CEEP Center for Evaluation & Education Policy

Education Policy Brief

Child Obesity in Indiana: A Growing Public Policy Concern

By Kyle P. Cline, Terry E. Spradlin, and Jonathan A . Plucker

VOLUME 3, NUMBER 1, WINTER 2005

Childhood and adolescent obesity rates have reached epidemic proportions in the United States and are growing. The sedentary routines found in schools and in the home as well as the overexposure to unhealthy snacks and non-nutritional foods contribute to the pervasiveness of this disease that afflicts America's children. Obese children face significant health risks such as Type 2 diabetes, tooth decay, and depression. This epidemic has significant implications for the public education and health sectors of our nation. In response, many federal and state policies have been implemented or are being initiated to address these concerns. This policy brief will examine the scope of the childhood obesity epidemic in the U.S. and in the state of Indiana, consider the relationship between the school environment and student health, review policy initiatives underway to address this problem, and offer policy recommendations to more effectively address obesity in Indiana.

CHILDHOOD OBESITY IN THE UNITED STATES

"Obesity" is defined as an excessively high amount of body fat or adipose tissue in relation to lean body mass (NRC, p. 114; Stunkard, p. 14).[1] The amount of body fat (or adiposity) includes concern for both the distribution of fat throughout the body and the size of the adipose tissue deposits. Another term that is also used widely within the context of school health is "overweight." This refers to increased body weight in relation to height (and, in children, age correlation) when compared to some standard of acceptable or desirable weight (NRC, p. 114; Stunkard, p. 14). Both terms are used in this report to describe weight-related health issues pertaining to children.

Recent increases in the levels of overweight and obese children in the United States are alarming. The percentage of overweight children has more than doubled in the past 20 years from 6.5 percent in 1980 to 15.3 percent in 2000 (see Figure 1). The percentage of overweight adolescents tripled from five percent in 1980 to 15.5 percent in 2000.[2] About 9 million American children over age six are considered obese.[3] The consequences of excess weight on children's health are significant. Obesity is a major contributor to Type 2 diabetes among children. Up to 85 percent of affected children are either overweight or obese at the time of diagnosis.[4] Recent estimates suggest that Type 2 diabetes may now account for as many as half of all new cases of diabetes in certain groups of children. Adolescents affected with Type 2 diabetes belong to all ethnic groups, but the condition is more commonly seen in non-White groups such as Native Americans, Hispanics and Latinos, and African Americans.

Another health effect attributed to obesity is chronic kidney failure. Kidney failure more than doubled in the U.S. during the 1990s, and led to 400,000 deaths in all age groups in 2000.[5] Obesity itself can eventually be fatal if unaddressed. About 300,000 deaths in all age groups are attributed to obesity each year in the U.S.[6]

Other, non-life threatening, health risks associated with obesity are tooth decay and depression. According to the Academy of General Dentistry, children who consume too much soda and not enough nutritional beverages are prone to tooth decay in addition to serious ailments later in life, such as diabetes and osteoporosis.[7] Obesity is also connected to social problems such as depression and low peer acceptance rates. One study shows that children who are substantially overweight throughout much of their childhood and adolescence have a higher incidence of depression than those who aren't.[8]

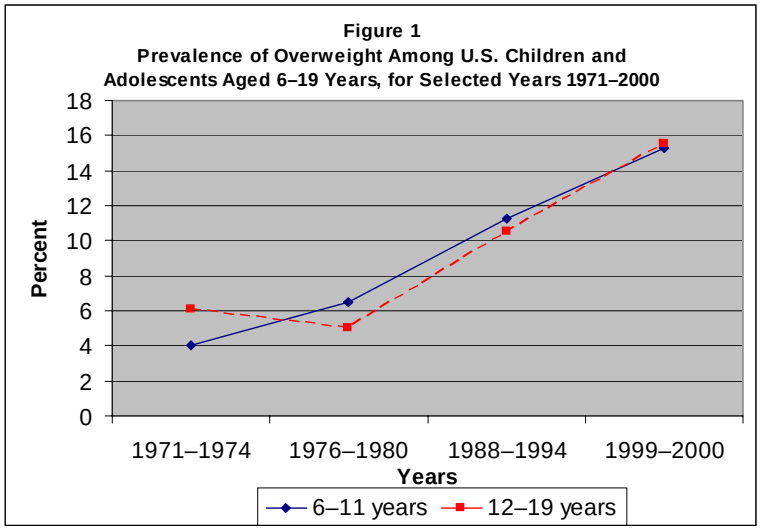
Research has also shown a connection between obesity and both decreased academic performance and increased likelihood of being bullied in school.[9] One source notes that perhaps the most obvious reason for the decrease in academic achievement is the increase in absenteeism. It is probable that students with poor nutrition, inactivity, and weight problems have a higher prevalence of physical conditions and psychological/social problems that are frequent causes of absenteeism.[10]

Obesity and its resulting health effects are extremely expensive. According to a report issued by the Office of the U.S. Surgeon General, the economic cost of obesity in the United States was approximately $117 billion

CONTENTS

Upcoming Policy Briefs. . .

- ✓ School Finance in Indiana
- ✓ Long-Term Effects of Full-Day - Kindergarten



Note: Data for Figure 1 provided by the Centers for Disease Control and Prevention. Prevalence of Overweight among U.S. Children and Adolescents Aged 6-19 Years, for Selected Years 1971-2000.

in 2000.[11] Obesity is also very costly to schools. At least nine states that receive state money based on student attendance are likely to lose millions of dollars because of absenteeism, a problem caused in part by the poor nutrition and inactivity of those missing school.[12]

Because young people spend nearly 2,000 hours per year in school,[13] educators have a responsibility to encourage physical activity and instill proper nutritional habits in the lives of their students. However, this role is often met with numerous obstacles and difficulties in the school environment. These obstacles include the lack of resources for quality physical education programs, the demand for higher student academic achievement in the core subjects, and the availability of foods of minimal nutritional value that compete with the existing United States Department of Agriculture (USDA) regulated lunch program and are promoted through attractive financial offers from outside sources.

A DECLINE IN PHYSICAL EDUCATION

Experts indicate that physical activity in schools is vital for the well-being of schoolchildren and may be a way to combat obesity and teach habits that promote healthy lifestyles. One report concluded that adding one hour per week of physical education time for first graders can significantly reduce body mass index for overweight and at-risk-for-overweight girls.[14] According to the Centers for Disease Control and Prevention (CDC), physical activity builds and maintains healthy bones, muscles, and joints, controls weight and reduces fat, prevents or delays the development of high blood pressure, and helps reduce blood pressure in some adolescents with hypertension.[15] The CDC also states that physical activity does not need to be strenuous in order to be beneficial. Even brisk walking is a recommended mode of increasing physical activity. Therefore, supporters of physical education programs feel that the moderate amount of activity needed for health benefits could easily be accommodated in school physical education classes.

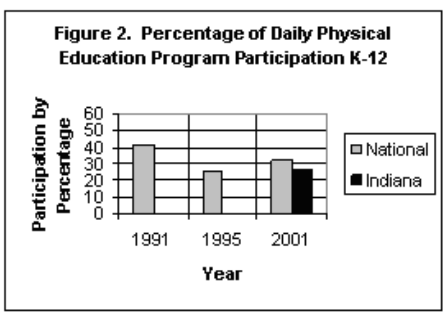
However, many schools are subject to tight budgets and are faced with the decision of whether to keep physical education programs. Moreover, despite numerous reports emphasizing the importance of a sound physical education curriculum and daily exercise, some school leaders contend that it is more important to focus on a rigorous academic curriculum and that high academic standards do not leave time for physical education.

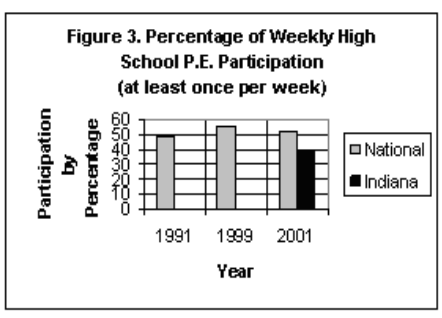
Data from the 2001 CDC's Youth Risk Behavior Surveillance System indicate that overall, daily participation in physical education programs decreased from 1991 to 2001 despite a slight increase from 1995 to 2001. In 2001, the number of Indiana students who participated in both weekly and daily physical education was lower than the national average (Figures 2 and 3).

According to the Indiana Department of Education, only two percent of Indiana's elementary school students have physical education classes more than two days a week.[16] In high school, students typically are only required to take two semesters of physical education and one semester of health education. As of December 2004, a proposed revision of Indiana's graduation requirements being considered by the State Board of Education includes two credits of physical education with an additional credit for health and wellness.[17] However, this recommendation is not an increase in physical education course participation by students; it reflects an increase in the credit hours granted for physical education per semester from a half credit hour to a full credit hour per semester.

Nationally, Illinois is the only state that requires daily K-12 physical education classes.[18] However, nearly one-quarter of Illinois school districts receive waivers from the state that allow students to opt out of physical education so long as they participate in some organized physical activity such as school sports or marching band.[19] Nevertheless, daily physical education, regardless of waiver usage, may have an effect on combating obesity in school-age children.

The increasing national and global obesity epidemic and its multiple effects on health have recently made a large impact on policy-making concerning physical education. States have increased efforts to address this aspect of the educational curriculum, as it presents an excellent opportunity to successfully deal with poor health within schools.





Note: Data for Figures 2 and 3 from the Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2001. Indiana data for 1991 and 1995 were unavailable.

States have also taken the initiative to implement policies regarding increased physical education. One example is the state of Massachusetts, where physical education is a required subject in all grades for the purpose of promoting the physical well-being of the students.[20] Other states such as Georgia have created committees to exclusively study physical education within their schools.

FOODS OF MINIMAL NUTRITIONAL VALUE

Another school-based issue that may contribute to the obesity epidemic is the lack of consumption of healthy foods due to the broad availability of unhealthy foods. According to the United States Department of Agriculture's "Team Nutrition Call to Action," less than 15 percent of school children eat the recommended servings of fruit each day, less than 20 percent eat the recommended servings of vegetables, less than 25 percent eat the recommended servings of grains, and only 30 percent consume the recommended milk-group servings in a given day.[21]

Health advocates have targeted the presence of soft drinks and foods found in vending machines in schools for criticism because many of those products are categorized by the USDA as having minimal nutritional value. Foods of Minimal Nutritional Value (FMNV) refer to artificially sweetened food that provides less than five percent of the Reference Daily Intakes (RDI) for each of eight specified nutrients per serving; and in the case of all other foods that are not artificially sweetened, a food which provides less than five percent of the RDI for each of the eight specified nutrients per 100 calories and per serving. The eight nutrients to be assessed for this purpose are protein, vitamin A, vitamin C, niacin, riboflavin, thiamin, calcium, and iron. Items found in the FMNV category include, among others, soda water, water ices, chewing gum, certain candies, hard candy, jellies and gums, marshmallow candies, licorice, spun candy, and candy-coated popcorn.[22] A recent study of 251 schools in 24 states found that 75 percent of drink and 85 percent of food options in school vending machines were of poor nutritional quality.[23]

Federal regulations specify that schools are not permitted to serve FMNV during meal service periods in areas where reimbursable meals are served or eaten. Additionally, USDA regulations speak to à la carte and snack bar food product sales that are extremely popular with students, particularly in junior and senior high schools. These foods, also known as "competitive foods," typically fail to provide the balanced nutrition necessary in a child's diet.[24] Competitive foods are defined by the USDA as any food sold in competition with the program to children in food service areas (where reimbursable meals are eaten or served) during lunch periods.[25] Meals that provide balanced nutrition are offered through the National School Lunch Program (NSLP) and the School Breakfast Program (NSBP), but these healthy foods are often not the choice of children when FMNV and à la carte items are present in the school environment.

Under federal rules, competitive foods are sold outside the school lunch program and are ineligible for federal reimbursement. The U.S. government reimburses schools for every lunch served that meets the program's nutritional guidelines. However, many schools choose not to abandon à la carte food sales because they provide needed funding to school districts.

According to the United States General Accounting Office, 43 percent of elementary schools, 74 percent of middle schools, and 98 percent of high schools have vending machines, school snack bars, or other food services outside of the school lunch and breakfast programs.[26] The National Dairy Council found that 71 percent of schools surveyed allow students to use vending machines or purchase minimal nutritional value foods via snack bars or à la carte during the lunch period.[27] Some of these items include soft drinks and fruit drinks containing large amounts of sugar; foods of high energy and low nutrient density, such as chocolate; chewing gum and candy; and chips or other salty snacks. Students may learn about good nutrition in the classroom, but junk food appears to be readily available in school-sponsored vending machines and à la carte or snack bar areas.

Supporters of vending machines claim that the machines generate much needed funding that can then be used to benefit students in many ways that would not be possible without the machines. Indeed, several school districts rely heavily on the proceeds of vending machines, which often are directed toward extracurricular activities, technology, or other classroom tools. Center Grove Community School Corporation in Greenwood, Indiana, earns at least $113,000 annually via a contract with Pepsi, and some Indiana school districts earn up to $300,000 every year from vendor contracts.[28]

Despite large economic incentives associated with the sale of foods with MNV, some schools are actively pursuing the fight against childhood obesity. The Chicago Board of Education recently voted to replace Coca-Cola products with pure juices, sports drinks, and water. The decision to accept a new contract with the American Bottling Company will result in financial losses. The new contract guarantees $6.4 million to the schools in revenue and sales while the Coca-Cola contract guaranteed $8.6 million. Sean Murphy, the schools' chief operations officer noted that this initiative is about better health and that a financial loss can be taken for this cause. According to Murphy, "It's really about better health. Is there a hit to be taken? Yes, there's that potential but at the end of the day, we're about kids." [29]

Health advocates argue that schools can still make money from vending machine contracts if healthy choices are made available in vending machines. The American Dairy Association claims that attractive packaging and a selection of flavors of milk will earn revenue similar to that of Coke or Pepsi products. The Center for Science in the Public Interest recently noted that several school districts have replaced standard vending products with healthier options and experienced no loss in revenue - and in at least one case increased revenue.[30]

Many opponents to the removal of vending machines in schools have argued that this action would not benefit the health of school children as much as perceived and would only hurt schools because it pulls away much needed funding. However, a recent study in Great Britain has shown that schools that have removed soda machines have been extremely effective in reducing obesity among school children. A one-year "Ditch the Fizz" campaign in British schools resulted in a significant decrease in obesity among school children.[31] Unfortunately, potential for profit created through à la carte sales and vending machines often seems to outweigh the risk of negative health effects for schools struggling financially.

A GLOBAL CONCERN

Countries around the world have increasing access to processed foods and "Western" foods, such as fast food and candies. As a result, many countries are beginning to see an increase in the obesity epidemic much like that in the U.S. According to the World Health Organization (WHO), the number of overweight and obese children has doubled in France and Germany in the past 10 years, verifying that these issues are no longer problems that are exclusively American.

In response to these health concerns, other countries are putting forth efforts in the schools to combat obesity by decreasing access to vending machines and foods of minimal nutritional value. Many communities in Canada recently took action that resulted in the removal of high-caloric carbonated drinks in elementary and middle schools by Coca-Cola Co. and Pepsico Inc.[32] This decision was ultimately made by the soda companies in response to educators, parents, and nutritionists who were concerned about inadequate diets and increasingly overweight children. In France, the Parliament recently voted to ban all vending machines that sell candy and soft drinks in schools. Before the 2005-06 school year, an estimated 8,000 vending machines must be removed from France's elementary and middle schools.[33]

STATE AND FEDERAL INITIATIVES TO COMBAT CHILDHOOD AND ADOLESCENT OBESITY

State-funded prevention programs have already been pursued in many states (see Table 1). These initiatives have been specifically targeted to assist schools with their efforts in battling childhood and adolescent obesity and their associated effects.

The federal government has also made efforts to address and present solutions on the issues of childhood obesity and the lack of emphasis in schools on student wellness and physical fitness. On June 30, 2004, President Bush signed The Child Nutrition and Women, Infant, and Children (WIC) Reauthorization Act into law with the goal of creating an appropriate balance between encouraging healthy environments that will address the childhood obesity epidemic while preserving local control for states, communities, and schools.[35]

The Act serves to strengthen nutritional service programs, promote healthy choices among children, and address growing concerns that the federal school lunch program does not do enough to ensure free and reduced-price lunch benefits go to children who qualify. The bill was based upon H.R. 3873, the Child Nutrition Improvement and Integrity Act, legislation introduced by Education Reform Subcommittee Chairman Mike Castle (R-DE) to strengthen and enhance federal child nutrition programs and services.

Specifically, the Act promotes nutrition education and physical activity at the state and local levels to prevent childhood obesity; requires local wellness policies designed and implemented by 2006 for local education agencies participating in the NSLP; and authorizes the U.S. Department of Agriculture to provide technical assistance, if requested by the school or school district, in implementing healthy school environments. Additionally, the Act continues current policy encouraging all children to consume cow's milk, yet gives schools the option to offer a nutritionally equivalent, non-dairy substitute to children who cannot drink cow's milk for medical or other special dietary reasons. One additional provision created a permanent Fresh Fruit and Vegetable Program (FFVP) under which free fresh fruits and vegetables are made available to students in public schools around the country, including 25 Indiana schools. The state of Indiana will receive $1,106,461 beginning in the 2004-2005 school year and continuing through 2009, to purchase fruits and vegetables.

Another important provision under the Act is the establishment and funding of the Team Nutrition Network. This is a statewide multidisciplinary program for children to promote healthy eating and physical activity based on scientifically valid information and sound educational, social, and marketing principles. Other provisions of the Act ensure food safety by maintaining and strengthening safety standards and improving meal quality.

Table 1. Sample of State Policy Initiatives

State	Policy
Arkansas	• Established a coordinated effort to combat student obesity by setting standards for "competitive" foods offered outside the federal food service program. • Prohibited elementary student access to vending machines beginning with the 2003-04 school year. • Created a child health advisory committee that coordinates statewide efforts to combat obesity and other related illnesses. • Mandates that every student in kindergarten through grade nine receive no less than one hour of physical education instruction per week for every student who is physically fit and able to participate.[34]
California	• Provides incentives for schools and communities to establish after-school enrichment programs that include nutrition education components.
Delaware	• Requires all public school students in grades 1-8 to be enrolled in a physical education program.
New York	• Requires all pupils above age eight in all public elementary and secondary schools to receive prescribed courses of instruction on physical education. These courses must be designed to aid in the well-rounded education of pupils and in the development of character, citizenship, physical fitness, health, and the worthy use of leisure.
Tennessee	• Enacted a law in 2001 which encourages primary and secondary schools to offer students more calcium rich food and beverages in their lunch and snack bar programs.
Texas	• Passed legislation in May of 2003 that requires local school boards to establish a local school health education advisory council to assist the district in ensuring that local community values are reflected in the district's health education instruction. • Requires the Texas Education Agency to make available to each school district a coordinated health program designed to prevent obesity, cardiovascular disease, and Type 2 diabetes in elementary school students; school districts are required to implement the coordinated health program.
Washington	• Requires that every pupil in grades 1-8 receives physical education instruction as prescribed by the state board of education.

CHILDHOOD OBESITY IN INDIANA

The Centers for Disease Control and Prevention reported that Indiana was third in the nation in the incidence of childhood obesity in 2001.[36] Also, Indiana had the highest rate of overweight children compared to neighboring states at that time. However, Indiana has since seen a decline in overall cases of overweight children and is currently below the national average for childhood overweight rates (see Table 2). Despite this positive news, obesity and overweight issues continue to pose a threat to the health of students and must be dealt with proactively at both the state and local levels of government and within communities.

Table 2. Childhood Overweight Rates in 2003

United States	13.5%
Indiana	**11.5%**
Michigan	12.4%
Wisconsin	10.4%
Ohio	13.9%
Kentucky	14.6%

Note 1. Data from the Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance Survey (YRBSS). (2003). Retrieved on October 11, 2004 at http://apps.nccd.cdc.gov/YRBSS/SelectLocyear.asp?cat=5&Quest=507.

Note 2. Data for Illinois not available in 2003 survey.

Research shows that children and adolescents who are obese are much more likely to be obese as adults.[37] One study demonstrated that the likelihood of childhood obesity persisting in adulthood is very high. Children who are obese at age four have a 20 percent possibility of developing adult obesity, and those who are overweight during their adolescence increase their risk of developing adult obesity to 80 percent.[38] One source states that it is very likely that obesity beginning in early childhood will persist throughout a person's lifespan.[39]

Obesity and overweight are not only immediate health problems for the state; they also prove to be extremely costly. In an average year, Indiana residents pay $1.6 billion in obesity-related medical costs. Of that amount, $379 million is billed to Medicare, which is 7.2 percent of Indiana's total Medicare expenditures.[40] In addition, $522 million is paid using Medicaid. This represents 15.7 percent of Indiana's total Medicaid expenditures. In comparison, medical costs related to smoking add up to $1.6 billion annually, with $380 million paid by Medicaid.[41]

RECENT ACTION TAKEN BY INDIANA TO ADDRESS CHILDHOOD AND ADOLESCENT OBESITY

During the 2004 session of the Indiana General Assembly, Representative Charlie Brown (D-Gary) sponsored Senate Bill 29 that called for the Indiana Department of Education to develop recommendations to assist school corporations in establishing nutritional policies, nutrition and wellness curricula, and model policies for the measurement of body mass indices. The bill provided that vending machines would be prohibited in areas of elementary schools that are accessible to students. The bill also proposed that healthy foods and beverages must account for 50 percent of the food and beverages available in the vending machines in middle and high schools. Finally, the bill proposed that school corporations adopt nutritional integrity policies and require 30 minutes of daily physical activity for elementary students in public schools.

Despite the efforts of health advocates and medical practitioners across the state, the proposed childhood obesity prevention bill did not pass during the 2004 Indiana General Assembly. However, the issue remains one of extreme interest among parents, educators, and policymakers and will likely be discussed once again in the 2005 session of the legislature. While the fate of this legislation is in question, other health initiatives have been undertaken in Indiana to address childhood and adolescent obesity.

One such initiative undertaken recently to combat the obesity epidemic is the Community Health Improvement Plan, a collaborative project of the Indiana Medicine and Public Health Initiative. Sponsors of this initiative include a network of 14 state organizations, including the Indiana Department of Health and the Indiana University School of Medicine. This project calls for the action of Indiana communities over the next three years by assessing current and proposed resources and programs, developing new initiatives, and stimulating thinking about how Indiana can ensure healthy communities for its residents. The vision of this plan is to recognize that public health includes not only integrating public health and health care policy but also strengthening the social, economic, cultural, educational, and spiritual fabric of Indiana's communities. Moreover, the purpose of the Community Health Improvement Plan is to provide a roadmap to guide action for all those entities concerned with the health of Indiana. The plan's goals specifically relevant to school health include increasing the capacity of schools to provide effective curricula in nutrition, physical activity, and tobacco prevention; developing a comprehensive prevention program for infants, children, and adolescents; and enhancing education and community-based programs using the schools. This project's success will depend greatly on the collective action of individual communities.[42]

On February 16, 2000, House Resolution 35 was adopted by the Indiana General Assembly by voice vote to encourage the Indiana Department of Education and local school boards to provide regular fitness programs for all students. The Resolution also requested that the Department assess the current fitness programs provided to Indiana students and develop recommendations for improvement. In 2001, the Indiana Department of Education, in collaboration with the Indiana Fitness Assessment Taskforce, presented recommendations to the Education Committees of the Indiana House and Senate in response to House Resolution 35. The recommendations called for the collaboration of physical education teachers with teachers of other subjects to encourage physical activity, additional physical education, a revision of current curriculum, and additional training for physical education teachers.[43] These recommendations were presented in the form of a report called Response to General Assembly Resolution No. 35: An Evaluation of Physical Fitness Programs in Indiana Schools. Professional development and integrated training for physical education teachers are emphasized more than any other alternative in this set of recommendations.

One of the most comprehensive efforts to date in Indiana that addresses school health and obesity has been the establishment of the Coordinated School Health Advisory Council. This is a collective network of more than 20 state and local organizations and resources that are dedicated to the betterment of public health in Indiana. In March 2003, the Indiana Department of Education received a $1.8 million grant from the U.S. Centers for Disease Control and Prevention to develop this unique committee that is composed of physi-

cians, legislators, medical agency executives, community agency executives, professionals from institutions of higher education, teachers of health and physical education at all levels, and members of the Indiana Department of Health and the Indiana Department of Education.[44]

The Coordinated School Health program is designed to coordinate the eight components of school health to provide better health services to students and reduce the possibility of students not receiving the services they truly need. These components include: health education, physical education, health services, psychological and sociological services, food services, a healthy school environment, community involvement, and staff wellness. The grant provides the infrastructure for an office staffed by the Indiana Department of Education. Staffing for the program and planning for activities to support the program have taken place according to the Indiana Department of Education.[45] In February 2004, ten Indiana school corporations were selected by the Indiana Department of Education as participants in a three-year intensive leadership-training program. This program was designed to provide new opportunities to learn how innovative and effective coordinated school health programs might be conducted and maintained within the districts.[46]

CONCLUSIONS AND RECOMMENDATIONS

Childhood obesity is a very serious health epidemic that continues to plague schoolchildren in Indiana and around the world. Obesity directly impacts student health and academic performance, as numerous studies and data show. Moreover, the prevalence of adult health problems - already a major problem in Indiana - will increase as these students age. While Indiana has made increased efforts to combat this epidemic, the issue must continue to be actively pursued in a collective and creative manner. To address the challenges of childhood obesity, the following recommendations are offered:

- State policymakers should continue investigating potential school-based interventions to decrease obesity.
- Education leaders should encourage participation by eligible students in the National School Breakfast Program. A large number of eligible students still do not participate in this program despite recent small increases in participation. Skipping breakfast is associated with a higher risk of obesity because it encourages overeating later in the day. Consumption of a balanced breakfast contributes to enhanced academic performance and improved student behavior.[47]
- State policymakers and local school officials should review current guidelines for food and beverages beyond the control of the USDA and consider the implementation of more suitable guidelines for these products.
- The state, via the Indiana State Department of Health or the Indiana Department of Education, should collect comprehensive data on childhood obesity. Without this important information, it will be extremely difficult to evaluate the effectiveness of school health initiatives and take appropriate action.
- Education and health advocates should work with schools to provide information and support to parents and caregivers about causes of obesity and prevention and intervention strategies. Efforts, such as those made by the Community Health Improvement Plan should continue to be encouraged. This is a vital network that is currently assisting schools in the revision of health policies. It serves as a resource that provides guidance and training to schools that are actively addressing childhood obesity, physical education, and nutritional issues.

Unhealthy food and drink options in school vending machines and lack of physical activity in schools have been linked to obesity in children. Indiana is significantly below the national average in physical education participation among school children.

- Education leaders should examine the possibility of negotiating vending machine contracts to ensure that machines include healthy alternatives.
- Educators should monitor vending machine use to ensure that machines are not in operation during lunch and other prohibited periods.
- Education leaders should be encouraged to examine the academic standards for health and nutrition classes to find possible disconnects between what is being taught in the classroom and the types of foods that are being promoted through school lunches, vending machines, à la carte sales, and snack bars.
- As educators work together to create rigorous academic curricula at the high school level, educators and policymakers should strive to find ways in which physical activity, including physical education programs, can be incorporated into a rigorous academic curriculum.
- School administrators should resist pressures that would lead to reductions in recess time and physical education instruction. Physical activity promotes the improved fitness and wellness of students which in turn can contribute to higher academic achievement.

ENDNOTES

[1] National Research Council (NRC). (1989). *Diet and health implications for reducing chronic disease risk.* Washington, DC: National Academy Press; Stunkard A.J., & Wadden, T.A. (1993). *Obesity: Theory and therapy* (2nd ed.). New York: Raven Press.

[2] U.S. Centers for Disease Control and Prevention, National Center for Health Statistics. (1999-2000). *Prevalence of overweight among children and adolescents: United States, 1999-2000.* Hyattsville, MD: U.S. Government Printing Office.

[3] Institute of Medicine. (2004). *Overview of the IOM's Childhood Obesity Prevention Study.* Washington, DC: 2004 National Academy of Sciences.

[4] American Diabetes Association. (2004). *Diabetes statistics for youth: Type 2 diabetes in youth.* Retrieved September 29, 2004, from http://www.diabetes.org/diabetes-statistics/children.jsp

[5] Yee, D. (2004, October 10). Sharp rise of kidney failure tied to obesity. *Indianapolis Star*, p. A22.

[6] United States Department of Health & Human Resources. (2001). *The Surgeon General's call to action to prevent and decrease overweight and obesity.* Washington, DC: U.S. Government Printing Office.

[7] Academy of General Dentistry. (2004). Children's nutrition: *What foods cause tooth decay in children.* [Brochure]. Chicago, IL: Retrieved October 8, 2004, from http://www.agd.org/consumer/topics/childrensnutrition/main.html

[8] Mustillo, S., Ph.D., (2003). Obesity and psychiatric disorder: Developmental trajectories. *Pediatrics, 111*(4). Retrieved November 1, 2004, from http://pediatrics.aappublications.org/cgi/content/full/111/4/851

[9] Janssen, I. (2004). Associations between overweight and obesity with bullying behaviors in school-aged children. *Pediatrics, 113*(5), p. 1187; Schwimmer, J. (2003). Health-related quality of life of severely obese children and adolescents. *JAMA, 289,* 1813-1819; Mosuwan, L., Lebel, L, Puetpaiboon, A, & Junjana, C. (1999). School performance and weight status of children and young adolescents in transitional society in Thailand. *International Journal of Obesity, 23,* 272-

277; M., Morrill, C., Leach, J., Shreeve, W., & Radebaugh, M. (1991). Teenage obesity: An academic issue. *International Journal of Adolescence and Youth, 2*, 245-250.

[10] Action for Healthy Kids. (2004). *The learning connection: The value of improving nutrition and physical activity in our schools.* Washington DC: Action for Healthy Kids.

[11] Office of the U.S. Surgeon General. (2001). *The surgeon general's call to action to prevent and decrease overweight and obesity.* Washington, DC: U.S. Government Printing Office.

[12] Action for Healthy Kids. (2004).

[13] Study: *Overweight students sapping school finances.* (2004, September 24). CNN.com, Education. Retrieved January 8, 2004, from http://www.cnn.com/2004/EDUCATION/09/24/schools.obesity.ap/index.html

[14] National Institute Health Care Management (NIHCM) Foundation. (2004). *Obesity in young children: Impact and intervention.* Research Brief. Washington, DC: NIHCM.

[15] Centers for Disease Control and Prevention. (1999). *Physical activity and health: Adolescents and young adults.* Washington DC: U.S. Government Printing Office. Retrieved April 26, 2004, from http://www.cdc.gov/nccdphp/sgr/adoles.htm.

[16] Indiana Department of Education. (2001). *An evaluation of physical fitness programs in Indiana schools.* Retrieved March 8, 2004, from http://ideanet.doe.state.in.us/opd/physed/response.html

[17] Indiana State Board of Education Roundtable Discussion. (2004, April 20). High school (grades 9-12) course and credit requirements for an Indiana high school diploma, Draft #4. Indianapolis, IN.

[18] P.E. 4 Life. (2001, October) *NASPE Shape of the Nation Executive Summary.* Retrieved March 31, 2001 from http://www.pe4life.com/naspe_shapeofnation.php

[19] Watters, C. (2004, April 20). Battle for gym class heats up. *Rockford Register Star*, Local News. Retrieved October 2004, from http://www.rrstar.com/apps/pbcs.dll/article?AID=/20040420/NEWS0107/404200315/1004/NEWS

[20] Byrne, D. (2003). *Physical education. 2003 Health Policy Tracking Service, National Conference of State Legislatures,* 1-22. Falls Church, VA: Netscan Publishing, Inc.

[21] United States Department of Agriculture. (2004). *Team nutrition call to action.* Washington, DC: USDA. (U.S. Government Printing Office?) (Author?)

[22] USDA. (2002). *State competitive foods policies. School Meals Program.* Retrieved October 9, 2004, from http://www.fns.usda.gov/cnd/lunch/CompetitiveFoods/state_policies_2002.htm

[23] Center for Science in the Public Interest (CPSI). (2004, May). *Dispensing junk: How school vending undermines efforts to feed children well.* Washington, DC: Author.

[24] The Democratic Staff of the Senate Committee on Agriculture, Nutrition, and Forestry. (2004, May). Food choices at school: Risks to *child nutrition and health call for action.* Washington, DC: Author.

[25] United States Department of Agriculture. (2001). *Foods sold in competition with USDA school meal programs: A report to congress.* Washington, DC: USDA.

[26] United State General Accounting Office. (2003). *School lunch program: Efforts needed to improve nutrition and healthy eating.* (GAO report number 03-056). Washington DC: General Accounting Office.

[27] National Dairy Council. (2004). Creating a healthy school environment for children. Retrieved March 8, 2004, from http://www.nationaldairycouncil.org/health/digest/dcd73-6.asp

[28] Weedman, J.E.W. (2004, March 30). The choice is theirs. *The Daily Journal.* Retrieved March 31, 2004, from http://www.thejournal-net.com/Main.asp?SectionID=1&SubSectionID=113&ArticleID=41490; Help trim obesity. (2004, March 8). *Indiana Daily Student.* Retrieved March 31, 2004 from http://idsnews.com/story.php?id=21899

[29] Cholo, A. B. (2004, October 27). City schools to lose their fizz. *Chicago Tribune,* Health. Retrieved online October 28, 2004, from http://www.chicagotribune.com/features/health/chi-0410270224oct27,1,6729406.story?coll=chi-news-hed; Soft drinks in schools get the boot. (2004, October 28). *Chicago Tribune,* Metro.

[30] National Dairy Council. (2004). *School milk makes the grade: Student nutritional status improves with enhanced milk product*. Rosemont, IL. Retrieved March 29, 2004, from http://www.nationaldairycouncil.org/press/alert/newsalert_128124.asp; CSPI (2004).

[31] The Associated Press. (2004, April 23). *Schools that can soda cut obesity.* CBSNEWS.com. Retrieved October 21, 2004 from http://www.cbsnews.com/stories/2004/04/23/health/main613336.shtml

[32] Reuters. (2004, January 7). *Soda gets the axe in Canada school crackdown.* CNN.com. Retrieved October 21, 2004, from http://www.cnn.com/2004/EDUCATION/01/07/canada.sodas.reut

[33] de Pommereau, I. (2004). French schools' new bête noire: Vending machines. *The Christian Science Monitor.* Retrieved October 21, 2004 from http://www.csmonitor.com/2004/1008/p01s02-woeu.html

[34] Byrne, D. (2003). *Physical education. 2003 Health Policy Tracking Service, National Conference of State Legislatures,* 1-22. Falls Church, VA: Netscan Publishing, Inc.

[35] Committee on Education and the Workforce. (2004). *Child nutrition and WIC Reauthorization Act.* Retrieved October 25, 2004 from http://edworkforce.house.gov/issues/108th/education/childnutrition/billsummaryfinal.htm

[36] Centers for Disease Control and Prevention. (2003). *Indiana 2003 Percentage of students who are overweight.* Washington, DC: CDC. Retrieved March 22, 2004 from http://apps.nccd.cdc.gov/YRBSS/QuestYearTable.asp?path=byHT&ByVar=CI&cat=5&quest=507&year=2003&loc=IN; Indiana State Department of Health. (2003). *Obesity.* Retrieved March 22, 2004 from http://www.in.gov/isdh/programs/owh/action/obesity.htm

[37] Whitaker, R.C., Wright, J.A., Pepe, M.S., Seidel, K.D., & Dietz, W.H. (1997). *Predicting obesity in young adulthood from childhood and parental obesity. National Library of Medicine.* Retrieved from http://content.nejm.org/cgi/content/short/337/13/869

[38] Guo, S.S., & Chumlea, W.C. (1999). Tracking of body mass index in children in relation to overweight in adulthood. *American Journal for Clinical Nutrition, 70,* 145S-148S.

[39] Epstein, L.H., Wing, R.R., Koeske, R., & Valoski, A. (1987). Long-term effects of family-based treatment of childhood obesity. *Journal of Consulting and Clinical Psychology, 55*(1), 91-95.

[40] Finkelstein, E.A., Fiebelkorn, I.C., & Wang, G. (2004). State-level estimates of annual medical expenditures attributable to obesity. *Obesity Research, 12,* 18-24.

[41] Indiana Tobacco Prevention and Cessation. (2002). *Fact sheet: Indiana's tobacco burden.* Retrieved June 12, 2004, from http://www.in.gov/itpc/files/research_87.pdf

[42] Indiana State Department of Health, Indiana Medicine and Public Health Initiative. (2004). *The future of public health in Indiana: A plan for community health improvement 2004-2007.* Indianapolis, IN: Indiana State Department of Health.

[43] Indiana Department of Education. (2001). *Response to General Assembly Resolution No. 35: An Evaluation of Physical Fitness Programs in Indiana Schools.* Pp. 15-16. Indianapolis, IN: IDOE.

[44] Indiana Department of Education. (2003, March 14). Indiana awarded $1.8 million, five-year grant for coordinated school health program. Indianapolis, IN: IDOE

[45] Roberts, D., Crouch, S., & Parish, T. (2004, October 8). *Coordinated school health program.* Indiana Department of Education. Retrieved October 27, 2004, from http://www.doe.state.in.us/super/2004Supermail/100804/health100804.htm

[46] Indiana Department of Education. (2004, February 26). *Department of Education selects ten corporations.* News: Press Release. Indianapolis, IN.

[47] Food Research and Action Center. (November 2004). *School breakfast scorecard 2004.* Washington, DC: Food Research and Action Center.

Authors

Kyle P. Cline

(kpcline@indiana.edu) is a Research Assistant at the Center for Evaluation and Education Policy.

Terry E. Spradlin

(tspradli@indiana.edu) is Associate Director for Education Policy at the Center for Evaluation and Education Policy.

Jonathan A. Plucker

(jplucker @indiana.edu) is the Director of the Center for Evaluation and Education Policy and associate professor of educational psychology and cognitive science at Indiana University.

Special thanks to **Mindy Hightower King** of CEEP and to **Jill Haler, Mike Gill, Beth Foland, Suzanne Crouch,** and **Dona Roberts** of the Indiana Department of Education for their input and support in providing information and review of this document many times. Their help was greatly appreciated!

■

Education Policy Briefs are Published by the Center for Evaluation and Education Policy

Child Obesity in Indiana: A Growing Public Policy Concern

Indiana University
509 East Third Street
Bloomington, IN 47401-3654
812.855.4438

NON-PROFIT ORG.
U.S. POSTAGE
PAID
Bloomington, IN 47401
Permit No. 2