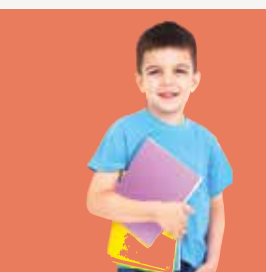




YEAR FOUR

Report



Assessing the Impact of the
Mississippi Healthy Students Act

SUMMARY OF ACTIVITY 2008-2013





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EXECUTIVE SUMMARY

This report summarizes the findings from a comprehensive set of studies conducted by researchers from three universities from 2008 through 2012 to assess the impact of the Mississippi Healthy Students Act on childhood obesity. The evaluation measures trends in childhood obesity rates and assesses the implementation of school health initiatives mandated by the Act. Because parents and the home environment can have a major influence on children's health, the project also includes a parent survey to examine changes occurring in the home and family. Data collected in 2006 from a survey of principals before implementation of the Act were also used.

This year's report also includes an analysis of data gathered through a study of fitness levels of a representative sample of public school students in physical education classes in grades 3 through 12. This research provides insight into differences in fitness levels by grade level, race, and gender for Mississippi students and provides a baseline from which future progress can be measured.

IMPLEMENTATION OF THE HEALTHY STUDENTS ACT

Considerable progress was seen immediately following passage of the Healthy Students Act in terms of implementation of the core components of the law, but data in later years indicated that progress slowed, and in some cases regressed. Schools were not appropriated additional resources to implement the Act, and budget constraints have been noted as limiting full implementation in several areas. Some of the places where the most progress has been documented have been those where additional funding was made available to schools, primarily through private and federal sources, such as special grants to purchase combination oven-steamers to replace fryers.

Nevertheless, significant progress has been made following policy changes. The Year Three Report noted major improvements from 2006 to 2010 as reported by principals in the percentage of schools implementing a local school wellness policy (78% to 97%), establishing a school health council (67% to 91%), conducting a self assessment (45% to 88%), providing health education to at least 75 percent of students (38% to 67%), and offering a physical education curriculum to at least 75 percent of students (57% to 77%). Most of these improvements occurred by 2008, and schools have been primarily in a maintenance mode since.

SCHOOL NUTRITION

Significant advances in school nutrition have been documented over the four years of research, particularly in removing fryers, serving whole grain foods daily, serving fresh fruit and vegetables, and reducing the fat content of milk. Researchers conducting on-site surveys of the nutrition environment of schools also noted high compliance with vending machine and competitive food regulations each year. Because many of these improvements are institutionalized through the State Department of Education and supported by the National School Lunch Program, continuing consistent statewide application of nutrition standards is likely. The recent reauthorization of the national Child Nutrition Act will further reinforce quality nutrition in the schools.

Areas that need extra effort and continuing oversight in order to reach full implementation are those that are not directly impacted by the National School Lunch and Breakfast Programs, such as use of food as a reward in the classroom, serving less healthy foods in school parties or at concession stands, selling food for fundraisers, and providing nutrition education to families. Training for food service staff and child nutrition program managers, which had declined significantly during Years Two and Three of the study period, likely due to budget restraints, showed improvements in Year Four, although not enough to return to Year One levels.

PHYSICAL EDUCATION

The Year Two Report outlined the close association between students' fitness levels and their academic performance and school attendance. Students with higher fitness levels (as measured by reaching more "Healthy Fitness Zones" on a battery of fitness tests) scored higher on math and language arts exams and were absent from school less often. The Year Three Report documented, however, that few improvements were made in the implementation of physical education after the initial gains noted immediately following passage of the Healthy Students Act.

The Mississippi Prevalence of Fitness Study summarized in this Year Four Report assessed the fitness levels of a representative sample of Mississippi public school students in grades 3 through 12 in physical education classes. To objectively assess physical fitness, PE teachers administered the Fitnessgram®, which measures six dimensions of health-related fitness. This study found that although a majority of students (55%) were able to reach a Healthy Fitness Zone in four or more areas, only 12 percent of students were able to achieve a Healthy Fitness Zone in all six areas. The percentage of students passing all fitness tests also declined in higher grade levels.

In light of the importance of physical fitness in regard to academic performance, the poor level of fitness demonstrated among Mississippi students, and the declining emphasis on physical education in the schools, it is essential for Mississippi policy-makers and school officials to place more attention on physical education in order for Mississippi children to realize health improvements envisioned in the passage of the Healthy Students Act.

SCHOOL HEALTH COUNCILS

The Healthy Students Act requires each school to establish a school health council, which must conduct an annual health needs assessment, regularly report to the school board, and make recommendations for modifications to the school's wellness policy. While 93 percent of schools have established a council, only 18 percent of schools meet all state requirements for its composition. The membership of the councils is dominated by principals and teachers. Fewer than half included representation from school food service staff, and only 19 percent included health professionals. Federal law requires each school district to have a school health council. Mississippi's law goes one step further in mandating that each school organize such a council. Given the lack of participation on school health councils by persons other than principals, teachers, school nurses, and parents, Mississippi policy-makers may want to consider reorganizing the structure. One option is to provide for a district council that would include greater outside participation by community members, superintendents, and school board members, as well as representation from each school.

PERCEPTIONS OF POLICY-MAKERS

In interviews with researchers, state legislators have consistently expressed concern with Mississippi's status as the most obese state in the nation and an understanding that childhood obesity is a serious problem that threatens the future of the state. Legislators express continued support for the Healthy Students Act and see a role for the Mississippi Legislature in promoting healthy lifestyles through state policy. Interviews in Year Four revealed some disagreement, however, in terms of what action on their part is necessary. A few respondents expressed wariness at dictating health-related lifestyle changes that they felt should be left up to individual choice.

Members of the State Board of Education and State Board of Health continue to express strong support for childhood obesity prevention through implementation of the Healthy Students Act. Education Board members emphasized the need for greater oversight, an assessment of best practices, engagement of multiple community sectors, and stronger partnerships with parents and families. Education Board members recognized the impact of competing priorities and suggested creative ways to heighten awareness of the importance of childhood obesity prevention.

Health Board members emphasized the need for stronger leadership and direction to ensure that the Healthy Students Act is carried out effectively and noted the need to start as early as possible in a child's life with efforts to prevent obesity. Year Four interviews indicated that board members also supported the use of local government funding to provide children access to places to play and exercise after school hours.

TRENDS IN PREVALENCE OF OVERWEIGHT AND OBESITY

As discussed in detail in the Year Three Report, the 2011 Child and Youth Prevalence of Obesity Survey (CAYPOS) documented changes in the weight status of Mississippi public school students that point to both positive and negative trends. In reviewing data from 2005 through 2011, researchers found a leveling off of obesity rates overall and significant declines in certain student groups, especially the combined prevalence of overweight and obesity for elementary age children, which dropped from 43.0 percent in 2005 to 37.3 percent in 2011. Significant decreases were also seen in the combined prevalence of overweight and obesity for white students, but not for black students, and disparities between white and black students appear to be increasing.

HOME ENVIRONMENT AND PARENT PERCEPTIONS

As noted in previous reports, parents often do not appear to recognize obesity in their children. This finding held true in Year Four as well. When public school parents were asked for their child's height and weight so that researchers could calculate the child's body mass index (BMI) and BMI percentile based on the child's gender and age, the percentage of children found to be overweight or obese did not differ much from the CAYPOS data. However, when asked to describe the weight status of their child, there was a considerable discrepancy between the parents' perception and reality. Even though more than 40 percent of public school children are overweight or obese, only 14 percent of parents would describe their child in this way. Health care providers do not appear to be getting the message to parents either. Although 95 percent of parents reported that their child had a regular healthcare provider, only 13 percent had been advised that the child was overweight, a consistent level over the four-year data collection period.

Over the four-year study period of tracking changes in nutrition and physical activity in the families of public school students, few significant trends have been found. While parents consistently report that they have been trying to eat healthier foods and increase physical activity, reported levels of healthy food consumption and exercise have not improved.

Nutrition knowledge also shows no improvement. In Year Four as in previous years, only one out of five parents correctly answering the question about how many servings of fruit and vegetables a person should eat each day. Approximately 40 percent of parents say that they never receive information from their child's school about ways their family can eat healthier foods. This finding is congruent with the trends noted by researchers interviewing food service staff about family nutrition education, a component of coordinated school health that is recommended, but not required, and has not been provided funding.

CONCLUSION

The research comprising this evaluation project documents transformative changes that have occurred in Mississippi public schools in terms of nutrition, health education, and physical education. Schools made the greatest leaps in health improvements in the first year or two following passage of the Mississippi Healthy Students Act, with implementation slowing in later years, and in some cases stalling. Nutrition standards have been institutionalized in the public school administrative system and are supported through funding and monitoring under the National School Lunch Program. Physical education requirements, however, can be more difficult to maintain under budget and time pressures. Given the research clearly outlining the close relationship between physical fitness and academic performance, as well as the study illustrating poor fitness levels of many of Mississippi students, support for and enforcement of comprehensive physical education must be a priority if Mississippi is to realize health improvements for the state's children. A renewed emphasis on the development of effective school health councils would help foster community support for coordinated school health initiatives. While it appears that Mississippi has realized significant positive impact from the Healthy Students Act, it is clear that further work is necessary to ensure that health improvements are realized by all students and to counteract decades of negative trends. Mississippi still lags far behind the rest of the nation, but continued commitment to childhood obesity prevention through coordinated school health is essential to helping the current generation of children grow to be fit and healthy adults.



INTRODUCTION

Mississippi has consistently ranked among the top states with the highest rates of children who are overweight or obese. Because of the significant consequences of obesity, including, but not limited to, higher risk of heart disease, high blood pressure, type 2 diabetes, stroke, and depression, this situation is of great concern.

In an effort to prevent further rise in the state's childhood obesity rates, the Mississippi Legislature in 2007 passed the Mississippi Healthy Students Act. The Act represents the core of an effort to improve nutrition, increase physical activity, and provide health education for public school students statewide. Focusing on the school, where children spend much of their time as they form lifelong habits, the Healthy Students Act also includes provisions for parental and community involvement through school health councils.

In 2008, the Robert Wood Johnson Foundation (RWJF) awarded the Center for Mississippi Health Policy (the Center) a five-year grant to assess the impact of the Healthy Students Act on childhood obesity in the state. The Center directs the evaluation project in collaboration with three Mississippi universities: The University of Southern Mississippi, Mississippi State University, and The University of Mississippi. The Center uses the RWJF grant in conjunction with funding from The Bower Foundation to provide for a comprehensive evaluation of the effectiveness of state policies aimed at preventing childhood obesity.

The evaluation period of this project spans 2008 - 2013. Data collected in 2006 from a survey of principals prior to implementation of the Act are also referenced. This document summarizes the key findings from the fourth year of the evaluation project (2011 - 2012) and notes trends identified through all years of data collection. Copies of the Year One, Year Two, and Year Three reports, as well as each of the individual studies, are available on the Center's web site at www.mshealthpolicy.com.

The National Survey of Children's Health and the Centers for Disease Control and Prevention's Youth Risk Behavior Survey (YRBS) have ranked Mississippi as having one of the highest rates of childhood obesity of all states.

The Child and Youth Prevalence of Obesity Survey (CAYPOS), conducted biennially by The University of Southern Mississippi, monitors the prevalence of obesity among public school children in Mississippi using height and weight measurements collected by school nurses. CAYPOS data provide further documentation of the high rates of obesity among Mississippi's youth.

Unlike CAYPOS, YRBS monitors the prevalence of obesity in youth nationwide through a school-based questionnaire completed by students. The survey is conducted by the Centers for Disease Control and Prevention (CDC) in collaboration with state and local education and health agencies. Data from at least two states, Mississippi and North Carolina, showed that middle school students who completed the questionnaire consistently underestimated their weight compared to actual measurements, leading the CDC to eliminate questions about height and weight from the middle school YRBS. The questions remain on the high school YRBS because of a higher correlation between students' self-reported data and actual measurements.

POLICIES RELATED TO THE HEALTHY STUDENTS ACT

- 2006** The Mississippi Legislature instructed the State Board of Education to develop a wellness curriculum and outline rules and regulations to be followed by school districts in implementing the curriculum. The legislature also mandated that the board define what products could be sold in vending machines on school campuses and when they could be sold.
- 2007** The State Board of Education began a two-year phase-in of newly developed rules and regulations defining the products that may be sold in vending machines on school campuses.
- The Mississippi Legislature enacted the Mississippi Healthy Students Act to address the state's high rates of childhood obesity by improving nutrition, physical activity, and health education in public schools. The Act's provisions:
- Mandate minimum requirements for health education and physical education;
 - Require local school wellness plans to promote increased physical activity, healthy eating habits, and abstinence from tobacco and illegal drugs;
 - Require a physical activity coordinator at the State Department of Education;
 - Make local school health councils mandatory rather than optional;
 - Direct the State Board of Education to adopt regulations that address healthy food and beverage choices, marketing of healthy food choices to students and staff, healthy food preparation, food preparation ingredients and products, minimum and maximum time allotments for lunch and breakfast periods, the availability of extra food items during lunch and breakfast periods, and methods to increase participation in the Child Nutrition School Breakfast and Lunch Programs; and
 - Specify the appointment of a committee to advise the State Board of Education in developing these regulations.
- 2008** The State Board of Education adopted regulations defining nutrition standards along with physical education and health education requirements. All regulations were in effect as of the 2008-2009 school year.
- 2010** The Mississippi Legislature enacted HB 1078, which provides financial incentives to public schools that successfully participate in the HealthierUS School Challenge, and HB 1079, which requires comprehensive training for school food service personnel.
- The State Board of Education made several regulatory changes to be effective in the 2010-2011 school year:
- Clarified requirements for serving dark green and orange vegetables;
 - Required schools to submit a three-year plan to eliminate fried foods;
 - Increased whole grain products to at least one serving three days a week; and
 - Reduced milk fat content to 1%.

The Office of Healthy Schools in the State Department of Education has been working closely with local schools to implement the new policies through its coordinated school health program. Visit www.healthyschoolsms.org for more information.



identifying the trends

PARENT'S DESCRIPTION
OF CHILD'S WEIGHT*

2011
CAYPOS DATA

PARENT'S REPORT OF
CHILD'S HEIGHT/WEIGHT*

1%

24%

22%

OBESE

13%

19%

17%

OVERWEIGHT

79%

56%
HEALTHY WEIGHT

54%

7%

2%

8%

UNDERWEIGHT

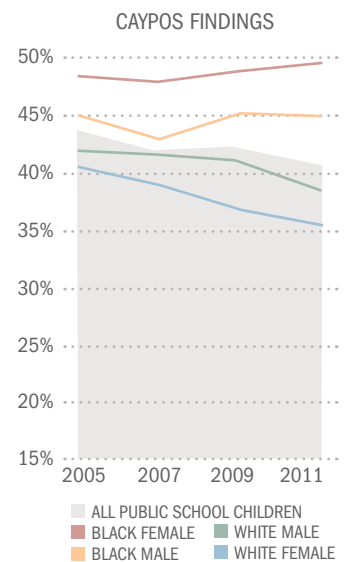
Obesity Prevalence: Progress & Misperceptions

In 2012, Mississippi was recognized for being one of a few places in the United States demonstrating a significant drop in the prevalence of overweight and obesity in children.¹ As highlighted in the Year Three Report, data from the Child and Youth Prevalence of Obesity Survey (CAYPOS) showed that the combined prevalence of overweight and obesity for elementary students in Mississippi dropped from 43.0 percent in 2005 to 37.3 percent in 2011. Overall prevalence rates for overweight and obesity in all public school students in Mississippi have declined from 43.9 percent in 2005 to 40.9 percent in 2011, a positive but not statistically significant development.

Despite some success in lowering childhood obesity rates, parents, as noted in previous reports, still do not appear to recognize obesity in their children. When public school parents were asked for their child's height and weight so that researchers could calculate the child's body mass index (BMI), the percentage of children found to be overweight or obese did not differ much from the CAYPOS data. However, when asked to describe the weight status of their child, there was a considerable discrepancy between the parents' perception and reality.

CAYPOS documented that 41 percent of public school children in Mississippi were either overweight or obese in 2011. Using the height and weight data provided by parents to calculate a BMI, researchers found that 39 percent of children would fit into one of the two categories. But only 14 percent of parents labeled their child overweight or obese. These rates and relationships have been consistent over the four-year project.

Although 95 percent of parents reported that their child had a regular healthcare provider, only 13 percent had been advised that the child was overweight. These proportions have remained steady of the four-year data collection period as well.

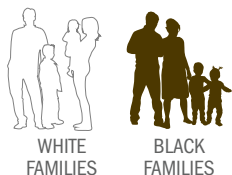


Data from the Child and Youth Prevalence of Obesity Study (CAYPOS) show that although the overweight and obesity rate of all public school children has leveled off since 2005, the racial disparities are increasing. Rates for all children are still high and need reduction.

For children and teens, Body Mass Index (BMI) is calculated from the child's weight and height and is age- and sex-specific (known as BMI-for-age). The BMI number is plotted on the CDC BMI-for-age growth charts to obtain a percentile ranking which determines the BMI-for-age weight status category:

UNDERWEIGHT
< 5th percentile
HEALTHY WEIGHT
5th percentile to < 85th percentile
OVERWEIGHT
85th percentile to < 95th percentile
OBESE
≥ 95th percentile

How many days in the past week were these foods served to your family?



4.46 **4.03**



* FRUIT

5.51 **4.59**



* VEGETABLES

3.31 **2.95**



* HIGH FAT FOODS

2.98 **3.47**



* 100% JUICE

6.03 **5.17**



* MILK

3.70 **2.66**



* SODAS

* comparisons that are statistically significant (p<0.001)

Parents have consistently expressed support for implementation of the Healthy Students Act. Ninety-three percent of parents supported state laws that require schools to offer only healthy foods to children and to increase physical education. When asked about the foods and beverages that should be offered to students in school vending machines, two-thirds of parents said that there should be only healthy items offered or there should be no vending machines at all.

RACIAL DISPARITIES NOTED

Although overall rates for overweight and obesity have leveled off among public school students and statistically significant declines were found among elementary students, trends also show that racial disparities are increasing. In 2011, the prevalence of overweight and obesity was significantly lower among white students than black students and significantly lower among white female students than black female students in all three grade categories.

A review of data from the 2012 parent survey shows statistically significant differences by race in the frequency of foods served to families. White families reported serving fruit, vegetables, high-fat foods, milk, and sodas more frequently. Black families reported serving juice more frequently.

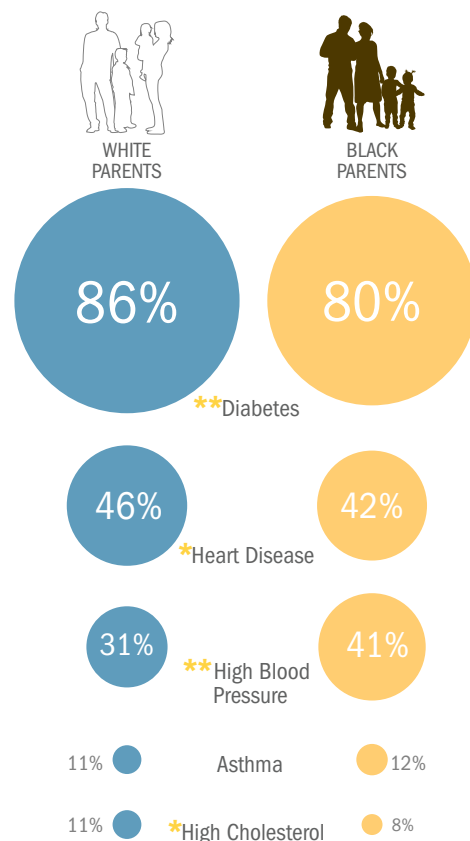


White parents reported sitting down to an evening meal together at a higher frequency (5.12 nights per week on average) than black families (4.70 nights per week) ($p < 0.001$). According to parent responses, black students spent significantly more time participating in electronic entertainment such as watching TV or playing video games and using a computer outside of school or work ($p < 0.001$), but the average amount of time spent physically active outside of school hours was not significantly different between the two groups.

White parents were more likely to recognize diabetes, heart disease, and high cholesterol as health problems associated with obesity, and black parents were more likely to note high blood pressure.

Black parents were significantly more likely to see their child's school as having a very important role to play in preventing childhood obesity (68.3% vs. 49.8%, $p < 0.001$), were more receptive to schools' collecting information on children's height and weight (86.8% vs. 75.8%, $p < 0.001$), and more likely to report that their child's school had a health council (28.8% vs. 13.3%, $p < 0.001$). Black parents were also significantly more likely than white parents to report that all three of the parent's closest friends were obese (22.5% vs. 16.8%, $p < 0.001$).

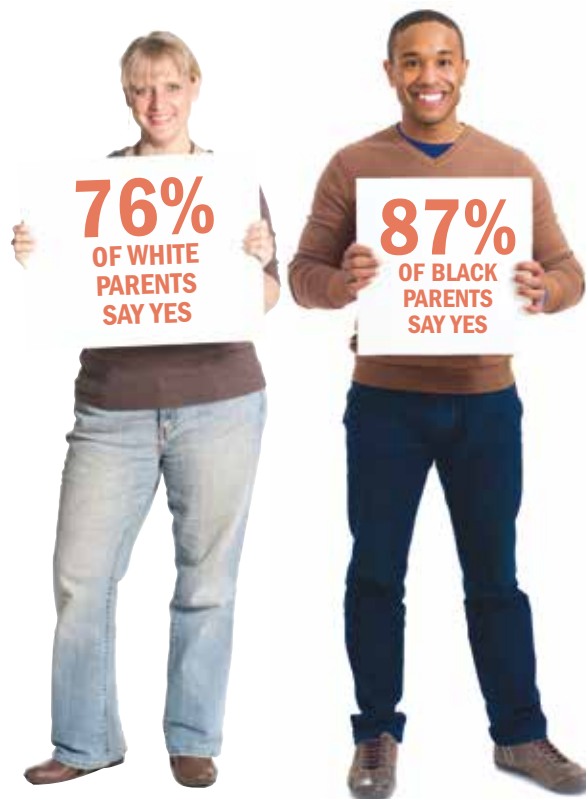
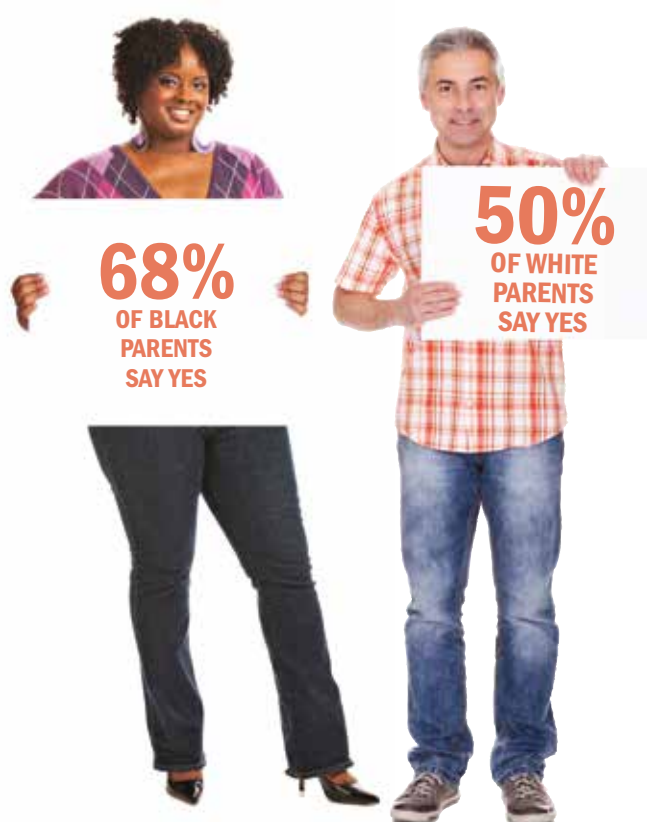
What health problems have you heard about happening to overweight children?



* comparisons that are statistically significant ($p < 0.05$)
 ** comparisons that are statistically significant ($p < 0.001$)

Does your child's school have a "very important" role to play in preventing childhood obesity?

Should the school collect information on your child's height and weight?



School Health Councils: More Participation Needed

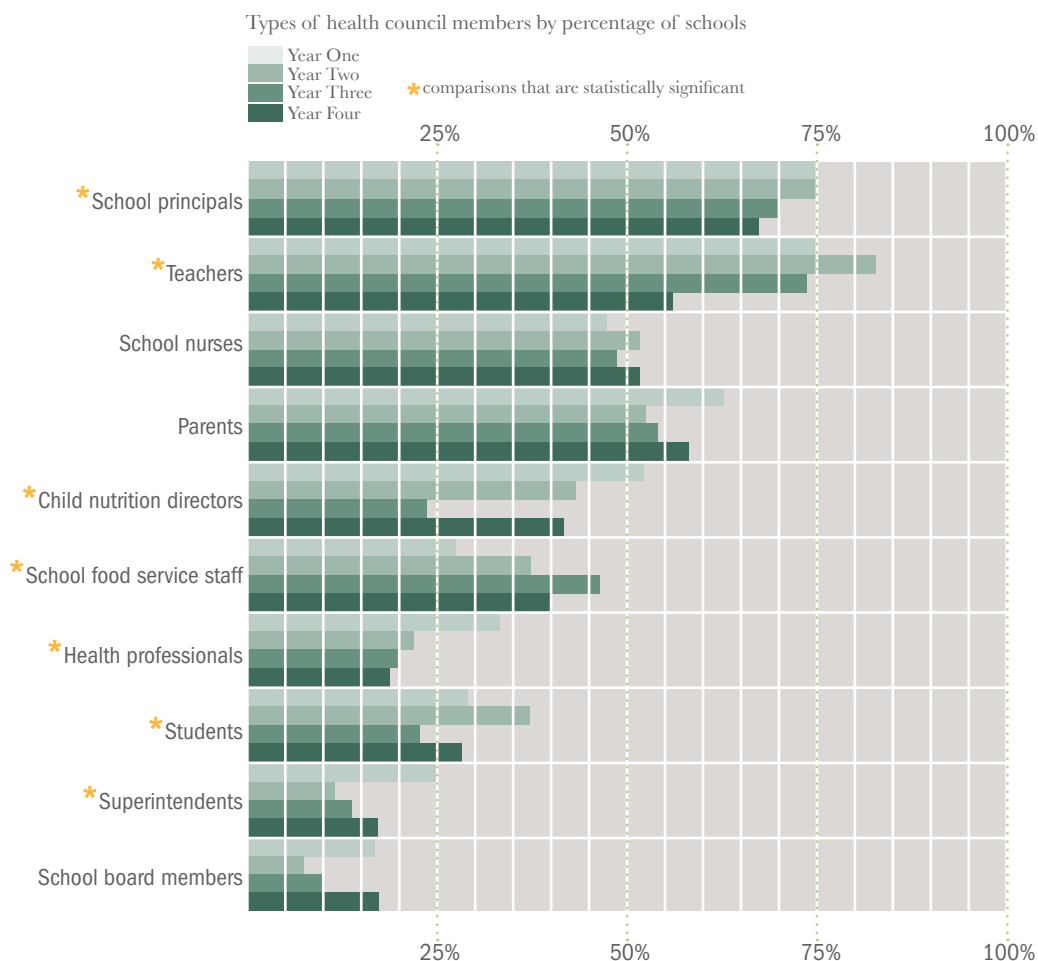
The law* requires each local school board to appoint the members of each school health council, which at a minimum must include at least one person from each of the following groups:

- Parents not employed by the school district
- Director of local school food services
- Public school teachers
- Public school administrators
- District students
- Health care professionals
- The business community
- Law enforcement
- Senior citizens
- Clergy
- Non-profit health organizations
- Faith-based organizations

*Section 37-13-134(8)(c) of the Mississippi Code of 1972, Annotated

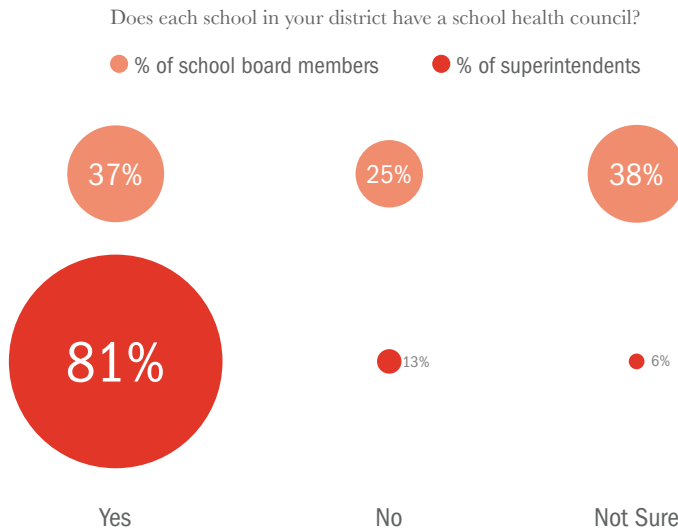
The Mississippi Healthy Students Act requires each school to have a school health council. State Department of Education operating guidelines for school health councils state that the group should meet a minimum of three times per school year and make at least one annual presentation to the local school board. Councils are to conduct a self-assessment annually, identify successes and weaknesses, and develop an improvement plan.

Researchers visiting a representative sample of public schools documented that while 92 percent of schools had a wellness committee or school health council, only 18 percent included representation from administration, faculty, staff, students, and parents. Both of these rates represent a statistically significant decline from 2009, when 96 percent had



a wellness committee and 22 percent included broad membership. High schools were more likely to have a school health council and to include representation from administration, faculty, staff, students, and parents.

The most predominant groups represented on the councils were principals and teachers, with more than two-thirds of the councils containing these education professionals. Parents and school nurses were included on half of the councils. School food service staff members were represented two out of five times. Health professionals, who in 2009 were on about one-third of councils, were included only 19 percent of the time in 2012. The least represented groups were district superintendents and school board members.



When asked if each school in the district had a school health council, approximately 13 percent of superintendents and 25 percent of school board members reported that they did not. In addition, more than one-third of school board members said that they did not know whether the schools had a school health council.

Only one-fifth of parents reported in 2012 that they were aware of whether their child's school has a school health council. This figure represents a statistically significant drop from 2009 when approximately one-quarter of parents were aware of the school health council. One out of 10 parents surveyed had attended a meeting of a school health council.



Past Four Years See Big Strides in Student Nutrition



Extra food items are defined as foods that may be purchased with a reimbursable school breakfast or lunch. Ninety-eight percent of schools limit these items to individually-packaged foods that do not exceed 200 calories, and limit additional meal servings to the size of a normal meal portion.

Competitive foods are defined as food items available to students through vending machines, student stores, snack bars, fundraisers, events, and parties. Sale of these items is prohibited on school campuses for one hour before the start of any meal period.

The Mississippi Healthy Students Act and associated regulations and policies set by the State Board of Education made significant changes in the foods and beverages available in schools. Evaluation data for 2009 through 2012 show particularly striking impact in a few key areas:

- Reduction in fried foods
- Shift from milk with higher fat content
- Increase in serving whole grain products

The percentage of schools serving no fried foods more than doubled from 18 percent in 2009 to 38 percent in 2012. By 2012, almost half of schools were no longer serving fried foods at lunch. Much of this shift was facilitated by grants from The Bower Foundation and the federal government that paid for schools to replace their fryers with combination oven-steamers.

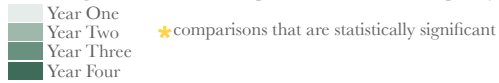
From 2009 to 2012, the percentage of schools with a working fryer dropped from 82 percent to 46 percent while the percentage of schools with at least one combi-oven rose from 31 percent to 44 percent.

In 2010, the State Board of Education modified regulations regarding the fat content of milk to limit the amount to one percent. Evaluation data document a major shift following this regulatory change where schools eliminated two percent milk, replacing it with primarily one percent milk.

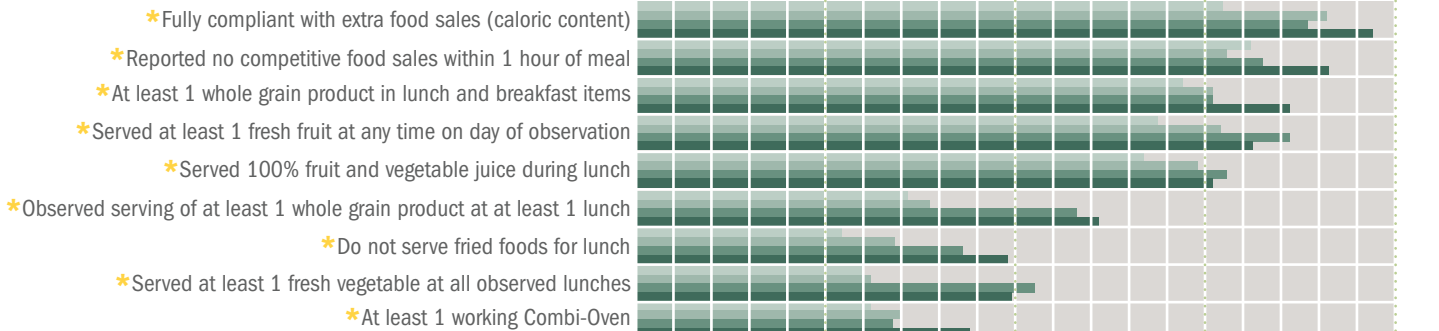
In that same year the State Board of Education also increased the amount of whole grain products required to be served in school cafeterias. Evaluation results point to a subsequent rise in the percentage of schools serving at least one whole grain product at lunch.



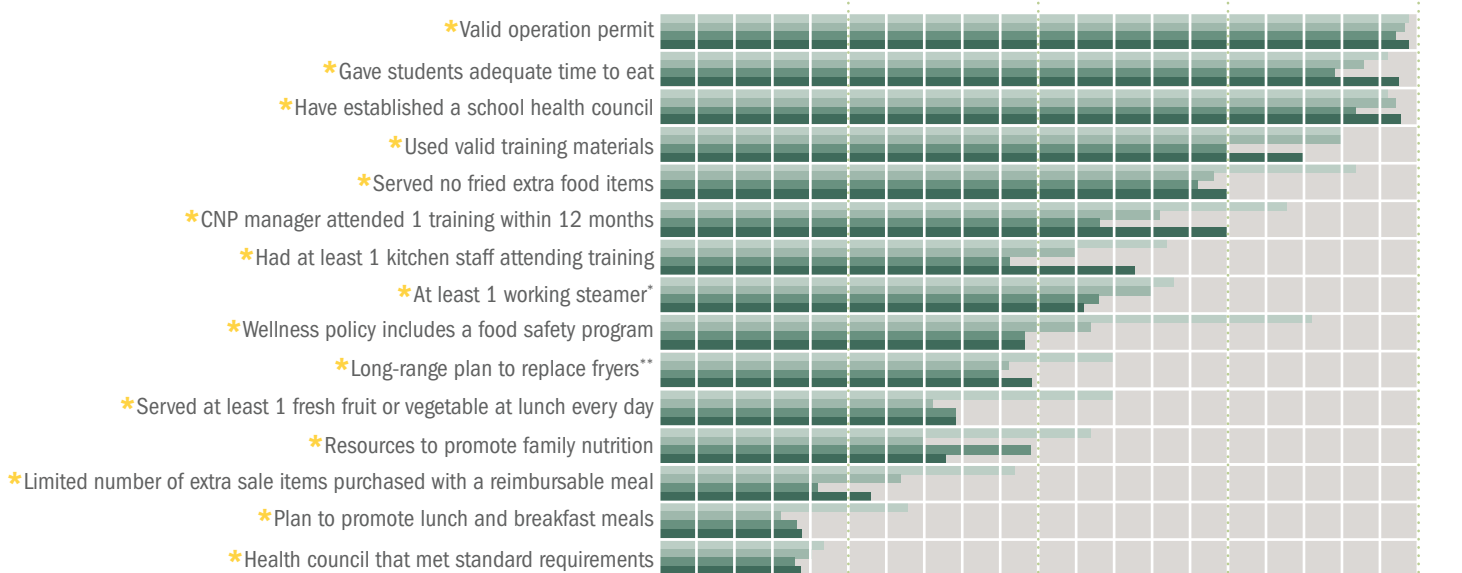
Percentage of schools in compliance with nutrition policy



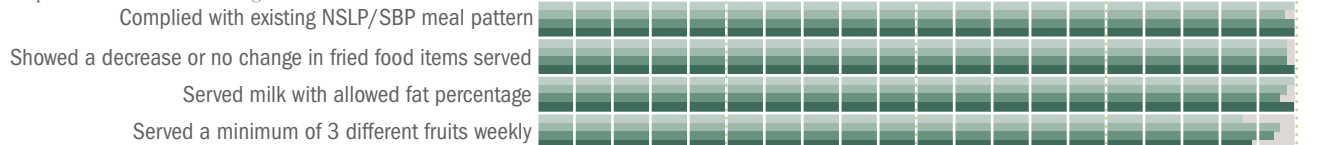
Components that showed statistically significant trends of increase in compliance rates over 4 years:



Components that showed statistically significant trends of decrease in compliance rates over 4 years:



Components that showed no statistically significant change, but compliance rates remained high:



Components that showed no statistically significant change, but compliance rates remained low:



*Trend possibly associated with replacement by combi-ovens

**Plan not needed for those who have eliminated fryers

***Lacks a uniform definition for what comprises dark green or orange vegetables or fruit

Fitness Assessment Shows Improvement Still Needed

Does your school conduct fitness testing?

● % of superintendents

● % of school board members

Yes

66%

29%

No

27%

27%

Don't know/
not sure

7%

44%

Research from Year Two of this evaluation demonstrated a strong relationship between physical fitness and academic performance. Findings from the Committed to Move study showed a direct correlation between the fitness level of students and their scores on math and language arts exams. There was also a negative correlation between fitness and absenteeism—students who could pass more fitness tests missed fewer days of school.

In 2012, researchers evaluated the fitness levels of a representative sample of public school students in grades 3 through 12 who were in PE classes. To objectively assess physical fitness, PE teachers administered the Fitnessgram®, which measures six dimensions of health-related fitness:

- Aerobic Capacity (pacer test or one-mile run or walk)
- Body Composition (BMI)
- Abdominal Strength (curl ups)
- Trunk Lift
- Upper Body Strength (push ups)
- Flexibility (sit & reach)

Each fitness component has a Healthy Fitness Zone, representing the minimal level of performance associated with good health or decreased risk. The overall fitness of a student was determined by the number of Healthy Fitness Zones achieved on the test battery, ranging from zero to six.

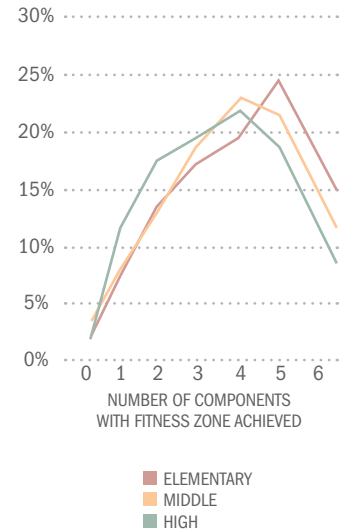
The highest percentage of students achieved a Healthy Fitness Zone in the Trunk Lift test (75.2%), followed by Abdominal Strength (60.6%), Flexibility (59.5%), Upper Body Strength (59.0%), Aerobic Capacity (55.7%), and Body Composition (54.6%). Similar statewide assessments were identified in only a few states – California, Georgia, Texas, and West Virginia. All of Mississippi's percentages are below those reported by these other states.



Although a majority of students (55.0%) were able to reach a Healthy Fitness Zone in four or more areas, only 12.0 percent of students were able to achieve a Healthy Fitness Zone in all six areas. Only 8.6 percent of high school students were able to pass all six fitness tests, and fewer than half could pass at least four tests. When assessed by gender, race, and grade levels, achievement of all six Healthy Fitness Zones was significantly higher among males and white students. There was no significant difference by grade level. As a general trend, fitness levels declined with higher grade levels.

The only component, however, for which there was a significant difference by race was Body Composition—measured by use of the Body Mass Index (BMI)—where 50.4 percent of black students reached a Healthy Fitness Zone compared to 59.3 percent of white students. When fitness levels were examined with BMI omitted—using the other five measures only—researchers found no significant differences by race. Achievement of all five Healthy Fitness Zones was still significantly higher among males than female students. Fitness levels for elementary students were significantly higher than older students when BMI was removed.

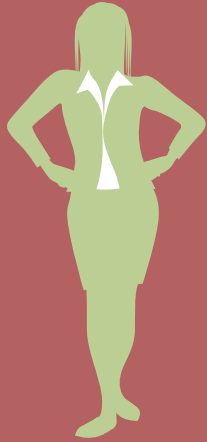
PERCENTAGE OF STUDENTS
ACHIEVING HEALTHY
FITNESS ZONES



PERCENTAGE OF STUDENTS
ACHIEVING HEALTHY
FITNESS ZONES

BODY COMPOSITION	54.6%
AEROBIC CAPACITY	55.7%
UPPER BODY STRENGTH	59.0%
FLEXIBILITY	59.5%
AB STRENGTH	60.6%
TRUNK LIFT	75.2%

**“WE [NEED TO] MAKE IT
A PRIORITY TO GET THE
WORD OUT [ABOUT]
HOW DANGEROUS
[OBESITY] IS.”**



“[Obesity] is creating all sorts of issues—from diabetes to all kinds of health issues—not only for the kids but for the adults, too.”

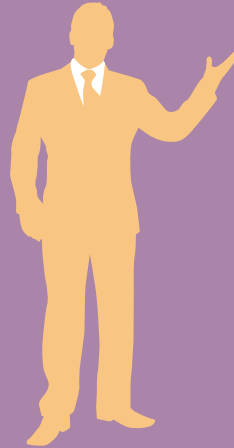
“I do worry that the spirit of the law is not met as much as the letter of the law.”



“It starts here. It ends here It should be our primary responsibility. If there is a problem out there that can be addressed by state government, then we should be addressing it.”

“I think [obesity is] the most important thing we could possibly work on throughout the entire state—not only children, but adults.”

“We are so creative as a state, and yet we won’t use our creativity with our children in this area. We need to begin to think outside the box a lot more, especially because we’re poor. We don’t have money to solve all our problems, so we need to be using our creativity.”



“If we don’t take care of it [obesity], then it’s just going to escalate, and so what we spend [on obesity-related health issues is not] anything compared to what we’re going to spend 10 or 15 years, 20 years out.”

“This also has a great link to economic development because if we don’t [prevent] obesity ... at the earliest possible level, we’re going to pay for this on the other end.”

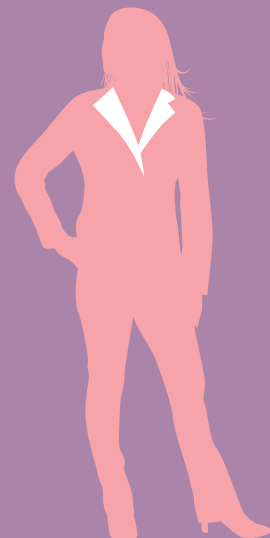
“Until we have coordinated, comprehensive, sequential, age-appropriate coordinated school health education funded and mandated, we will not likely have great success.”

“I think what the state is doing is really good ... I believe we’re on the right track ...”

“I think the entire community has a responsibility, and it should be a school-family-community involvement.”

“But [there] has to be more help to educate the parents ...”

“I was against the 2007 Act, and I was wrong for being against it.”



Policy-Makers & State Officials

MISSISSIPPI STATE LEGISLATURE

Legislators interviewed in 2012 were different from those interviewed in earlier years because of changes in leadership following 2011 elections. All legislators interviewed stated that they see a role for the Mississippi Legislature in promoting healthy lifestyles through state policy. Key themes emerged from the interviews:

RECOGNIZING THE ISSUE OF CHILDHOOD OBESITY:

As in previous years, legislators expressed the opinion that everyone generally understands that Mississippi has a serious childhood obesity issue and that the Mississippi Healthy Students Act is an important tool in the prevention of childhood obesity. They reported favorable reactions to the Act among constituents and increased activity in their districts related to the prevention of childhood obesity (such as healthier meals, increased physical education, and positive changes in the types of food available in schools). Legislators also noted some confusion over the Mississippi Healthy Students Act (with complaints about having to make changes without corresponding additional funds for new programming, as well as low-prioritization and noncompliance with requirements of the Act).

“[Obesity] is creating all sorts of issues—from diabetes to all kinds of health issues—not only for the kids but for the adults, too.”

“If we don’t take care of it [obesity], then it’s just going to escalate, and so what we spend [on obesity-related health issues is not] anything compared to what we’re going to spend 10 or 15 years, 20 years out.”

DISAGREEMENT ABOUT THE BEST PATH TO TAKE IN ORDER TO ADDRESS CHILDHOOD OBESITY:

In Year Four, unlike previous years, some respondents expressed wariness of dictating health related lifestyle changes that they felt should be left up to individual choice, and for which individuals should take responsibility.

The Mississippi Board of Education is comprised of nine members appointed across various branches of government, including four at-large representatives, a teacher representative, an administrator-at-large representative, and one representative from each of the state’s three Supreme Court districts.

The Mississippi State Board of Health includes 11 members appointed by the governor for staggered six-year terms. The current board members include five physicians and two nurses, as well as representation from the academic and business communities.

Mississippi has six public health officers supervising a total of nine public health districts in a single, statewide public health system.

“There are some legislators who believe that it is the government’s role to make sure our children are being healthy, eating healthy, and choosing healthy lifestyles, and there are [other] legislators who believe that individuals have to make decisions for themselves.”

“It starts here. It ends here It should be our primary responsibility. If there is a problem out there that can be addressed by state government, then we should be addressing it.”

“I think anywhere that we can implement [the Act] without trampling upon the personal liberties of individuals, we should do that and it should mostly be from an encouragement and behavioral side incentive instead of a punitive type thing.”

“I was against the 2007 Act, and I was wrong for being against it. I thought kids would throw the food away instead of eating it. I just thought they would totally turn their nose up on it But now that I’ve seen [the Act] working, I’ve got a little more tolerable attitude towards it.”

SETTING A POSITIVE EXAMPLE:

Several legislators pointed to the positive role modeling they have tried to set for their constituents through personal participation in a fitness “boot camp.”

“Many legislators were actually getting up at five or six in the morning and working out We were able to stand in front of cameras and send the message out that we thought it was important and we were serving as role models.”

ARE WE DOING EVERYTHING POSSIBLE?

Legislators provided mixed responses on whether Mississippi has done enough to strengthen the school policies on nutrition, health education and physical education. However, legislators gave a number of interesting ideas for policies to annually track the status of childhood obesity in Mississippi as well as lead to better outreach and more creative, out-of-the-box thinking to address Mississippi’s childhood obesity issue. Legislators offered policy ideas to reach children outside of the school setting, such as initiatives to raise community awareness in venues where children and families gather (such as churches), more positive reinforcement of health messages learned at school carrying over to afterschool programs, detailed information for parents about nutrition and physical activity within daycares and afterschool programs, and initiatives to implement health education services targeting expectant parents.

“It’s a team effort. I think whether it’s the church, or ... the school system, whether it’s fraternal organizations, sororities, all of those groups should have that commitment to try and do something to basically improve the health and well-being of Mississippians.”

“We are so creative as a state, and yet we won’t use our creativity with our children in this area. We need to begin to think outside the box a lot more, especially because we’re poor. We don’t have money to solve all our problems, so we need to be using our creativity.”

MEMBERS OF THE MISSISSIPPI STATE BOARD OF EDUCATION

Of the nine state Board of Education members, six agreed to complete an interview in 2012.

There were six key themes identified by these board members:

UNDERSTANDING THE COMPLEXITIES OF PREVENTING CHILDHOOD OBESITY:

When asked to rate the importance of childhood obesity prevention for Mississippi, all members of the State Board of Education gave the issue the highest score of “most important.”

A CALL FOR STRONGER OVERSIGHT AND EVALUATION OF THE HEALTHY STUDENTS ACT:

Board members felt that regulations and minimum standards are needed to ensure all school districts adhere to statutory requirements and support an evaluation to determine activities and programs that are working. An assessment of best practices would serve to better understand what needs to be replicated or changed.

“I think we’re doing some good things, some great things. We need to ensure that what we’re trying to do is put into effect—test it and see. But I don’t know if we’re going to be able to say we’re doing enough until we see results.”

“I think it’s an incredibly important piece of legislation. I just hope those of us ... responsible for making policies for the state that ... affect our children [will] start to value the policy itself and make sure it’s adhered to.”

THE NEED FOR ENGAGING MULTIPLE COMMUNITY SECTORS:

Local community members, child care centers, churches, and civic organizations need to be engaged in childhood obesity prevention. Examples include community-based health education and promotion programs, Joint Use Agreements between schools and communities, and use of county extension offices to serve parents of young children.

“I think it has to be some type of civic clubs and maybe ... county extension offices that reach mothers and what have you. But [there] has to be more help to educate the parents.”

A CALL FOR STRONG SCHOOL-FAMILY-COMMUNITY PARTNERSHIPS:

Emphasis was placed on the critical role parents and families play in their children’s health and the need to educate parents about the dangers of childhood obesity. Practical actions

were suggested such as supporting parents' abilities to offer healthier food at home and educating parents and children to make healthier choices at home as well as in school. Some board members spoke of the need for a cultural shift in the types of food that Mississippians traditionally value and serve.

"I think the entire community has a responsibility, and it should be a school-family-community involvement."

COMPETING PRIORITIES:

Board of Education members described competing priorities related to childhood obesity at the state-level, school district-level, and among local schools. Members shared suggestions for new and creative ways to heighten awareness of the importance of childhood obesity prevention, such as launching a media blitz to support a childhood obesity prevention campaign similar to the smoke-free air campaigns of recent years. Responses in 2012 reflected a keen sense of urgency among board members that coordinated and sustained public health initiatives are needed to heighten awareness of the serious short- and long-term consequences of the childhood obesity epidemic in the state and the nation.

"We [need to] make it a priority to get the word out [about] how dangerous [obesity] is, how many people are on kidney dialysis because of type 2 diabetes and overweight problems, and how it affects our health, how it affects our manpower in the state. If people are not able to work, how it's going to affect us so much in the future."

MEMBERS OF THE MISSISSIPPI STATE BOARD OF HEALTH

In 2012, 7 of the 11 members of the State Board of Health were interviewed.

Five key themes were identified by researchers:

UNDERSTANDING THE COMPLEXITIES OF PREVENTING CHILDHOOD OBESITY:

When asked to rate the importance of childhood obesity prevention for Mississippi, all members of the State Board of Health gave the issue the highest score of "most important."

"I think [obesity is] the most important thing we could possibly work on throughout the entire state—not only children, but adults."

"I think what the state is doing is really good I believe we're on the right track—we just need to really push it hard."

A NEED FOR STRONGER LEADERSHIP AND CLEARER DIRECTION:

Stronger leadership and direction is needed to ensure that the Act is carried out effectively. Also, understanding is needed on the part of those working for and with children (including parents), regarding their respective roles in fighting childhood obesity. Finally, the need for improved collaboration between agencies such as the Department of Health and Department of Education was highlighted.

“Until we have coordinated, comprehensive, sequential, age-appropriate coordinated school health education funded and mandated, we will not likely have great success.”

“I see some things that we can do together in partnership with the State Department of Education that will help us ... as it relates to the health of our children.”

A NEED FOR MANDATED TIME FOR PHYSICAL EDUCATION:

Board members’ recommendations ranged from 20 minutes to at least one class period, every day. A call by all board members for local funds to be used for the purpose of providing children access to places to run and play after school hours. This opinion is very different from the comments provided by State Board of Health members as reported in the Year Three Report where three out of five did not support the use of government funds for this purpose.

“I think the most important thing is the Department of Education putting back the physical education course in the schools and mandating that kids—even if you can’t afford the P.E. teachers—at least [be] allowed a minimum of 20 minutes a day ... to just walk around ... as a point of exercise, just doing something [physical] on a regular basis.”

EARLY INTERVENTION:

Board members suggested a strong need to start as early as possible with efforts to prevent childhood obesity. They advocated for teaching young children about making healthy food choices and the importance of exercise, so that they will develop healthy habits to last a lifetime.

“This also has a great link to economic development because if we don’t [prevent] obesity ... at the earliest possible level, we’re going to pay for this on the other end.”

MISSISSIPPI STATE DEPARTMENT OF HEALTH DISTRICT HEALTH OFFICERS

Six district health officers oversee the public health programs in Mississippi’s nine public health districts, and all six were interviewed in 2012. Although not a key theme, one noteworthy response called for a stronger and more meaningful role for children in implementing Healthy Students Act activities and initiatives, rather than leaving implementation activities solely in the

hands of school staff and administrators. The district health officer who offered this suggestion suggested an innovative example of putting menu planning in the hands of children by giving students a list of nutritious foods and the required dietary nutrients per meal, and then guiding them in developing their own menus that meet dietary guidelines. Key themes identified from the responses from the six district health officers interviewed in 2012 include the following:

CRITICAL ROLE OF PARENTS AND FAMILIES IN FIGHTING CHILDHOOD OBESITY:

Health officers recognize parents and families as critical participants in preventing childhood obesity and support training parents on how to cook nutritious foods to encourage children are eating healthy meals outside of the school setting. Health officers suggest conducting research on whether children's health education knowledge is being shared at home and if healthier menu options at school are influencing meals at home and resulting in healthier food choices outside of school settings.

"Is it [the Healthy Students Act] changing Mississippi's view on obesity? Are we addressing [obesity prevention] in the family or is it simply something that's just happening at school and not going home? ... Ultimately, the goal of this whole thing is to increase lifelong decreases in obesity with the result of a decrease in chronic illnesses that are related [to obesity]."

A RIPPLE EFFECT:

School health initiatives may be influencing services outside of public schools, such as the WIC (Women, Infants, and Children) Program and the healthier food now being offered in WIC meal packages.

"For our WIC clients [we're] mirroring what we're trying to do with the school legislation so [that] we've got plenty of fruits and veggies in the [WIC] meal package. And we've also added whole bread and eggs in addition to the fruits and veggies in the meal package We're starting early in getting them used to fruits and veggies, and portion size, food education. And so the two have helped [support] each other."

JOINT USE AGREEMENTS:

District health officers discussed the popularity of Joint Use Agreements between many Mississippi community groups and schools that allow community members to play and exercise on school playgrounds and outdoor tracks after school hours. This was the first year that this topic was mentioned so frequently, likely a result of the passage of House Bill 540 during the 2012 Regular Session of the State Legislature which facilitated shared use agreements with public schools.

“This joint use agreement will get a major boost with this legislation ... so we remove liability from the schools [and] open up the school grounds for public use The access to the buildings and school grounds should be facilitated, [and school liability] has been one of our hold-ups.”

ENERGIZING THE PUBLIC:

Health officers called for broader public involvement and support, and discussed the importance of securing buy-in from educators, the Department of Education, and all school districts, along with the need for statewide shifts in eating norms in Mississippi. One health officer pointed out that many children eat their first two meals of the day at school—five days a week—and offering more nutritious food options to children could instill lifelong habits of healthy eating that carry over from childhood to adulthood.

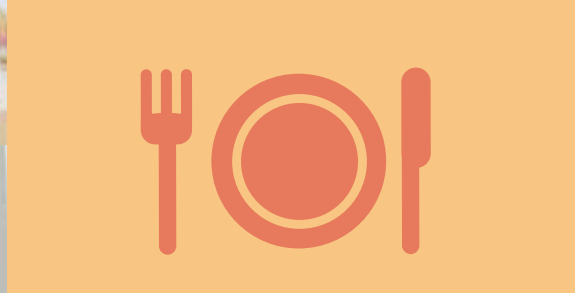
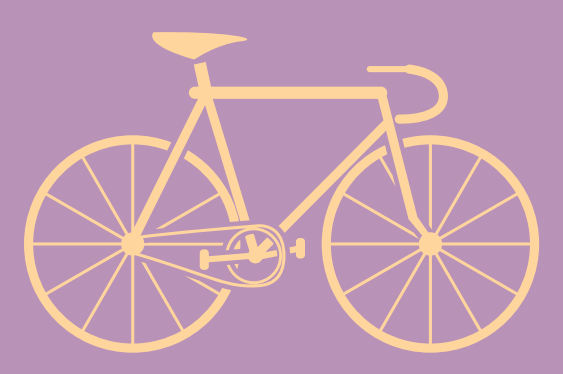
“I do worry that the spirit of the law is not met as much as the letter of the law. Sometimes flexibility is important. ... The nutritional component is enormous, and also the norms of eating. You know, a lot of people eat their first two meals at school and making normative behavior with the foods that people consume could set lifelong goals. So, I think making sure the nutritional standards are really spot on is an important component as well.”

LIMITED INVOLVEMENT:

Health officers reported limited involvement in assisting schools with their coordinated school health programs and called for opportunities for district- and local-level health staff to support schools in their quest to effectively meet Mississippi Healthy Students Act requirements.

“Other than just taking on individual initiatives, we don’t have a direct connect there between the school districts and [the] State Health Department.”

“We are on a few school councils, health councils with the school nurses, but they seldom meet and don’t get anything accomplished.”



The Family & Community

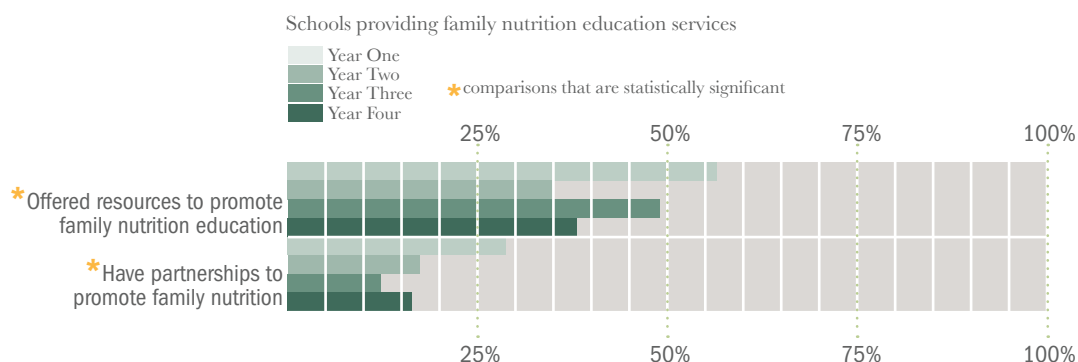
Over the four-year study period of tracking changes in nutrition and physical activity in the families of public school students, few significant trends have been found. While parents consistently report that they have been trying to eat healthier foods and increase physical activity, reported levels of healthy food consumption and exercise have not improved.

SCHOOL PROMOTION OF FAMILY NUTRITION DECLINES

Nutrition knowledge also shows no improvement, with only one out of five parents correctly answering the question about how many servings of fruit and vegetables a person should eat each day. Approximately 40 percent of parents say that they never receive information from their child's school about ways their family can eat healthier foods. This finding is congruent with the trends noted by researchers interviewing food service staff about family nutrition education. The percentage of schools that offered resources to promote family nutrition education dropped significantly from 57 percent in 2009 to 38 percent in 2012 ($p < 0.0001$). The percentage of schools with partnerships to promote family nutrition also declined significantly from 29 percent in 2009 to 16 percent in 2012 ($p < 0.0001$). Schools are encouraged to offer family nutrition education programs, but these activities are not required and additional resources are not provided to the schools for these efforts.



only
20%
of parents know
the correct amount
of fruits and
vegetables they
should consume
for good health





Mississippi adults have the lowest consumption of fruit and vegetables in the nation²

Parents were asked if they faced obstacles purchasing fresh fruit or vegetables, and 90 percent said “no.” Of the 10 percent who answered affirmatively, the most common obstacle identified was cost.

While little change was documented on the amount of physical activity in the family or among children outside of school, there was an improvement in the percentage of parents reporting that their child walked or rode a bicycle to school. After a statistically significant drop from 9.8 percent in 2009 to 7.4 percent in 2011, the rate rose in 2012 to 9.5 percent, back close to the 2009 level.

Forty-three percent of parents reported public school facilities were available for the community to use outside of regular school hours, and more than half of these parents said that they used them. The primary reasons provided for not using school facilities for physical activity were lack of time and transportation.

Over 70 percent of parents said there was a park nearby where their children could play, and over 80 percent of these parents reported their children played there. The main reasons given for not using a park were lack of time and safety issues.

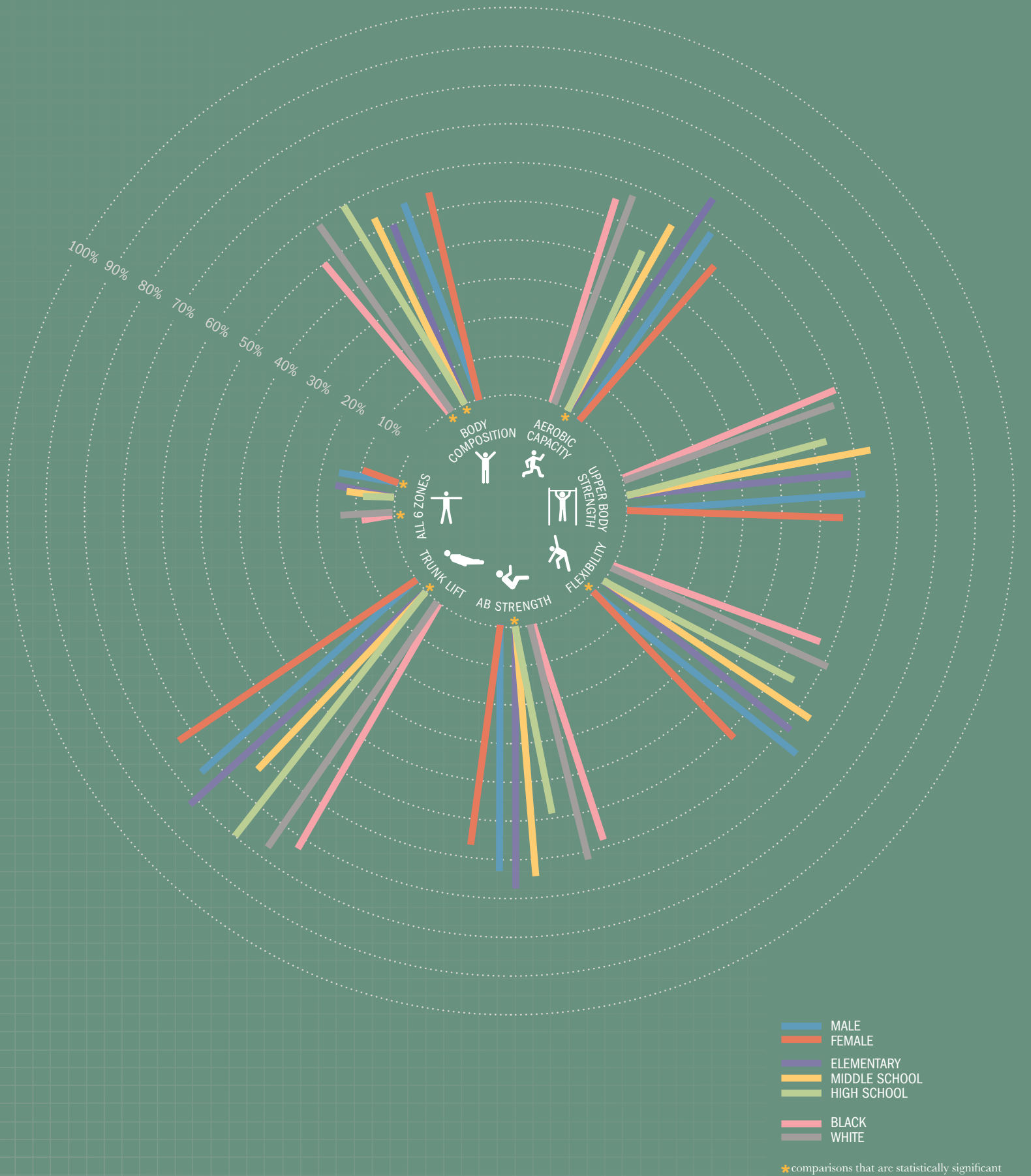




summarizing the findings



Percentage of students achieving the healthy fitness zones



Summary of Findings & Discussion

The passage of the Mississippi Healthy Students Act in 2007 precipitated major transformations in nutrition, health education, and physical education in the state's public schools. In 2008, the Robert Wood Johnson Foundation awarded the Center for Mississippi Health Policy a five-year grant to assess the impact of the Healthy Students Act on childhood obesity in the state. The Bower Foundation provided matching funds for the project.

The Center partnered with researchers from three Mississippi universities to conduct the evaluation: The University of Southern Mississippi, Mississippi State University, and the University of Mississippi. Their studies were comprehensive, examining child obesity trends, school environments and programs, parent perspectives, home environments, and policy-maker attitudes and opinions.

The University of Southern Mississippi had conducted a survey of principals in 2006, prior to the implementation of the Healthy Students Act. This survey provided baseline data from which progress could be measured. These data, along with the results from four years of research (from the fall of 2008 through the spring of 2012) by all three universities, provide much insight on the impact of the Healthy Students Act from multiple perspectives.

This year's report also includes an analysis of data gathered through a study of fitness levels of a representative sample of public school students in physical education classes in grades 3 through 12. This research provides insight into differences in fitness levels by grade level, race, and gender for Mississippi students and provides a baseline from which future progress can be measured.

IMPLEMENTATION OF THE HEALTHY STUDENTS ACT

Considerable progress was seen immediately following passage of the Healthy Students Act. Core components of the Act were quickly implemented, but data in later years indicated that progress slowed and in some cases regressed. Schools were not appropriated additional

resources to implement the Act, and budget constraints have also been noted as limiting full implementation in several areas. The most progress has been documented in those areas where additional funding, such as special grants to replace fryers with combination oven-steamers, was made available to schools.

SCHOOL NUTRITION

Over the four years of research, significant advances in school nutrition have been documented, particularly in removing fryers, serving whole grain foods daily, serving fresh fruit and vegetables, and reducing the fat content of milk. High compliance with vending machine and competitive food regulations have also been noted each year by researchers conducting on-site surveys. Because many of these improvements are institutionalized through the State Department of Education and supported by the National School Lunch Program, the continuation of consistent statewide application of nutrition standards is likely. The recent reauthorization of the national Child Nutrition Act will further reinforce quality nutrition in the schools.

Several areas need extra effort and continuing oversight in order to reach full implementation. Those areas, which are not directly impacted by the National School Lunch and Breakfast Programs, include the use of food as a reward in the classroom, serving less healthy foods in school parties or at concession stands, selling food for fundraisers, and providing nutrition education to families. Areas that declined over the study period include training for food service staff and child nutrition program managers. These declines are most likely due to budget restraints and may require renewed attention.

PHYSICAL EDUCATION

The Year Two Report outlined a close relationship between students' fitness levels and their academic performance and school attendance. Students with higher fitness levels scored higher on math and language arts exams and were absent from school less often. However, after the initial gains immediately following passage of the Healthy Students Act, few improvements were made in the implementation of physical education, as documented in the Year Three Report. The Mississippi Prevalence of Fitness Study summarized in this Year Four Report assessed the fitness levels of Mississippi public school students and found that although a majority of students (55.0%) were able to reach a Healthy Fitness Zone in four or more areas, only 12 percent of students were able to achieve a Healthy Fitness Zone in all six areas. The percentage of students passing all fitness tests also declined in higher grade levels. In light of the strong correlation between physical fitness and academic performance, the poor level of fitness demonstrated among Mississippi students, and the declining emphasis on physical education in the schools, Mississippi policy-makers and school officials need to place more attention on physical education in order for the Healthy Students Act to have the intended positive health impact on Mississippi children.

SCHOOL HEALTH COUNCILS

Federal law requires each school district to have a school health council. The Healthy Students Act goes one step further and requires each school to establish its own school health council. The duties of each council include conducting an annual health needs assessment, regularly reporting to the school board, and making recommendations for modifications to the school's wellness policy.

While 93 percent of schools have established a council, only 18 percent of schools meet all state requirements for its composition. Membership of the councils was dominated by principals and teachers. Fewer than half included representation from school food service staff. Only 19 percent included health professionals. School board members and superintendents participated on 17 percent of councils. The notable absence of school board members may explain why only a little more than one-third of them were aware of the existence of these councils.

Given the lack of participation on school health councils by persons other than principals, teachers, school nurses, and parents, Mississippi policy-makers may want to consider reorganizing the structure. One option is to provide for a district council that would include greater outside participation by community members, superintendents, and school board members, as well as representation from each school.

PERCEPTIONS OF POLICY-MAKERS

All four years of research showed that state legislators were concerned with Mississippi's status as the most obese state in the nation. They understood that childhood obesity is a serious problem that threatens the future of the state and they expressed continued support for the Healthy Students Act. Legislators saw a role for the Mississippi Legislature in promoting healthy lifestyles through state policy, however, interviews in Year Four revealed some disagreement in terms of what action on their part is necessary. A few legislators expressed wariness at dictating health-related lifestyle changes that they felt should be left up to individual choice.

Members of the State Board of Education and State Board of Health continue to express strong support for childhood obesity prevention through implementation of the Healthy Students Act. Education Board members emphasized the need for greater oversight, stronger partnerships with parents and families, engagement of multiple community sectors, and an assessment of best practices. Education Board members recognized the impact of competing priorities and suggested creative ways to increase awareness of the importance of childhood obesity prevention.

Health Board members emphasized the need for stronger leadership and direction to ensure that the Healthy Students Act is carried out effectively and noted the need to start as early as possible in a child's life with efforts to prevent obesity. Year Four interviews indicated that board members also supported the use of local government funding to provide children access to places to play and exercise after school hours.

TRENDS IN PREVALENCE OF OVERWEIGHT AND OBESITY

As discussed in detail in the Year Three Report, the 2011 Child and Youth Prevalence of Obesity Survey (CAYPOS) documented changes in the weight status of Mississippi public school students that point to positive and negative trends. In reviewing data from 2005 through 2011, researchers found an overall leveling off of obesity rates. Significant declines were seen in certain student groups, especially the combined prevalence of overweight and obesity for elementary age children, which dropped from 43.0 percent in 2005 to 37.3 percent in 2011. White students also saw significant decreases in the combined prevalence of overweight and obesity. Black students did not see a decrease. In fact, disparities between white and black students appear to be increasing.

CONCLUSION

The Healthy Students Act appears to have had transformative changes in Mississippi public schools, particularly in the areas of nutrition, health education, and physical education. Schools made the greatest leaps in health improvements in the first year or two following passage of the Act, although, in later years, implementation slowed and in some cases stalled. Nutrition standards have been institutionalized in the public school administrative system, and are supported through funding and monitoring under the National School Lunch Program. Physical education requirements, on the other hand, can be more difficult to maintain under budget and time pressures. However, given the research clearly outlining the close relationship between physical fitness and academic performance, and the poor fitness levels of many of Mississippi students, support for and enforcement of comprehensive physical education must be a priority if Mississippi is to realize health improvements for the state's children. A renewed emphasis on the development of effective school health councils would help foster community support for coordinated school health initiatives. The research comprising this evaluation project suggests that more work is needed to counteract decades of negative trends and ensure that health improvements are realized by all students. Mississippi still lags far behind the rest of the nation. A continued commitment to childhood obesity prevention through coordinated school health is essential to helping the current generation of children grow to be fit and healthy adults.

Highlights from Year One

The Year One Report presented results of initial data collection under this project. Overall, considerable progress was shown in implementing school wellness policies in response to the Mississippi Healthy Students Act. While most schools had formed local school wellness committees and school health councils, the need for more emphasis on the work of the councils, particularly in making required reports to school boards, was noted.

Middle schools led in implementing wellness policies, followed by high schools, then elementaries. Of 11 policy components, implementation was highest for food-safe schools, nutrition, and counseling/psychological/social services and lowest for staff wellness programs, healthy school environment marketing, and family/community involvement.

Statistically significant increases (2008 vs. 2006) were found in several nutrition policies:

- Percentage of schools with at least 75 percent of students receiving nutrition education (72.3% vs. 35.2%)
- Percentage serving at least three different fruits weekly (99.6% vs. 97.0%)
- Percentage serving whole grains (31.7% vs. 21.5%)

CDC surveys confirmed the improvements. In 2009, CDC recognized Mississippi as making the greatest strides of all surveyed states in removing unhealthy foods from its schools.

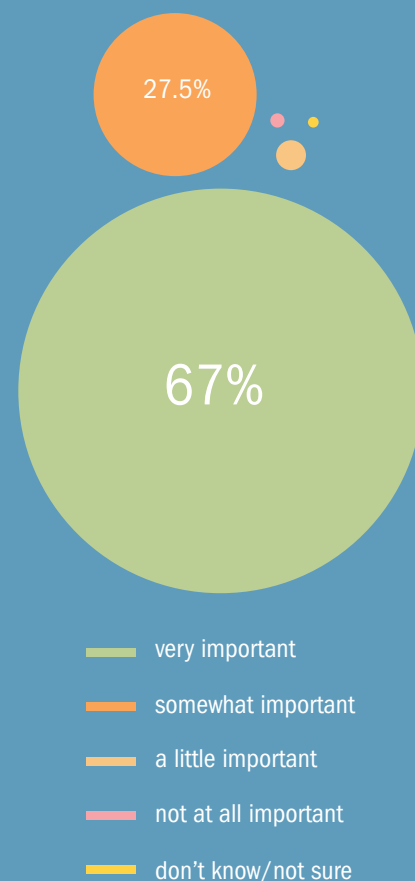
Also showing statistically significant increases were the percentages of schools reporting a physical education curriculum for at least 75 percent of students (84.2% vs. 57.1%), physical activity for at least 75 percent of physical education class time (73.8% vs. 64.1%), health education for at least 75 percent of students (75.9% vs. 38.4%), and at least 75 percent of health education taught by classroom teachers (61.1% vs. 38.2%).

Parents reported strong support for school policies requiring physical education and healthy eating but were not widely aware of specific changes at their child's school. Demonstrating keen understanding of the impact of childhood obesity on health and the economy, state and district policy-makers conveyed strong support for full implementation of the Healthy Students Act while recognizing the constraints schools face in fulfilling its requirements.

As statewide data suggested childhood obesity rates are leveling off, the gap between rates for white and nonwhite students showed a statistically significant increase for the first time.

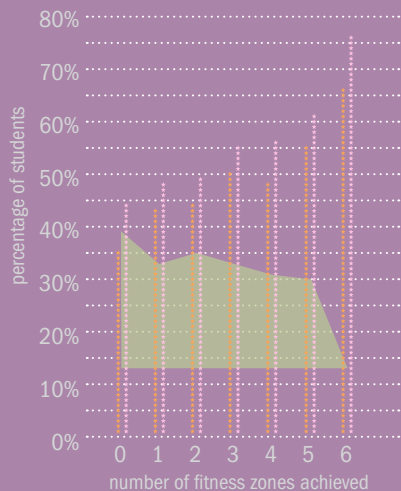
Question:
How important would you say is
the role of the school in trying to
prevent obesity?

PARENTS' RESPONSE



Highlights from Year Two

Impact of Fitness
on Academic Performance



- % of students with an absentee record in excess of 8 days
- % of high-achieving students in math
- % of high-achieving students in language arts

Percentages of students with high achievement on the Mississippi Curriculum Test Version 2 (made up of language arts and math tests) increased with the number of fitness tests passed.

For example, 44% of the students who passed no fitness tests had high math achievement, compared to 76% of students who passed all six fitness tests. Likewise, only 35% of students who passed no fitness tests were high language arts achievers, compared to 66% of those who passed all fitness tests.

The Year Two Report presented the results of continued data collected after the implementation of the Mississippi Healthy Schools Act. Results were generally positive, though mixed, with slow progress and regression in some areas that may have been a result of budget constraints and other challenges facing Mississippi's school districts.

Schools offered less training for child nutrition program managers and food service staff in Year Two, and there were reductions in the promotion of healthy eating and family nutrition education. There was also a significant drop in the percentage of schools offering at least one fresh fruit or vegetable all five days of the week, to 36 percent. However, schools improved other categories related to nutrition, showing significant progress in reducing the amounts of fried foods served during school meals, an increase in the amount of whole grains served from 72% to 76%, and improved compliance with restrictions on the kinds of foods and drinks that can be offered in addition to school meals.

In the home environment, little change occurred, and some of the change that did occur was not positive. There was a statistically significant increase in the number of days on which parents served their families sodas, from 3.0 to 3.6. Year Two also showed that parents fail to recognize obesity in their own children, with only 14 percent saying they would describe their child as overweight and a mere one percent saying they would describe their child as obese. This trend may be exacerbated by a lack of accurate communication from healthcare providers about a child's weight status, with only 13 percent of parents reporting their child's healthcare provider had told them their child weighed too much. Parents did express the desire to receive more information from schools about their child's health, such as body mass index evaluations.

Particularly revealing in Year Two were findings about the connection between physical fitness and academic performance. Research included in the Year Two Report demonstrated a direct correlation between the fitness level of students and their test scores in math and language arts. There was also a correlation between low levels of fitness and absenteeism—students who were fit in more study areas missed fewer days of school.

School health councils were shown to be in place at most schools, but few parents were aware of their existence. Between Years One and Two there was a drop in the percentage of schools with parents on their councils. The percentage of superintendents reporting that each school in their district had a health council dropped, possibly a result of a similar fall in the percentage of schools with superintendents serving on their councils.

Highlights from Year Three

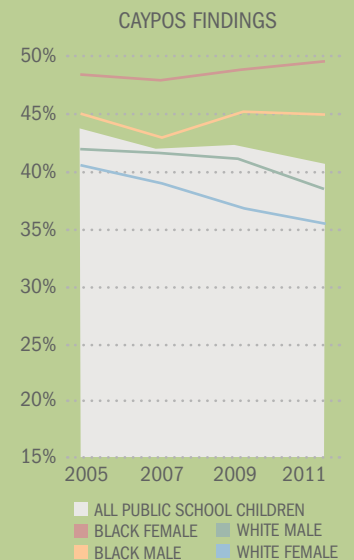
The Year Three Report presented results from the third year of data collection, highlighting findings of a statistically significant reduction in the combined prevalence of overweight and obesity among elementary students, a major shift in direction after decades of steady increases. Other obesity trends noted included a leveling off of childhood obesity rates overall and increases in racial disparities, particularly among female students.

Implementation of school wellness policies continued to progress, but at a slower pace, indicating that schools may be struggling to reach full implementation. A higher percentage of principals reported partial or full implementation of a school wellness policy, establishment of a school health council, and completion of the required self-assessment.

The trend for physical education indicated implementation may be stalling and in some cases regressing. Although 87 percent of principals reported full implementation of the minimum requirements for physical education and physical activity, two key measures related to the scope and intensity of physical education showed reductions. Similar trends were seen with health education.

Year Three found significant improvements in school nutrition, particularly with the percentage of schools that serve whole grain foods on a daily basis and that have eliminated fryers from their kitchens. Schools demonstrated success in adhering to new milk standards that allow only non-fat or one percent milk to be served, with 98 percent of schools found in compliance. The percentages of principals reporting that their schools serve raw vegetables and fruits daily also increased, and rates of serving a variety of fruits and vegetables remained high.

Consistent with previous reports, parent surveys found that little change had occurred in the home environment in terms of nutrition and physical activity. More than three-quarters of parents told surveyors that they were trying to change to healthier eating patterns, but when asked about specific foods and beverages served to the family, the pattern revealed was not a healthy one. The only statistically significant changes found were a decrease in vegetable consumption and an increase in sodas. Only 20 percent of parents responded with the correct answer regarding the amount of fruit and vegetables a person should eat daily.



Data from the Child and Youth Prevalence of Obesity Study (CAYPOS) show that although the overweight and obesity rate of all public school children has leveled off since 2005, the racial disparities are increasing. Rates for all children are still high and need reduction.

For children and teens, Body Mass Index (BMI) is calculated from the child's weight and height and is age- and sex-specific (known as BMI-for-age). The BMI number is plotted on the CDC BMI-for-age growth charts to obtain a percentile ranking which determines the BMI-for-age weight status category:

UNDERWEIGHT
< 5th percentile
HEALTHY WEIGHT
5th percentile to < 85th percentile
OVERWEIGHT
85th percentile to < 95th percentile
OBESE
≥ 95th percentile

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Methodology

All studies were approved by the respective university's Institutional Review Board.

MISSISSIPPI SCHOOL NUTRITION ENVIRONMENT EVALUATION DATA SYSTEM (MS NEEDS) (UM)

To gain an independent assessment of statewide progress in implementation of school nutrition policies, staff at the University of Mississippi conducted onsite assessments of the school nutrition environments in a statewide representative sample of public schools to evaluate the stage of implementation and level of compliance with Mississippi's established policies.

Study Design

A statewide sample of schools, 150 for the first year, 180 for year 2 and 156 for year 3 and year 4, was obtained using simple random sample. The weights based on school enrollment size and post-stratification were applied to the selected schools. The Mississippi School Nutrition Environment Evaluation Data System

(MS NEEDS) instrument was designed to assess the level of nutrition policy implementation at each school, provide a comparison between schools with different demographics, and through repeated measures, show nutrition-related environmental changes over time.

The MS NEEDS instrument was used to collect data through several methods: (1) observation of school lunches (Observation Form), (2) interviewing the Child Nutrition Program (CNP) manager (Interview Form), and (3) reviewing school and district written documentation of food policies and procedures (Written Documentation Form). In addition detailed information was collected about the food and beverage items available at school stores, vending machines, and extra food items (Competitive Food Venues Forms). Although the Healthy Students Act addresses school breakfast meals as well as lunch, only the lunch meals were observed. Where possible, data were collected about breakfast meals through the interview and written documents.

Evaluation Design

An evaluation protocol was developed to assess the adoption of the Mississippi Healthy Students Act in the schools' nutrition environment. The Act's criteria were divided into "Policy Points" that were used to measure schools' compliance with the Act. The evaluation was conducted through interviews, observations, and the manual gathering of information for the food and beverage venues within each school's child nutrition program and school grounds.

The mission of MS NEEDS was to help organize and better understand the following through meaningful indicators:

- The implementation status of the Act throughout schools in Mississippi
- Ways the Act has impacted changes in the MS school nutrition environment
- Barriers/challenges and successes to implementation of the Act

Subjects & Sampling

A total of 156 schools, 52 per school level (elementary, middle, and high school), were randomly selected to participate in year 4 of this study. Of those, 144 agreed to participate for interview (participation rate 92%), of which there are 5 multi-level schools: 2 elementary/middle schools, 1 elementary/high school, and 2 middle/high schools. According to the stratified random sampling design of the study, the elementary/middle school is used both in elementary school category and middle school category. Likewise the elementary/high school and middle/high schools are used in both respective school categories. This resulted in a final breakdown of 48 elementary schools, 50 middle schools, and 46 high schools for analyses.

Instruments

Interview Form—Each school's Child Nutrition Program (CNP) Manager provided information about nutrition-related policies adopted by the school and how those policies had been implemented to date. Verbal responses to both quantitative and open-ended qualitative questions, as well as data pulled from written documentation were recorded on the Interview Form. Written documentation provided by the CNP manager included the following: production records and lunch and breakfast menus from four full weeks in September, the school Wellness Policy, food safety policies, other school nutrition-related policy documents, and CNP staff training records. Most policy points of the Mississippi Healthy Students Act were covered on the Interview Form.

Observation Form—Data about schools' implementation of the Mississippi Healthy Students Act was collected on a single day through observation. Data recorded on the Observation Form primarily documented evidence of a school's compliance within the kitchen and cafeteria settings as observed during the lunch periods. Example

indicators include the following: the types of fruits, vegetables, and beverages served at lunches; whether whole grain and "0 trans fat" foods were sold; if and how competitive foods were sold; evidence of CNP staff using written documentation for HACCP food safety plans; and ratings of the general atmosphere in terms of promoting healthier food options. Detailed information about specific food items sold were recorded on accompanying forms, the Reimbursable Meal, Vending, and Extra Food Items Foods forms, all of which were incorporated into the Observation protocol.

Reimbursable Meal Form—Data collectors documented the specific food and beverage items sold as part of the reimbursable lunch meal on the observation day. For each item they recorded a brief description, whether it was available only with the meal or if extra portions were for sale, whether the item was part of the original menu or was a substitution, and whether substitutions were reanalyzed for nutrients. In addition, if extra servings of the item were available after purchasing the meal, data collectors noted the price of the extra serving and its size in comparison to the portion served with the meal.

Extra Food Items Foods Form—Data were also collected on foods and beverages sold as extra food items during lunch periods. Data collectors recorded a description of each item, whether an item was available for sale without having purchased a meal, the item's price, and either the number of calories or enough information to determine caloric content at a later date.

Vending/School Store Form—A form was completed for each vending machine and/or school store in the school. First, data collectors documented general information about the machine or store itself including hours of operation, location, group responsible for the machine or store, and if a machine was in the faculty lounge, and whether or not students had access. Then item specific details were noted, such as manufacturer, product name, flavor, size, number of slots (vending machines only), and price.

Procedures for Data Collection

The evaluation tool was pilot tested for clarity and validity in a local elementary and high school (which were omitted from the study) resulting in some revisions. Ten consultants (data collectors) with nutrition and/or educational backgrounds were recruited to collect data in the schools using the MS NEEDS evaluation tool. Each of the data collectors was trained in two schools before evaluating a school alone.

The program coordinator was responsible for arranging school visits through communication with the CNP district director and the data collector assigned to the school. Once arrangements were made to visit the school, a document with all the requested written documentation was faxed or e-mailed to the CNP district director.

The written documents were requested to be at the school when the data collector met with the CNP manager.

Upon arrival at the school, data collectors began the evaluation process by meeting with and interviewing the CNP manager. The interview took approximately 60-90 minutes. Once the interview was completed, data collectors used their time to gather data on the competitive food venues such as vending machines and/or school stores. The observation evaluation was conducted during the lunch periods to observe the reimbursable meal and extra food item sales.

The evaluation took approximately five to six hours. Upon completion of the evaluation, data collectors mailed or delivered the evaluation document to the program coordinator. Once the evaluation tool was received, it was reviewed for quality assurance. Any missing data or data that were unclear were investigated by the program coordinator with assistance from the data collector who evaluated the school. Once data were reviewed and validated, they were entered into the MS NEEDS database program. Upon completion of data entry for all 144 participating schools, the data were forwarded to the statistician collaborator for data analysis.

Analyses

Basic descriptive statistics are presented in this report. Proportions and frequencies are presented for all schools and by school level – elementary, middle, and high school. For variables that have missing values, valid percentages are reported. One-way analysis of variance (ANOVA) or Chi-Square test was used, as appropriate, to determine if any significant differences existed between school levels on the various outcomes.

SURVEY OF PUBLIC SCHOOL SUPERINTENDENTS (MSU)

The survey was conducted by the Wolfgang Frese Survey Research Laboratory at the Social Science Research Center, Mississippi State University. Contact with 145 Mississippi public school district superintendents was made via telephone. Forty of the school superintendents were unable to schedule an interview during the data collection period in June, 2012. There were 105 superintendents who completed the survey for a response rate of 72%. Since this was not a random sample, margin of error should not be considered. The data from this survey represent a census of the entire population of Mississippi school superintendents.

SURVEY OF SCHOOL BOARD MEMBERS (MSU)

Researchers sent surveys to school board members in packets containing multiple copies of the survey (enough for each school board member), along with a self-addressed, stamped envelope to return the

completed surveys to the SSRC research team.

The survey packets for school board members were mailed to the attention of the superintendent of each Mississippi public school district, with a cover letter requesting that the superintendent encourage each school board member to individually complete the survey during one of their regularly scheduled school board meetings, and then return the completed surveys in the enclosed self-addressed and stamped envelope. In an attempt to generate higher participation from school board members, researchers also offered an incentive. For school districts who achieved a 100% response rate from their school board members, the school district name was placed in a drawing for a chance to win an “interactive white board/Smart Board” for their school district. Because the response rate was lower than expected, researchers called school districts in April 2012 to remind them to complete and send the forms, and encouraged them to seek 100% participation in order to be eligible for the interactive white board. School boards were asked to complete and return the surveys prior to their July 2012 meetings. Names of all school districts with a 100% completion and return rate were then placed in a random drawing and one school district won the random drawing for the interactive white board. The response rate in 2012 was 32.8%. Response rates for other years of the evaluation were 20.8% in 2009, 33.94% in 2010, and 37.1% in 2011.

SURVEY OF PARENTS AND ADOLESCENTS (MSU)

Surveys were conducted by the Wolfgang Frese Survey Research Laboratory of the Social Science Research Center at Mississippi State University. The Mississippi Department of Education provided the telephone numbers of all parents in the state of Mississippi who had at least one child enrolled in public school during the 2011-2012 school year. From this database of 493,660 telephone numbers, a random sample of 50,000 numbers was drawn. The data collection period spanned from early April 2012 to mid-August 2012. The total number of completed interviews with parents was 3,702.

As in previous years, adolescents surveyed in Year Four were 14 years of age or older, and a parent had given permission for the survey to be conducted. In 2012, a total of 170 adolescents answered questions about nutrition standards and vending machines, physical education and physical activity, and health education and health knowledge, compared to 210 adolescents in 2011, 260 adolescents in 2010, and 150 adolescents in 2009.

The sampling error for the total dataset (binomial response option with 50/50 split) is no larger than + or – 3.5% with a 95% confidence interval. Telephone numbers were dialed a maximum of eight times. There was a cooperation rate of 65.8%.

INTERVIEWS WITH STATE POLICY-MAKERS (MSU)

The 2012 interview guides were consistent with interview guides used in 2011 and 2010, and were developed in concert with staff from the Center for Mississippi Health Policy and the SSRC research team. State Legislators were interviewed again in 2012, after skipping a year in 2011, as planned at the outset of the five-year evaluation, because of the state's election cycle. A mixed-method of telephone, written interviews via email, and face-to-face interviews were conducted from February 2012 through May 2012.

All telephone and face-to-face interviews were digitally recorded and were conducted by SSRC researchers. Key Mississippi policymakers, including members of the State Board of Education and State Board of Health, District Health Officers, and State Legislators were asked about their perceptions and opinions regarding the Mississippi Healthy Students Act of 2007. Respondents were asked a series of open-ended questions concerning how the three major components (nutrition, health education, and physical education) should be prioritized, their views on the roles of various district offices as related to the Act, perceptions of support by local constituents, opinions regarding how well the components of Healthy Students Act have been implemented, opinions regarding the need for additional policies to increase the health of Mississippi school children, and appropriate methods of measuring the success of Act. Interviews were transcribed and then analyzed by research associates affiliated with the SSRC.

Researchers analyzed each transcript qualitatively to identify patterns and their underlying meanings within each group of key stakeholder interviews. Qualitative research methods are particularly useful for obtaining information about issues that cannot be directly observed. Specifically, this method of analysis is particularly appropriate for identifying and understanding perspectives, opinions, and experiences in exploratory research. For this evaluation, researchers were interested in the ideas, feedback, and perspectives from an array of policymakers regarding the implementation of the Mississippi Healthy Students Act.

The researchers noted key themes which emerged from the data. Themes were identified as a response topic that was mentioned by more than one respondent in the group, and mentioned on at least one question. Researchers also identified key quotes that reflected the themes identified in the analyses. The qualitative portions of each interview were organized by group and topic. Each respondent's ideas and opinions were then categorized by themes. Careful review of the interviews revealed areas of consistency with past reports from previous years, as well as some changes. The data were then systematically arranged accordingly, which enabled the researchers to discuss the findings in this report.

The research noted key themes that emerged from the data.

The qualitative analysis component includes analysis of interviews comprised of six Board of Education members, seven State Board of Health members, six District Health Officers, and twelve State Legislators. Each interview guide also had quantitative questions, and these responses were tabulated and when appropriate were compared to findings from previous years.

MISSISSIPPI PREVALENCE OF FITNESS STUDY (MPOFS) (USM)

Subjects

Fitness data were collected from 2,911 Mississippi public school students enrolled in physical education in grades 3 – 12. A total of 3,539 students were sampled from 60 of the 84 randomly selected elementary, middle and high schools.

Sampling

The sampling procedure was conducted by Westat, Inc. Westat employed a two-stage stratified probability design. The first stage was the random selection of schools. A systematic sample of schools was drawn with probability proportional to the enrollment in the target grades. The second stage of sampling was the random selection of PE classes within the sampled schools. PE classes were selected using equal probability systematic sampling. Three separate samples were selected for each school type: elementary, middle, and high school. The elementary school sampling frame consisted of 500 public schools offering any of grades 3 through 5 or grades 3 through 6, depending on the grade span of the school. If the highest grade was 6, then the target grades were 3 through 6. Otherwise, the target grades were 3 through 5. The middle school sampling frame contained 286 schools offering any of grades 6 through 8 (schools with grade 6 only were included in the middle school frame). The high school frame contained 247 schools offering any of grades 9 through 12.

The overall response rate was then calculated as the product of the school response rate and the student response rate. For this fitness study, the school response rate was 74% (62 participating schools/84 sampled schools), the student response rate was 82% (2911 usable surveys/3539 sampled students). Thus, the overall response rate was 61% $((62/84) * (2911/3539))$, exceeding the 60% rate set for a sample to be representative.

Instruments

To objectively assess physical fitness, researchers used the Fitnessgram®, a physical fitness test battery developed by the Cooper Institute (Cooper Institute for Aerobic Research, 2007). The test battery was

used in tandem with the Physical Best curriculum developed by the National Association for Sport and Physical Education (NASPE). The Fitnessgram® test battery provides suggested tests for six components of health-related fitness, PACER (Progressive Aerobic Cardiovascular Endurance Run), curl-up, push-up, trunk lift, sit and reach, and skinfold/Body Mass Index (BMI), with each fitness component having a Healthy Fitness Zone (HFZ). These HFZ are criterion-referenced standards and considered to be the minimal level of performance associated with good health or decreased risk (Welk & Meredith, 2008). Participants' overall fitness level was determined by the number of Healthy Fitness Zones they achieved on the test battery, ranging from zero to six.

Procedures

Principals and superintendents from the 84 randomly selected schools were first contacted by mail. Once approval for conducting the study was obtained, then the PE teacher designated by the school principal was contacted by phone, mail or email. All of the PE teachers were invited to one of two training sessions. Between March and April 2012, representatives from each of the participating schools from across the state received training on the use of the Fitnessgram® software by certified trainers. Participants received the Fitnessgram® software, the study protocol and forms, and the equipment necessary to conduct the fitness tests.

During the remaining months of the spring semester of 2012, the PE teachers in each of the schools were to conduct the fitness tests, and to collect, record, and submit their data through the Fitnessgram® software. Test administration was handled by the PE teachers at each school who had received the training to ensure that the Fitnessgram® would be administered in a consistent manner.

Data Treatment

The participating PE teachers input all demographic, bio-statistical, and fitness data into the Fitnessgram® software as instructed in the training sessions and then exported the data directly from the software. All data files submitted by the schools were checked to determine if the required information was included. The researchers then created an Excel Fitnessgram® template from the exported data to confirm that necessary variables had been properly recorded and reported. All data from all schools were combined and submitted to Westat, Inc., for weighting and initial analysis.

Data Analysis

SAS 9.2 was used for all statistical analysis. Sample sizes by subcategories were reported as the "unweighted count", while the "estimates" were weighted percentages. Also, valid percentages were used for reporting when the associated subcategories have missing values. Chi-square analyses were used to assess the statistical

significance of observed differences by gender, race, or educational level. All reported p-values were two-sided.

CHILDREN AND YOUTH PREVALENCE OF OBESITY SURVEY (CAYPOS) (USM)

Similar to the 2005, 2007, and 2009 CAYPOS, in the 2011 CAYPOS, the sampling frame consisted of 467,941 students in 892 public schools offering kindergarten or any combination of grades 1 through 12 in Mississippi. The sample design was a two-stage stratified probability design. The first stage included the random selection of 95 schools. A systematic sample of schools was drawn with probability proportional to the enrollment in grades K - 12 of each school. In the second stage of sampling, classes were randomly selected within the sampled schools. Classes were selected using equal probability systematic sampling. All eligible students in the selected classes were asked to participate in the survey. The sample was designed to yield a self-weighting sample so that every eligible student had an equal chance of selection, thereby, improving the precision of the estimates.

As in each of the previous years, the weighting process was intended to develop sample weights so that the weighted sample estimates accurately represented the entire K - 12 public school students in Mississippi. Every eligible student was assigned a base weight, which was equal to the inverse of the probability of selection for the student. Adjustments were made to the initial weights to remove bias from the estimates and reduce the variability of the estimates.

This CAYPOS (2011) was conducted in April 2011. As with all of the previous CAYPOS, once selected schools agreed to participate and classes were chosen, measuring equipment (i.e., digital scales and stadiometers) and passive consent forms were delivered to the schools. Each school designated a school nurse who was responsible for collecting data and had been trained on the use of equipment. Two or three days before data collection began, students in the selected classes were read a prepared paragraph containing information about the study. Each student was then given a passive parental consent form to take home to parents or guardians.

If a parent did not want his or her child to participate in the study, the parent was instructed to indicate such on the form, sign it, and have the child return it to the teacher. Prior to the collection of height and weight, the nurse would check with the teacher to determine if any students returned a signed form. Students who returned a signed form did not participate in the study. There were neither consequences for nonparticipation nor rewards for participation.

As with all the previous CAYPOS, the protocol for making measurements required that the weight scale be placed on a hard, smooth surface; carpeted areas were not to be used. The scale was calibrated to zero before use and recalibrated after every 10th student. All students were weighed and measured in a location where the information gathered would be confidential.

As in the previous CAYPOS, nurses were sent an email with a link to a secure website developed and maintained by Qualtrics, Inc. to record and submit their data. These data were compiled in aggregate form by the Qualtrics software and made available in excel format to the study authors for analysis. Body Mass Index (BMI) was computed for each responding student based on height (in meters) and weight (in kilograms). The height in feet and inches was first converted to meters. The weight in pounds was then converted to kilograms. BMI was calculated using the SAS program, gc-calculate-BIV.sas as follows: $BMI = \text{Weight (in kg)} / \text{Height (in m}^2\text{)}$. BMI values were checked to ensure that the results were biologically plausible, using the limits developed by the Centers for Disease Control and Prevention (CDC). BMI percentiles were computed using the SAS program, gc-calculate-BIV.sas.

SUDAAN 10.0 was used to calculate weighted estimates and standard errors, and Proc Crosstab procedure was used to compare prevalence of child overweight and obesity among different subgroups for the 2011 CAYPOS. The differences between summary statistics were considered statistically significant if the p-value from Chi-square test was less than 0.05. For comparisons of subgroups with more than two levels (e.g., obesity by gender and race, etc), differences between estimates were considered statistically significant if their associated 95% confidence intervals did not overlap. In addition, SUDAAN logistic regression procedure was used to investigate linearity of the longitudinal trends in overweight and obesity. Since elapsed time was the same between successive CAYPOS surveys, the logistic regression used orthogonal variables to model longitudinal trends while controlling for students' gender, race, and grade level. The linear coefficient (-3, -1, 1, 3) and quadratic coefficients (4, -4, -4, 4) were assigned over the years 2005, 2007, 2009, and 2011, respectively.

COMMITTED TO MOVE EVALUATION (USM)

Fitness data were collected from 6,022 Mississippi public school children in grades 3-8. Once these student records were matched by the Mississippi Department of Education (MDE) with student records within the Mississippi Student Information System (MSIS), a data set consisting of 3,398 students was produced. From these, 351 matched records did not include associated academic scores and/or behavior performance information. Further, 55 records were duplicated. Hence the final analysis included 2,992 records.

Demographic information related to gender, race, grade level, and lunch status based on the 2007-2008 academic year was obtained through the MDE's Office of Management Information Systems. This information was merged with fitness scores, behavioral performance measures, and academic test scores to produce a comprehensive analysis for each student.

To objectively assess physical fitness status, researchers used the Fitnessgram®, a physical fitness test battery developed by the Cooper Institute. This test battery is used in tandem with the Physical Best curriculum developed by the National Association for Sport and Physical Education (NASPE) as a guide for best practice for implementing health-related physical fitness in the K-12 physical education setting.

The Fitnessgram® test battery is described previously in the methodology discussion for the Mississippi Prevalence of Fitness Study.

Each student's BMI was further categorized into one of the four weight status categories based on the 2000 Centers for Disease Control and Prevention (CDC) BMI-for-age growth charts: underweight, healthy weight, overweight, or obese. The Mississippi Curriculum Test, Version 2 (MCT2), which is administered annually to all Mississippi students in grades 3-8 in the areas of language arts and mathematics achievement, has four categories of achievement: minimal, basic, proficient, and advanced. For the purposes of this study, the levels were further grouped into two categories: low academic achievement for minimal and basic scores, and high academic achievement for proficient and advanced scores.

MDE collects data on each student's attendance and disciplinary incidents on each student in K - 12. For this study, attendance was measured by the number of days students were absent and categorized into three groups: 0-3, 4-7, and 8 or more days missed during the academic year. For the purpose of this study, disciplinary incidents that resulted in students receiving either in-school suspensions or out-of-school suspensions were used for categorization into one of two groups: those students with at least one reported incident or those with no reported incidents.

Due to the sensitive nature of using and merging student records, a memorandum of understanding (MOU) regarding the protection of the data was established between MDE and Principal Investigator at The University of Southern Mississippi. All data were handled electronically and once merged, were password protected.

In November 2007, 25 elementary and middle schools from across the state of Mississippi received funding from The Bower Foundation as part of the Health is

Academic Quality Physical Education Program. The gender composition of these schools (52.4% male vs. 47.6% female) was similar to the rest of the state for gender (50.9% vs. 49.1%). The racial composition of the sample (52.3% White, 42.8% Black, 4.9% Other) was somewhat different than the rest of the state (46.4% White, 50.6% Black, 3.0% Other). As for economic status, the percentage of students who received free or reduced lunch in the study sample (63.7%) was comparable to the rest of the state.

As part of their funding, each school received the Physical Best Curriculum and the Fitnessgram® software. In January 2008, all schools sent three representatives (a school administrator, a physical education teacher, and a school health champion selected by each school) to training sessions on the curriculum and software. Training on the Physical Best Curriculum was conducted by a certified NASPE trainer and training on the use of the Fitnessgram® software was provided by a certified Physical Best/ Fitnessgram Instructor from the Cooper Institute. During the remaining months of the spring semester of 2008, 22 of the 25 schools were able to implement the curriculum in their PE classes, conduct the fitness tests, and collect, record, and submit their data through the Fitnessgram® software. Test administration was handled by the physical education teachers at each school using the procedures taught at the Fitnessgram® training and found in the Fitnessgram/ Activitygram® Test Administration Manual (2007).

The participating PE teacher input all demographic, biostatistical, and fitness data into the Fitnessgram® software as instructed in the training sessions and then exported the data files directly from the software as either a comma delimited file or zip file for use in Excel. All data files submitted by the schools were checked to determine if the required information was included in the submitted data. The researchers then created an Excel Fitnessgram® template from the exported data to confirm that necessary variables had been properly recorded and reported.

Consequently, several schools were asked to resubmit data in the correct format and to make sure all required information was included. Each record included student name, date of birth, gender, grade level, and fitness test scores. Once the data submitted by the 22 schools were in the correct format with all of the required information, the fitness data were reformatted into interval data as an overall fitness score.

The overall fitness score was calculated based on Fitnessgram® healthy fitness zones, which are criterion-referenced standards developed by Fitnessgram®. These standards are considered to be the minimal level of performance on the test associated with good health or decreased risk. In the Fitnessgram® software, students are given a score of “needs improvement” or

“healthy fitness zone” based on whether the cutoff score is met. BMI, however, has a minimal and maximal score within which the student must fall to be considered in the healthy fitness zone. For this test, students’ BMI scores were categorized as too low, healthy fitness zone, or needs improvement. To appropriately score these measures, students’ tests had to fall within the given range based on age and gender. Student overall fitness scores ranged between zero and six as determined by the number of healthy fitness zones they attained on the test battery.

Once data were reformatted, all schools’ data were compiled into one file. This data file was submitted to the MDE’s Office of Management Information Systems. The fitness data from spring 2008 were merged with academic records within the Mississippi Student Information System. The data merged included race, free and reduced lunch status, academic achievement scores, and school behavioral factors.

SAS 9.2 (SAS Institute Inc, Cary, NC, USA, 2009) was used for all statistical analysis. Chi-square analyses were used to assess the statistical significance of observed differences in high academic achievement and unfavorable behaviors (i.e., absence and disciplinary incident) according to any selected characteristics. Multiple logistic regression models were used to identify factors associated with high academic achievement and unfavorable behavior. An adjusted odds ratio (aOR) and 95% confidence interval (CIs) were obtained in each subgroup relative to a referent group while controlling for students’ gender, race, grade, SES/lunch status, and physical fitness. An aOR was considered statistically significant if its 95% CI did not include one (1.0). Reported p-values are two-sided.

Endnotes

¹ Robert Wood Johnson Foundation. (2012). Declining childhood obesity rates—where are we seeing the most progress? Issue Brief, September 2012. Available at http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2012/rwjf401163.

²Centers for Disease Control and Prevention. (2013). State Indicator Report on Fruits and Vegetables, 2013. Available at <http://www.cdc.gov/nutrition/downloads/State-Indicator-Report-Fruits-Vegetables-2013.pdf>.



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