such as the Colorado Association of School Boards to develop stronger policy wording and, if possible, provide assistance to small rural districts for policy development and implementation.

Based on concerns and barriers raised in the key informant interviews, several strategies are needed to increase opportunities for physical activity during the school day. These include identifying and empowering local champions to take on important health issues, providing administrators with convincing evidence of the link between physical activity and academic achievement, obtaining new financial resources and/or redirecting existing resources to support additional physical education opportunities by hiring more physical education teachers, increasing communication to principals about the Local Wellness Policy, and implementing accountability processes to ensure compliance. Additional research is needed to identify how some schools have overcome barriers related to scheduling, financial challenges, and competing priorities. It would also be important to conduct a multi-state, systems-level study to assess how states varied in their communication and technical assistance approaches when helping school districts comply with this federal mandate. This information could inform federal and state policymakers, state-level departments of education, school board associations, and local communities on best practices for increasing the impact of federal mandates.

With the broader society continuing to place higher expectations and demands on schools (often with little or no additional funding), making physical activity a higher priority in schools will require stronger legislation together with resources, accountability mechanisms, and local community involvement.

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