Arkansas Act 1220 of 2003 to Reduce Childhood Obesity: Its Implementation and Impact on Child and Adolescent Body Mass Index

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ABSTRACT

Arkansas was among the first states to pass comprehensive legislation to combat childhood obesity, with Arkansas Act 1220 of 2003. Two distinct but complementary evaluations of the process, impact, and outcomes of Act 1220 are being conducted: first, surveillance of the weight status of Arkansas children and adolescents, using the statewide data amassed from the required measurements of students' body mass indexes (BMIs); and second, an independent evaluation of the process, impact, and outcomes associated with Act 1220. Various stakeholder groups initially expressed concerns about the Act, specifically concerns related to negative social and emotional consequences for students and an excessive demand on health care. Evaluation data, however, suggest that few adverse effects have occurred either in these areas of concern or in other concerns which have emerged over time. Schools are changing environments and implementing policies and programs to promote healthy behaviors and BMI levels have not increased since the implementation of Act 1220 in 2004. The Arkansas experience to date may serve to inform the efforts of other states to adopt policies to address the epidemic of childhood obesity.

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INTRODUCTION

Obesity prevalence among children and adolescents in the United States has increased markedly over the past few decades (1). Considerable effort is being devoted at local, state, and federal levels to understand the factors involved and to identify solutions. Arkansas was among the first states to introduce and pass ambitious and comprehensive legislation to address childhood obesity. This paper briefly summarizes both the development of Act 1220 (described in some detail elsewhere (2,3)) and key findings from the evaluation of its implementation over 5 years, as well as describes the body mass index (BMI) trends of Arkansas schoolchildren over 5 years.

DEVELOPMENT AND PASSAGE OF THE ACT

The initial ideas for finding a solution to the growing problem of obesity among Arkansas children derived from two conferences in early 2002 that focused on obesity among persons of all ages: one national conference followed by a statewide conference in Arkansas. The state-level meeting was co-sponsored by a Nutrition Academic Award funded by the National Heart, Lung, and Blood Institute of the US National Institutes of Health, with Ronald F. Kahn, M.D., serving as Principal Investigator at the University of Arkansas for Medical Sciences. A number of Arkansas legislators and public health officials were present at these meetings. A series of planning meetings was then held with Arkansas House of Representatives Speaker-elect Herschel W. Cleveland, other key legislators, and public health officials. These discussions culminated with Speaker Cleveland requesting that the Arkansas Department of Health develop a bill to be introduced into the Arkansas Legislature during the regular session of 2003. This bill had strong support in both the House of Representatives and the Senate and quickly passed into law, becoming Arkansas Act 1220 of 2003.

Act 1220 included these key components:

- Annual measurement of BMI for all children attending public schools (i.e., schools funded by both state and local funding sources) and reporting of the BMI and associated health risks to parents.

- Elimination of student access to vending machines during the school day in elementary schools.
- Specification of funding to hire Community Health Promotion Specialists with expertise in community health promotion to work with schools and communities – the only funding identified in the Act to support its implementation.
- Establishment of a statewide Child Health Advisory Committee with membership from specified groups (including academic units from the University of Arkansas for Medical Sciences) to develop regulations for schools in a variety of specified areas, based on scientific evidence related to nutrition and physical activity.
- Public reporting of vending contracts.
- Establishment of school nutrition and physical activity advisory committees with broad membership.

The ensuing deliberations and review of the literature by the Child Health Advisory Committee led to a series of evidence-based regulations enacted by the State Board of Education and phased in over the next few years. Additional changes in school policies and practices were recommended by some local advisory committees and adopted by local school districts. Thus, the Act established mechanisms for both immediate and longer-term initiatives to be established at both the statewide and local levels.

Soon after Act 1220 was enacted into law, the Robert Wood Johnson Foundation funded the Arkansas Center for Health Improvement at the University of Arkansas for Medical Sciences (Joe Thompson, M.D., MPH, Principal Investigator) to develop and analyze a statewide BMI database. The Robert Wood Johnson Foundation also provided funding for the University of Arkansas for Medical Sciences Fay W. Boozman College of Public Health (James Raczynski, Ph.D., Principal Investigator) to conduct a statewide evaluation of the implementation of the Act.

IMPLEMENTATION OF ACT 1220'S BMI REPORTING COMPONENT

Act 1220 required that parents be sent weight screening information, utilizing the BMI percentiles established by the US Centers for Disease Control and Prevention (2), based on the recommendations

of the Institute of Medicine (3) and the American Academy of Pediatrics (4). This BMI measurement/reporting requirement was inconspicuously stated in only four lines of the Act, with no funding provided, and required schools to measure and report this information to parents of students in all grades (K-12) every year. Originally described as being included on the academic report card, an immediate modification of the Act changed the format of the report to that of a confidential child health report to be sent to parents.

Recognizing the importance of parental information and the opportunity afforded by statewide assessment of public school students, the health and school communities struggled with the mechanism and process for implementation of this newly required, unfunded mandate on public schools. In response, the Arkansas Center for Health Improvement established a working group that included the Departments of Health and Education, local school districts, and the research and clinical communities to devise a standard protocol for BMI assessment and data collection.

The working group's initial statewide assessment of school-based resources for implementation found critical shortages in both hardware (scales and stadiometers, to measure weight and height, respectively) and personnel trained to conduct school-based assessments. A staged process led to the development of an assessment protocol, identification and procurement of scales, manufacture and distribution of stadiometers by the Arkansas Department of Corrections, and the development of a process of data collection that complied with the requirements of the US Health Insurance Portability and Accountability Act of 1996 ("HIPPA"). Ultimately, the height and weight of more than 450,000 children in approximately 1,300 schools were assessed during the first year following passage of the Act (5). To supplement funding from the Robert Wood Johnson Foundation, which supported the development of the statewide database and data analysis, additional funding was obtained from state agencies and national organizations, including the Arkansas Department of Health and the American Diabetes Association, to support the overall implementation of BMI measurement.

The first distribution of confidential child health reports occurred in June of 2004 and provided tailored information to over 90,000 parents of overweight or obese children, to raise awareness and

recommend changes within the household. The remaining children received information to reinforce good nutrition and adequate physical activity. Recognizing that BMI is only a screening tool, not a definitive determination of overweight status, feedback also made it clear that families should follow up with their health care providers for further assessment, determination of overweight status, and recommendations.

From the data amassed in the statewide BMI database, the Arkansas Center for Health Improvement generated school, school district, and county-level reports highlighting the obesity risks in children. With each successive year, an additional individual report to parents and set of school geographical reports were generated. These reports allowed for the tracking of progress and identification of achievements at the state level but also at the level of each school, school district, and county.

Modifications to Act 1220 Related to BMI Measurement

Although elements of the legislation were discussed and debated after its passage, Act 1220 was initially passed into law with scant attention by the media, education interest groups, or the general public. This is likely attributable both to the simplicity of the bill as well as that, during 2003, the energy and attention of education stakeholders and potential opponents were focused on other more contentious issues (e.g., resolution of school funding shortfalls and calls to consolidate rural school districts). Limited, but nonetheless vocal, opposition soon began to mobilize, focusing on the lack of state funding for schools to implement the Act's mandates, potential loss of funding to local school districts from reduction in vending contracts, and/or concerns related either to unintended adverse consequences of BMI measuring and reporting or impingement on parental rights. National press headlines mischaracterized the intent of the legislation as, "In Arkansas, Schools to Score a Child's Weight." (6) This mischaracterization reinforced the concerns of some in the state.

Act 1220 was modified in subsequent legislative sessions (7–10). In brief, the first modification of Act 1220 occurred in a special legislative session in 2004 and was intended to mitigate concerns by some that providing BMI information to parents on a student report

card (i.e., a periodic, written report to parents of a student's progress, generally given to students at school) could result in teasing and other adverse events. Although such a mode of transmission was not intended by the originators of the bill, the modification made explicit the requirement that BMI information was to be transmitted to parents "confidentially" and separately from the standard report card. Funding secured by the Arkansas Center for Health Improvement was used to mail the child health reports (consisting of a letter with the child's BMI assessment as well as health education information), reducing the potential for access by persons other than parents.

Additional opposition to the BMI assessment and reporting requirement surfaced in late 2006 before the initiation of the 2007 regular session of the Arkansas General Assembly, centering around lack of an express parental choice to "opt out" of participation (i.e., choose not to participate) and concerns that the annual assessment requirement was unnecessarily burdensome. The original legislation did not speak of parents' ability either to opt in or opt out of their children's participation in the school-based BMI assessment program; thus, parents and students always had an *implied* ability to opt out of the program. However, because the Commissioner of the Arkansas Department of Education had issued several "advisory" letters to school district superintendents instructing them to comply with the mandates of Act 1220 and assess all students, there was at least some perception that participation was mandated.

The overwhelming majority of school districts had complied with the instruction. Yet, parents in many districts who did not want an assessment and students who refused to participate were allowed to make that choice without consequence. A number of school districts developed a consent to assess, which was completed by parents as a part of the annual registration at the beginning of each school year, thus eliminating the issue. However, a minority of school district officials and parents remained opposed and vocal in their dissatisfaction with the lack of a specific "opt out" provision in the statute.

In response to these concerns, combined with school leadership concerns regarding the non-academic demands being placed on schools, the 2007 Arkansas General Assembly modified the original

annual assessment requirements. Beginning with the 2008–2009 school year, the assessment for each child was to be done every 2 years, completed for students enrolled in even-numbered grades from Kindergarten through grade 10. In addition, an explicit parental opt out provision was adopted that required parents to notify their child's school, annually and in writing, of their desire to avoid school-based screening and their acceptance of the assessment responsibility. Other legislative activity modified Arkansas Department of Education rules and regulations (promulgated in response to Child Health Advisory Committee recommendations) to eliminate physical activity requirements in grades 6–12. Although the pressures placed on the academic school day by state and federal academic requirements were clearly evident, continued support for health was apparent in the legislative expansion of the Child Health Advisory Committee's mission beyond physical activity and nutrition to include a broader focus on child health programs within schools.

METHODS AND RESULTS OF EVALUATING THE PROCESS, IMPACT, AND OUTCOMES OF ACT 1220

Development of the statewide BMI database has allowed an assessment of the final, anticipated outcome of Act 1220: childhood obesity. However, the data did not provide information about the process of implementation of Act 1220 nor its impact on school environments and the knowledge, attitudes, and behaviors of parents and children. The Evaluation of Act 1220 Project conducted by the College of Public Health team was conceptualized to address process and impact domains. The evaluation was guided by a logic model and relevant theory to guide the development of evaluation methods. Initial funding provided for a 1-year collection of baseline data in 2004, prior to the implementation of Act 1220. This initial funding was followed by two more years of funding for data collection as the Act was implemented in phases. Additional funding by the Robert Wood Johnson Foundation now extends the data collection for a total of 9 years. Data reported most recently cover 4 years of data collection through the 2006–2007 school year (10). Summaries of key findings from each year of data collection can be found online (11).

Evaluation Methods

The evaluation used both quantitative and qualitative methods to obtain data from multiple sources. Records review, key informant interviews, surveys, and telephone interviews all contributed information that informed a comprehensive, multi-dimensional annual evaluation with reports of key findings (7–10).

Quantitative assessment strategies

Quantitative data for the impact evaluation were collected annually from several sources, including telephone surveys of cross-sectional samples of parents of public school students, students themselves if they were 14 years of age or older, and all public school superintendents and principals. These surveys were designed to document changes in policies, environments, knowledge, attitudes, and behavior as well as key characteristics of schools and families that may influence those changes.

Sampling methods for the parent/child surveys have been presented in detail elsewhere (12). However, the basic methods involved randomly selecting households from listed phone numbers in a 15-mile (24-km) radius around selected schools.

Qualitative assessment of Act 1220 implementation

Record reviews and key informant interviews were incorporated in the evaluation methods to characterize stakeholders' views of areas of concern and views of the implementation of Act 1220. These qualitative data enriched and complemented the quantitative data with the perspectives of the multiple stakeholders. Records were also reviewed and summarized from the statewide Child Health Advisory Committee meetings, Department of Education policies and procedures, State Board of Education meetings, legislative oversight committee meetings, and relevant Arkansas legislative meetings.

Key informant interviews were conducted annually with members of stakeholder groups, including members of the Child Health Advisory Committee, Department of Education, State Board of Education, and legislative oversight committees; legislative sponsors of the original Act 1220 legislation; other members of the Arkansas

legislature; principals and superintendents; school nurses; community-based physicians who may be treating students; and members of the local Nutrition and Physical Activity Advisory Committees. The interviews documented the opinions and observations of these key participants as the implementation of Act 1220 progressed.

Media coverage was monitored using a clipping service to catalogue media articles related to Act 1220 and childhood obesity for later analysis. This service covered both large and small newsprint media articles throughout Arkansas and bordering counties in three neighboring states.

Data and statistical analyses

Analysis strategies for the multi-method evaluation data included both qualitative analysis of records and key informant interviews and quantitative analysis of survey data. In addition, qualitative and quantitative methods were applied to media articles. Descriptive and univariate (chi-square and *t*-test) analyses were conducted with quantitative survey data from parents, youth, principals, and superintendents, followed by multivariate analyses (linear regression, or logistic regression, as appropriate). Weighted analyses of parent and child data were conducted with a functional sample size representative of approximately 450,000 students coming from 390,000 households, generating estimates of the overall state public school population.

Results

Proponents of Act 1220 intended it to increase the proportion of Arkansas youth who achieve and maintain their weight in a healthy range. From statewide data amassed by the Arkansas Center for Health Improvement, the initial assessment, completed in the 2003–2004 school year, indicated that 38.1% of Arkansas public school students were either overweight (20.9%) or obese (17.2%) (13). Following the 2006–2007 assessment year, the stable observation of 20.6% of the students being obese and 17.2% being overweight documented that Arkansas' efforts had at least contributed to halting the progression of the childhood obesity epidemic (14).

Major concerns about the implementation of Act 1220 emerging from the evaluation

Qualitative analysis of key informant interviews, records review, and review of media articles indicated that a number of concerns emerged about Act 1220 after it became law and during its subsequent implementation. These concerns can be categorized into the following groups:

(1) *Increase in dietary practices that were not medically recommended*: Concerns were expressed by school personnel as well as a few members of the academic/professional community that Act 1220 would result in parents and children resorting to unsupervised or inappropriate diets such as skipping meals and using diet pills.
(2) *Increase in weight-based teasing*: Some parents and some school personnel were concerned that the increased attention to student weight generally, and the initiation of BMI measurements in schools in particular, would result in an increase in teasing of students because of their excess weight.
(3) *Increase in eating disorders*: Some academicians and other professionals reported that the attention being focused on obesity and, in particular, the measurement of BMI might result in an increase in eating disorders.
(4) *Excessive burden on health care providers*: The child health report sent to parents of overweight children suggested that parents consult with the child's physician, leading some people to raise concerns that this otherwise desirable seeking of advice and care might overwhelm limited community resources.
(5) *Violation of parent and student "rights"*: Concerns emerged in the media and among some individuals in virtually all groups surveyed and interviewed that Act 1220 was an invasion of the privacy and "rights" of parents and/or their children.

Data addressing anticipated problems

Although not all of the concerns that emerged were anticipated by the original evaluation plan, qualitative and/or quantitative data provided evidence addressing each of the five categories of concerns.

(1) *Changes in dietary practices that were not medically recommended*: Table 1 summarizes the proportion of parents who reported putting a child on a non-medically supervised diet or giving their child diet pills for the baseline year and the 3 years of follow-up evaluation. The proportion of parents who put a child on a non-medically supervised diet significantly decreased across years. The proportion of parents who reported giving diet pills to a child was very low at baseline and showed no change over time.

(2) *Changes in weight-based teasing*: We previously reported on changes in weight-based teasing through the second follow-up year (15) and have continued to monitor this phenomenon. As seen in Table 2, weight-based teasing occurred before BMI measurements were taken (as indicated by reports in the baseline year), and adolescents did not report a significant increase in weight-based teasing through the 3 years of follow-up evaluation.

(3) *Changes in eating disorders*: Adolescents did not report any increased frequency of taking diet pills, exercising excessively, or starting diets over the course of the 3-year period (see Table 2). Further, statewide BMI data did not show any change in the proportion of children in the lowest category of BMI (14).

(4) *Burden on health care providers*: In follow-up Year 2, community-based physicians specializing in pediatrics and/or family practice throughout Arkansas were surveyed to assess the impact of the distribution of the child health reports (BMI letters sent to parents) on the health care system (9). A majority (57%) of responding physicians indicated that they had at least one parent bring a child's BMI letter for consultation. However, only 3% of physicians (primarily pediatricians) said they had seen as many as 40 letters. Thus, the demand for health care services appears to have been well within the capacity of the system.

(5) *Violation of parental/student "rights"*: The baseline assessment of parental attitudes toward the BMI assessment indicated that a majority were aware of the plan to measure their children's BMIs and to send a child health report to parents, and were comfortable with that measurement. The proportion of parents who were comfortable with the BMI measurement did not significantly change over time (see Table 1). Further, the proportion of parents who were concerned about the confidentiality of BMI measurements did not increase.

Table 1: Parental reports of possible consequences of Act 1220

	Baseline (N=1,551) (%)	*1-year follow-up (N=2,508) (%)*	*2-year follow-up (N=2,358) (%)*	*3-year follow-up (N=2,202) (%)*	*P-value*
Put child on non-medically supervised diet	9.0	6.3	6.1	5.4	⩽0.0001
Gave child diet pills	0.4	0.5	1.3	0.6	NS
Aware of BMI measurement	74.4	82.5	86.3	88.6	⩽0.0001
Comfortable getting BMI report from school	69.2	65.0	65.8	58.4	NS
Read some or all of BMI report	NA	92.5	92.9	94.6	NS

NA, not applicable; NS, not significant.

Table 2: Adolescent student reports of possible consequences of Act 1220

	Baseline (N=209) (%)	*1-year follow-up (N=481) (%)*	*2-year follow-up (N=361) (%)*	*3-year follow-up (N=347) (%)*	*P-value*
Concerned about weight	23.5	28.6	25.3	24.8	NS
Embarrassed by BMI measurements	NA	11.9	7.5	10.5	NS
Started a diet within the past 6 months	28.8	23.2	25.7	26.9	NS
Teasing because of weight	11.7	9.3	6	12.2	NS

NA, not applicable; NS, not significant.

Changes in school environments

A great deal of attention is being focused on childhood obesity nationally as well as in statewide and local initiatives, all of which make any interpretation of causality of the impact of Act 1220 very difficult, particularly in an uncontrolled evaluation. Nonetheless, in the 4 years since Act 1220 became law, the evaluation suggested schools were increasing policies prohibiting the sale of "junk" foods and guiding the selection of foods offered at school-sponsored activities. Schools were also offering nutrition information for students more frequently and prohibiting commercial advertising of food and beverage products on school campuses. When compared to baseline data, students had significantly less access to vending machines before and after school hours, before and during lunch, and during breaks. Further, the availability in vending machines of high-fat, high-sugar items decreased, and students had greater opportunities to purchase healthier foods and beverages. Compared to baseline, elementary schools were more likely to report that physical education classes were being taught by certified physical education teachers, and schools at all levels were more likely to prohibit the use of physical activity as punishment for bad behavior. More detail on changes to school environments, policies, and practices is available in the College of Public Health evaluation reports online(11).

CONCLUSION

Arkansas Act 1220 of 2003 was the first statewide, comprehensive legislative initiative to address childhood obesity in the United States. The BMI data and the ongoing evaluation of Act 1220 process, impact, and other outcomes have been instrumental in informing the policy and research communities about the impact and outcomes of Act 1220. The results also have been important in informing the debate in key areas in which some groups have sought modifications to the law and its associated rules and regulations. Finally, the data have been helpful in informing the debate about legislation to reduce childhood obesity in other states.

Although the data suggested no adverse consequences of Act 1220 and instead documented both favorable changes in environments

which may affect childhood obesity and positive trends in obesity levels, the political process had ongoing challenges and external influences. Continued modification based on competitive challenges for limited resources (e.g., academic time, financial support), additional understanding of the factors associated with successful reductions in the proportion of overweight children in schools and communities, and ongoing requests by the community at large are expected.

The monitoring of changes in BMI among Arkansas public school students and the evaluation of Act 1220 continues. Those processes include an investigation of subgroups of students and families who may have different experiences of childhood obesity and responses to Act 1220 initiatives, factors associated with successful policy change in schools, and a compilation of innovative and successful practices that can be replicated and disseminated across the state and shared with the nation.

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