



YEAR FOUR

Arkansas Act 1220 of 2003 to Combat Childhood Obesity

EVALUATION

UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES / FAY W. BOOZMAN COLLEGE OF PUBLIC HEALTH
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INTRODUCTION

Today, data suggest that 66 percent of U.S. adults and more than 33 percent of children and adolescents fall into the top two weight categories.

Obesity is widely recognized as one of the most pressing health threats to families and children across the country. The rates of obesity among adults and children have increased at an alarming rate over the past four decades. Today, data suggest that 66

percent of U.S. adults and more than 33 percent of children and adolescents fall into the top two weight categories as defined by the Centers for Disease Control and Prevention. Those categories are defined as “obese” and “overweight” for adults, and as “overweight” and “at risk of overweight” for children.^{1,2} The epidemic is even more pronounced in Arkansas—recent statistics based on actual measurements reveal that 38 percent of Arkansas public school children are “overweight” or “at risk of being overweight.”³

The health implications associated with obesity are serious. Among adults, obesity is linked to cardiovascular disease, hypertension, type 2 diabetes, osteoporosis and some cancers. Even more alarming, children are being diagnosed with health problems previously considered to be “adult” conditions. Obese children are at greater risk than their normal-weight peers for type 2 diabetes, hypertension, high cholesterol and orthopedic problems.⁴ Obese children are also more likely to become obese adults and to carry the associated health risks into later periods of their lives.⁵

With the creation and passage of Act 1220 of 2003, Arkansas became a national leader in attempting to address and combat childhood obesity through a comprehensive school-based intervention. The Act mandated a number of immediate statewide policy changes and also established mechanisms to help create future changes at both the state and local levels. Act 1220 calls for school personnel, state health officials and legislators to work together to implement policies to promote better nutrition and more physical activity in public schools statewide. The ultimate objective of the legislation is to improve health outcomes for Arkansas families and children.

This report summarizes the most recent findings from four years of evaluating the implementation of Act 1220. Researchers at the Fay W. Boozman College of Public Health at the University of Arkansas for Medical Sciences have conducted the evaluation with support from the Robert Wood Johnson Foundation. Current funding by the Robert Wood Johnson Foundation will support the evaluation for an additional five years.



HISTORY OF ACT 1220

In 2003, Arkansas legislators passed Act 1220, a comprehensive and coordinated approach to combat childhood obesity.

In 2003, Arkansas legislators passed Act 1220, a comprehensive and coordinated approach to combat childhood obesity that involves public schools and communities across the state. Components of the law, which have been summarized in greater detail in previous evaluation reports, include:

- the creation of a state Child Health Advisory Committee (CHAC) to develop physical activity and nutrition standards for public schools;
- annual body mass index (BMI) screenings for every public school student, with results provided to parents in a confidential report;
- the creation of a Nutrition and Physical Activity Advisory Committee in every school district to implement the new standards and develop applicable local policies;
- public reporting by school districts of the expenditures and revenue from district vending contracts; and
- prohibition of student access to food and beverage vending machines in all Arkansas elementary schools.

The idea for developing a state law to combat childhood obesity originated in 2002 with support from several key legislators and officials at the Arkansas Department of Health (ADH) and the Arkansas Department of Education (ADE). After passage of the original bill by the Arkansas legislature, Arkansas Gov. Mike Huckabee signed Act 1220 into law in April of 2003.

This report provides data from the fourth annual evaluation of Act 1220. Previous evaluation reports and more information about the Act are available online at www.uams.edu/coph/reports. See *Establishing a Baseline to Evaluate Act 1220 of 2003, An Act of the Arkansas General Assembly to Combat Childhood Obesity* (2004); *Year Two Evaluation: Arkansas Act 1220 of 2003 to Combat Childhood Obesity* (2005); and *Year Three Evaluation: Act 1220 of 2003 to Combat Childhood Obesity* (2006).



IMPLEMENTATION OF ACT 1220 IN YEAR 4

The fourth year of implementation of Act 1220 was marked by debate and challenging new proposals.

The fourth year of implementation of Act 1220 was marked by debate and challenging new proposals during the Arkansas General Assembly's regular, biennial session, which began in January 2007. Within weeks of the opening of the

session, bills were introduced to eliminate BMI measurements, alter physical activity and physical education requirements in schools, allow candy incentives in classrooms and reinstate access to vending machines before the lunch period.

The Impact of 2007 Legislative Action on Act 1220

House Bill 1173 proposed to eliminate the measurement of BMI in Arkansas public schools. Proponents of the bill—including school administrators and school nurses—argued that the continued BMI assessments were not necessary, took too much time away from academic instruction, and could have potentially harmful emotional and self-esteem consequences for students. A compromise resulted in an amended bill (which became **Act 201** of 2007) specifying that:

- BMI measurements will occur annually in schools, but individual students will participate in BMI assessments in kindergarten and in grades 2, 4, 6, 8, and 10;
- BMI measurements will be eliminated for students in grades 11 and 12;
- parents can provide written notice to the school if they choose to exclude their children from BMI assessments; and
- community health nurses will work with schools to assure that proper protocol is followed during the BMI assessments.

House Bill 1039 sought to override the rules and regulations promulgated by the State Board of Education by reducing both physical activity and physical education requirements. The bill passed with amendments in both houses and became Act 317, with provisions that require:

- sixty minutes of physical education training and instruction each calendar week for students in kindergarten through grade 6;
- ninety minutes of physical activity, between PE and recess, each calendar week for students in kindergarten through grade 6;
- sixty minutes of physical education each calendar week for grades 5 through 8 in middle school, with no additional requirement for physical activity; and
- one half-unit of physical education for students in grades 9 through 12, with no additional requirement for physical activity.

A similar bill, **House Bill 1346**, which would have reduced physical education requirements from 60 minutes to 40 minutes per week, was unsuccessful.

House Bill 1522 proposed to allow candy incentives in the classroom but only for candy with 50 calories or fewer per piece. Proponents of the bill argued that eliminating the use of candy as a classroom reward was an overreaction to the issue of childhood obesity. The bill was not approved.

Two additional bills were introduced in the Senate during the session. The first, **Senate Bill 861**, added members to the Child Health Advisory Committee, including representatives from the Department of Health's Office of Minority Health and Health Disparities, the Arkansas School Board Association, the Arkansas Association of School Business Officials, the Arkansas Association for Supervision and Curriculum Development, and a classroom teacher. This bill, which ultimately became **Act 719**, effectively increased the representation of school personnel on the committee.

The final bill, **Senate Bill 897**, would have modified restrictions to vending access in middle and high schools. This bill, with heavy support by representatives of the vending industry, did not pass but was referred for interim study.

In response to the legislative changes that took place in 2007, the Arkansas State Board of Education and the Arkansas Department of Education developed rules and regulations to assure implementation of the new legislation within Arkansas public schools. In addition, the Arkansas Departments of Education and Health, in collaboration with the Arkansas Center for Health Improvement, have developed methods for assuring fidelity with the assessment protocol as BMI measurements are completed in upcoming years.

MEDIA COVERAGE IN ARKANSAS

From October 2006 to November 2007, a total of 307 news stories, editorials and letters to the editor mentioned Act 1220, childhood obesity or related topics. These stories appeared in newspapers in 59 of the 75 counties in Arkansas. Overall, media coverage was evenly spread throughout the state's geographical regions. The central area of the state had slightly more coverage than the other regions, followed by northwest, northeast, southwest and then southeast Arkansas.

Most of the print media was informative in nature and focused on the changes made to the rules and regulations of Act 1220 during the 2007 legislative session as well as various reports on obesity and BMI percentages for the state and selected counties.

In 2007, the most frequently discussed issues that appeared in media coverage related to Act 1220 were BMI assessments, obesity and childhood obesity.

The majority of the coverage, approximately 92 percent, was neutral in tone. Seven percent of the coverage was positive and consisted mainly of personal interest stories about healthy behavior changes that could

be attributed in part to the state's BMI initiative as well as optimistic reports of the progress of Act 1220 and its components. The remaining 1 percent was negative in tone and included editorials and letters to the editor expressing concern for the BMI assessments, such as the associated cost and inconvenience and the state government's intrusion on issues of weight and health, which some consider a private matter.

In 2007, the most frequently discussed issues that appeared in media coverage related to Act 1220 were BMI assessments (69 percent), obesity (57 percent) and childhood obesity (36 percent). While stories related to BMI assessments continued to receive the most frequent coverage in both 2006 and 2007, there was a significant change in the coverage of other related topics between years three and four of the evaluation. For example, there was a precipitous drop in the coverage of vending machines in schools, from 34 percent in 2006 to only 6 percent in 2007. There also was a decrease in the percentage of stories mentioning Act 1220 and childhood obesity. The only substantial increase occurred in the percentage of media coverage surrounding the topic of obesity in general.



THE IMPACT OF ACT 1220 IN YEAR 4

Highlights of Key Findings

Four years after the passage of Act 1220, important changes continue to take place in public schools throughout Arkansas. As part of this evaluation, data collected from educators, parents and students were analyzed to assess the impact of policy changes on each of these groups. Highlights of the key findings include:

Policies Regarding Nutrition and Vending Access

Key findings from the Year 4 evaluation document an increase in policies prohibiting the sale of “junk foods” and guiding school personnel in the selection of foods for school-sponsored activities.

Since Year 1, fewer high-fat, high-sugar items and more healthy food and beverage options are available through vending machines.

Since Year 1, *fewer* high-fat, high-sugar items and *more* healthy food and beverage options are available through vending machines—and

students report significantly less access to vending machines before and after school hours, before and during lunch, and during breaks. Schools also are more frequently providing nutrition information for students and prohibiting commercial advertising of food and beverage products on campus.

Physical Activity Policies

Rules and regulations regarding physical education and physical activity that were previously approved by the Arkansas Board of Education were reversed in early 2007 by the state’s General Assembly. The Year 4 evaluation found that individual schools and school districts continued to implement policies to reduce the use of physical activity as punishment and to require that lifetime physical activities be included in physical education programs. In elementary schools, physical education classes were more likely to be taught by certified physical education teachers and less likely to be taught by non-certified physical education, health education or classroom teachers.

BMI Assessment and Reporting Process

The Arkansas General Assembly also scaled back the Act 1220 requirement mandating schools to assess and report BMI measures for all students each year. In Year 4 public schools were required only to measure and report BMI levels for students in kindergarten and in even-numbered grades through grade 10. According to survey responses, the BMI assessments were not a highly controversial issue among principals, parents and adolescent students; superintendents, however, were vocal about the burden imposed on schools by the BMI measurement process.

Potential Consequences of Act 1220 on Students and Parents

For the third consecutive year, parents and adolescents have not reported significant increases in potentially negative outcomes of any of the Act 1220 mandates, including the BMI assessments. In contrast, Year 4 data show an increasing trend among parents to limit “junk foods” at home and a significant increase in the percentage of parents who are limiting screen time to give their children more time for physical activity. It will be important to monitor these trends over the coming years. Survey results also indicate an increased awareness of the health risks associated with childhood obesity among families, communities and decision-makers throughout the state.

New Data Collection and Analyses Conducted in Year 4

During Year 4 evaluators collected new details from parents and conducted important new analyses. For example, parent interviews revealed that less than one in five parents had children who expressed concern about weight and that younger students were more likely to express concern only after BMI measurements began. A comparison of dieting and physical activity practices found no significant differences between Arkansas public school students and a national sample of high school students. A comparison between students who are and are not overweight found that soda consumption may be significantly higher among overweight students ages 13 and younger.

Following this summary of key findings, the complete 2006–2007 data set is presented and compared with data collected during the previous three years.



Key Findings at the District Level

In Year 4, survey data were collected from 171 Arkansas public school district superintendents to assess the impact of Act 1220 on their policies and practices. The following section includes data on nutrition and physical activity policies, efforts to promote physical activity programs, and reporting of vending revenues and expenditures at the district level.

Changes to Food and Physical Activity Policies Continue

During Year 4, school districts and their Nutrition and Physical Activity Advisory Committees (Wellness Committees), continued to work together to change nutrition and physical activity policies in schools. As summarized in Table 1, there was a significant increase in policies prohibiting the sale of “junk foods” and the use of physical activity as punishment for students. Some of these policies were enacted to assure compliance with new statewide regulations; however, in many cases, school districts adopted these policies voluntarily, before they were mandated by law.

Table 1. Summary of school district policies

| District policies | 2004 | 2005 | 2006 | 2007 |
|--|------|------|------|------|
| Physical education/physical activity | | | | |
| Policy prohibiting use of physical activity as punishment for bad behavior in: | | | | |
| Physical education classes** | 24% | 28% | 39% | 39% |
| Other classes* | 32% | 31% | 44% | 41% |
| Policy requiring lifetime physical activities be included in physical education program | | | | |
| Elementary schools** | 39% | 36% | 47% | 56% |
| Middle schools | 52% | 44% | 57% | 63% |
| High schools | 56% | 45% | 59% | 66% |
| Policy requiring student fitness levels be measured on a regular basis | 26% | 26% | 37% | 37% |
| Policy requiring that newly hired physical education teachers be certified to teach physical education | | | | |
| Elementary schools*** | 69% | 64% | 74% | 86% |
| Middle schools | 87% | 85% | 86% | 91% |
| High schools | 88% | 87% | 87% | 91% |
| Nutrition | | | | |
| Policy prohibiting “junk foods” (foods that provide calories primarily through fats or sugars and contain few vitamins or minerals) from being offered in: | | | | |
| A la carte lines in cafeterias** | 37% | 32% | 58% | 63% |
| Student parties**** | 2% | 5% | 21% | 28% |
| After-school programs** | 16% | 15% | 30% | 35% |
| School stores**** | 13% | 18% | 50% | 57% |
| Vending machines**** | 18% | 27% | 53% | 61% |
| Concession stands* | 2% | 7% | 12% | 11% |
| Policy prohibiting or discouraging use of food or food coupons as rewards in classrooms**** | 12% | 22% | 70% | 76% |
| Policy requiring that schools offer students low-fat alternatives to whole milk each day | 51% | NA | 63% | 68% |

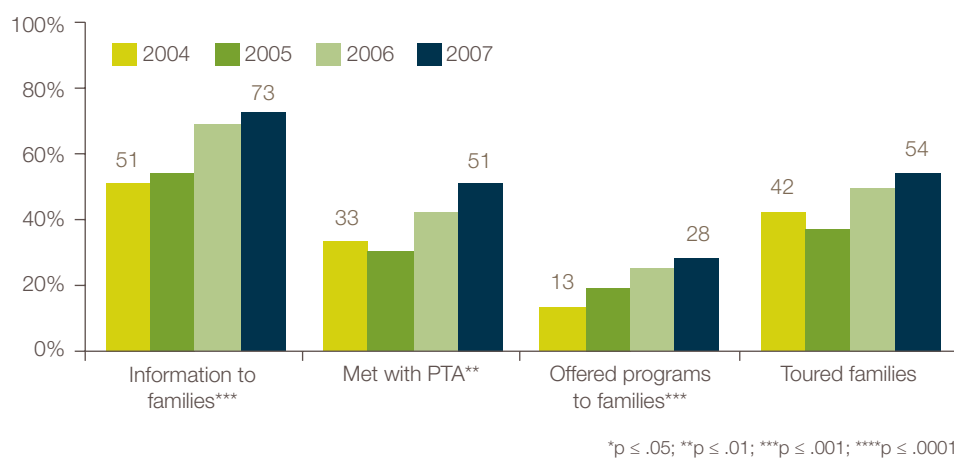
*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001

The policies that appear in bold print in Table 1 were either required or recommended by the Arkansas Department of Education.

Efforts to Promote Physical Activity Programming

Year 4 data show that school districts are increasing their efforts to inform families about physical education and physical activity programs. Superintendents also report that they are working to engage parents and students in district-level programs.

Graph 1. Activities to promote school physical education and physical activity programs



Since Year 1, more school districts are now requiring newly hired elementary physical education teachers to be certified in physical education and mandating that lifetime physical activities be included in physical education programs in elementary schools.

Reporting of Vending Revenues and Expenditures

Act 1220 of 2003 mandates that school districts publicly report revenues and expenditures from vending and pouring contracts each year. In Year 4, 89 percent of the districts reported compliance with this regulation, up from 84 percent of districts in Year 3. Similar to the previous year, the majority (69 percent) of districts that complied with the reporting regulations in Year 4 presented their information in verbal reports at public school board meetings. This year, however, more districts released their information as part of an annual report (38 percent in Year 4, an increase from 30 percent in Year 3) or in the local newspaper (30 percent in Year 4, an increase from 18 percent in Year 3). Other districts published the information in a school newsletter (8 percent) or on the school's website (8 percent) or disseminated the information in another way (10 percent).



Key Findings at the School Level

Principals from 832 public schools in Arkansas provided insight on their campus food and physical activity environments in the fourth year of the evaluation. This section highlights data on changes that affect the types of foods and beverages available to students on campus and describes policy change regarding fundraising, on-site marketing and the quality of physical education programming.

Changes to the Food Environment

For the third consecutive year, schools have implemented new and changed existing policies and practices that affect the food environment for students, families and school personnel. As part of the Year 4

evaluation, data were collected and analyzed to assess changes in vending policies, snack bars and school stores, cafeteria food and beverage service, food options at school-sponsored activities, the availability of nutritional information, commercial advertising, the use of food as a reward for students and fundraising efforts.

Student Access to Vending Machines on Campus

In Years 3 and 4, the percentage of schools with vending machines on campus has remained at 80 percent, a decrease from 85 percent in Year 1 of the evaluation. As shown in Table 2, students who attend schools with vending machines on campus have significantly less access to food and beverage machines than they did in Year 1.

Today, students have significantly less access to vending machines before and after school hours, before and during lunch, and during breaks than in Year 1.

Table 2. Summary of vending machine accessibility

| | 2004 | 2005 | 2006 | 2007 |
|----------------------------------|------|------|------|------|
| Vending machine locations | | | | |
| Beverage machines | | | | |
| Cafeteria* | 13% | 11% | 10% | 9% |
| Gymnasium** | 30% | 26% | 24% | 23% |
| Snack bar/school store**** | 6% | 7% | 4% | 2% |
| Staff/teachers' lounge | 71% | 78% | 78% | 78% |
| Hallway | NA | 20% | 18% | 19% |
| Snack food machines | | | | |
| Cafeteria | 6% | 5% | 5% | 4% |
| Gymnasium* | 11% | 9% | 8% | 6% |
| Snack bar/school store | 14% | 10% | 6% | 4% |
| Staff/teachers' lounge | 70% | 66% | 72% | 80% |
| Hallway | NA | 16% | 13% | 10% |
| Times of student access | | | | |
| Beverage machines | | | | |
| Before school**** | 28% | 30% | 20% | 17% |
| Before lunch* | 10% | 10% | 9% | 7% |
| During lunch**** | 43% | 40% | 20% | 19% |
| After lunch**** | 16% | 18% | 27% | 24% |
| During breaks**** | 13% | 13% | 8% | 4% |
| After school*** | 39% | 37% | 31% | 31% |
| Snack food machines | | | | |
| Before school**** | 28% | 33% | 21% | 14% |
| Before lunch** | 11% | 11% | 8% | 5% |
| During lunch**** | 45% | 45% | 20% | 19% |
| After lunch* | 16% | 19% | 25% | 22% |
| During breaks**** | 15% | 15% | 8% | 5% |
| After school** | 38% | 39% | 30% | 28% |

*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001

In apparent violation of state rules and regulations that became effective in Year 2, 19 percent of schools continue to allow student access to vending machines during the lunch period and 5 to 7 percent continue to allow student access to vending machines before lunch.

Table 3. Availability of food types in school vending machines

| | 2004 | 2005 | 2006 | 2007 |
|--|------|------|------|------|
| Less healthy food and beverage options (foods that provide calories primarily through fats or sugars and contain few nutrients) | | | | |
| Chocolate candy**** | 42% | 47% | 28% | 22% |
| Other candy**** | 45% | 49% | 29% | 23% |
| Cookies**** | 47% | 51% | 36% | 31% |
| Pastries*** | 32% | 40% | 23% | 18% |
| Chips*** | 32% | 40% | 23% | 18% |
| Ice cream**** | 15% | 15% | 12% | 4% |
| Sodas** | 49% | 48% | 40% | 45% |
| Fruit drinks**** | 46% | 50% | 41% | 37% |
| Healthier food and beverage options | | | | |
| Low-fat, low-sugar cookies | 11% | 19% | 22% | 14% |
| Low-fat crackers | 12% | 17% | 21% | 14% |
| Low-fat, low-sugar pastries | 8% | 10% | 14% | 7% |
| Low-fat chips | 21% | 40% | 33% | 24% |
| 100% fruit juices | 32% | 36% | 38% | 32% |
| Vegetable juices | 9% | 10% | 11% | 7% |
| Water | 49% | 53% | 49% | 51% |
| Principal estimate of percentage of vending items in healthier category (from list provided) | 18% | 18% | 22% | 26% |

*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001

Since Year 1, there has been a significant decrease in the availability of candy, cookies, chips, ice cream and sugary drinks in school vending machines.

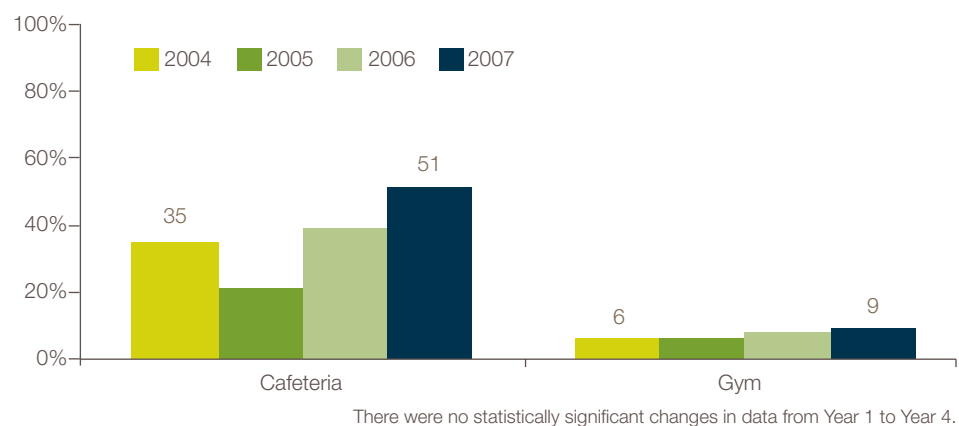
Vending Machine Contents

In addition to changes in vending machine access, the contents of vending machines continued to change in Year 4. Overall, the availability of high-fat, high-sugar items decreased, and students had the opportunity to purchase more healthy items in both food and beverage machines. As shown in Table 3, the changes in vending options that occurred between Years 2 and 3 have generally been maintained in Year 4. Further, the proportion of healthier vending options as reported by principals has steadily increased since Year 1.

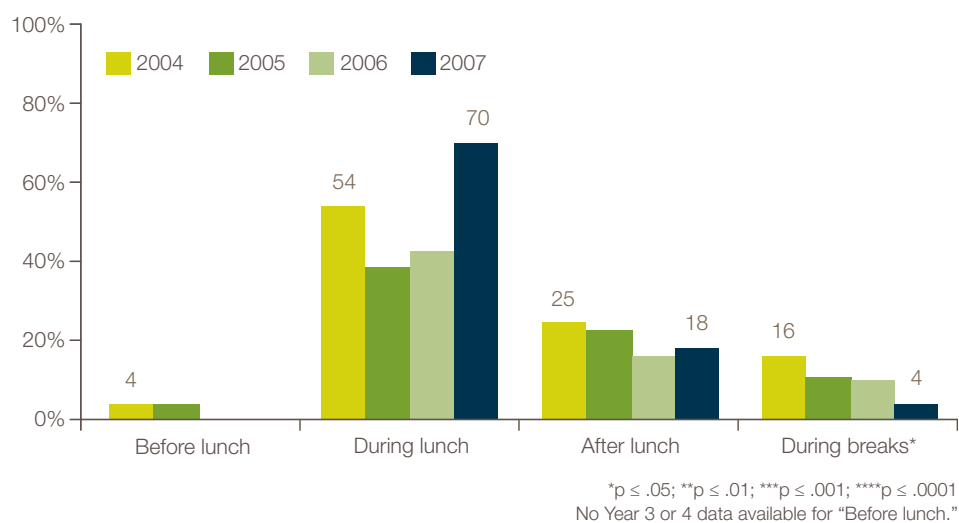
Snack Bars, Snack Carts and School Stores on Campus

In Year 4, 8 percent of schools reported having a snack bar or cart on campus, a significant decrease from 22 percent in Year 1. As illustrated by Graphs 2 and 3, when snack bars or carts are present in schools, they are most often located in cafeterias and open for purchases during lunch periods.

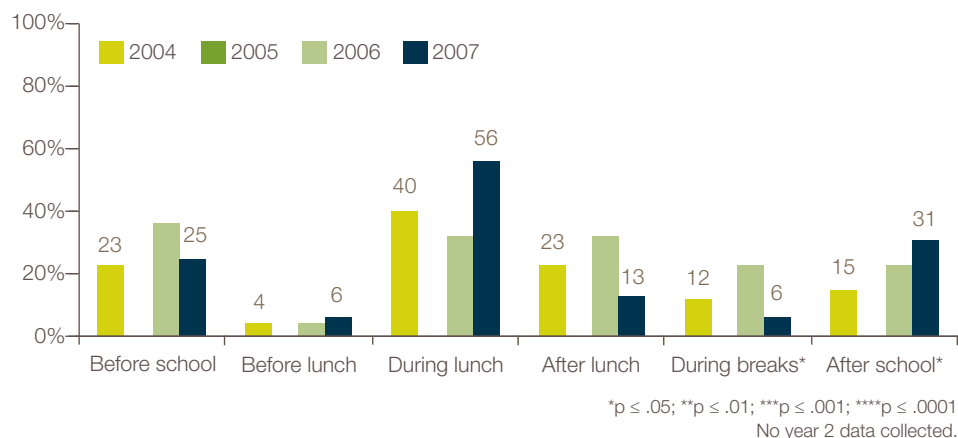
Graph 2. Location of school snack bars and snack carts



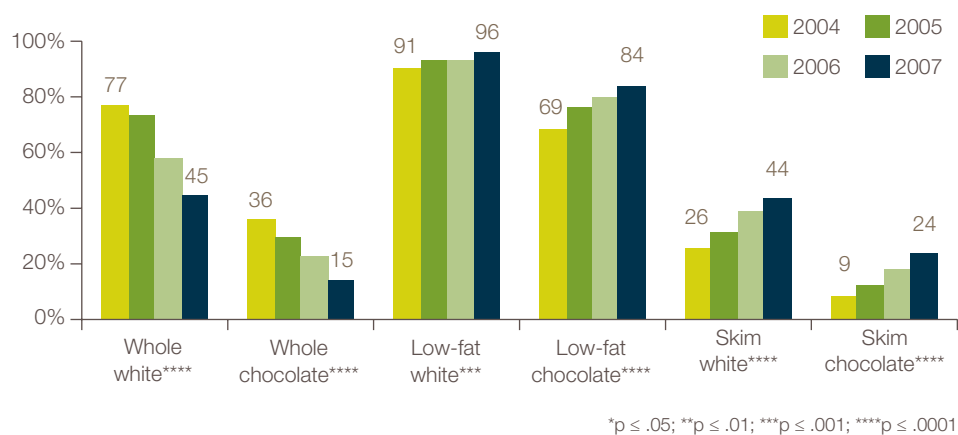
Graph 3. Student access times for school snack bars or snack carts



Since Year 1, schools are significantly less likely to have a store on campus, and those with school stores are significantly less likely to sell foods and beverages to students. As shown by Graph 4, those school stores that do sell foods and beverages to students are more likely to offer them during lunch periods than during any other part of the day.

Graph 4. Access to foods and beverages in school stores**Cafeteria Food and Beverage Options**

As summarized in Graph 5, over the past four years, there has been a steady trend among schools to offer more low-fat or skim milk options and fewer whole milk options.

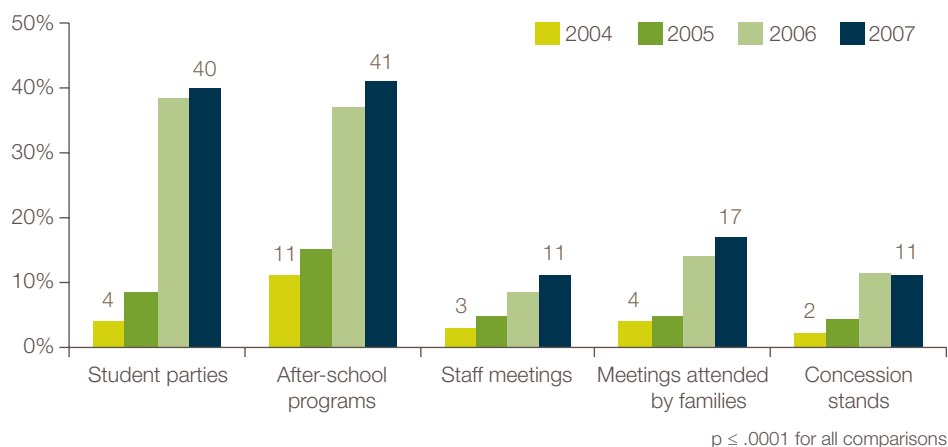
Graph 5. Summary of milk options offered in school cafeteria

Schools also appear to be offering students more healthy food options in the cafeteria. For example, in Year 4, 39 percent of schools reported that they serve foods prepared with low-fat cooking methods, and they provide more fruits and vegetables at lunch. This represents a significant increase from 26 percent of schools that reported these healthy food options in Year 1.

Healthy Food Options at School Activities and Events

Since Year 1, many schools also have implemented food policies for school-sponsored activities, including assemblies, events, faculty and staff meetings, sporting events and teacher trainings. The most significant increases were among schools that reported implementing policies regarding the types of foods served at assemblies (28 percent in Year 4, an increase from 4 percent in Year 1) and at events (35 percent in Year 4, an increase from 5 percent in Year 1). Additionally, there has been a significant increase in the percentage of schools that require healthy options be provided when food is served at school-sponsored activities, as shown in Graph 6.

Graph 6. Summary of policies requiring healthy options at school-sponsored events



Commercial Advertising and Availability of Nutritional Information in Schools

Schools are not only changing the foods and beverages that are offered to students and limiting access to vending machines, they are finding other ways to create a healthier food environment for students, families and school personnel. For example, there has been a 60 percent increase in the number of schools that report offering point-of-sale signage on campus to provide nutritional information for

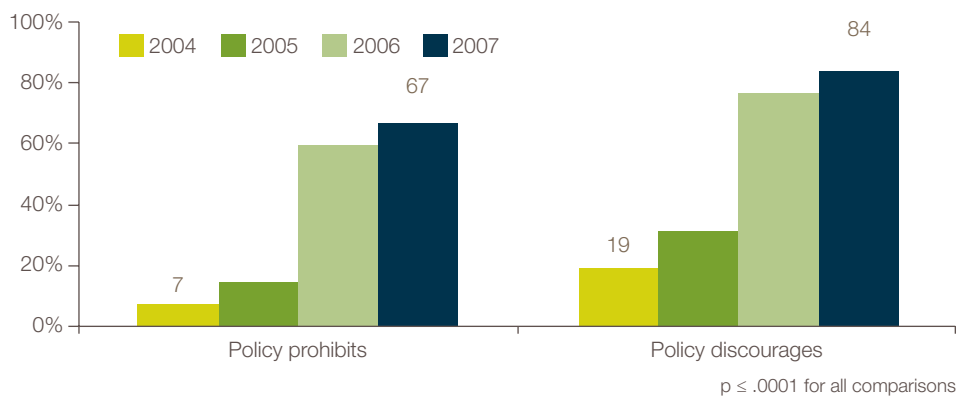
Schools are more frequently offering nutritional information for students and prohibiting commercial advertising of food and beverage products on campus.

students—an increase from 12 percent in Year 2 to 19 percent in Year 4. Schools also are significantly more likely to have a policy prohibiting commercial advertising on school premises by food or beverage companies—an increase from 32 percent in Year 2 to 39 percent in Year 4.

Policies Regarding Use of Foods as a Reward

As summarized in Graph 7, significantly more schools have a policy prohibiting or discouraging the use of foods or food coupons as a reward for students. There was a substantial increase in the proportion of schools with such policies in Year 3, which was most likely in response to new rules and regulations mandated by the Arkansas Department of Education. The proportion of schools with policies that prohibit or discourage the use of foods as a reward continued to rise in Year 4, even as the issue was debated in the Arkansas General Assembly in session during early 2007.

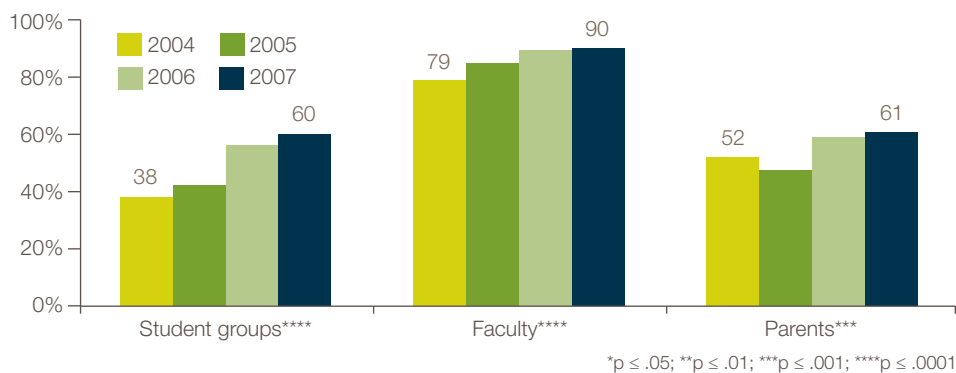
Graph 7. School policies concerning the use of foods or food coupons as a reward



Changes in Fundraising Policies and Practices

Since Year 1, a significantly higher percentage of schools have implemented policies that prohibit students, faculty and parents from selling food items for fundraising. Further analysis revealed that schools that continue to allow food sales for fundraising are moving away from the sale of unhealthy items. In Year 4, 74 percent of schools that allowed foods for fundraising sold cakes, candy, cookies and doughnuts, a decrease from 85 percent in Year 2.

Graph 8. Policies prohibiting the sale of food items for fundraising by group



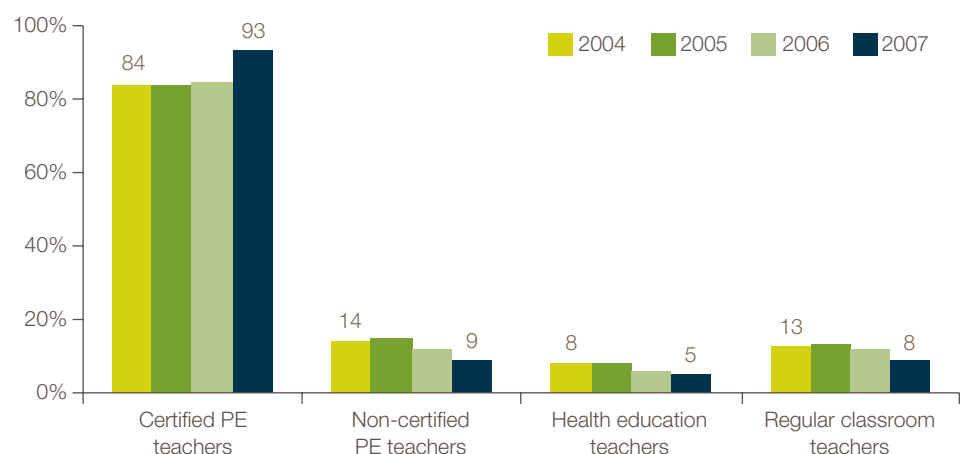
Changes to the Physical Activity Environment

In addition to changing policies and practices that impact the food environment, schools are beginning to make an effort to support physical activity and strengthen physical education programming. As described in “Key Findings at the District Level,” school districts are implementing policies to reduce the use of physical activity as a punishment, and to require that lifetime physical activities be included in physical education programs. Findings from the school level include an evaluation of policies regarding the qualifications of newly hired physical education teachers. Additional data concerning participation in physical education classes and leisure-time physical activity are presented in the sections “Key Findings from Parents” and “Key Findings from Students.”

Physical Education Instructors

As detailed in Graph 9, the proportion of schools requiring that newly hired physical education teachers be certified to teach the subject has risen during the past four years, a significant trend in elementary schools. In addition, physical education classes in elementary schools are more likely to actually be taught by certified physical education teachers and less likely to be taught by non-certified physical education, health education or classroom teachers. Differences in these proportions are small and statistically insignificant, but changes were seen in both Year 3 and 4.

Graph 9. Percentage of PE classes taught by certified PE teachers



There were no statistically significant changes in data from Year 1 to Year 4.



Key BMI Assessment Findings

During Year 4, schools worked with the Arkansas State Board of Education, the Arkansas Departments of Education and Health, and the Arkansas Center for Health Improvement to develop policies and practices in compliance with new state laws that were introduced regarding BMI measures. Our evaluation of these efforts shows that four years after the passage of Act 1220, there continues to be some level of concern and controversy surrounding student BMI assessments. The key findings presented in this section reflect data from responding principals and 2,202 parents with children in Arkansas public schools that were analyzed to assess changes in school experiences with BMI measures and parental attitudes and concerns about BMI assessments and the reporting process.

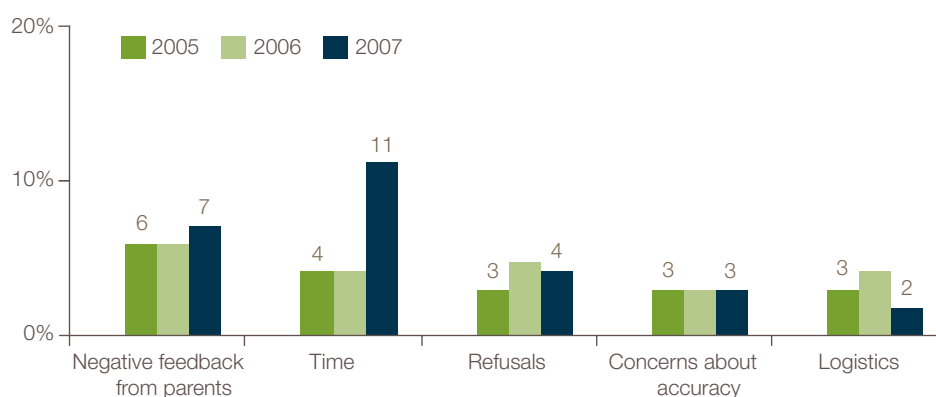
School Experience with BMI Assessments

In Year 4, 32 percent of principals reported having some level of difficulty with the BMI measurements. As shown in Graph 10, the most common complaints concerning BMI assessments reported by principals were time taken away from academic instruction and negative feedback from parents. While there were no statistically significant changes in the proportion of complaints from Year 2 to Year 4, the percentage of schools reporting complaints about the amount of time spent on BMI assessments increased from 4 percent in Years 2 and 3 to 11 percent in Year 4. This increase may have been a result of the debates over BMI assessments that occurred during the Arkansas General

Assembly session in early 2007. Another noteworthy finding was that the proportion of schools reporting problems with the logistics of measurement dropped from Year 3 to Year 4, reflecting a growing comfort and familiarity with the processes of the measurements themselves.

In Year 4, there was an increase in the percentage of principals expressing concerns regarding student BMI assessments. This may have been a result of the legislative debate that took place in early 2007.

Graph 10. Types of BMI assessment concerns, reported as percent of total number of schools



These categories represent only the most common concerns expressed by schools and are not mutually exclusive. There were no statistically significant changes in data from Year 2 to Year 4. No Year 1 data collected.

Table 4. Parental knowledge and attitudes toward BMI assessment

| | 2004 | 2005 | 2006 | 2007 |
|---|------|------|------|------|
| Knowledge and attitudes | | | | |
| Aware of school BMI measurements**** | 75% | 83% | 87% | 89% |
| Not at all or only a little concerned about classmates finding out BMI measurements | NA | 71% | 72% | 68% |
| Comfortable getting BMI report from school | 69% | 65% | 66% | 58% |
| Read some or all of BMI report | NA | 95% | 95% | 95% |
| Found report at least somewhat helpful | NA | 49% | 49% | 46% |

****p ≤ .0001

Parental Comments about BMI Measurements

The annual measurement of BMI in Arkansas schools was a controversial issue for the 2007 Arkansas General Assembly. An evaluation of survey responses from principals, however, suggests that it was a less controversial issue for parents. In Year 4, the majority of principals (64 percent) reported that no parents contacted them due to concern about BMI measurements, and 85 percent of principals had fewer than five parental contacts during the year. Only 5 percent of principals reported contact from 20 or more parents regarding BMI measurements. While the majority of parental contacts have been negative in tone (68 percent in Year 4 and 72 percent in Year 3), the

proportion of positive parental contacts rose from 1 percent in Year 3 to 7 percent in Year 4.

Parental Assessment of BMI Reporting Process

As shown in Table 4, parental knowledge and attitudes surrounding student BMI measures have remained essentially stable over the past four years. The majority of parents continue to be aware of BMI measurements, express minimal concern about confidentiality and indicate comfort with receiving a BMI report from school. However, in Year 4 there was a slight, but statistically insignificant, trend among parents that indicates less comfort with the BMI reporting process and more concern about confidentiality issues.

Survey responses from principals seem to indicate that conducting annual student BMI assessments in Arkansas public schools was not a highly controversial issue among parents in Year 4.



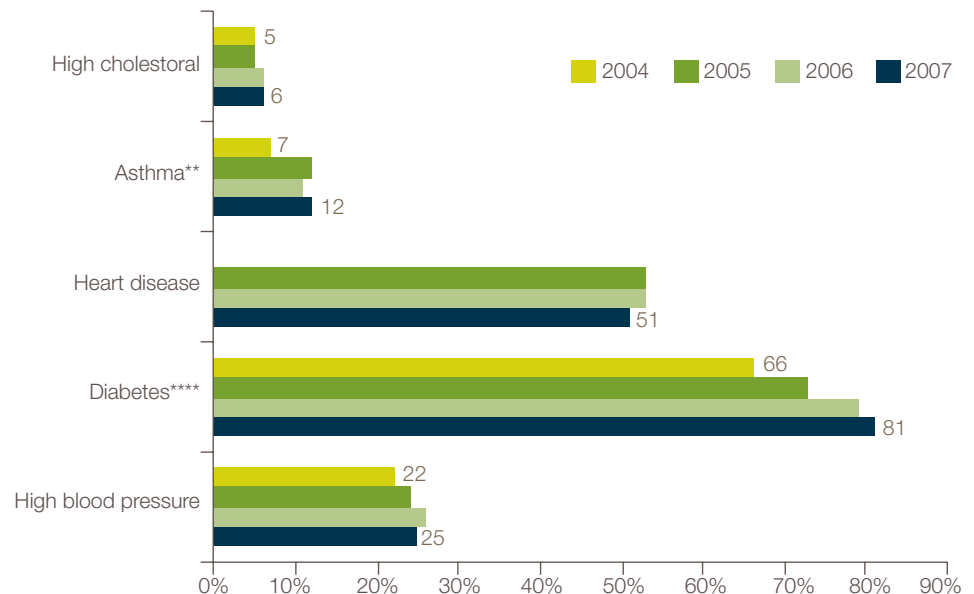
Key Findings from Parents

In addition to surveying parents about BMI-specific issues, it also is important to assess their attitudes toward other changes occurring in schools as a result of Act 1220. This section presents data collected from parents in Year 4, which provided valuable details about their beliefs and opinions regarding childhood obesity, school vending issues, possible consequences of Act 1220 mandates, weight concern expressed by their children, and nutrition and physical activity patterns at home.

Parental Knowledge and Beliefs Regarding Childhood Obesity

As shown in Graph 11, Year 4 findings suggest that parents are maintaining their awareness of short- and long-term health problems that are associated with childhood obesity. Parents interviewed in Year 4 also are significantly more likely to mention asthma and diabetes as health problems for overweight children. Further, from Year 1 to Year 4, there was a significant increase in the percentage of parents who asserted the belief that overweight children are more likely to become overweight adults.

Graph 11. Parental awareness of health problems associated with childhood obesity

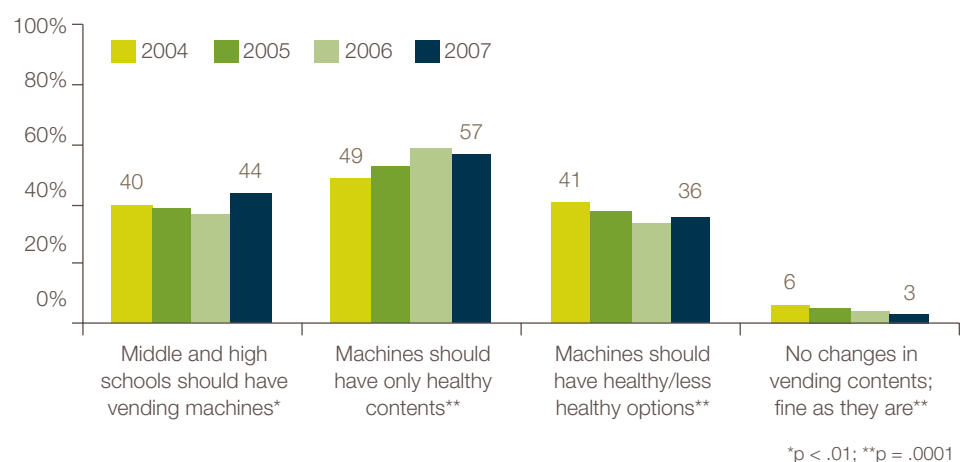


*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001
No Year 1 data available for "Heart disease."

Parent Opinions Concerning Vending Machines in Schools

The majority of parents continue to endorse the belief that middle and high schools should not have vending machines, though the percentage has significantly decreased since Year 1. Other significant changes that have occurred during the past four years, including an increase in the proportion of parents who believe that vending machines should offer only healthy items, are highlighted in Graph 12. Overall, the percentage of parents who believe that vending machines in secondary schools should at least offer healthy options for student purchase has remained stable at about 90 percent since the passage of Act 1220.

Graph 12. Parental beliefs about school vending machines



Possible Consequences of Act 1220

The passage of Act 1220 in 2003 sparked some concern about potentially negative outcomes of school-based BMI assessments, including increased teasing because of weight, use of diet pills and other inappropriate dieting behaviors. While this evaluation does not assess the impact of individual components of the Act, there has been no evidence of an increase in negative consequences of any Act 1220 mandates over the past four years.

In fact, the proportion of parents who have put their child on a diet within the past six months decreased from 9 percent in Year 1 to 5 percent in Year 4. Results from parent interviews also indicate that there has not been a significant change in parental concern about their child's weight status—the percentage of parents who expressed concern decreased from 25 percent in Year 1 to 22 percent in Year 4. Other

Since the passage of Act 1220, there has been a significant increase in the percentage of parents who signed their children up for sports or exercise classes. Parents report no increase in inappropriate dieting behaviors among their children.

findings from parent interviews, which are presented in Table 5, show that parents were more likely to report increased physical activity among their children, either through routine physical activity, sports or exercise classes. Although excessive physical activity can be an inappropriate attempt to control weight, modest increases in physical activity and exercise may be an appropriate response to concerns about weight.

Response to Child's Expressed Weight Concern

For the first time in this on-going evaluation of Act 1220, parents were surveyed in detail about weight concerns expressed by their children. Nineteen percent of parents who completed the evaluation interviews reported that their child had expressed concern about his/her weight within the past year.

Parents were asked if they were worried about their child's expressed concern. Among the 19 percent of parents with children who expressed weight concern,

39 percent of the parents were not worried about the child's expressed concern, either because they considered the expressions to be typical for the child's age or because they believed the child could benefit from some weight loss. A similar proportion (38 percent) were, however, worried that their child was more concerned than he/she should be, and 20 percent of those parents were very worried about their child's expressed level of weight concern.

Data also revealed that parents of students in the underweight and healthy weight categories were typically less worried about their child's expressed concerns than were parents of overweight and obese students. Complete details regarding parental attitudes toward their child's expressed weight concern are illustrated in Graphs 13 and 14. Because these questions were added to the parent interviews during Year 4, there are no baseline data against which to compare these findings.

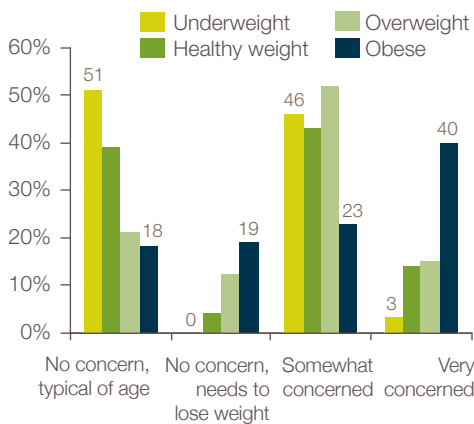
Table 5. Parental reports of possible consequences of Act 1220

| | 2004 | 2005 | 2006 | 2007 |
|--|------|------|------|------|
| Put child on diet** | 9% | 6% | 6% | 5% |
| Took child to weight loss clinic | <1% | 1% | <1% | 1% |
| Gave child diet pills | <1% | <1% | 1% | <1% |
| Increased child's exercise or physical activity | 28% | 28% | 24% | 32% |
| Signed child up for sports or exercise classes** | 42% | 40% | 45% | 48% |

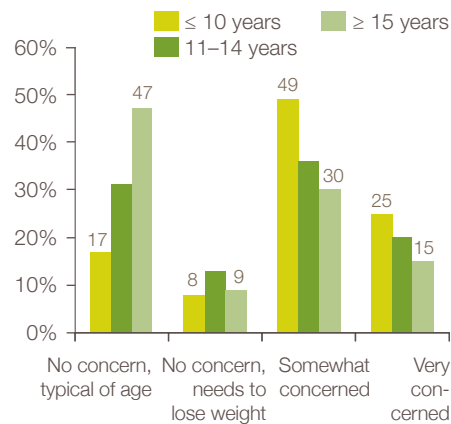
*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001

Graphs 13 and 14. Parental concerns, among parents whose children expressed weight concern in Year 4⁺

Student weight status



Student age



In Year 4, 19 percent of parents reported that their child expressed concern about his or her weight.

+ In Year 4, 19 percent of students expressed concern about their weight to parents.

Table 6. Family nutrition and physical activity patterns

| Behaviors | 2004 | 2005 | 2006 | 2007 |
|---|------|------|------|------|
| Nutrition | | | | |
| Trying to limit family consumption of chips, soda, sweets** | 76% | 79% | 79% | 83% |
| Younger child (≤13 years of age) drank no sodas yesterday*** | 44% | 47% | 48% | 57% |
| Average number of times per week parent modified recipes to make them healthier | 2.3 | NA | 2.5 | 2.7 |
| Average number of times family ate in fast food restaurant last month | 5.9 | NA | 6.4 | 6.0 |
| Physical activity | | | | |
| Limit the amount of child's screen time, including television, video games and Internet | 72% | 71% | 75% | 74% |
| To give more time for homework | NA | 20% | 20% | 17% |
| To give more time for physical activity** | NA | 33% | 37% | 40% |
| As punishment for bad behavior | NA | 2% | 2% | 1% |
| Because of TV program content | NA | 8% | 7% | 6% |
| To give more time for sleep | NA | 6% | 7% | 4% |
| Require child to stay inside after school rather than playing outside | 11% | 10% | 10% | 9% |

*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001

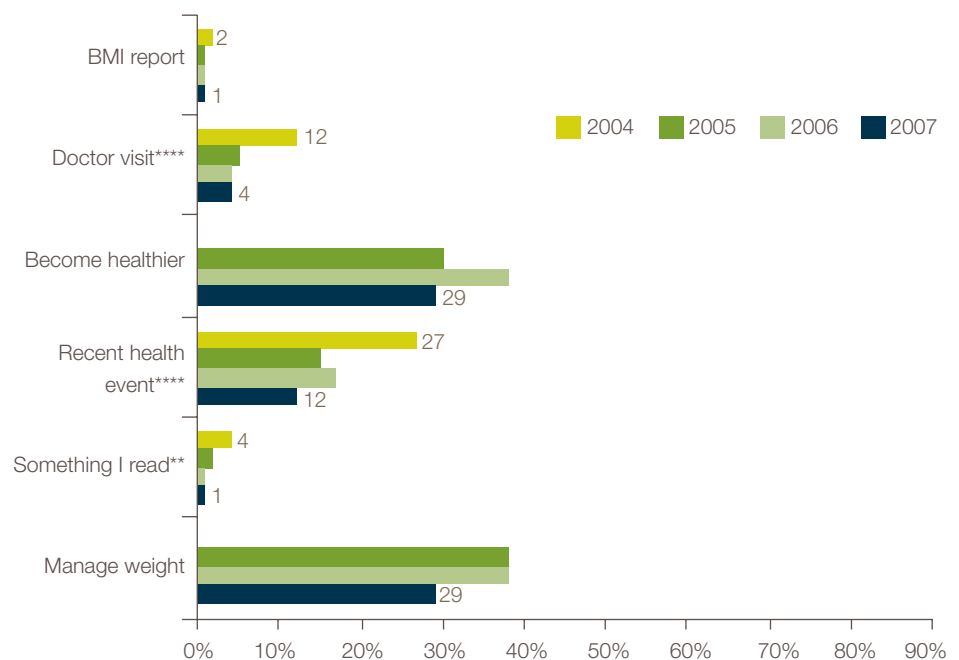
Changes in Nutrition and Physical Activity Patterns at Home

For the first time since the evaluation of Act 1220 began, modest changes in family diet and nutrition patterns were reported by parents, including more efforts to limit family consumption of chips, soda or sweets and less frequent soft drink consumption by children ages 13 and younger. As shown in Table 6, data also indicate no significant changes in the amount of fruits or vegetables served at home, the modification of recipes to make them healthier or the frequency of eating meals outside of the home. The proportion of parents who report limiting their child's screen time has not changed significantly since Year 1, but more parents do report that they attempt to limit screen time to give their kids more time for physical activity. The percentage of parents who require their child to remain indoors after school is also decreasing gradually.

Over the past four years, about two-thirds of parents have indicated that they were trying to make their family's diet healthier. While the percentage of parents who report trying to implement these changes at home has remained consistent, parents' reasons for changing their family's diet have changed significantly over time. As highlighted by Graph 15, parents were significantly less likely to indicate that a doctor's visit, a recent health event in the family or reading something inspired them to change family eating behaviors in Year 4 than they were in Year 1.

There is an increasing trend among parents to limit “junk foods” at home and a significant increase in the percentage of parents who are limiting screen time to give their kids more time for physical activity.

Graph 15. Parents' reasons for changing family to a healthier diet



*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001
No Year 1 data available for “Become healthier” or “Manage weight.”



Key Findings from Students

Interviewing Arkansas public school students is an important part of evaluating the impact of Act 1220. Researchers collected and analyzed information from 347 adolescent Arkansas public school students in Year 4. Information gained from student reports is presented in this section, including details about access to and purchases from food and beverage vending machines, possible consequences of Act 1220, concern about weight, and physical activity patterns. Student data from this evaluation were also compared with national data on adolescent weight control behaviors, physical education participation and leisure-time physical activity to provide insight about how behaviors among Arkansas youth compare to those observed in the nation as a whole.

Students' Vending Machine Access and Purchases

In Year 4, students reported several significant changes to the availability of vending machines and to their

vending purchases. According to students, there continues to be a declining trend in the availability of both food and beverage vending machines over the past four years. As highlighted in Table 7, the average number of beverage purchases by students rose from 5.4 in Year 3 to 7.2 in Year 4, but overall the frequency of reported purchasing was significantly lower than in Year 1. There also was an increase in the percentage of students who reported making daily purchases from beverage and food machines from Year 3 to Year 4. This increase may be a temporary, single-year variation in purchasing patterns. It also may be a result of changes in options made available to students. For example, the increase in daily purchases may be due to more frequent purchasing of healthier foods and beverages by students. Continued tracking of student purchasing patterns will contribute to a better understanding of these trends.

Possible Consequences of Act 1220

Similar to data collected from parents, results from interviews with students ages 14 and older also show no significant increases in potentially negative consequences of Act 1220 mandates. As illustrated in

Table 8, student reports of inappropriate dieting behaviors and weight-related teasing and embarrassment have remained relatively stable over the past four years. Compared with Year 1, data from Year 4 indicate that a significantly higher percentage of students reported an increase in physical activity.

Table 7. Student reports of vending machine access and purchase patterns

| Access or purchase pattern | 2004 | 2005 | 2006 | 2007 |
|---|------|------|------|------|
| Vending machine available at school | | | | |
| Food machine**** | 64% | 58% | 39% | 31% |
| Beverage machine*** | 97% | 94% | 84% | 74% |
| Student purchases from beverage machines | | | | |
| Average number of purchases per month* | 11.6 | NA | 5.4 | 7.2 |
| Student made no purchases in past month* | 22% | 29% | 37% | 34% |
| Student made daily purchases in past month* | 18% | 11% | 7% | 10% |
| Student purchases from food machines | | | | |
| Average number of purchases per month | 10.3 | NA | 2.9 | 5.2 |
| Student made no purchases in past month | 28% | 33% | 59% | 58% |
| Student made daily purchases in past month | 8% | 5% | 4% | 11% |

Table 8. Student reports of possible consequences of Act 1220

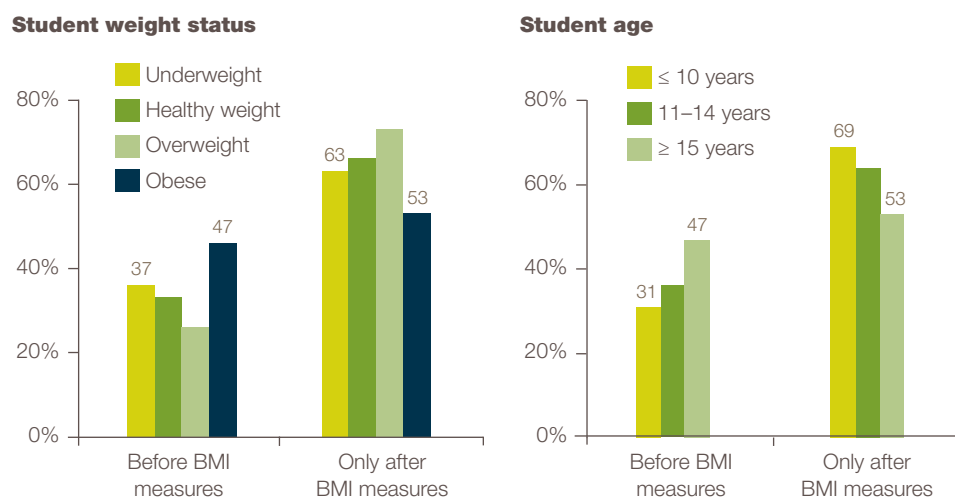
| | 2004 | 2005 | 2006 | 2007 |
|--|------|------|------|------|
| Concerned about weight | 23% | 29% | 25% | 25% |
| Embarrassed by measurements | NA | 12% | 7% | 11% |
| Not at all comfortable with BMI report | 29% | 22% | 15% | 25% |
| Teasing because of weight | 12% | 9% | 6% | 12% |
| Teasing for other reasons | 21% | 20% | 19% | 25% |
| Gone on a diet | 29% | 23% | 26% | 27% |
| Took diet pills | 6% | 5% | 2% | 5% |
| Increased physical activity* | 59% | 63% | 62% | 72% |

*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001

Weight Concern Among Students

As previously discussed, 19 percent of parents interviewed reported that their child had expressed weight concerns within the past year. Among those parents, 62 percent indicated that their child's concern had not been expressed before BMI assessments began at school. Graphs 16 and 17 summarize data collected from the 19 percent of parents with children who expressed concern about their weight and reveal differences based on student age and weight category. For example, students ages 15 and older were more likely to have expressed concern about their weight before BMI measurements began, while students ages 14 and younger were more likely to have expressed their concern only after the BMI measurements. Among students in underweight, healthy weight and overweight categories, expressed concerns were more likely to occur after BMI measurements, while the timing of expressed concern among students in the highest weight category did not seem to be affected by the BMI measurements. As previously explained, these interview questions were added during Year 4, and there are no baseline data against which to compare these findings.

Graphs 16 and 17. Weight concern expressed by students, among students reporting concern to parents in Year 4*



*In Year 4, 19 percent of students expressed concern about their weight to parents.

In Year 4, about one in five students expressed some concern about their weight to a parent—and 62 percent of those students had not expressed concern before BMI assessments began at school, suggesting that Act 1220 has raised awareness of weight issues among students.

Corresponding Youth Risk Behavior Survey Data on Dieting Behaviors

As part of the evaluation of the impact of Act 1220, findings from the biennial Youth Risk Behavior Survey (YRBS)⁶ also are monitored. The YRBS, which is administered to a representative sample of high school students in each state, includes specific questions about dieting behaviors. According to the YRBS data presented in Table 9, weight control behaviors among Arkansas youth have been essentially consistent since 2001 and are not significantly different from behaviors observed in the nation as a whole. There was a slight increase in the percentage of Arkansas students who reported vomiting or using laxatives to lose weight or prevent weight gain, which may be attributable to chance alone. An inspection of the data concerning the use of vomiting or laxatives for weight control

showed that the percentage of males reporting these behaviors increased from 1 percent in 2001 to 7 percent in 2005, and females reported only a slight increase, from 9 percent in 2001 to 10 percent in 2005.

It is important to note that the Arkansas YRBS data from 2001 were collected two years before the passage of Act 1220 and three years before implementation of its mandates. The Arkansas YRBS data from 2005 were collected two years after the passage of the Act and one year after full implementation of its mandates regarding BMI assessments. Thus, comparing these data provide further insight on how statewide BMI measures may impact adolescent weight control behaviors. YRBS data from 2003 for Arkansas high school students were not available.

Table 9. Adolescent self-reports of weight control behaviors from Youth Risk Behavior Survey

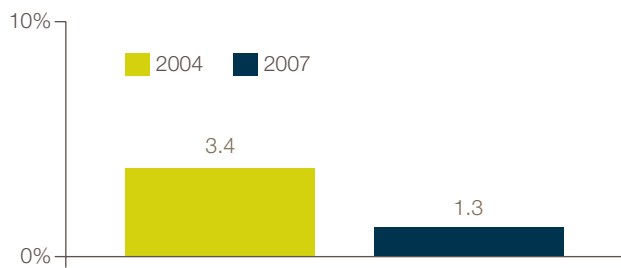
| Adolescent self-reported behavior | Arkansas | | | U.S. | | |
|-----------------------------------|----------|------|------|------|------|------|
| | 2001 | 2003 | 2005 | 2001 | 2003 | 2005 |
| Dieting | 43% | NA | 40% | 44% | 42% | 41% |
| Fasting | 15% | NA | 16% | 13% | 13% | 12% |
| Diet pills | 12% | NA | 12% | 9% | 9% | 6% |
| Vomiting or laxative use | 5% | NA | 9% | 5% | 6% | 5% |

There were no statistically significant differences between Arkansas and national YRBS data.

Students' Physical Activity Patterns

Graphs 18 and 19 summarize student reports of their participation in physical education classes. Data indicate a substantial increase in the percentage of adolescents who report no participation in physical education classes in school and a substantial decrease in the percentage of adolescents who report participating some or all days of the school week. Adolescent reports of leisure time physical activity, such as walking, playing games or engaging in other physical activity with friends, doing chores outside, exercising with family or playing sports, have not changed over the four years of the evaluation.

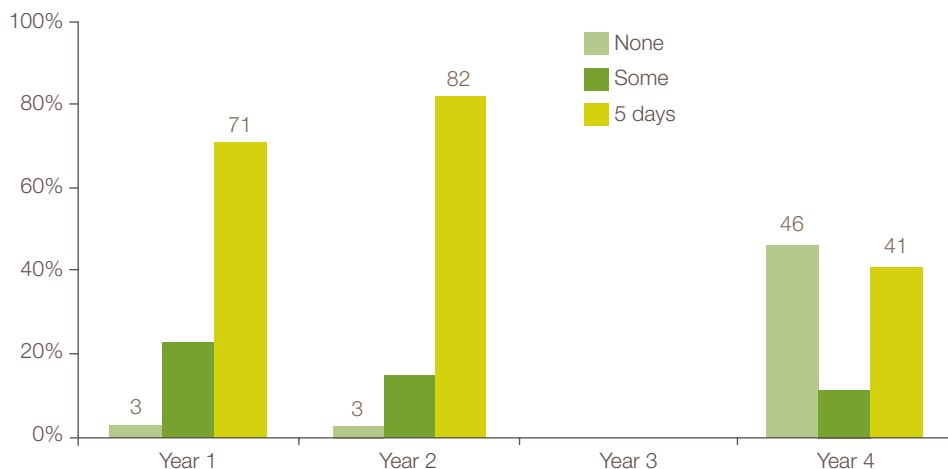
Graph 18. Students participating in PE classes three or more days per week



There were no statistically significant changes in data from Year 1 to Year 4.

The percentage of students who report participating in daily PE has dropped from 71 percent in Year 1 to 41 percent in Year 4, while the percentage of students who report no participation in PE has risen from 3 percent in Year 1 to 46 percent in Year 4.

Graph 19. Frequency of student participation in PE classes



$p \leq .0001$ for the distribution of percentages across categories from Year 1 to Year 4.

No Year 3 data available.

Corresponding Youth Risk Behavior Survey Data on Physical Activity Patterns

Findings from the YRBS show a similar pattern among adolescents across the state of Arkansas and the nation. From 2001 to 2005, the percentage of Arkansas teens who reported participating in daily physical education declined from 30 percent to 27 percent, and the percentage who reported engaging in leisure time physical activity that met national recommendations declined from 66 percent to 61

percent. During that same time period, the national percentage of adolescents who reported engaging in the recommended levels of leisure-time physical activity remained stable. According to the U.S. Surgeon General⁷ and the U.S. Centers for Disease Control and Prevention, the recommended amount of leisure-time physical activity for adolescents is at least 30 minutes of vigorous physical activity three or more days per week and/or at least 60 minutes of moderate physical activity five or more days per week.





Comparison of Student and Parental Reports by Student Weight Status

For the first time during the four years of the evaluation, data were analyzed by student weight status to assess the impact of Act 1220 components on overweight students and their families. Adolescent students were surveyed about their attitudes and behaviors concerning their own weight status. Parents of students also were interviewed about their attitudes and behaviors concerning their child's weight status. Lastly, student behaviors from Years 1 and 4 were analyzed to determine if there were significant changes since the passage of Act 1220.

Attitudes and Behaviors of Students Compared by Weight Status

Table 10 summarizes the Year 4 analyses of responses to select questions posed to adolescents, which indicate that there are some significant differences between overweight students and students who are not overweight. For example, overweight students expressed more concern about their weight than did their peers who are not overweight. Overweight students also were more likely to report drinking more soda, trying to change to a healthier diet, starting a

specific weight loss diet within the past six months and increasing their level of exercise in the past six months.

Attitudes and Behaviors of Parents Compared by Student Weight Status

As shown in Table 11, findings indicated that there were significant differences between parents of overweight and non-overweight students in only four areas of comparison. Parents of overweight students

were significantly more likely to be concerned about their child's weight and to be concerned about the confidentiality of BMI measurements than were parents of students who were not overweight. Parents of overweight students also were significantly more likely to be trying to change their family to a healthier diet. Lastly, parents of students age 13 and younger who were not overweight were significantly more likely to report that their child consumed no sodas during the previous day.

Overweight students were more likely to indicate that their physician had discussed their BMI report with them than were their peers who are not overweight.

Table 10. Adolescent attitudes and behaviors compared by student weight status in Year 4

| Knowledge/behavior | Student not overweight | Student overweight |
|---|------------------------|--------------------|
| Concerned about weight** | 60% | 80% |
| Embarrassed by BMI measurements* | 5% | 19% |
| Trying to change to healthier diet** | 60% | 80% |
| Started a diet within the past six months* | 19% | 46% |
| Increased exercise within past six months** | 66% | 87% |
| Purchased from a beverage vending machine in school within past 30 days | | |
| Never | 26% | 46% |
| At least once | 74% | 54% |
| Drink sodas per day | | |
| None | 43% | 28% |
| At least one | 57% | 71% |
| Parent discussed BMI report with student | 29% | 34% |
| Physician discussed BMI report with student | 10% | 24% |

*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001

Table 11. Parental attitudes and behaviors, by student weight status, Year 4

| Knowledge/behavior | Student not overweight | Student overweight |
|---|------------------------|--------------------|
| Concerned about student weight**** | 14% | 38% |
| Comfortable with receiving child health report | 63% | 57% |
| Concerned about confidentiality of BMI measurements*** | 24% | 39% |
| Perceived child health report as helpful | 47% | 48% |
| Trying to change to healthier family diet** | 65% | 71% |
| Trying to limit “junk foods” eaten by family | 83% | 85% |
| Younger child (≤ 13 years of age) drank no sodas yesterday** | 60% | 47% |
| Limiting TV time for student | 73% | 74% |
| Require student to stay inside after school | 10% | 7% |
| Aware of health problems faced by overweight children | 97% | 95% |
| Believe overweight children more likely to develop health problems | 98% | 97% |
| Believe overweight children more likely to become overweight adults | 98% | 97% |

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; **** $p \leq .0001$

Among parents of students ages 13 and younger, 60 percent of parents whose children were not overweight reported that their child consumed no soft drinks the previous day, while only 47 percent of parents whose children were overweight reported the same.

Student Behavior Changes From Year 1 to Year 4 Compared by Student Weight Status

In Year 1, student and parent reports indicated some behavior differences between overweight and non-overweight students. The gap between most of these behavior differences has not changed significantly over the past four years. This is consistent with our findings from an analysis of changes in parental behaviors between Year 1 and Year 3⁸ and suggests that whether or not a child is overweight has not, in most cases, been a significant factor in behavior changes that may have occurred over time.

However, as highlighted in Table 12, three significant changes have occurred between overweight and non-overweight students since Year 1. For example, in Year

4 there was a significant increase in the percentage of parents of younger, non-overweight children who reported that their child(ren) consumed no soft drinks within the past 24 hours. In addition, overweight students were more likely to report that they had not purchased beverages from school-based vending machines in Year 4, while the frequency of such reports from students who were not overweight remained constant across all four years. Similarly, overweight adolescents were more likely to report in Year 4 that they had not purchased food from school-based vending machines. The frequency of purchases from food vending machines also increased among students who were not overweight, but the increase was significantly greater among overweight youth.

Table 12. Changes in behavior over time, by weight group

| Knowledge/behavior | 2004 | 2007 |
|--|------|------|
| No purchases from beverage vending machine in past 30 days (adolescent)* | | |
| Overweight | 14% | 46% |
| Not overweight | 24% | 26% |
| No purchases from snack vending machine in past 30 days (adolescent)* | | |
| Overweight | 32% | 89% |
| Not overweight | 28% | 42% |
| No sodas consumed within past 24 hours (children younger than 14 years – parent proxy)* | | |
| Overweight | 47% | 43% |
| Not overweight | 47% | 60% |

*p ≤ .05; **p ≤ .01; ***p ≤ .001; ****p ≤ .0001



Key Findings from Informant Interviews

As in previous years, the Year 4 evaluation included interviews with key informants. During 2007, evaluators conducted telephone interviews with 12 legislators, five Child Health Advisory Committee members, three Department of Education representatives, 20 principals, 17 superintendents, 19 public school nurses, 17 Wellness (also known as Nutrition and Physical Activity Advisory) Committee chairpersons, six community health nurses and five community health promotion specialists. These interviews, which are summarized below, provide insight about informants' needs, concerns and beliefs regarding recent legislative changes and schools' implementation of Act 1220 mandates.

Year 4: Legislative Changes

Key informants were asked for their opinions concerning the intent and impact of, as well as public response to, recent legislative changes relating to: BMI screening, physical activity and physical education requirements, and regulations regarding the use of candy as a classroom reward.

Changes in BMI Assessments

Most informants viewed the 2007 legislative efforts as an attempt to eliminate BMI screening requirements and believed the proposals were suggested primarily to reduce the workload of school nurses. However, views

on the actual impact of the legislation differed across informant groups and even within them. For instance, legislators' opinions of the BMI legislation were equally divided among the following four positions:

- 1) support for a repeal of BMI screening requirements because they believed parents were against the state's BMI measures;
- 2) support for a repeal of BMI screening requirements because it is not the school's responsibility to track student weight status, and the screening process takes too much time away from academic instruction;
- 3) agreement with the enacted, compromise legislation because they understand the concerns educators have about conducting BMI assessments as well as the importance of collecting and analyzing data on student weight status; and
- 4) endorsement of the importance of BMI screening and fear that the compromise will negatively impact the usefulness of the data collected.

The remaining informants had similarly divided opinions. Some felt that the compromise legislation would provide sufficient BMI data while reducing the burden of collecting the data on schools. Others thought that the change would send a message to schools and parents that monitoring childhood obesity, individually and at the state level, is not important. Respondents frequently cited legislative turnover and the associated loss of institutional knowledge of Act 1220 as an impediment to progress.

Changes in Policies and Practices for Physical Activity and Physical Education

All of the informants recognized that the physical activity requirements were repealed to address school administrators' concerns about a lack of time in the school day. Many legislators acknowledged the difficulty of incorporating physical activity requirements into the school day and believe that, while

school administrators recognize the importance of physical activity, they struggle to make time for it. Other informants reported pressure from superintendents to introduce the legislation in an attempt to override the controversial and unpopular requirements. The 2005 regulations required a certain amount of time per week of physical activity—time that superintendents had trouble finding in their school day. Many superintendents encouraged the passage of House Bill 1039, approved into Act 317, to undo these requirements. Some legislators said that decisions about incorporating physical activity into the school day should be made by local school districts rather than by the Arkansas State Board of Education. Several informants suggested that the pressure placed on legislators by some school districts was due to their school personnel's inability to distinguish between physical activity and physical education, a failure to consider strategies to integrate physical activity into academic curricula or a poor understanding or rejection of Act 1220 objectives.

Changes to the Failed “Candy Bill”

Informants were strongly divided in their opinions of the legislation that proposed to reverse an earlier prohibition and allow the use of candy as a classroom reward. About half of the legislators and other informants opposed the bill, offering comments ranging from “[it’s] an absurd bill” to “... there are other ways to reward besides dangling a piece of candy.” Other respondents believed that providing candy as a reward helped teachers with the educational process, did not harm children and would not make a substantial difference in preventing childhood obesity. According to one informant, “You’ve taken an important tool away from the teachers, and it’s not going to make a difference [in how much junk food students consume].” Several informants, including some legislators, suggested that “[this type of legislation] is not the way to solve the problem,” preferring to let the Child Health Advisory Committee and the Arkansas State Board of Education deal with the issue.

Year 4: School Actions

Informants also were asked to comment on recent action in public schools around the state. Interviewees provided their thoughts regarding the school-based BMI assessment process, schools' efforts to implement nutrition standards, provide nutrition education and increase physical activity among students. Informants also discussed action by local Wellness Committees and creative programs that individual schools undertook to create healthier environments for students.

BMI Screening

Opinions regarding BMI screening varied across informant groups. Approximately two-thirds of school nurses, half of principals, one-third of Wellness Committee chairs and one-quarter of superintendents either expressed support for the BMI screenings or were neutral. Many informants supported the initiative's long-term potential for preventing the chronic diseases that are associated with childhood obesity. Some informants, particularly Wellness Committee chairs, felt that the BMI screenings help to raise awareness of weight-related health concerns for some students and parents. One respondent described it as a "useful barometer that your child has a weight problem." Other informants, however, expressed more negative opinions. Some principals and superintendents believed that school-based BMI screenings are impractical and intrude on academic time, and that there is inadequate funding for Act 1220 implementation. Overall, Wellness Committee chairs indicated that BMI screening should be conducted by physicians or parents, not by schools. However, of 105 interviews, only three respondents (all of whom were superintendents) voiced concern about the potentially adverse side effects of BMI screening on children, such as weight-based teasing or unhealthy dieting practices.

One concern expressed by all respondent groups was that BMI data that is collected by schools may not be properly utilized or are not useful enough

to justify the required investment. School-based respondents (principals, superintendents, school nurses and Wellness Committee chairs) were most likely to question whether the benefits derived from BMI assessments are worth the investment and whether the information is useful to parents.

Although informants expressed concerns about the BMI assessments, many of them reported no barriers to conducting the screenings—half of principals and one-third of superintendents and school nurses successfully completed BMI assessments in Year 4. A few principals noted that partnerships with community organizations and volunteers enabled them to conduct the screenings more effectively. Several school nurses noted that increased student and parent awareness of the importance of BMI measurements and better organization improved the BMI screening procedure.

Among the informants who did report obstacles to the BMI screening procedure, the most frequently mentioned barriers included: time constraints; staffing, labor and postage costs; scheduling and organization. Superintendents reported the strongest and most consistent issues with these barriers, and the cost—in staff time, materials and postage—of mailing the Child Health reports to parents was cited most frequently.

Nutrition Standards and Education

The majority of principals, superintendents and school nurses who were interviewed supported creating healthier standards for foods in schools. In addition, a strong majority of legislators described higher nutrition standards for vending and cafeteria foods as the most important component of Act 1220. A number of principals and Wellness Committee chairs were proud to note that they had implemented such policies prior to the Act's mandates. Some principals highlighted the importance of decreasing the amount of sugar in foods that were made available to students. School nurses supported the following initiatives: removing vending machines, hosting nutrition classes and using

alternative (non-food) fundraising activities. Wellness Committee chairs, legislators, health promotion specialists and community health nurses specifically stated that schools should limit vending to healthy options and provide healthier foods in cafeterias by reducing fat content, offering salad and vegetables, and baking instead of frying foods.

Policies regarding snacks at school parties and events received less support from informants. One in three principals and half of superintendents felt that such policies were too restrictive and were unlikely to have a large impact on students' health. Many of the principals and superintendents believed that children will purchase unhealthy foods elsewhere, and such restrictions exceed the school's jurisdiction. One principal even indicated that the limitation on snacks resulted in decreased parental involvement, stating: "I had more parental involvement at the school because parents would be up here for [food-related events, such as holidays and birthdays] and would notice other items and things that the school had need of. Anything that reduces the number of times that I can have a parent walk in the door, it has a negative effect on our school."

School-based informants (principals, superintendents, school nurses and Wellness Committee chairs) identified several significant barriers to implementing healthier nutrition standards—particularly resistance from parents and lack of follow-up at home. School personnel noted that many parents allow their children to bring non-nutritious items to school, contradicting policies the school might enact. These informants also mentioned that there are few alternative fundraising options, and the small size, poor configuration and outdated cooking equipment in existing cafeterias create a significant challenge.

Community health specialists who support creating healthier school environments reported that schools have concerns about improving the quality of the

foods they offer. Their primary concerns include: a perception that healthy foods cost more, the need for equipment upgrades in cafeterias and the anticipated loss of vending revenue. Both community health promotion specialists and Wellness Committee chairs noted that, because of these concerns, many schools have difficulty securing district-level administrative and parental support for changes. Wellness Committee chairs reported that many schools use their websites and parent information centers to address these concerns, share information and boost parental support.

Legislators discussed the need to encourage families, communities and schools to endorse nutrition changes and the need to develop more effective strategies for monitoring and enforcing school compliance with rules and regulations. Legislators also consistently stated that schools should have a strong role in nutrition education and should begin the process in elementary school.

Principals and superintendents had different perceptions of the existing nutrition education in schools. The majority of principals reported that state-mandated health classes provide sufficient nutrition education, and students receive additional nutritional education during school assemblies, through school nurse classroom visits and by participation in the health action team events, during which school personnel develop a health-focused project for the school. In contrast, only a quarter of superintendents interviewed believe that existing nutrition education is sufficient. Less than half of the superintendents reported that their school districts have nutrition education programs or have such information integrated into other curricula. Despite believing that students may need more nutrition education, six of the interviewed superintendents agreed with a colleague who said, "... there simply isn't time to do more whether it is needed or not."

Physical Activity

Most informants stressed the value of physical activity in promoting children's health, but they also recognized the difficulties schools face in incorporating physical activity into students' schedules. Some interviewees were especially concerned that physical activity requirements would detract from school's academic focus. Principals and superintendents seemed to agree that strong extracurricular programs are the best way to encourage physical activity among kids. Informants also suggested providing daily structured physical activity opportunities, teaching lifetime physical activity skills, working with community organizations, increasing parent and volunteer involvement, and introducing students to physical activity in lower grades. A few suggested lengthening the school day to provide more time, which would allow schools to increase physical activity and other non-academic activities.

Wellness Committee Activity

Wellness Committees are often seen as a vehicle for incorporating locally relevant change, instead of state-mandated directives, into schools. To learn more about these important agents for change, evaluators asked randomly selected chairpersons of Wellness Committees to share their priorities, activities, successes and challenges. Nearly all of the chairs felt that the intent of Act 1220 was to improve the overall health of students in Arkansas. The majority also thought that the primary role of schools in promoting healthy weight among Arkansas' youth was to educate children about healthy food choices and the importance of physical activity.

Wellness Committee chairs reported that they were engaged in a wide variety of activities related to improving nutrition and physical activity in schools. Some of those activities include:

- completion of the School Health Index, a self-assessment of school environments, policies and programs, to help establish priorities for change;
- recommending healthy changes in cafeterias, such as reducing the fat content of food, offering more salads and vegetables, and baking instead of frying foods;
- recommending additional and specific types of in-school education for food service staff;
- updating facilities or expanding after-school and summer access to physical activity equipment, playgrounds and walking tracks;
- offering intramural sports programs; and
- sponsoring activities for students and their families, such as dance-a-thons, walk-a-thons, health fairs and programs offered by county extension agents.

Wellness Committee chairs, and the community health promotion specialists and community health nurses who work with them, discussed a number of factors that increase the Committees' effectiveness in improving the nutrition and physical activity environments in schools. Some of the factors associated with their success include:

- having a diverse membership, including student representation and parents who are not school employees;
- involving community health professionals with the schools;

- employing creative staff who have implemented programs such as PE4LIFE, Integrated Change Activity and Nutrition Program (ICAN), Recess with a Purpose, and walking tracks; and
- garnering support from school administrators and the community at large.

The Committee chairs and community health workers also discussed barriers to their efforts. A lack of commitment on the part of school administrators and/or committee members themselves was the most frequently cited barrier. Several informants suggested that some committees are “just waiting for [the requirements] to go away.” Others suggested that their schools were meeting minimum nutrition and physical activity requirements but not making any efforts beyond that. Other specific barriers included:

- limited support for Act 1220’s vending components;
- a lack of school resources;
- isolated, rural locations;
- poverty in their communities;
- poor teamwork among committee members; and
- failure to collaborate with other committees in nearby school districts.

Creative Programs

Throughout the interviews, the informants discussed innovative programs in schools across the state. Through these interviews, it became clear that schools in Arkansas are identifying local opportunities to promote healthy eating, physical activity and other healthy behaviors for students and their families.

The list below is not a comprehensive list of the creative initiatives reported by key informants, but it does provide a snapshot of efforts schools are making to address childhood obesity across the state. For example, a number of schools are participating in formal programs, such as Balance It Out Arkansas, the Great Arkansas Workout, the Wellness, Academics & You (WAY) program, the 5 for Life program and the Take 10 program. Some less formal activities include:

- incorporating physical activity and fitness goals into the math curriculum;
- improving physical education facilities;
- providing after-school physical activity programs or facility access;
- sponsoring walk- or bike-to-school programs;
- sponsoring healthy food tasting events;
- establishing nutrition clubs;
- coordinating and sponsoring health fairs;
- having teachers walk with students at lunch;
- sponsoring intramural sports, sometimes during lunch breaks; and
- walking contests, in which students and teachers log daily miles to equal the distance to another state or country, for example “walk to Mexico” or “walk to Hawaii.”

The insights of the legislators, principals, superintendents, public school nurses, Wellness Committee chairpersons, community health nurses and community health promotion specialists who make up the key informants provide a unique perspective on how Act 1220 is being perceived and implemented across the state. The informant views of the legislative action and school efforts that took place during Year 4 are an important supplement to the data collected during the evaluation.



CONCLUSION

In summary, this evaluation suggests that four years after the passage of Act 1220, broad-scale changes continue to impact students, parents and school personnel across Arkansas. Together, these changes support a healthier school environment for students. Parents and students report that eating, physical activity and screen time behaviors at home are beginning to change as well. To date, there also is no evidence of a significant increase in any adverse consequences of Act 1220 mandates.

Together, the changes mandated by Act 1220 support a healthier school environment for students. To date, there also is no evidence of a significant increase in any adverse consequences of Act 1220 components.

Some changes to school environments were implemented in response to Act 1220 mandates, while other changes resulted from local initiatives led by school personnel and/or Wellness Committees seeking solutions to the problem of childhood obesity. We will continue to monitor changes that are occurring in Arkansas' schools and how those changes impact students, families and school personnel.

We also will seek information to answer additional questions that may provide insight about the process and outcomes surrounding the implementation of Act 1220.

Specifically, in the coming year, we will seek information to help answer the following questions:

1. What are the characteristics of schools that have been successful in reducing the percentage of students who are overweight, and how did they achieve that success? Successful schools will be identified, and they and their communities will be examined in greater depth in an effort to learn lessons that can be shared with other schools in Arkansas and throughout the country.
2. What factors are supporting or inhibiting the implementation of changes and policies that impact food and physical activity environments within schools? We will be talking with superintendents, principals, food service personnel and physical education teachers from schools across Arkansas to identify the key factors that are needed to accomplish desired change in school environments. We also will be asking about barriers that have been encountered and how those barriers are being overcome. We hope that this information will help decision-makers at state and local levels focus their efforts to reverse the trend in childhood obesity.

3. Are subgroups of Arkansas families and adolescents responding differently to the implementation of Act 1220? We began this work in Year 4, with comparisons between behaviors of overweight children and children who are not overweight. We will continue to explore how families and adolescents with different characteristics and different levels of risk for obesity report on their knowledge, attitudes, beliefs and behaviors.

In addition to conducting this on-going evaluation of Act 1220 in Arkansas, we are currently working with teams in Delaware and West Virginia that have been funded by the Robert Wood Johnson Foundation to evaluate statewide policies aimed at preventing childhood obesity. The goals of this collaboration are to share lessons learned, incorporate comparable measures as appropriate and eventually make cross-state comparisons within the evaluation findings. These continued efforts to monitor, evaluate and report on Act 1220 and other initiatives that aim to improve health outcomes for children will help inform decision-makers and advocates who are working to reverse the childhood obesity epidemic.

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APPENDIX I:

RESEARCH METHODS

The University of Arkansas for Medical Sciences' College of Public Health (COPH) secured funding in February 2004 from the Robert Wood Johnson Foundation to support efforts to evaluate the implementation of Act 1220 of 2003. An initial one-year award was followed by a two-year renewal, effective February 2005. The initial year of evaluation was considered a baseline year and culminated in the publication of a summary report. The current report is the summary of the fourth year of evaluation.

With Robert Wood Johnson Foundation funding, a team of COPH investigators, led by Drs. Jim Raczynski and Martha Phillips, evaluated the implementation of the Act and the effects it has on school environments, knowledge concerning childhood obesity issues, and the nutrition and physical activity behaviors of Arkansas students' families. The weight status of Arkansas students also was monitored, using the annual BMI assessments mandated by Act 1220 and led by the Arkansas Center for Health Improvement.

This evaluation is designed to assess the impact of the full range of Act 1220 components. Annual evaluation activities provide snapshots of policies and procedures and show changes over time. The evaluation is based on a conceptual model, which proposes that existing environments will be changed by the implementation of state and local policies, which will in turn change the knowledge, attitudes, beliefs and behaviors of families and students. Those behavior changes should ultimately affect the weight status (as measured by BMI) of Arkansas students, although we do not expect to see significant changes in weight status in the first years of the evaluation.

The information presented in this report has been gathered over the past year (2007) through a series of activities, including:

- Key informant interviews with a total of 105 individuals who were either involved in or represented groups involved in the fourth year of the implementation of Act 1220 of 2003. These individuals were identified as a result of a review of public records as well as referrals from other people who were interviewed and information gathered from the earlier years of evaluation. Interview participants were randomly selected from five geographical regions across the state of Arkansas: central, north, northwest, south and southwest. Those selected were representatives of the following groups: the state legislature, the state's Child Health Advisory Committee, the Arkansas Department of Education, the Arkansas Center for Health Improvement, community health nurse specialists, community health promotion specialists, district Wellness Committees, district superintendents, and school principals and nurses. Details regarding these interviews include:
 - Interviews were completed by telephone, audio-taped for accuracy and transcribed to protect informant confidentiality. Discussions were focused by semi-structured interview guides.
 - Interviews were conducted with 20 principals and 17 superintendents. Each of these school leaders was randomly selected using a stratified selection procedure that ensured representation from each of the geographic regions of the state as well as from each school level (primary,

- middle and high school). Telephone interviews were completed using the same methods explained above. Interviews of principals and superintendents focused particularly on their experiences with and reactions to key components of the Act such as vending machine changes and BMI measurements and how implementation of the changes progressed in the fourth year of Act 1220.
- Surveys were mailed to all principals (1,051 total) and school district superintendents (245 total) in the state, accompanied by a stamped, self-addressed envelope for use in returning the survey to the evaluation team. Those who failed to respond were sent a second survey and return envelope. Those who failed to respond to the second request received a third survey mailing. Of those who failed to return any one of the three mailed surveys, a group of 50 principals and superintendents were randomly selected and were faxed the survey. A total of 832 principals and 171 superintendents returned surveys. The return rate was 79 percent for principals and 70 percent for superintendents. All conclusions regarding changes were based on adjusted multivariate models.
 - Telephone interviews were conducted with families whose children attended Arkansas public schools at the time of the interviews. A total of 484 schools were selected, using a multi-stage stratified random selection procedure that ensured the inclusion of schools, families and children located in all areas of the state, affiliated with schools of various enrollment sizes, and serving students at all grade levels.⁹ A random sample of households with a listed number in the zip codes included in the attendance zones for those schools were randomly contacted by phone. A parent was interviewed if he/she had a child attending the selected school and agreed to complete the interview. If the student in the household was age 14 or older, and if both the parent and adolescent consented, the adolescent was interviewed as well. In all, a total of 2,202 parents and 347 adolescents were interviewed in this manner. Data from these parents and adolescents were weighted so that the results presented in this report can be considered representative of the state overall.
 - All conclusions regarding changes across years were based on adjusted multivariate models. Models using outcome variables from parent survey were adjusted for parent's age, race and gender. Models using outcomes from adolescent and parent proxy surveys were adjusted for child's age, race and gender. Models using outcome variables from principal surveys were adjusted for school level (elementary, middle or high school), percentage of free or reduced meal participants, school location and enrollment. Models using outcome variables from survey of school district superintendents were adjusted for district size (average enrollment), location of the district, average percentage of free or reduced meal participants, and average number of full-time classroom teachers.

APPENDIX II: ONLINE RESOURCES

Arkansas Websites

Arkansas Government Act 1220 of 2003
www.arkleg.state.ar.us/ftproot/acts/2003/public/act1220.pdf

Arkansas Government Act 201 of 2007
www.arkleg.state.ar.us/ftproot/acts/2007/public/act201.pdf

Arkansas Government Act 317 of 2007
www.arkleg.state.ar.us/ftproot/acts/2007/public/act317.pdf

Arkansas Government Act 719 of 2007
www.arkleg.state.ar.us/ftproot/acts/2007/public/act719.pdf

Arkansas Child Health Advisory Committee
www.healthyarkansas.com/advisory_committee/advisory.html

Arkansas Department of Education
<http://arkansased.org>

Arkansas Coordinated School Health
<http://arkansascsh.org>

Arkansas State Board of Education
<http://arkansased.org/sbe/sbe.html>

Healthy Arkansas Initiative
www.arkansas.gov/ha

Health Action Teams (H.A.T.)
<http://cnn.k12.ar.us/What's%20Happening/Health%20Action%20Teams/Health%20Action%20Teams.htm>

Fay W. Boozman College of Public Health, University of Arkansas for Medical Sciences
www.uams.edu/coph

Arkansas Center for Health Improvement
www.achi.net

Arkansas Physician's Guide to Weight Management in Children and Adolescents
www.achi.net/BMIResourceLinks.asp

Management of Pediatric Overweight
www.afmc.org/HTML/programs/quality_improve/phys_office/obesity.aspx

The Great Arkansas Workout
www.arkansasfitness.com/gaw.php

Balance It Out: Arkansas
www.balanceitoutarkansas.com

Integrated Change Activity and Nutrition Program (ICAN)
www.blueandyoufoundationarkansas.org

National Websites

Robert Wood Johnson Foundation

Childhood Obesity Program Area
www.rwjf.org/programareas/programarea.jsp?pid=1138

Obesity Publications & Research
www.rwjf.org/pr/topic.jsp?topicid=1024

The Obesity Society
www.obesity.org

The Weight-Control Information Network, National Institutes of Health (NIH)
<http://win.niddk.nih.gov/index.htm>

School Health Index
www.cdc.gov/HealthyYouth/SHI

CDC School Health Policies and Program Study
www.cdc.gov/nccdphp/dash/shpps

Action For Healthy Kids
www.actionforhealthykids.org

Blue and You Foundation for a Healthier Arkansas
www.blueandyoufoundationarkansas.org

Food and Nutrition Information Center: Dietary Guidance
www.nal.usda.gov/fnic/dga

National Association of State Boards of Education, State-Level School Health Policies
www.nasbe.org/index.php/projects-separator/shs/health-policies-database

Center for Science in the Public Interest
www.cspinet.org

National Heart Lung and Blood Institute
www.nhlbi.nih.gov/index.htm

American Diabetes Association
www.diabetes.org

American Dietetic Association
www.eatright.org/cps/rde/xchg/ada/hs.xsl/index.html

American Heart Association
www.americanheart.org

PE4Life
www.pe4life.org

Take 10 Program
www.take10.net/funforstudents.asp

Arkansas 5 A Day
www.healthyardarkansas.com/services/services_5aday.html

Wellness, Academics & You (WAY) Program
<http://i4learning.com.concentric.com/way/main.asp>

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COPH EVALUATION RESEARCH TEAM

James M. Raczynski, Ph.D.
Martha M. Phillips, Ph.D., M.P.H., M.B.A.
Zoran Bursac, Ph.D., M.P.H.
LeaVonne Pulley, Ph.D., C.H.E.S.
Delia Smith West, Ph.D.
Rebekah L. Craig, B.S.
C. Heath Gauss, M.S.
Jennifer R. Ivory, M.P.H.
Amanda G. Philyaw Perez, M.P.H.
Blake A. Talbot, B.S.
Jada Walker, M.Ed.





UAMS

FAY W. BOOZMAN
COLLEGE OF
PUBLIC HEALTH

UNIVERSITY OF ARKANSAS
FOR MEDICAL SCIENCES

University of Arkansas for Medical Sciences
Fay W. Boozman College of Public Health
4301 W. Markham Street
UAMS Slot 820
Little Rock, AR 72205-7199
(501) 526-6700
www.UAMS.edu/COPH