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Information for Action: School Policies to Prevent Childhood Obesity

An RWJF national program

SUMMARY

In response to dramatic increases in the number of Arkansas children and adolescents who are overweight or at risk for overweight, the Arkansas legislature passed Arkansas Act 1220 of 2003 to Combat Obesity. This new law included the most ambitious school reforms in the nation to limit vending and competitive foods (a la carte and vending items that compete with the school meals that must meet federal guidelines, e.g. sodas and foods of limited nutritional value). It also established better standards for food offerings and physical activity.

One section of the act requires all school districts to measure body mass index (BMI) for every public school student annually and report results to parents.

The Robert Wood Johnson Foundation (RWJF) started funding a set of grants it calls *Information for Action* that takes advantage of Arkansas Act 1220 by supporting two activities that promote understanding about the effectiveness of school-based initiatives in reducing childhood obesity. *Information for Action's* components are:

- **Act 1220 Evaluation,** in which researchers at University of Arkansas for Medical Sciences Fay W. Boozman College of Public Health measure the effects of Act 1220 on children, families and schools. The evaluation assesses children's diet, physical activity and school environment the year Act 1220 took effect (year 1) and again for each of the three years after implementation of the act (years 2, 3 and 4). This component is funded to mid-August 2012.
- **The Arkansas BMI Database Project,** in which researchers at the Arkansas Center for Health Improvement (ACHI) at the University of Arkansas for Medical Sciences analyze BMI data to study how BMI status affects health status and to use findings to inform policy. Through 2007, the database contains four years of BMI data on Arkansas students. This component is funded through November 2009.

Key Findings Through the 2006–07 School Year: Act 1220 Evaluation

Over the four-year evaluation period:

- After three years, the percentage of students classified as overweight or at risk for overweight decreased from 38.1 percent during the first year to 37.6 percent during the third year. In year 4 (2006–07 school year), the percentage increased slightly to 37.8 percent.
- School districts increasingly adopted new nutrition and physical activity policies. For example:
  - The percentage of districts with a policy prohibiting "junk food" in cafeterias increased from 37 percent to 63 percent.
  - From year 1 to year 4, an increasing percentage of school districts prohibited the use of physical activity as a punishment for bad behavior.
  - An increasing percentage of school districts required that physical activities such as walking be included in the physical education program—in elementary school the increase was from 39 to 56 percent; in middle schools from 52 to 63 percent and in high schools from 56 percent to 66 percent.
- The percentage of all schools—elementary, middle and high—with vending machines on campus decreased from 85 percent to 80 percent. In districts with separate elementary schools, vending machines in elementary schools were available to staff but not to children.
  - In the first-year evaluation report, researchers determined that 100 percent of the elementary schools assessed had removed student access to vending machines—which is what the law required.
- Principals estimate that the percentage of healthier food and beverages sold in the machines increased from 18 percent to 26 percent.
- Parents did not view BMI assessments as controversial. Overall, 85 percent of principals had fewer than five parental contacts on the issue during the year.
- Parents are frequently unable to characterize their child's weight status accurately, especially when the child is overweight. Among parents whose children were overweight, 51 percent incorrectly perceived the child to be of normal weight. Most parents (93 percent) of children with BMI percentiles in the normal to underweight categories correctly characterized their children's weight status.
- Parents have become more aware of health problems associated with childhood obesity. Some 81 percent of parents interviewed mentioned diabetes as a health problem for overweight children in year 4, compared with 66 percent in year 1.
- Student reports of teasing because of their weight did not increase.

- Student reports of inappropriate dieting behaviors (such as fasting and taking diet pills) remained stable over the four-year period and were similar to behaviors reported by students across the country.

For more information, see Act 1220 Evaluation Findings.

Key Results Through the 2006–07 School Year: BMI Database Project

- The project demonstrated to all the stakeholders in Arkansas that childhood and adolescent obesity is a problem in every Arkansas school district, with all districts having at least 20 percent of students who were overweight or at risk of overweight.
- ACHI lowered costs and improved efficiency by hiring a subcontractor that created a Web-based data entry process that captures student height and weight, calculates BMI and generates the Child Health Report.
- ACHI negotiated with the Arkansas Department of Human Services to link the BMI database and the state's Medicaid claims database. During the 2004–05 school year, this link resulted in a match of 247,101 students (more than half of all public school students) whose BMI had been assessed and who also received Medicaid. With this information, ACHI staff and other researchers are able to analyze the costs, health service utilization, and diagnoses associated with child and adolescent obesity.
- By 2006, ACHI housed the world's largest database of child-specific BMIs with matching sociodemographic information (such as gender and race)—and the database has kept growing.
- After three years (school year 2005–06), the rate of obesity leveled off in Arkansas. The percentage of students who were overweight or at risk for overweight decreased from 38.1 percent to 37.6 percent. In year 4 (the 2006–07 school year), the percentage increased slightly to 37.8 percent. The leveling off of the trend may or may not have been a result of the law; this is unclear.
- In June 2004, BMI Initiative director, Joseph Thompson, M.D., presented preliminary findings of the first year of BMI assessment at the Time/ABC News Summit on Obesity; it was attended by approximately 400 health experts, food industry executives, government officials and members of the media. As a result of Thompson's presentation, many state and federal policy-makers contacted BMI Initiative team members for information and guidance on replicating the Arkansas BMI process across the country. Overall, during the first three years of the Arkansas BMI Initiative, 20 states and six countries contacted ACHI for information or assistance in developing similar policies and practices.

For more information see Arkansas BMI Database Project Results.

This report covers findings and results through 2007; it will be updated when *Information for Action* has closed.

Program Management

RWJF manages *Information for Action* internally. Special Adviser for Evaluation Laura C. Leviton, Ph.D., has provided overall direction from the start and continues to oversee the Arkansas BMI Database Project. Program Officer Celeste Torio, Ph.D., M.P.H., manages the Act 1220 Evaluation.

Funding

Eight grants totaling $9,096,469, beginning in February 2004 and extending through August 2012, comprise the program.

THE PROBLEM

National Increases in Overweight and Obesity

Rates of overweight and obesity among adults, children and adolescents are dramatically higher than they were a generation ago.

Results of the 1976–80 and 2003–04 National Health and Nutrition Examination Survey (NHANES) administered by the Centers for Disease Control and Prevention (CDC) show that the prevalence of overweight among children and adolescents increased significantly in the intervening years:

- From 5.0 percent to 13.9 percent among children aged 2–5 years.
- From 6.5 percent to 18.8 percent among children aged 6–11 years.
- From 5.0 percent to 17.4 percent among adolescents aged 12–19 years.

The CDC uses body mass index (BMI)—a measure of a person's weight in relation to height—as an index of overweight and obesity. While BMI is not a direct measure of body fat, it is the most widely accepted measurement used to screen for weight-related health problems.

The CDC defines overweight and obesity among *adults* as follows:

- Overweight: BMI greater than or equal to 25.
- Obese: BMI greater than or equal to 30.

Starting in September 2008, the CDC began defining overweight and obesity among *children and adolescents* as follows:

- Overweight: BMI at or greater than the 85th percentile, but below the 95th percentile, for age and gender.
- Obese: BMI at or greater than the 95th percentile, for age and gender.

Before, September 2008, the CDC and other organizations used "at risk for overweight" instead of "overweight" and "overweight" instead of "obese" for children and adolescents. ACHI reports use these terms because they were the terms in effect and used by researchers during the period covered by the report.

See the Healthy Weight section of the CDC website for a description of how BMI is defined and used for children and adolescents.

Overweight and Obesity in Arkansas

Statistics from the CDC's 2001 Youth Risk Behavior Survey (YRBS) indicate that the average rate of obesity is higher among Arkansas than it is among U.S. adolescents. Youth Risk Behavior Surveys are conducted every two years among U.S. high school students and monitor health risk behaviors and the prevalence of obesity and asthma. According to the survey:

- Some 13.8 percent of Arkansas high school students were obese compared with 10.5 percent of U.S. high school students who were obese.
- Some 15.9 percent of Arkansas high school students were overweight compared with 13.6 percent of U.S. high school students who were overweight.

BACKGROUND

Arkansas Act 1220 of 2003 to Combat Childhood Obesity

In reaction to these trends, the Arkansas legislature passed Arkansas Act 1220 in April 2003. This act required every school district, beginning with the 2003–04 school year, to:

- Prohibit in-school access to food and beverage vending machines for elementary school students.
- Publicly report expenditures and revenue from vending machine and beverage pouring contracts.
- Convene local nutrition and physical activity advisory committees (including school board members, school administrators, food service staff, teachers, parents, students and others) to implement new standards and develop local policies.
- Measure BMI for every public school student annually and confidentially report results to parents with an explanation of possible health effects of being overweight.

The act also created a 15-member statewide Child Health Advisory Committee to make recommendations to the state departments of education and of health regarding physical activity and nutrition standards in public schools. (In 2007, its recommendations were embodied in state regulations).

Despite strong interest in reducing overweight among Arkansas's students, little information was available, according to researchers at the University of Arkansas for Medical Sciences, to:

- Develop strategies to implement policy changes (particularly ways to measure BMI and share results with parents).
- Examine how policies were implemented and the impacts and outcomes associated with them.

Act 1220 was an unfunded mandate. There were no resources available to monitor whether vending machines were removed from elementary schools, nor to assist schools in implementing new regulations for healthy food and physical activity in school. In addition, Act 1220 required only that schools assess students for BMI and report results to parents. It did not require or fund production of school, district or statewide reports. There was no requirement to analyze data to learn how BMI status affects health or to guide future policy.

If additional resources were available to analyze data and evaluate the effects of Act 1220, this could provide information critical to mounting national strategies to control obesity.

CONTEXT

RWJF emphasizes environmental and policy change as its primary approach in achieving that goal.

RWJF has developed three integrated strategies to reverse the childhood obesity epidemic:

- **Build Evidence.** Investments in building evidence regarding effective strategies will help ensure that the most promising efforts are replicated. RWJF's research efforts in building evidence include three national programs:
  - *Active Living Research* supports research to identify environmental factors and policies that influence children's physical activity.
  - *Healthy Eating Research* supports research on environmental and policy strategies to promote healthy eating among children to prevent childhood obesity—especially among low-income, racial and ethnic groups at highest risk for obesity.
  - *Bridging the Gap: Research Informing Practice and Policy for Healthy Youth Behavior* seeks to improve understanding of economic, policy and environmental influences on youth substance use (including tobacco), obesity and physical activity.

In building evidence regarding effective strategies, RWJF also seeks to evaluate innovative approaches in states, schools and communities. *Information for Action*, which evaluates the effects of legislation in Arkansas, is a key example of this strategy.

RWJF also brings together researchers, policy-makers and practitioners to talk about measurement tools, research strategies and ways to make research useful to states and communities. For example, RWJF sponsored a National Evaluation and Measurement Meeting on School Nutrition and Physical Activity Policies. See Program Results on ID# 050063.

- **Prompt Action.** RWJF's action strategy for communities and schools focuses on engaging partners at the local level, building coalitions and promoting the most promising approaches. For example:
  - The Food Trust, a Philadelphia-based organization, has brought supermarkets to underserved communities in Pennsylvania. RWJF and the Food Trust are working together to replicate those results in New Orleans and also nationwide. For more information see Program Results on the Philadelphia project.
- **Educate and Advocate.** RWJF shares results gleaned from the evidence and action strategies by educating leaders and investing in advocacy, building a broad national constituency for preventing childhood obesity. For example:
  - Through *Leadership for Healthy Communities*, RWJF helps organizations that represent public officials—such as the National Conference of State Legislatures and the U.S. Conference of Mayors—to educate their members about ways to increase physical activity and healthy eating among children and adolescents. The goal is to help decision-makers create healthier states, counties and cities.

PROGRAM DESIGN

The goals of *Information for Action* are to:

- Evaluate the effects of Arkansas Act 1220 on children, families and schools.
- Maintain the Arkansas BMI database and analyze data housed in it.

Information for Action comprises eight grants that support the two program activities.

Eight Grants

Eight grants totaling $9,096,469 began in 2004 and extend through 2012.

- Four grants totaling $5,962,866 to University of Arkansas for Medical Sciences College of Public Health for the Act 1220 evaluation.

- Four grants totaling $3,133,603 to the Arkansas Center for Health Improvement for the BMI database.

Two Program Components

Information for Action includes two components:

- **Act 1220 Evaluation,** in which researchers at the University of Arkansas for Medical Sciences Fay W. Boozman College of Public Health measure the effects of all provisions of Act 1220 on children, families and schools. The evaluation includes a baseline assessment of children's diet, physical activity and school environment before Act 1220 and a similar assessment each year after implementation.

  James M. Raczynski, Ph.D., professor and founding dean of the College of Public Health, directs the evaluation.

- **The Arkansas BMI Database Project,** in which researchers maintain a centralized database of BMI data on all public school children in Arkansas. The database allows researchers to conduct epidemiologic analyses to study how BMI status affects health status and to track student BMI results over several years.

The Arkansas Center for Health Improvement (ACHI) at the University of Arkansas for Medical Sciences serves as the lead institution for the database project. ACHI is a health policy center whose mission is "to be a catalyst for improving the health of Arkansans through evidence-based research, public issue advocacy and collaborative program development."

Joseph W. Thompson, M.D., the center's director, directs the BMI Database Project. (See Grantee Profile on Thompson.)

Management

RWJF has managed *Information for Action* internally. Special Adviser for Evaluation Laura C. Leviton, Ph.D., has provided overall direction from the start and continues to oversee the Arkansas BMI Database Project. Program Officer Celeste Torio, Ph.D., M.P.H., manages the Act 1220 Evaluation.

THE PROGRAM: THE FIRST COMPONENT: EVALUATION OF ACT 1220

The goals of the Act 1220 evaluation, conducted by staff at the University of Arkansas for Medical Sciences College of Public Health, under the direction of James Raczynski, Ph.D., are to:

- Characterize the processes for enacting and implementing all provisions of Act 1220, including but not limited to the BMI assessments.

- Assess changes in school environments relating to nutrition and physical activity.
- Assess changes in student and family behavior regarding nutrition and physical activity that may be associated with school environment changes.
- Begin to assess the long-term impact on the percentage of Arkansas children who achieve and maintain a healthy weight.

Establishing the Baseline (2003–04 School Year)

In order to characterize nutrition and physical activity policies in existence prior to the enactment of Act 1220, researchers at the College of Public Health collected baseline data near the end of year 1 (the 2003–04 school year). They:

- Surveyed by mail school principals and superintendents. Some 811 principals and 223 superintendents responded, for a response rate of 72 percent for each group.

  Surveys covered:

  — Policies, procedures and programs related to physical activity, physical education, nutrition, health and nutrition education, vending machines, foods sold outside of the cafeteria, health assessments and reporting to parents.

  — Financial impact of changes to vending machine and other food sale practices.

- Conducted telephone interviews with 19 principals and 21 superintendents. These interviews addressed topics such as:

  — Personal and school reactions to Act 1220.

  — Support for changes to school nutrition standards.

  — Financial impact of changing food vending practices.

  — Best ways to encourage students to engage in physical activity.

  Conducted telephone interviews with 1,551 families with children attending a random sample of 113 schools. This was about 1 percent of the total enrollment in the sample schools.

Southern Research Group (a marketing research and political consulting firm located in Jackson, Miss.) conducted the interviews under a subcontract.

Staff conducted separate interviews of parents and children 14 years of age and older (with parental permission). Parents provided information on behalf of younger children.

Parent interviews covered topics such as:

- Opinions of the BMI measurement process, vending machine policy changes and other school policies.
- Stigmatization of their child related to BMI measurement and reporting.
- Knowledge, attitudes and beliefs about health risks associated with a child's weight status.
- Family physical activity and food intake.
- Intent to change family physical activity and dietary intake patterns.

Adolescent interviews covered topics such as:

- Perceptions of the BMI measurement process, including confidentiality.
- Teasing and stigmatization subsequent to BMI measurement and reporting.
- Physical and sedentary behavior in the past seven days.
- Dietary intake and dietary behavior (e.g., fast food meals, use of vending machines).
- Intention to change physical activity or dietary behaviors.

- Conducted telephone interviews with 22 key informants involved with the development, passage and implementation of Act 1220. Informants included members of the legislature, the Child Health Advisory Committee, the Arkansas Departments of Health and Education, and the state Board of Education.

  These interviews addressed topics such as:

  - Perceptions as to how Act 1220 was implemented.
  - Successes and challenges related to Act 1220.
  - Views on school nutrition standards and strategies for implementation.

The Follow Ups (School Years Starting 2004, 2005 and 2006)

During the school years starting 2004, 2005 and 2006, College of Public Health staff:

- Reviewed selected records of committees and governmental bodies related to the passage and/or implementation of Act 1220.
- Visited 52 schools (in school year starting 2004), randomly selected from schools that indicated on the baseline survey that there was a vending machine on campus, to determine consistency between interview and survey reports and placement and contents of machines.

- Annually surveyed by mail all public school principals and superintendents. Response rates each year varied between 75 and 79 percent.
- Annually surveyed by telephone families, including adult and youth respondents. Each year approximately 2,200 adults and 400 adolescents were surveyed. Staff from Southern Research Group conducted the family interviews.
- Annually interviewed by telephone about 100 key informants, including:
  - Twenty superintendents.
  - Twenty principals.
  - Four to five school nurses.
  - Twenty members of school district wellness/health advisory committees.
  - Selected members of the Child Health Advisory Committee.
  - Selected legislators.

ACT 1220 EVALUATION FINDINGS

Researchers issued baseline findings and findings for years 2, 3 and 4 of the Act 1220 evaluation. Key findings from the baseline and year 4 reports are summarized below. See Appendix 3 for key findings from years 2 and 3.

Year 1 (Baseline) Evaluation Findings (School Year 2003–04)

College of Public Health staff reported year 1 (baseline) evaluation findings in a report entitled "Establishing a Baseline to Evaluate Act 1220 of 2003: An Act of the Arkansas General Assembly to Combat Childhood Obesity."

- **Fears about the confidentiality of the Child Health Reports mostly subsided over time.**
  - Nearly three-quarters of parents and adolescents surveyed were aware of plans to measure BMI at school.
  - Some 70 percent of parents and 63 percent of adolescents were comfortable getting a BMI report from the school. Only 20 percent of parents were very concerned about others finding out the BMI measurement.
- **Some 85 percent of Arkansas schools—elementary, middle and high—had vending machines, with 81 percent receiving $5,000 or less annually from vending machine sales.**
  - More than one-third (37 percent) of adolescents reported purchasing snacks or beverages from school vending machines at least twice each week.

- Some 90 percent of parents and 80 percent of adolescents supported changes to vending machine contents:
  - Almost half (49 percent) of parents and 20 percent of adolescents believed school vending machines should offer only healthy items.
  - Another 41 percent of parents and 60 percent of adolescents believed that vending machines should offer both healthy and less healthy items.

- **Parents frequently are unable to characterize their child's weight status accurately, especially when the child is overweight.**
  - Among parents whose children were overweight, 51 percent incorrectly perceived the child to be of normal weight.
  - Most parents (93 percent) of children with BMI percentiles in the normal to underweight categories correctly characterized their children's weight status.

- **School districts are adopting policies to include lifetime physical activities, such as walking or jogging, in physical education programs.**
  - Some 40 percent of superintendents reported such policies for elementary schools.
  - Some 52 percent reported such policies for middle and junior high schools.
  - Some 56 percent reported such policies for senior high schools.

- **School principals and district superintendents were almost unanimous in their agreement that there should be healthier nutrition standards for beverages and other items sold on school campuses outside of meal programs and the cafeteria service.**

Year 4 Evaluation Findings

College of Public Health staff reported year 4 (school year 2006–07) evaluation findings in a report entitled "Year Four Evaluation: Arkansas Act 1220 of 2003 to Combat Childhood Obesity." These findings incorporated data from all four years of the evaluation (through the 2006–07 school year) and fall into four categories.

1. Key Findings at the District Level

- **From year 1 to year 4, an increasing percentage of school districts adopted the following physical education/physical activity policies:**
  - Prohibiting use of physical activity as punishment for bad behavior in:
    - Physical education classes: from 24 percent to 39 percent.
    - Other classes: from 32 percent to 41 percent.

- Requiring that lifetime physical activities such as walking be included in the physical education program:
  - In elementary schools: from 39 percent to 56 percent.
  - In middle schools: from 52 percent to 63 percent.
  - In high schools: from 56 percent to 66 percent.
- Requiring regular measurement of student fitness levels: from 26 percent to 37 percent.
- Requiring that new physical education teachers are certified to teach that subject:
  - In elementary schools: from 69 percent to 86 percent.
  - In middle schools: from 87 percent to 91 percent.
  - In high schools: from 88 percent to 91 percent.

- **From year 1 to year 4, an increasing percentage of school districts adopted the following nutrition policies:**
  - Prohibiting "junk foods" (those providing calories mainly through fats or sugars and containing few vitamins or minerals) in:
    - Cafeteria lines: from 37 percent to 63 percent.
    - Vending machines: from 18 percent to 61 percent.
    - School stores: from 13 percent to 57 percent.
    - After-school programs: from 16 percent to 35 percent.
    - Student parties: from 2 percent to 28 percent.
  - Prohibiting or discouraging using food as a classroom reward: from 12 percent to 76 percent.
  - Requiring low-fat alternatives to whole milk: from 51 percent to 68 percent.

2. Key Findings at the School Level

- **From year 1 to year 4 there was a decline in the percentage of all schools—elementary, middle and high—with vending machines on campus, from 85 percent to 80 percent.** In districts with separate elementary schools, vending machines in elementary schools were available to staff but not to children.
  - In the first-year evaluation report, researchers determined that 100 percent of the elementary schools assessed had removed student access to vending machines—which is what the law required.

Other decreases during that same time:

- Beverage machines in cafeterias: from 13 percent of schools to 9 percent.
- Beverage machines in gymnasiums: from 30 percent of schools to 23 percent.
- Snack food machines in gymnasiums: from 11 percent of schools to 6 percent.
- Snack food machines in snack bars and school stores: from 14 percent of schools to 4 percent.

- **Where vending machines were available, hours of student access to them decreased significantly from year 1 to year 4:**
  - Access to beverage machines before school: from 28 percent of schools to 17 percent.
  - Access to beverage machines during lunch: from 43 percent of schools to 19 percent.
  - Access to snack machines before school: from 28 percent of schools to 14 percent.
  - Access to snack machines during lunch: from 45 percent of schools to 19 percent.
- **Food and beverages available in school vending machines were healthier in year 4 compared with year 1.** For example:
  - The percentage of vending machines offering chocolate candy decreased from 42 percent to 22 percent. The percentage offering cookies decreased from 47 percent to 31 percent.
  - School principals estimate that the percentage of healthier food and beverage options offered in school vending machines increased from 18 percent to 26 percent.

3. Key BMI Assessment Findings

- **Some level of concern and controversy surrounding student BMI assessment continued four years after the passage of Act 1220.** In year 4, 32 percent of school principals reported some difficulty with BMI assessment, most commonly: time taken from academic instruction and negative feedback from parents.
  - The percentage of schools reporting complaints about time used for the assessments increased from 4 percent in years 2 and 3 to 11 percent in year 4. According to researchers, this may have resulted from 2007 debates in the Arkansas General Assembly.
  - Some 7 percent of schools reported negative feedback from parents in year 4, a slight increase from the 6 percent of schools reporting in years 2 and 3.

- Only 2 percent of schools reported problems with the logistics of BMI measurement in year 4.

- **By year 4, BMI assessments did not appear to be a controversial issue for parents.**
  - Overall, 85 percent of principals had fewer than five parental contacts on the issue during the year. Only 5 percent reported 20 or more parental contacts.
  - While most parental contacts have been negative, positive parental contacts increased from 1 percent in year 1 to 7 percent in year 4.

- **"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."—from year 4 evaluation findings.
  - Some 68 percent of parents in year 4 said they were not concerned about confidentiality, compared with 72 percent in year 3 who said they were not concerned.
  - Some 58 percent of parents in year 4 said they were comfortable with the BMI reporting process, compared with 66 percent in year 3 who said they were comfortable.

- **Parents have become more aware of short- and long-term health problems associated with childhood obesity.** In year 4, parents were significantly more likely to mention asthma (12 percent) and diabetes (81 percent) as health problems for overweight children, than in year 1 (7 percent and 66 percent, respectively).

- **The percentage of parents who believe that middle and high schools should not have vending machines declined from 60 percent in year 1 to 56 percent in year 4.**

- **Year 4 marked the first time in the evaluation that parents were surveyed in detail about weight concerns expressed by their children.**
  - Some 19 percent of parents reported their child expressing concern about his/her weight during the past year.
  - Some 39 percent of these parents were not worried about their child's concern, but 58 percent were worried or very worried that their child was more concerned than he or she should be.
  - Some 62 percent of these parents said their children had not expressed such concern before BMI assessments began at school. According to researchers, this suggests "that Act 1220 has raised awareness of weight issues among students."

- **By year 4, parents reported modest changes in family eating patterns, particularly limiting consumption of chips, sodas and sweets:**
  - Some 83 percent said their family limited consumption of chips, sodas and sweets, compared with 76 percent in year 1 who said their family limited consumption of these items.
  - Some 57 percent said their younger children drank soda less often compared with 44 percent in year 1 who said their young children drank soda less often.

4. Key Findings from Students

- **Students significantly reduced their vending machine purchases in year 4 compared with year 1:**
  - Beverage machines: from 11.6 purchases per month to 7.2 purchases.
  - Food machines: from 10.3 purchases per month to 5.2 purchases.
- **Some 12 percent of students interviewed in year 4 reported teasing because of their weight, the same percentage as in year 1.**
- **Student reports of inappropriate dieting behaviors (such as fasting and taking diet pills) have remained stable over the four-year period, and are not significantly different from behaviors of students across the country.** These findings are from researchers' monitoring of the CDC-sponsored Youth Risk Behavior Survey for 2001 and 2005.
- **Some attitudes and behaviors differed between overweight students and students who were not overweight:**
  - Some 80 percent of overweight students expressed concern about their weight, compared with 60 percent of non-overweight students.
  - Some 46 percent of overweight students had started a diet in the past six months, compared with 19 percent of non-overweight students.
  - Some 87 percent of overweight students had increased their exercise over the past six months, compared with 66 percent of non-overweight students.
- **The percentage of students who said they participated in daily physical education classes decreased from 71 percent in year 1 to 41 percent in year 4.** The percentage who reported no physical education participation increased from 3 percent in year 1 to 46 percent in year 4. These drops in physical education are consistent with national trends.

THE PROGRAM: THE SECOND COMPONENT: ARKANSAS BMI DATABASE PROJECT

BMI Database Funding

During the 2003–04 school year, the Arkansas Department of Health and other sources provided funds to support activities related to collecting BMIs and establishing a centralized database. The Department of Health provided funds for BMI data collection in subsequent years. See Appendix 1 for a list of other funders.

RWJF funds did not support activities related to collecting the BMIs in the schools, although these activities are described below for context. RWJF funds enabled staff at ACHI to use BMI data to produce school, district and statewide reports and to conduct epidemiologic analyses of how BMI status affects health.

Preparations for Measuring Body Mass Indexes: The 2003–04 School Year

Concerned that measuring and recording student BMI would disrupt schools, violate student privacy and stigmatize overweight students, the Arkansas Departments of Education and Health asked staff at ACHI to create a process for measuring student BMI, starting in the 2003–04 academic year.

ACHI staff, working with school personnel, developed procedures to collect accurate and confidential BMI data from all public school students:

- Training school personnel to measure student weight and height.
- Handling communications with the general public, state officials and school personnel.
- Assuring that schools had accurate scales and stadiometers (tools to measure height).
- Maintaining a telephone help desk.
- Arranging for distribution and retrieval of measurement forms.
- Establishing procedures for confidential distribution of student BMI reports to parents.

Each school received a scale, a stadiometer and a video demonstrating the proper assessment protocol. Community nurses trained district and school nurses on the process.

ACHI staff also helped representatives of pediatric and family medicine specialties design continuing education materials to prepare physicians for communicating with parents about childhood obesity.

During the 2003–04 school year, ACHI staff:

- Developed, tested and disseminated a Child Health Report that gives parents accurate, comprehensible information about BMI by age. Samples are available online.
- Helped parents and community members understand the BMI measurement project and increase their awareness of childhood obesity, physical activity and interpretation of BMI assessments. Staff:
  - Added components to the ACHI website about the BMI initiative, and links to news and BMI reports, and created a section for school and community nurses.
  - Created a training video for schools and nurses.
  - Presented the initiative to groups such as the State Parent-Teachers Association, Superintendents Association, State School Board Association, Arkansas Dietetics Association, Arkansas School Nurses Association and others.
  - Spoke with representatives of local, national and international media outlets.
- Collaborated with:
  - The Arkansas Foundation for Medical Care (which can certify credits for continuing medical education) to prepare a protocol for physicians to assess children whose BMI screenings indicated they were underweight, at risk for overweight or overweight. Physicians can receive continuing medical education credit for completing education about the protocol.
  - The Arkansas chapter of the American Academy of Pediatrics, which mailed the protocol to all pediatricians in the state.
- Established a centralized BMI database to house BMI assessment results.
- Developed strategies to minimize negative effects of BMI assessments, such as stigmatizing overweight children. Strategies included:
  - Taking care with terminology to prevent negative labeling.
  - Providing immediate responses to school and parent inquiries.
  - Convening focus groups to hear concerns about the assessment process.
  - Soliciting regular feedback from child serving professionals.
  - Incorporating parental feedback into the Child Health Reports.
  - Developing procedures to keep BMI data confidential.

Implementing and Analyzing BMI Assessments: School Years Starting 2003, 2004, 2005 and 2006

Collecting BMIs

During year 1, or the 2003–04 school year, 93 percent of Arkansas public schools (1,058 of 1,135) submitted BMI forms on 421,973 students.

Some 61 percent of these students were absent that day or were no longer attending that school. Some 32 percent either refused to be assessed or had parents who refused. About 2 percent either had disabilities that precluded measurement or were pregnant. Some 5 percent could not be measured for a variety of other reasons.

Parents received the report that related to their child's BMI. Categories of BMI were based upon CDC recommendations for BMI for children by age and gender:

- Underweight: BMI-for-age less than 5th percentile.
- Normal weight: BMI-for-age between 5th and less than 85th percentile.
- At risk for overweight: BMI-for-age between 85th and less than 95th percentile.
- Overweight: BMI-for-age greater than or equal to 95th percentile.
- Unable to assess.

The Child Health Reports included:

- The child's BMI and a graphic comparing the BMI to all assessed children of the same age and gender.
- An explanation of BMI as a screening tool and a recommendation that parents visit their child's health care provider for additional assessment and information.
- The American Academy of Pediatrics guidelines for dealing with at risk for overweight or overweight children. See article in Pediatrics (August 2003) for an explanation of the guidelines.

By September 1, 2004, all parents/guardians had received their child's/children's relevant BMI report.

ACHI staff also generated reports for each school detailing the percent of children in each BMI category. The reports provided school data by gender and grade. School data were combined into district reports. School and district reports are available on the ACHI website.

To lower costs and improve efficiency, in 2005 ACHI contracted with the University of Arkansas Survey Research Center and a data-collection system design vendor to create a Web-based data entry process that captures student height and weight, calculates BMI

and generates the Child Health Report. As of the 2008–09 school year, ACHI will be using a new data entry system with a future vision of creating a comprehensive child health report to include results of all school-based health screenings.

School nurses from two districts pilot-tested the electronic data entry protocol in the 2004–05 school year. It was implemented in all school districts starting with the 2006–07 school year, although data entry procedures vary depending upon availability of equipment and technical savvy of staff.

Linking and Analyzing BMI and Medicaid Data

ACHI negotiated with the Arkansas Department of Human Services to link the BMI database and the state's Medicaid Claims database. The Arkansas Medicaid program for children is known as ARKids First.

During the 2004–05 school year this link resulted in a match of 247,101 students (more than half of all public school students) whose BMI had been assessed and who also received Medicaid. Using these results, ACHI developed a strategy for analyzing the cost and utilization of Medicaid services received by the matched students and correlating them with students' BMI assessments.

With this information, ACHI staff and other researchers are able to analyze the costs, health service utilization and diagnoses associated with child and adolescent obesity. These insights could lead to programmatic and preventive interventions for ARKids First beneficiaries who are overweight or at risk of overweight.

Managing Growth of the Database

By 2006, ACHI housed the world's largest database of child-specific BMIs with matching sociodemographic information (such as gender and race)—and the database has kept growing.

Demand for access to the database continues to escalate. ACHI staff planned two activities to respond to the growth of the database and make it easier for others to access.

First, staff began to establish a data management structure and data access protocol by:

- Convening an advisory committee to establish policies and procedures.
- Purchasing hardware and software to manage large amounts of information.

ACHI contracted with Metis Associates, Inc. (a New York-based research, evaluation and information technology consulting group) to:

- Review the staff and information technology resources involved in the BMI database.
- Recommend ways to build ACHI's capacity to develop and maintain a data center.

The Metis August 2007 report offered recommendations regarding:

- Data center hosting and staffing.
- Implementing and maintaining the database.
- Policies for managing the database, including policies regarding access to it.

In response to the Metis report, ACHI began to build capacity in its data management team and added two new staff members. ACHI also secured data sets from other state agencies and, as of June 2008, is investigating options for structuring the data center.

Second, ACHI staff planned to test ACHI's assessment model with other southern states to determine whether it could be replicated with similar results. This plan did not move forward for several reasons. See Challenges below.

Analyzing and Supporting the Development of Interventions to Prevent or Reduce Childhood Obesity

Under grant ID# 057821 (December 2006 to November 2009), ACHI staff is analyzing information from the BMI database to create a childhood obesity risk classification system. This system will identify and categorize risk factors, such as cardiovascular problems, for obesity.

To inform the risk classification system, researchers:

- Created a BMI National Advisory Panel of experts in childhood obesity and epidemiology. The panel provides guidance designing and implementing the analyses, reviewing study results and consulting with ACHI staff on dataset security and privacy. See Appendix 2 for a list of panel members.
- Analyzed four years of BMI data to characterize the level of childhood overweight in Arkansas in terms of demographic, economic, geographic and clinical factors.
- Analyzed data from the Medicaid match to evaluate the impact of overweight on the Medicaid system and to determine linkages between childhood overweight and diseases/diagnoses.
- In conjunction with colleagues at the University of Michigan:
  - Compared Arkansas data with national data to assess variation in BMI by age. Michigan researchers have compiled information from the nationally representative Medical Expenditure Panel Survey (MEPS).
  - Evaluated indicators of disease to link disease risks to children's BMI levels.

This project continues through November 2009.

CHALLENGES TO THE BMI DATABASE PROJECT

The Arkansas BMI Database Project faced challenges related to staff resources, equipment, media coverage, privacy regulations and replication.

Competition in the School Environment for Limited Time and Resources

According to Project Director Thompson, competition for time and resources in the schools was (and still is) the "the most significant challenge." Many recognize the risks presented by childhood obesity, but they are pressured by academic issues and requirements. As a result health is not as high a priority as those in the health field would like it to be. Thompson said, "My policy has been that when we want to do something in the schools it must be that all we ask of them is to say yes. You can't add a burden to the schools to do yet more things."

When ACHI took on the responsibility of developing and implementing a statewide BMI assessment strategy, ACHI staff worked closely with school and district personnel to help them work up to full implementation over a period of time.

Lack of Proper Equipment and Procedures

Schools did not have accurate scales or stadiometers. The American Diabetes Association provided funding for a scale for each school. Staff did not find stadiometers on the market durable enough to last a whole school year, so ACHI staff designed one and the Arkansas Department of Prisons manufactured them.

Scales have instructions for people being measured to face forward. In order to maintain confidentiality, however, the protocol required that students stand on the scale backwards, so they would not see the weight registered. Since no one would know his or her own weight, no one could ask another student about his/her weight. Project staff conducted a mini-research project to assure that the scale registered the same weight whether the student stood facing forward or backward.

Inaccurate Media Coverage

Media coverage was initially negative. Attention focused on the issuance of "fat report cards," an idea stemming from the act that mandated the reporting of BMI on report cards.

"There were communications challenges," noted Project Director Thompson. "Right after we announced this program, the Wall Street Journal did a front-page story about Arkansas grading students 'F for fat.' This was not true. This is not a grade, not on a report card. It is a risk-factor assessment. Some of this still continues."

ACHI staff addressed this challenge in two ways:

- They participated in radio and television interviews about the project, stressing that there would be child-specific, confidential Child Health Reports and not "report cards."
- During a 2004 special legislative session, staff worked with a legislator who did not originally support BMI assessments, to replace "report card" with "Child Health Report." ACHI staff reported this won them respect on the legislative front because it demonstrated willingness to protect legislative intent legislation and deliver more than the legislation called for.

Restrictive Federal Privacy Rules

Under federal HIPAA (Health Insurance Portability & Accountability Act of 1996, which established national standards to protect the privacy of personal health information), rules that took effect in 2003, ACHI had less access to Medicaid claims data.

ACHI and Department of Human Services staff had to develop a more rigorous protocol for exchanging information. ACHI's longstanding relationship with the Department of Human Services and other state agencies helped facilitate the process.

Unwillingness of Other States to Replicate the Arkansas Model

Other states were unwilling to test the BMI assessment model for several reasons:

- While some states were launching efforts to conduct BMI assessments, most were not far enough along to commit to trying the Arkansas BMI model.
- Some states were already executing plans that either explicitly determined that BMIs would not be collected, or that they would be, but another system was in place to do so.
- Negative press about the hazards of measuring children's weight and height at school had a chilling effect on state agencies' willingness to take a risk and conduct the assessments.
- The states did not want to retain the BMI information over time or report children's BMI to parents.
- Most states indicated that they did not have the resources—either in time or money—to be a pilot for replicating the BMI assessment model.

ACHI staff continues to refine the data entry training materials and make them as generic as possible for use in other states and regions. As of June 2008 ACHI was not actively engaged in partnerships with other states. Staff responds to inquiries about the model as they occur.

ARKANSAS BMI DATABASE PROJECT RESULTS

ACHI staff reported results each year in reports available online:

- Year 1: The Arkansas Assessment of Childhood and Adolescent Obesity.
- Year 2: The 2005 Arkansas Assessment of Childhood and Adolescent Obesity. Executive Summary.
- Year 3: The Arkansas Assessment of Childhood and Adolescent Obesity Tracking Progress: State Results Year 3 (Fall 2005–Spring 2006).
- Year 4: Assessment of Childhood and Adolescent Obesity in Arkansas Year Four (Fall 2006–Spring 2007).

The year 4 report includes the following summaries of results across all four years:

- **After three years, the percentage of students classified as overweight or at risk for overweight decreased from 38.1 percent during the first year to 37.6 percent during the third year.** In year 4 the percentage increased slightly to 37.8 percent.

Percentage	Year 1	Year 2	Year 3	Year 4
	2003–04	2004–05	2005–06	2006–07
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 Assessed	347,753	368,871	369,416	366,801

- **Childhood and adolescent obesity is a problem in every Arkansas school district, with all districts having at least 20 percent of students who were overweight or at risk of overweight.**

The year 3 report includes trends by gender, ethnicity and grade:

- **Males (38 percent) were slightly more likely to be overweight or at risk for overweight than females (37 percent).** Males were more often overweight or at risk for overweight during all years, with the greatest differences in high school.
- **Hispanics (46 percent) were more likely to be overweight or at risk for overweight than whites (36 percent) or African Americans (41 percent).**
- **Hispanic males (at 50 percent overweight or at risk for overweight) and African-American females (at 44 percent) had the highest risk for obesity.**
- **The percentage of overweight or at risk of overweight students increased through elementary school and peaked during middle school, when at least 40**

percent of students fell into these categories. The rates then declined through high school to 34 percent in 12th grade.

COMMUNICATIONS

Act 1220 Evaluation

College of Public Health staff has published four annual evaluation reports, beginning with a baseline report of data from 2004 (published in 2005), through a year 4 report of 2007 data (published in 2008). All four annual reports are available on the college's website.

Staff presented year 3 findings to the Arkansas General Assembly and distributed 5,000 copies of the report (*Year Three Evaluation: Arkansas Act 1220 of 2003 to Combat Childhood Obesity*) online and by mail to legislators, principals, superintendents, school nurses, food service personnel, local school wellness committees, Arkansas state agencies and other interested parties in the state and the country.

Staff wrote three articles published in peer-reviewed journals and made presentations at national meetings, including the American Public Health Association annual meetings and the American Statistical Association Section on Health Policy Statistics.

See the Bibliography for details about publications from both the BMI Database Project and the Act 1220 Evaluation.

Arkansas BMI Database Project

As of June 2008, ACHI has published four annual reports summarizing BMI assessment data and distributed them to legislators, media and various health organizations. These reports are also available on the project's website.

Findings were the centerpiece of three news conferences: one local media conference, a statewide audio/video news conference and a national audio news conference.

ACHI has also published a training manual used by school nurses to facilitate the use of the BMI Web-based data entry system (Available online).

In June 2004, Joseph Thompson, M.D., BMI Initiative director presented preliminary findings of the first year of BMI assessment at the Time/ABC News Summit on Obesity. Approximately 400 health experts, food industry executives, government officials, members of the media and others attended the summit. Sponsored by RWJF (see Program Results on ID# 051122), the summit highlighted the issue of obesity in the United States and discussed interventions.

As a result of Thompson's presentation, many state and federal policy-makers contacted BMI Initiative team members for information and guidance on replicating the Arkansas BMI process across the country.

ACHI staff wrote articles published in seven peer-reviewed and other journals. They also made presentations at national meetings such as the AcademyHealth Annual Research Meetings, American Public Health Association Annual Meeting and the Children's Health Forum, and at local and regional meetings. Project Director Thompson presented testimony to the Congressional Staff Briefing (House Majority and Senate) in September 2007.

Media coverage of the BMI Initiative includes:

- An article in Nation's Health and an Associated Press story included in print editions of the *Washington Post* and *USA Today* and online editions of the *New York Times, Los Angeles Times, TIME,* the *Economist,* CNN and nearly 70 other websites of newspapers, television news programs and news magazines.
- Wire service coverage by the Associated Press, Reuters and United Press International resulting in articles in nearly 80 leading U.S. print and online publications.
- News stories covering release of the annual reports in local and regional newspapers and on local and regional television stations. The Associated Press also covered the release of the year 4 annual report.
- An interview of Project Director Thompson by "60-Minutes" Australia.

CONCLUSIONS

Joseph Thompson, M.D., BMI Database project director, concluded (in a January 2008 interview) that the most important results of Act 1220 to that point were:

- "Most important, parents across Arkansas have been given a number representing their child's risk. We have doubled the parental awareness in the state."
- "At the state level, we have halted the progression of the childhood obesity epidemic."
- "At the national level, we look forward to contributing and learning with others what works and testing and tracking strategies to see what works."

James Raczynski, Ph.D., director of the Act 1220 Evaluation, offered the following conclusions in a January 2008 interview:

- "We have not found any evidence of adverse effects. In fact, weight-based teasing has gone down, as reported by kids and parents. There are no concerns, among kids and

parents, about the BMI itself. The initial concern about a possible increase in eating disorders and non-medically supervised diets has not happened. The percentage of underweight kids has stayed the same. Health care providers have not been overwhelmed by people coming in."

- "In general, there has been wide scale acceptance of BMI assessments. Many schools are going beyond the requirements of the act and implementing additional creative policies to impact childhood obesity."

SIGNIFICANCE TO THE FIELD

The Act 1220 Evaluation has produced findings about the effects of legislation addressing childhood obesity that are useful to other states considering similar programs. Because the annual evaluation reports were influential within Arkansas, RWJF has commissioned statewide evaluations of policies to prevent childhood obesity in five states—Delaware, Mississippi, New York, Texas and West Virginia. See Challenges for the Future for more information.

Arkansas was the first, and to date (October 2008), the only state to collect BMI data from all of its public school students. One result is the world's largest dataset of individual, child-specific BMIs with matched sociodemographic information—a dataset that continues to grow.

In October 2005, ACHI received an Innovation in Prevention Award from the secretary of the federal Department of Health and Human Services for the Arkansas BMI Assessment Project. The award highlights businesses and organizations that are leading efforts to promote healthy lifestyles in their communities.

RWJF leadership and senior staff, program leadership and others offered the following comments about the impact of the work in Arkansas:

RWJF staff observations

- RWJF President and CEO Risa Lavizzo-Mourey, M.D., M.B.A.: "This is an important window into the possible. We know we can change what happens in schools-not by being overly prescriptive, but by working with them. We can help families know when their kids are at risk and help them change the environment at home. There is a shift from looking at this only at home or on the individual level to how we can change the environment to help change behavior.

  "This program has given us confidence that the things we are focusing on can happen. It has given us encouragement that a state-based approach is important. So this program has buoyed us in thinking that this is an approach with real payoff."

- RWJF Special Adviser for Evaluation Laura C. Leviton, Ph.D.: "On a national level, [the work in Arkansas] has engendered a lot of support for similarly ambitious

programs [in other states]. This firmed up our belief that we could not just halt the epidemic but reverse it."

- RWJF Senior Program Officer Terry Bazzarre, Ph.D.: "The key result of the BMI Database Project is developing and implementing the system and demonstrating the value of the system to multiple stakeholders. This accomplishment should encourage more states and communities to invest in the monitoring and surveillance needed. Other states can learn from [the Arkansas experience] and will be more effective, as a result. There are lots of spin-offs [in other states] that may have arisen from the work in Arkansas.

  "In addition, BMI can help identify which counties/school districts have more severe problems in terms of the prevalence of obesity and show the characteristics and policies of districts that are showing progress in reducing obesity."

- RWJF Senior Communications Officer Kathryn Thomas: "Arkansas showed that its childhood obesity rates were not going up. The ripples out of Arkansas have really helped to focus attention on this epidemic and the potential to turn things around."

- RWJF Distinguished Fellow/Senior Scientist C. Tracy Orleans, Ph.D.: "The major accomplishment of this program is that it shows that a state and a state legislature can make important changes that affect childhood obesity. Arkansas has created a laboratory to demonstrate, with high quality data, what children are eating and what physical activity they are getting and what their BMI is."

Program staff observations

- Act 1220 Evaluation Project Director Raczynski: "This has gotten a lot of national attention. The academic community is very aware of a lot going on in Arkansas. There has been lots of national press and attention. This is an unusual evaluation of statewide policy since it will have gone on for so long [through 2012]. Very few policy evaluations go on for nine years."

Federal staff observations

- William Dietz, M.D., Ph.D., director of the Division of Nutrition and Physical Activity in the Center for Chronic Disease Prevention and Health Promotion at the CDC (as reported by RWJF's Leviton): "The Arkansas data are unique and important. The sheer number of cases made it possible to do much more detailed analysis by demographic characteristics and age. It caused the CDC to rethink some of its assumptions about risk for disease and the health benefits of bringing kids down from the 99th percentile to even the 98th percentile, because there is real clinical benefit. The linkage of the data to Medicaid utilization and cost was also impressive and an important motivator of policy change."

LESSONS LEARNED

1. **Build a year of planning into initiatives that involve school-based activities.** The Arkansas legislation required immediate implementation. If staff had had a year to plan the BMI assessment process, some problems would not have occurred or would have been addressed earlier. For example, ordering, manufacturing and distributing equipment would have gone more smoothly. Confusion among school personnel might have been avoided and concerned parents might have been enlisted as allies. (Project Director Thompson, BMI Database Project)

2. **Identify supporters "in the field" early in the planning.** For the BMI Database Project these included state educational cooperatives and the health department's community health nurses. These staff helped to resolve crises, but local problems might have been avoided if they had been on board. (Project Director Thompson, BMI Database Project)

3. **Establish a proactive communication strategy.** During the first year, ACHI was often in a defensive position relative to the media, with staff responding to media inquiries or media interpretation of events. In years 2 and 3, staff began to proactively engage the media by providing regular updates and information on initiative progress. (Project Director Thompson, BMI Database Project)

4. **Do not take shortcuts when designing and implementing a BMI assessment process.** "We have gone to the extreme in maintaining a protocol of accurate hardware, confidential reports, communication to parents and not to children, etc.," said BMI Database Project Director Joseph W. Thompson, M.D. "In other states that have taken a shortcut on one of these components, it has backfired. You must think through the process and take no shortcuts. If you do it right, you can get good outcomes."

5. **Engage staff with appropriate skills when designing and implementing a Web-based data entry system.** Particularly valuable to the BMI data entry system, according to Project Director Thompson, BMI Database Project, were:

   — A computer programmer who could "speak the language" and provide detailed specifications to ACHI's subcontractor.

   — A writer/editor with expertise in creating technical training materials.

   — A public health educator skilled in adult education, facilitation and training.

6. **Create protocols and systems in schools so that BMI assessment will be viewed in the same way as other annual school-based health screens.** Over time, local resistance to BMI screening has subsided in Arkansas and the screenings have become part of the annual health screening routine. (Project Director Thompson, BMI Database Project)

7. **Maximize the use of technology in order to reduce time needed to conduct the BMI assessment.** When school staff was able to enter height and weight measurements electronically, they saved time and reduced errors. This also lessens the resistance of school personnel. (Project Director Thompson, BMI Database Project)

8. **Establish a detailed workplan with clearly designated deliverables.** This is essential to managing the data-collection process and ensuring data integrity. (Project Director, Thompson BMI Database Project)

9. **Take a multi-level team approach to bolster implementation success.** The school-to-ACHI team includes school nurses, community health nurses and school administrators. The internal ACHI team includes a programmer, data analyst, communication specialist, science writer and health educator. (Project Director Thompson, BMI Database Project)

10. **Be able to present data at different levels of detail, such as statewide, district and school, depending on your audience.** "We have the ability to re-frame the data at different political levels. This is valuable both for evaluating policy interventions and for maintaining political support," said Thompson.

11. **Take action on childhood obesity, even without as much scientific underpinning as one might like.** "Childhood obesity is slow burning," said Thompson. "The negative impact won't happen for years or decades, but kids' future health is in balance based on actions we take today. We have information that other states can learn from and we can be a learning laboratory for the nation."

12. **Maintain close relationships with key state agency officials and legislative committees in order to keep current with changes in legislation and other events that may impact school nutrition and physical activity.** For example, such relationships allowed College of Public Health staff to be aware of the additional 2007 legislation (see Challenges for the Future) that affected the original Act 1220 of 2003. (Evaluation Director James Raczynski, Ph.D., Act 1220 Evaluation)

13. **Consider the major concerns that people have about newly implemented policies and design an evaluation to address those concerns.** "We had about a full year after Act 1220 passed to see the issues playing out in the press (such as concerns about teasing, eating disorders, and so on)," said Evaluation Director Raczynski. "The principals and superintendents have used some issues to advocate for changes in this unfunded mandate [such as reducing the frequency of BMI data collection]. We had data to address the issues so we were able to get a compromise of doing the BMI collection every other year rather than not at all. The principals and superintendents couldn't rely on the arguments [about teasing, etc.] since we had data showing otherwise."

14. **Include qualitative data in the evaluation.** "The qualitative data [e.g., key informant interview data] were of great value," said Evaluation Director Raczynski.

"The qualitative data really enriched the quantitative data from the survey work and led to a bigger picture."

CHALLENGES FOR THE FUTURE

Legislative Challenges

During the legislative session starting January 2007, several bills were introduced to eliminate or cut back on the BMI measurement project. Two of these bills passed:

- Act 201 changed the BMI assessment schedule. Starting with the 2007–08 school year, students would receive BMI assessments in kindergarten and in even numbered grades. BMI measurements were eliminated for students in grades 11 and 12.
- Act 317 reduced the time required for physical activity and physical education programs in schools.

Evaluation Director Raczynski noted, "Overall, the biggest challenge has been legislative challenges to Act 1220, where people have tried to reverse some of the requirements of the act. For example, the requirement to collect BMIs every year has been backed off to collect them every other year. This was a result of the concerns of principals and superintendents about the time it took to do this, given that this was an unfunded mandate."

The BMI Database

As of June 2008, under grant ID# 057821, which runs through November 2009, ACHI staff was continuing to refine the Arkansas BMI database and to conduct analyses in support of a childhood obesity risk classification system.

During summer 2008, ACHI staff worked on a data collection model that assembles multiple health indicators into one comprehensive child health report with the aim of managing a student's entire school-related health record and allowing easy access to student BMI, immunization, hearing, vision, scoliosis and other data for school nurses and parents.

As of September 2008, according to new BMI data from Arkansas, the state continued to hold the line on the progression of the childhood obesity epidemic. Nearly 38 percent of Arkansas public schoolchildren were in the two heaviest weight categories (up slightly from 37.7 percent in year 4). Year 5 data show that 47 percent of Hispanic students and 41.5 percent of African-American students were in those risk groups, compared with 36 percent of white students. The data came from 99.2 percent of Arkansas public schools that participated in the statewide BMI assessments.

RWJF Continues Support

In August 2007, RWJF continued the Act 1220 Evaluation with a grant of $3,993,343 (grant ID# 061551) to the College of Public Health. This grant extends through July 2012. Under this grant, College of Public Health staff will continue evaluation activities that include key informant interviews, records reviews, principal and superintendent surveys, and telephone interviews of parents and adolescents. In addition, researchers will:

- Develop a culturally and linguistically adapted version of the parent and adolescent surveys in order to strengthen understanding of concerns, knowledge and behaviors in the high-risk and rapidly growing Hispanic population.
- Complete a series of about 130 case studies to understand school differences related to proportions of students who are at risk or overweight and short-term decreases in those proportions.
- Investigate challenges faced by schools in changing food service policies and practices.
- Provide technical assistance to school personnel, policy-makers and advocates throughout the country to support policy development at state and local levels and strengthen broader programmatic and evaluation efforts. Assistance will include:
  - Workshops for stakeholder groups (legislators, school personnel, PTA leaders).
  - Web-based resources.
  - On-site consultations.

Related RWJF Programs

In 2005, the West Virginia legislature passed House Bill 2816 to address childhood obesity, especially within school settings. In August 2007, RWJF awarded $1,499,997 (grant ID# 062079) to West Virginia University Research Corp. Researchers will assess the impact of the legislation and use findings to inform policies on childhood obesity in West Virginia and in other states considering similar legislation.

RWJF also funded a five-year evaluation of state policies in Delaware that may affect children's access to health foods and opportunities for physical activity. The evaluation focuses on policies in two settings: schools and child-care centers (grant ID# 062078).

Through an invited competition of evaluation proposals from 12 states, RWJF has funded four additional evaluations:

- In Texas, two evaluations, of the implementation of Safe Routes to School, and of the Texas Healthy WIC package (the nationally funded Women, Infants and Children's nutrition program).
- In New York, evaluation of the New York Healthy WIC package.
- An evaluation of Mississippi's state level school reforms around physical activity and nutrition.

RWJF launched the Robert Wood Johnson Foundation Center to Prevent Childhood Obesity in January 2009 as a national institution focused solely on the epidemic that threatens the country's children and adolescents—and on the actions needed to reverse it.

The center provides expertise and support to organizations, policy-makers and communities. It aims to help shape and coordinate these groups' efforts and build a nationwide movement to solve this critical health issue. It is based in Little Rock at the Arkansas Center for Health Improvement (ACHI), working in strategic partnership with PolicyLink of Oakland, Calif.

Specifically, the center's goals are to:

- Synthesize the science and best available evidence to ensure that obesity prevention policies and activities are built on what works.
- Educate policy-makers and advocates about which national, state, regional and local policies are most effective for preventing childhood obesity, with an emphasis on the needs of those communities most severely impacted by the epidemic.
- Develop capacity and leadership in the movement to prevent childhood obesity, in part by reaching out to other constituencies to expand the field.
- Advance effective communications strategies to increase public awareness and public will to turn the epidemic around.

The center is led by ACHI and its director, Thompson. ACHI will collaborate with PolicyLink, a research and action institute that advances economic and social equity. Under Founder and Chief Executive Angela Glover Blackwell, J.D., PolicyLink provides national leadership and advocacy to improve health and well-being in low-income communities and communities of color.

RWJF established the center with a $20-million commitment. RWJF has committed $500 million over five years toward its goal of reversing childhood obesity in the United States by 2015—a goal it believes can only be accomplished through action, advocacy and collaboration across the country.

Nearly one in three American youth—more than 23 million—is now obese or overweight, triple the rate in 1980. The sharp spike in prevalence is putting a generation at risk of serious health problems that could impair or even shorten their lives. Expert organizations such as the Institute of Medicine and Trust for America's Health have called for an integrated national response. The charge of the RWJF Center to Prevent Childhood Obesity Center is to galvanize, guide and support the work that will sustain that response and ensure the epidemic's reversal.

This report on *Information for Action* will be updated when the two-pronged initiative has closed.

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APPENDIX 1

Other Funders

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

Year 1 Funding

- Internal ACHI resources: protocol design and field testing ($150,922).
- Arkansas Department of Health: purchase of measurement equipment for schools ($350,000).
- American Diabetes Association ($75,000) and Arkansas Department of Human Services: printing and mailing of more than 425,000 copies of the Child Health Report prepared during year 1 of the program.
- Local schools and districts: in-kind resources to support the assessments.

Later Funding

The Arkansas Department of Health committed funding for implementation and data collection as follows:

- 2004–05: $332,000.
- 2005–06: $233,998.
- 2006–07: $178,491. This occurred after the Department of Health's merger with the Arkansas Department of Human Services. This funding thus came from the new Division of Health in the new Arkansas Department of Health and Human Services.

APPENDIX 2

BMI National Advisory Panel

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APPENDIX 3

Act 1220 Evaluation Results for Years 2 and 3

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

Year 2 Evaluation Results (School Year 2004–05)

College of Public Health staff reported year 2 evaluation findings in a report entitled "Year Two Evaluation: Arkansas Act 1220 of 2003 to Combat Childhood Obesity."

- **Parents and adolescents continued to be generally accepting of and comfortable with the measurement and reporting of BMI through the schools.**
  - Some 71 percent of parents said they were confident the BMI reports were confidential and 65 percent said they were comfortable receiving the report from the school.
  - Of the 71 percent of parents who remembered receiving the BMI report from the school, 95 percent had read at least part of it and 67 percent said it had been helpful in some way.
  - Some 61 percent of adolescents said they were comfortable with their parents receiving a report of their BMI. Researchers inferred that adolescents had a comfortable experience with measurement and reporting process the first year.

- Only 12 percent reported being embarrassed at all by the process.

- **No negative outcomes related to BMI measurement were found.**
  - According to parents and adolescents surveyed, teasing because of the student's weight did not increase after implementation of BMI measurement compared with before the policy began.
    - The percentage of parents reporting that their child had been teased due to his or her weight decreased from 14 percent before BMI measurement to 13 percent afterwards.
    - The percentage of adolescents who reported they had been teased due to their weight declined from 12 percent before BMI measurement to 9 percent afterwards.
    - Among overweight children there was no increase in teasing because of weight after BMI measurement.
  - Adolescents did not skip meals or snacks after the BMI policy began.
    - The percentage of parents reporting their child skipping meals or snacks was 9 percent after BMI measurement started and 8 percent before.
    - Many adolescents reported skipping meals (44 percent) or snacks (55 percent), but 90 percent of them reported reasons other than weight, such as "not having enough time to eat" or "not feeling hungry."
  - Adolescents did not increase their use of diet pills and/or herbal supplements after implementation of BMI measurement.
    - Less than 1 percent of parents reported that their child used these items both before the implementation of BMI measurement and after.
    - Some 6 percent of adolescents reported using diet pills and/or herbal supplements in the year before BMI measurement began; 5 percent reported doing so after implementation.

- **Schools have made voluntary changes to their nutritional environment, often as a result of input from local nutrition and physical activity committees.** For example, some schools:
  - Prohibit the use of food as a reward for student behavior or achievement.
  - Added more fruits and vegetables to cafeteria menus and removed deep fryers.
  - Increased the availability of low-fat and low-sugar beverages and snacks in vending machines, snack bars and school stores.

- **Parental awareness of overweight or risk of overweight in their child significantly and substantially improved after BMI screening was initiated and they received a letter about their child's weight status.**
  - After implementation of BMI measurement, 53 percent of parents correctly classified their overweight or at risk for overweight child compared with 40 percent who correctly classified their child at baseline.
  - Parents of younger children increased their accuracy from 35 percent at baseline to 42 percent after implementation, while parents of adolescents increased their accuracy from 49 to 56 percent.
  - African-American parents increased their accuracy from 30 percent at baseline to 44 percent after implementation. White parents increased their accuracy from 43 to 48 percent.
- **Neither parents nor adolescents reported changes in physical activity patterns after the implementation of BMI measurement.**
- **Parents, though not adolescents, reported some changes in family eating patterns:**
  - The percentage of families having a family meal together every evening increased from 27 percent at baseline to 46 percent after implementation.
  - The percentage of families trying to limit the amount of chips, soda or sweets consumed increased from 76 percent at baseline to 80 percent after implementation.
- **Adolescents reported changes in their frequency of vending machine purchases after implementation of BMI measurement.**
  - At baseline, 22 percent of adolescents reported never purchasing from beverage machines at school. This increased to 29 percent after implementation of BMI measurement.
  - The proportion of adolescents reporting daily beverage machine purchases declined from 18 percent at baseline to 11 after implementation.

Year 3 Evaluation Findings (School Year 2005–06)

College of Public Health staff reported year 3 evaluation findings in a report entitled "Year Three Evaluation: Arkansas Act 1220 of 2003 to Combat Childhood Obesity."

- **School districts made changes to their nutrition and physical activity policies from baseline to year 3.** Examples include:
  - Some 30 percent of districts required recess for elementary students at baseline, compared with 42 percent that required recess during year 3.

- The percentage of districts prohibiting use of physical activity as a punishment in physical education classes increased from 25 percent at baseline to 39 percent in year 3 and in other classes from 32 percent to 44 percent.
- The percentage of districts prohibiting "junk foods" increased from baseline to year 3 as follows:
  - In vending machines: from 18 percent to 53 percent.
  - In school stores and/or snack bars: from 13 percent to 50 percent.
  - In after-school programs: from 16 percent to 30 percent.
  - At student parties: from 2 percent to 21 percent.

- **More than half (53 percent) of reporting schools indicated that they had made changes to nutrition during year 3.** These included:
  - Removing the sources of competitive foods (such as vending machines, snack bars, school stores, etc.): 21 percent.
  - Adding healthier options to vending machines: 18 percent.
  - Restricting the sale of particular food items: 14 percent.
- **The percentage of all schools—elementary, middle and high—with vending machines on campus decreased from 85 percent in year 1 to 80 percent in Year 3.** The percentage of students with access to vending machines after school decreased from 61 percent to 31 percent.
- **The food and beverage content of school vending machines became healthier.** For example:
  - The percentage of vending machines offering regular chips decreased from 46 percent in year 1 to 31 percent in year 3. The percentage of machines offering low-fat chips increased from 22 percent to 33 percent.
  - The percentage of vending machines offering sodas and other sweet beverages decreased from 49 percent in year 1 to 40 percent in year 3. The percentage of machines offering 100 percent fruit juice increased from 33 percent to 38 percent.
  - Survey responses suggest that there has not been a substantial decline in vending revenues as a result of included healthier items.
- **Schools were less likely to change physical activity policies than nutritional policies.** For example, there were no significant changes in:
  - Average length of a physical education class.

— The percentage of schools with certified physical education teachers teaching those classes. However, the percentage of schools requiring new physical education teachers to be certified increased from 87 percent to 92 percent.

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