

# Arkansas' Experience: Statewide Surveillance and Parental Information on the Child Obesity Epidemic

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## KEY WORDS

obesity, public policy, body mass index, surveillance

## ABBREVIATIONS

AAP—American Academy of Pediatrics

ICD-9—*International Classification of Diseases, Ninth Revision*

CME—continuing medical education

PE—physical education

ACHI—Arkansas Center for Health Improvement

UAMS—University of Arkansas for Medical Sciences

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## abstract

Parents, clinicians, public health officials, and policy makers need readily available information on the extent of the childhood obesity epidemic. As in any epidemic, the strategies and tools used to combat the imminent threat are frequently based on scientific rationale and experience but applied in areas in which we lack complete understanding. The urgent need for information requires execution of decisions that are not risk-free—such is the case of BMI screening obesity. Use of BMI percentiles to classify weight status among youth and quantify the epidemic can inform and engage parents and other key stakeholders. Arkansas has completed its sixth year of BMI screenings for public school students. Through a groundbreaking legislative mandate that requires BMI assessments in public schools, the state has achieved both enhanced awareness among parents and their children and increased engagement by school, clinical, public health, and community leaders in response to the epidemic. External evaluations conducted since institution of BMI assessments have revealed none of the initially feared negative consequences of BMI measurements such as teasing, use of diet pills, or excessive concerns about weight. In the face of this epidemic, the risks of using BMI assessments in clinical or school-based settings must be recognized but can be managed. Arkansas' Act 1220 and BMI-reporting efforts have not only afforded parents detailed information about their children's health but also provided longitudinal data needed to fully understand the scope of childhood and adolescent obesity in the state and to track progress made in combating this epidemic. *Pediatrics* 2009;124:S73–S82

The United States has entered the 21st century faced with a new epidemic of child and adolescent obesity that threatens the health of current and future generations. Since epidemiologic surveillance began in the 1970s, the proportion of children in the United States defined as either at risk for overweight or overweight has increased dramatically, with the overweight prevalence in children and adolescents aged 6 to 19 years tripling between 1980 and 2002.<sup>1</sup>

### PROBLEM RECOGNITION AND CALLS TO ACTION

Both children and adults who are obese are at increased risk for a multitude of diseases such as heart disease, high cholesterol levels, high blood pressure, glucose intolerance, type 2 diabetes, arthritis-related disabilities, and various cancers.<sup>2-4</sup>

The recognition of this epidemic led first the American Academy of Pediatrics (AAP)<sup>5</sup> and, subsequently, the Institute of Medicine<sup>6</sup> to call for every child to have his or her BMI percentile assessed and provided to parents every year. Similar to height, weight, and head-circumference measurements commonly used to assess infant growth and development by comparisons with standardized population norms, the BMI percentile was considered to be an easily obtained, noninvasive screening tool for assessing health risk.

### ARKANSAS' ACTION

Arkansas, similar to other Southern states, is disproportionately burdened by obesity risks in adults and children. Reflected by annual assessments of the Centers for Disease Control and Prevention through the Behavioral Risk Factor Surveillance System, Arkansas has experienced a dramatic increase in adult obesity, with more than

29% of its adults being classified as obese in 2007.<sup>7</sup>

In 2002, recognizing the health threat of obesity, a statewide summit of Arkansas' health experts, clinical providers, and policy makers convened to identify strategies for combating the epidemic. The outcome of this 1-day summit was a list of desired interventions to address obesity for both children and adults; however, no immediate vehicles for implementation were identified.<sup>8</sup>

Over the subsequent year, growing awareness of the risk was enhanced by the Centers for Disease Control and Prevention's pronouncement of the national threat of childhood obesity. Local efforts and individual experiences also enabled select discussions to advance the issue. In spring 2003, the Arkansas General Assembly's Speaker of the House, Herschel Cleveland, quietly introduced a bill to implement the interventions previously identified to address childhood obesity. This idea was introduced after his personal health experience of obesity-related myocardial infarction, with the bill incorporating most of the strategies identified from the summit. Without substantive public discussion and without a request for state appropriations for implementation, the bill<sup>9</sup> easily passed both the House and Senate and was signed by a yet-undeclared obesity-prevention advocate, Governor Mike Huckabee, as Act 1220 of 2003.

### ACT 1220 OF 2003: AN ACT TO COMBAT CHILDHOOD OBESITY IN ARKANSAS

#### Initial Requirements of the Act

Act 1220 provides a broad state-based set of interventions designed to improve the school environment, within which children spend most of their day, to support parents in their awareness of and ability to change behaviors and to mobilize community resources

to support families struggling with obesity. Described in detail elsewhere,<sup>10</sup> the act established a process through the Child Health Advisory Committee that has resulted in modified access to and food availability in vending machines in schools, improved cafeteria food offerings, and increased physical activity requirements. In addition, the act eliminated vending machines from elementary schools, requires public disclosure of "pouring contracts," and requires professional education for individuals involved in food preparation within schools.

Other state efforts that occurred after passage of the act have included elimination of some financial barriers for child obesity treatment and counseling by achieving Medicaid support and educating providers on the use of medical bill coding for inappropriate or abnormal weight gain (*International Classification of Diseases, Ninth Revision* [ICD-9] code 783.1) instead of obesity-risk coding (ICD-9 code 278). Additional actions included dissemination of the first continuing medical education (CME) program to primary care providers and raised awareness in adults through health risk assessments and tiered insurance premiums based on obesity risk for state and school employees.

On the basis of the AAP and Institute of Medicine guidelines,<sup>5,6</sup> the act incorporated a requirement that each school assess and report to parents their child's BMI percentile each year in grades kindergarten through 12. Originally not seen as controversial, the requirement was stated simply in 3 lines of text in the act. Funding or accountability for execution was not described in the act and proved to be both a strategic challenge and an opportunity.

The original language of Act 1220 required that the BMI percentile be reported to parents on the child's report card. This directive was soon recog-

nized as problematic, not only because of the negative potential of perceiving obesity as within the student's control and reflective of their individual performance but also because of interpretation difficulties; a 99th percentile for BMI reflects the highest risk, whereas a 99% in academic areas (eg, math, science, English) is a laudable goal.

In fall 2003, as implementation of the assessment process was being developed, during a special session of the Arkansas General Assembly, called for other reasons, legislative changes were made to Act 1220 through Act 29<sup>11</sup> to eliminate the "report-card" phrasing and replace it with a requirement for a separate, confidential health report to convey obesity-risk information to parents.

### Challenges Overcome When Implementing a Statewide BMI-Assessment Process

Despite the legislative modification to require confidential child health reports to parents, the national press depiction and subsequent public perception of the BMI percentile as a "grade" generated some initial resistance to the effort. This resistance was variable across the state and largely emanated from parental concern over the invasive aspect of school-based screening, the use of limited school time and resources for assessments, or the appropriateness of government evaluation of children's health risks. Select schools were engaged to better understand and attempt to resolve these concerns.

Other challenges not addressed in the legislation included responsibility for developing and implementing BMI-assessment protocols, ensuring availability of necessary measurement equipment, quality assurance, data oversight, and message development for the child health reports. The singular requirement in the legislation was

that schools would provide the report to parents; not addressed were the requisite clinical skills or interpretation, which were not inherently part of the public school systems' responsibilities. However, conducting BMI assessments was fundamentally similar to school-based vision, hearing, and scoliosis screenings conducted in the school settings, and state requirements for a school nurse for every 500 students provided the appearance of available skills and resources.

As the 2003–2004 school year approached, many school administrators were only beginning to understand the new requirements that Act 1220 placed on schools. The existing work load on school health professionals combined with the clinical interpretation requirements and the familial implications of obesity communications heightened concerns of some school nurses related to BMI screenings. In addition, equipment (scales and stadiometers) was not available in all school settings, and no guidance on type or quality or financial support for procurement was provided in the law. Although support from school nurses was initially mixed, physical education (PE) teachers, particularly in the elementary schools, were fully engaged. Some PE teachers had been calculating BMIs and plotting percentiles by hand for their students and became local champions and statewide spokespersons. However, school administrators exhibited appropriate concern about how clinical screening for obesity risk would be interpreted and effectively communicated to parents.

Recognizing the opportunity to implement statewide, controlled screening but tempered by the identified challenges, consideration was given to vest responsibility at the Arkansas Department of Education, newly formed College of Public Health, the Arkansas Department of Health, or the Arkansas Children's Hospital. Each of these enti-

ties had strengths, but each also had concerns about resources required for and exposure generated by the undertaking. The Department of Education lacked necessary clinical expertise, the college was newly formed and was focused on attaining its academic accreditation, the Department of Health was restructuring to better meet local public health needs, and the Arkansas Children's Hospital was concerned about "medicalizing" the risk factor and its clinical capacity to respond to the generated need.

After others in the state declined to provide an institutional home, leadership of the Arkansas Center for Health Improvement (ACHI), with the approval of its health policy board, assumed responsibility for oversight and statewide implementation. In September 2003, the ACHI undertook a systematic planning and assessment process that included equipment testing and procurement, protocol development, report design, and recruitment and training of personnel. Collaborative relationships key to successful implementation were established with school administrators, nurses and PE teachers, parental advocacy organizations, regional health department nurses, and select schools interested in piloting implementation. These groups with the Arkansas Departments of Health and Education formed a task force to inform implementation.

### Collecting Statewide BMI Data: Equipment and Protocols

As the school year opened in fall 2003, the ACHI interviewed school personnel and found that a key to successful implementation was to optimize efficiency by assessing groups of students within a school. Because of academic pressures, many schools were limiting nonacademic instructional time, and the necessity of the most efficient process possible be-

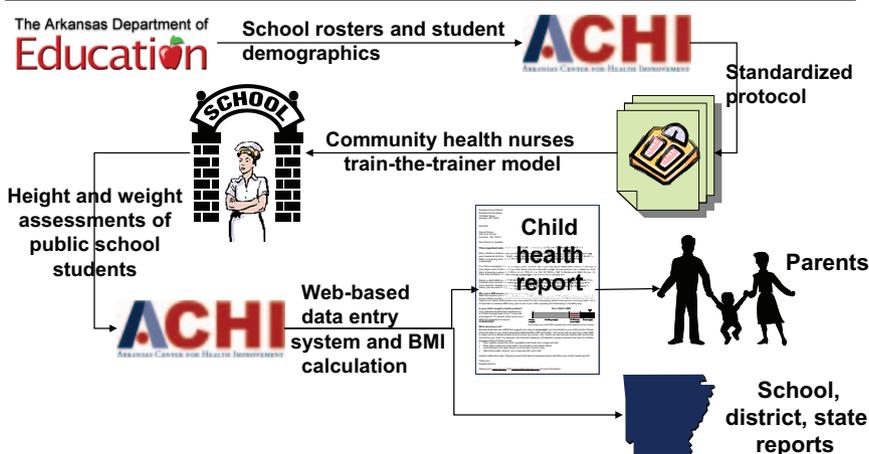
came clear. Needs for equipment were also expressed. Few schools had scales, those that did questioned their accuracy and reliability for mass measurements, and rarely did schools have a stadiometer to measure height.

The challenge of providing more than 1100 schools across 316 school districts with equipment, a tested and standardized protocol, and oversight over the next 8 months was daunting.

As described elsewhere,<sup>12</sup> the ACHI and colleagues from the University of Arkansas for Medical Sciences (UAMS) Department of Pediatrics and Arkansas Children's Hospital conducted studies to test and validate affordable equipment.<sup>13</sup> Tanita (Arlington Heights, IL) HD-314 scales were selected. After an assessment of commercially available stadiometers yielded none that would satisfy the school-based assessment protocol, a stadiometer was constructed of plywood, a metal ruler, and a carpenter's square. This stadiometer demonstrated equivalent performance with commercially available models but much greater durability. Thus, the Arkansas Department of Corrections, which manufactures state furniture, was approached to assemble stadiometers to specification in 2004. The ACHI then coordinated distribution of scales and stadiometers to more than 1100 schools statewide at a total equipment cost of \$60 per site in 2004.

A standardized protocol was developed by the ACHI and colleagues at the Arkansas Children's Hospital and UAMS Department of Pediatrics. The protocol required appropriate but limited de-clothing (eg, shoes, jackets, sweaters), double height measurements, and single weight measurements. To maintain confidentiality and to blind students to their assessment, measurements were not to be read aloud, and students were to step backward on the scales (a procedure also

## BMI Task Force—created strategic plan



**FIGURE 1**  
BMI-assessment process (year 1).

tested given that all scale instructions were to step on facing forward). After piloting at select schools<sup>14</sup> and minor refinements, a “train-the-trainer” model was employed by using Arkansas Department of Health community health nurses who trained each of the 16 educational cooperatives in the state. Each “co-op” nurse in turn trained local school nurses and other responsible personnel, with videotapes provided for subsequent training or refresher courses. Schools were discouraged from using parent volunteers because of confidentiality concerns.

Data-management challenges were overcome through the use of pre-printed forms, bar-coding for data entry, and centralized double entry of assessment data into a database (Fig 1). During April and May of 2004, more than 500 000 forms were processed by the ACHI.

## COMMUNICATING RESULTS

### Reporting to Parents

ACHI leaders and other health professionals recognized that the method of communication with parents was of paramount importance. By using feed-

back from parent focus groups and established professional recommendations, the child health report was developed. Included in the report was information on health risks related to obesity; explanatory information about BMIs; and the student's assessment information including date, height, weight, and calculated BMI percentile. A graphic was included, as suggested by parent focus-group research, that displayed where their child was compared with other Arkansas children. Finally, on the basis of the category of risk, parents were provided information on their child's specific risk category, including steps the family could take if their child was at risk or overweight (recommendations by the AAP regarding limited screen time, nonfat milk, elimination of sugared drinks, and family exercise strategies) or reinforcement of positive nutritional and activity messages if the child was not at risk or underweight. The final suggestion on the report was for parents to contact their child's health care provider if more assistance was desired, not as a requirement for successful risk management.

As recommended by parents in the focus groups, the report was signed (originally by the ACHI director and by each school's superintendent in subsequent years) to convey the importance of the information. Focus groups with parents in Arkansas, conducted in 2007 (unpublished data), showed that, overall, parents endorsed the idea of having BMI information presented in a longitudinal format, which allowed them to see their child's status over a number of years. They also generally wanted text and graphics to be simple, not wordy or technical, and practical with an explanation of weight categories as well as specific numbers for height, weight, and BMI percentile.

On June 15, 2004, less than 10 months after initiating the school-based BMI-assessment strategy, more than 420 000 child health reports were mailed to parents. All public school children in Arkansas received 1 of 5 versions of the report: overweight, at risk for overweight, normal weight, underweight, or unable to be assessed (see samples at [www.achi.net/ChildObDocs/2006%20CHR%20All%20Classifications%20English.pdf](http://www.achi.net/ChildObDocs/2006%20CHR%20All%20Classifications%20English.pdf)). Five Spanish versions of the report were added the next year for families identified by the Arkansas Department of Education as having Spanish as their primary language.

### Development of Clinical Support

Preparation of the clinical community to support parents was critically needed. Before 2004, the ARKids First Medicaid and State Children's Health Insurance Program did not reimburse for obesity-related services because of the federal restrictions that classified obesity as a "risk factor" rather than a disease (contrary to Medicare). In addition, most clinicians had no formal training in screening, counseling, or treatment for child and adolescent obesity. In fact, no CME program existed at the time for such training. Rec-

ognizing this barrier, concurrently with the school assessments the UAMS and the state quality-improvement organization (Arkansas Foundation for Medical Care) developed a Web-based CME program. Over the summer of 2004, every primary care physician received notification of the availability of the free CME and guidance on appropriate billing under ICD-9 codes 783.1 and 783.9 (excessive weight gain or abnormal growth, respectively) for service reimbursement. Through these and other communication efforts, the clinical community was prepared to support parents who turned to them for assistance.

### Aggregate Reporting for Statewide Surveillance

The ACHI had recognized the value of a comprehensive database for determining the actual statewide and local burden of obesity and for long-term follow-up of efficacy of political changes in the state. Thus, with grant funding, a comprehensive database was created, and data collected primarily for parental risk notification were transformed into politically supportive information. Aggregate results of the first year of BMI assessments were reported in September 2004 according to schools, school districts, 75 counties in the state, legislative and congressional districts, and for the state as a whole according to various student demographic characteristics (eg, gender, grade, race). Wide variations in obesity prevalence were observed across the state, with some school districts having more than 50% of their children in 1 of the 2 highest obesity-risk categories (at risk for overweight and overweight). This information was relayed to local parental advisory committees established in Act 1220, local school boards, and legislative committees and was widely disseminated through the print and television media.

### Process Refinement

Over the course of the 4 years since the first data-collection efforts in 2003–2004, the process has been streamlined with adoption of a secure, Web-based data-entry process that has eliminated the physical transfer of data-entry forms. Provision of rosters by the Department of Education and electronic access to forms and data entry via a secure Web site have enabled earlier assessments during the school year and increased comfort and efficiency in local implementation. Some challenges with standardized implementation have arisen and been solved or at least recognized (eg, double knots in kindergartners' shoes dramatically slows the process; teenagers in 1 high school wore leg weights under their jeans; and a school measured height on the slanted floor of an auditorium resulting in "shrinkage" of their student body), but overall competency has increased and resistance from front-line staff has dissipated.

### Funding

Using its own center resources, a \$100 000 grant from the American Diabetes Association, and grant funds from the Arkansas Department of Health, the ACHI purchased equipment and supplied all schools with scales and stadiometers built by the Arkansas Department of Corrections during the first year of BMI assessments, created the reporting system to generate individual child health reports, and directly mailed the first-year reports to parents. Since that time, schools have taken up the responsibility of distribution, choosing to distribute the reports via mail, letters home with students, parent-teacher conferences, or in-person pick-up at the schools. Since 2003, the Arkansas Department of Health has allocated approximately \$200 000 to \$350 000 per year from its chronic disease prevention funding to

**TABLE 1** Participation in Arkansas BMI Assessments (Kindergarten Through 12th Grade)

Category	Year 1 (2003–2004)		Year 2 (2004–2005)		Year 3 (2005–2006)		Year 4 (2006–2007)	
	Total	%	Total	%	Total	%	Total	%
<b>Participation<sup>a</sup></b>								
Public schools	1060/1123	94.4	1115/1129	98.8	1090/1106	98.6	1070/1080	99.1
Students (kindergarten through 12)	425 372/458 991	92.7	443 632/461 815	96.1	431 981/470 279	91.9	472 558/490 495	96.3
<b>Student data</b>								
Valid for analysis <sup>b</sup>	347 753	81.8	368 871	83.1	369 416	85.5	366 801	77.6
Invalid	5796	1.4	4678	1.1	1539	0.4	647	0.1
Unable to assess <sup>b</sup>	71 821	16.9	70 083	15.8	61 026	14.1	105 110	22.2

<sup>a</sup> Results include all data available for years 1, 2, and 3 for kindergarten through 12th grade and data received by June 6, 2007, for year 4. Some public schools and districts merged after year 2.

<sup>b</sup> A contributing factor to the decrease in valid assessments and increase in percentage of unable to be assessed may have been the uncertainty surrounding the BMI-assessment process that was created by proposed state legislation during the 2007 General Assembly, which caused some schools to delay conducting their BMI assessments and prevented completion of reporting measurements before the end of the school year.

Data source: Arkansas Center for Health Improvement. *Assessment of Childhood and Adolescent Obesity in Arkansas: Year Four (Fall 2006–Spring 2007)*, Little Rock, AR: Arkansas Center for Health Improvement; 2007. Available at: [www.achi.net/ChildObDocs/ACHI\\_2007\\_BMI\\_Online\\_State\\_Report.pdf](http://www.achi.net/ChildObDocs/ACHI_2007_BMI_Online_State_Report.pdf).

help in ACHI's efforts and has continued to support BMI collection in local schools through the nurses in the educational cooperatives. In addition, after successful implementation of a standardized statewide protocol and establishment of a centralized database, the ACHI approached the Robert Wood Johnson Foundation in 2004 to support development and analyses of the largest population-based assessment of childhood obesity in the nation. Estimates of the direct funds expended are approximately \$1.5 million for initial-year assessments (approximately \$3 per student) with ongoing expenditures of approximately \$750 000 (approximately \$1.50 per student), excluding local in-kind costs associated with school assessments (authors' estimates).

## EVALUATION AND RESULTS OF BMI ASSESSMENTS

In this undertaking, the needed assessment of statewide and individual risk related to obesity and communication to parents had to be balanced with the potential risk of stigmatizing or alienating children who were obese. To evaluate not only whether BMI screening in schools had any unintended negative impact but also to assess the broader implications of Act 1220, the UAMS College of Public Health

received funding to conduct an external and independent assessment. The fourth annual report showed that surveys of school administrators and personnel, parents, and overweight adolescents have not identified substantial negative consequences from the school-based assessments. Although superintendents and principals did express concern about time taken away from academics by the BMI assessments, it was not highly controversial among parents. Other positive findings include an increase in policies and practices that support healthy eating in schools (such as limiting "junk foods"). Since the passage of the act, the percentage of parents who signed their children up for sports or exercise classes increased significantly, and parents did not report an increase in inappropriate dieting among their children. Also, modest changes in family diet and nutrition patterns were reported. The percentage of students who reported an increase in physical activity has increased since the first year, although the percentage of students participating in PE has declined.<sup>15</sup>

Arkansas has recently completed its sixth year of data collection. Participation rates by schools and their students were robust during the first 4 years (Table 1). More than 94% of

schools in the first year, increasing to 99% of schools in the fourth year, assessed students' obesity risk. Data were reported for ~96% of the students in 2006–2007, with absenteeism being the most common reason for no valid BMI assessment being made (Table 2). Participation rates were higher in elementary compared with high schools.

Although Act 1220 and Arkansas Board of Education rules contains many components that address the school environment, physical activity, cafeteria offerings, vending-machine content and access, pouring-contract disclosure, and establishment of local parental advisory groups (Table 3), BMI assessment and reporting has not only provided parents with recommended information, but it has also enabled the state to track the epidemic and provide local-area information for policy development and program evaluation (Table 4). Figure 2 provides both the published National Health and Nutrition Examination Survey data for school-aged children through 2004 and also the results from the past 4 collection cycles for Arkansas data. As is apparent, the risk burden for the state's children was greater than that suggested for the nation as a whole, which was not unexpected given the

**TABLE 2** Reasons for Nonassessment in School-Based BMI Assessment (Percentage of Total Population)

Reason	Year 1 (2003–2004)	Year 2 (2004–2005)	Year 3 (2005–2006)	Year 4 (2006–2007) <sup>a</sup>
Absent from school, %	6.3	7.7	6.7	8.1
Not attending that school, %	3.8	1.4	0.4	6.8
Parent refused to allow measurement, %	3.7	3.3	3.4	2.9
Student refused measurement, %	1.7	2.6	2.7	3.3
No 2 measurements within 1 in, % <sup>a</sup>	0.02	0.002	0.009	0.005
Other, %	1.1	0.6	0.6	0.8
Disability prohibited measurement, %	0.2	0.2	0.2	0.3
Student was pregnant, %	0.1	0.1	0.1	0.1
Weight exceeded scale limitations, %	NA	NA	NA	0.03
Total students, <i>n</i> <sup>b</sup>	71 821	70 083	61 026	105 110

<sup>a</sup> The established protocol requires that 2 height measurements be taken and that the difference in height between the 2 measurements be <1 in. If the assessor is unable to obtain height measurements within this variance, then the student cannot be assessed for BMI.

<sup>b</sup> Results include all data available for years 1, 2, and 3 for kindergarten through 12th grade and data received by June 6, 2007, for year 4.

Data source: Arkansas Center for Health Improvement. *Assessment of Childhood and Adolescent Obesity in Arkansas: Year Four (Fall 2006–Spring 2007)*, Little Rock, AR: Arkansas Center for Health Improvement; 2007. Available at: [www.achi.net/ChildObDocs/ACHIL\\_2007\\_BMI\\_Online\\_State\\_Report.pdf](http://www.achi.net/ChildObDocs/ACHIL_2007_BMI_Online_State_Report.pdf).

regional risk burden known to exist for adults. It is important to note that, presuming the same trajectory as the nation, Arkansas has demonstrated a halt in that progression through the multifaceted approach to modifying the school environment and support of parents through communities.

## DISCUSSION

In 2003, Arkansas implemented an innovative and comprehensive statewide effort to combat childhood obesity that included a somewhat controversial strategy of school-based BMI screening. Over the ensuing years, the state has documented increased parental awareness of weight risk in their children, a lack of adverse consequences, and a halt in the progression of the epidemic.

As other communities and states consider implementing school-based assessments, important early decisions are required to frame communications, guide development, and ensure optimal impact. Three potential justifications for BMI collection in schools include:

- individual screening of risk factor for parental notification;

- surveillance screening for public health tracking; and
- programmatic screening to evaluate interventions.

Arkansas undertook its population-based assessment to provide parents with information about their children that was deemed to be critically important but lacking from other sources. Secondary goals of surveillance were incorporated, and programmatic evaluation using the secondary data is underway both at the state and community levels. Advocates for surveillance screening note the school setting as being efficient for assessment. However, the small but real impact on academic time requires consideration of a sampling strategy and/or alternative approaches because of the minimal benefit to the individual child or his or her family from surveillance-only approaches. Finally, school-based BMI screening to evaluate interventions are frequently used in research strategies that require school support and parental consent.

Arkansas experienced challenges to school-based screening that should not be minimized. The initial lack of

equipment (scales and stadiometers) in schools, the time and training of personnel, and the logistics of data collection, report generation, and dissemination required innovative solutions. The lack of funding for the initiative initially was a major barrier. However, the integration of funding into existing systems (eg, school nurse responsibilities, Department of Health chronic disease programming) may have safeguarded the activities during legislative challenges because there was no budget to cut.

The pressure for academic time related to educational testing and performance requirements of No Child Left Behind combined with the financial impact of other aspects of Act 1220 (eg, potential reductions in school revenue from vending-machine restrictions and potential backlash over pouring-contract disclosure) have resulted in consecutive efforts led by school superintendents with support of the vending industry to modify and/or repeal the BMI requirements as well as other components of the act or actions of the Board of Education.

In the 2005 and 2007 sessions of the Arkansas General Assembly, several efforts to eliminate components of the act were successfully defeated. For example, bills were introduced but not enacted that would have completely eliminated BMI screenings, permitted schools to sell vended products during academic school periods, or permitted schools to develop policies that allowed the use of candy or gum in the classrooms as a reward.

However, in 2007, 3 pieces of legislation were passed that modified the original act. With many schools cited for performance deficits under No Child Left Behind, another legislative challenge was mounted. After 4 years of individual reporting for all grades (kindergarten through 12th grade), the periodicity of the BMI was modified

**TABLE 3** Act 1220 Requirements and Arkansas Board of Education Rules and Regulations

84th General Assembly Act 1220 of 2003

Goals

- Change the environment within which children go to school and learn health habits everyday
- Engage the community to support parents and build a system that encourages health
- Enhance awareness of child and adolescent obesity to mobilize resources and establish support structures

Requirements

- Establishment of an Arkansas CHAC
- Vending-machine content and access changes
- PA/PE requirements
- Requirement of professional education for all cafeteria workers
- Public disclosure of “pouring contracts”
- Establishment of local parent advisory committees for all schools
- Confidential child health report delivered annually to parents with BMI assessment

Amendments to Act 1220

Act 201 of 2007

- BMI assessments apply only to students in even grades (kindergarten through 10th grade)
- Arkansas Department of Health nurses responsible for quality assurance to follow protocols
- Schools can screen children in the nonrequired grades if they wish to do so unless the school has received written refusal from the student’s guardian

Act 719 of 2007

- Adds 5 members to CHAC (Office of Minority Affairs at Arkansas Department of Human Services, Arkansas School Boards Association, Arkansas Association of School Business Officials, Arkansas Association for Supervision and Curriculum Development, and a classroom teacher)
- Broadens CHAC scope to make recommendations concerning the implementation of the Arkansas Coordinated School Health Program in addition to original role in PA and nutritional standards

Arkansas Board of Education regulations

School Nutrition and Physical Activity Advisory Committee

- Assist in development of local policies around nutrition and PA
- Ensure age-appropriate recommendations
- Assess the school environment by using the *School Health Index* and help develop the district’s Arkansas Consolidated School Improvement Plan

Access to foods and beverages

- Per Act 1220, no vending machines in elementary schools
- Foods of minimal nutritional value cannot be served, sold, or provided as an award during the school day in elementary schools
- During the school day, vending-machine access and foods of minimal nutritional value cannot be served, sold, or provided as an award until 30 min after last lunch period (middle, junior, and high schools)
- New/renewed vending contracts for beverages limited to no more than 12 oz
- Exceptions: foods provided by parents to individual students, school nurses, special-needs students, school events

Standards for foods and beverages

- Nutrition standards applied to all foods/beverages sold or made available (except US Department of Agriculture–governed meals)
- Maximum portion sizes established
- Choices of fruits and juices available in conjunction with competitive foods
- 50% of vended beverages to be healthy choice (water, 100% fruit juice, low-fat/fat-free milk)

Nutrition education

- Promote grade-appropriate nutrition education as part of a broad-based integrated health education program
- Implement grade-appropriate nutrition education through a comprehensive education program

Healthy school environment

- No food or beverage to be used as rewards
- School cafeterias/dining areas to reflect healthy nutrition environments
- Ensure that all students have access to school meals
- Drinking water available without charge to all students on campus

PE/PA standards

- Schools to work with local School Nutrition and Physical Activity Advisory Committee to establish strategies for achieving increased PA programs for children and their families in their community and decrease sedentary activities
- Beginning in the 2006–2007 school year, PE classes in kindergarten through 6th grade will have a maximum student-to-adult ratio of 30:1
- Beginning in 2008–2009 school year, for kindergarten through 6th grade, the district will employ at least 1 licensed and/or qualified PE full-time equivalent teacher for every 500 students; this licensed and/or qualified PE teacher will directly supervise PE instruction
- Beginning with the 2012 school year, all personnel teaching PE in kindergarten through 12th grade will hold a PE license appropriate for the grade levels being taught
- Initially required by 2007–2008 that kindergarten through 6th grade to receive 150 min/wk of PA (includes 60 min of PE); 7th–8th grades to receive 150 min/wk of PA; 9th–12th grade to take 1 semester of PE and receive 150 min/wk of PA

Legislation amending Board of Education rules and regulations

- Act 317 of 2007 increased class time by limiting mandated PA in kindergarten through 12th grade; provides 60 min/wk of PE and 90 min/wk of PA for kindergarten through 5th grade only; no PA requirements for grades 6–12

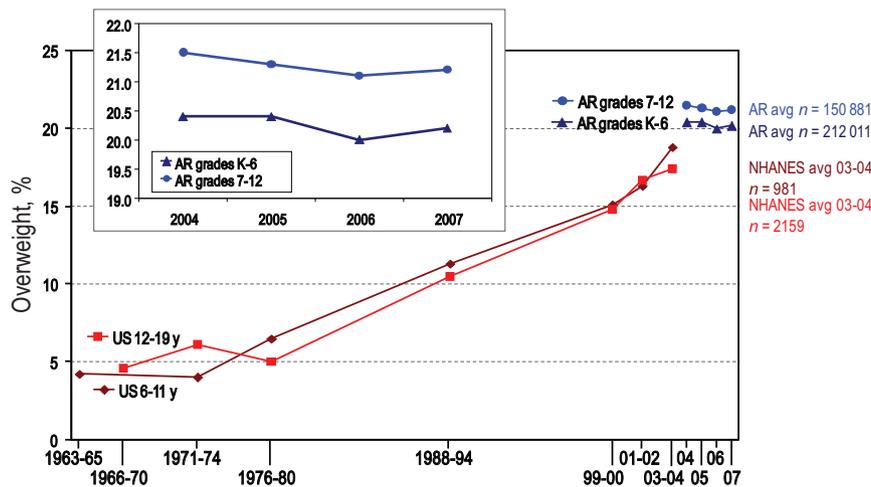
CHAC indicates Child Health Advisory Committee; PA, physical activity.

**TABLE 4** Percentage of Arkansas Students According to Weight Classification (Kindergarten Through 12th Grade)

Category	Year 1 (2003–2004)	Year 2 (2004–2005)	Year 3 (2005–2006)	Year 4 (2006–2007)
Overweight, %	20.9	20.8	20.5	20.6
At risk for overweight, %	17.2	17.2	17.1	17.2
Healthy weight, %	60.1	60.1	60.5	60.4
Underweight, %	1.8	1.9	1.9	1.8
Total No. of students assessed <sup>a</sup>	347 753	368 871	369 416	366 801

<sup>a</sup> Results include all data available for years 1, 2, and 3 for kindergarten through 12th grade and data received by June 6, 2007, for year 4.

Data source: Arkansas Center for Health Improvement. *Assessment of Childhood and Adolescent Obesity in Arkansas: Year Four (Fall 2006–Spring 2007)*, Little Rock, AR: Arkansas Center for Health Improvement; 2007. Available at: [www.achi.net/ChildObDocs/ACHI\\_2007\\_BMI\\_Online\\_State\\_Report.pdf](http://www.achi.net/ChildObDocs/ACHI_2007_BMI_Online_State_Report.pdf).



**FIGURE 2**

National and Arkansas childhood obesity trends. NHANES indicates National Health and Nutrition Examination Survey; K, kindergarten. NHANES data sources: Ogden CL, Flegal KM, Carroll MD, Johnson CL. *JAMA*. 2002;288(14):1728–1732; and Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. *JAMA*. 2006;295(13):1549–1555. Arkansas data source: Arkansas Center for Health Improvement, Little Rock, AR, unpublished data September 2007.

to be performed among those students in even school grades (kindergarten and 2nd, 4th, 6th, 8th, and 10th grades) to reduce academic interruption, reduce personnel time, and to adopt a standard parental refusal process. Importantly, additional legislative requirements were added regarding adherence to the established protocol.<sup>16</sup> Also, a successful legislative initiative in 2007 reduced some of the physical activity standards that had previously been put into place by the Arkansas Department of Education, providing more time for academic instruction.<sup>17</sup> The Child Health Advisory

Committee’s scope was broadened, and new members were added.<sup>18</sup> Throughout these challenges, the primacy of parental information served as an important justification for continuing school-based assessments.

Future additions and modifications to the child health report are under consideration, including development of longitudinal information to enable both parental and clinician tracking of percentile changes over time. In addition, incorporation of other school-based screenings including vision, hearing, and scoliosis into the health

report may provide a formal feedback that is currently lacking across most schools in the state. Finally, the establishment of stronger relationships between the educational and clinical communities may allow integration of education and health goals to address many of the medical and behavioral health conditions that negatively affect educational attainment. Through coordinated school health, real opportunities exist to align resources and support parents in their primary goal: to have healthy and educated children.

**CONCLUSIONS**

School-based BMI assessment is an important component for consideration as part of a broad, multifaceted strategy for combating child and adolescent obesity. Within Arkansas, its successful implementation and ongoing value have been demonstrated through increased parental awareness and ongoing support. However, investment in strategies to ensure that quality information is provided to parents with appropriate safeguards and risk interpretation is critically important to success. Strategic design of program implementation may enable not only parental notification but also opportunities for statewide surveillance and local assessments to build ongoing support for efforts to combat the epidemic.

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