National Evaluation & Measurement Meeting on School Nutrition and Physical Activity Policies

Final Report
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I. INTRODUCTION

a. Background

Enormous attention, effort, and resources are being paid to the obesity epidemic and its related health consequences, which are responsible for medical costs greater than those associated with both smoking and problem drinking (Sturm, 2002). The Nation's children in particular are facing a health crisis—the number of overweight and obese children is rising at a rapid rate (Institute of Medicine). The National Health and Nutrition Examination Survey (NHANES) data show that the prevalence of overweight among children from six to eleven years old increased nearly four-fold between 1963 and 2000 (Ogden et al., 2002). Among adolescents age 12–19, the prevalence of overweight increased more than three-fold between 1966 and 2000 (Ogden et al., 2002). According to the Surgeon General (2001), overweight children face a greater risk of a host of problems, including Type 2 diabetes, high blood pressure, high blood lipids, asthma, sleep apnea, chronic hypoxemia (too little oxygen in the blood), early maturation, and orthopedic problems. There is a strong correlation between childhood and adult overweight, and adult obesity is associated with a number of chronic diseases including diabetes, heart disease, hypertension and some cancers. Alarmingly, some of the chronic diseases that have traditionally been considered "adult onset" are appearing in younger segments of the population, including type 2 diabetes, elevated blood pressure, and hyperlipidemia. Overweight children also suffer psychosocial problems, including low self-esteem, poor body image, and symptoms of depression (UCB/Cooperative Extension, 2000). For girls in particular, poor self-image from being categorized as obese follows them into adulthood, resulting in fewer years of completed education, lower family incomes, and higher rates of poverty, regardless of their initial socioeconomic background (Dietz, 1998). Though the prevalence of overweight in children and adolescents is increasing for the overall U.S. population, the rate of increase is particularly pronounced among certain ethnic groups (Ogden et al., 2002).

Traditional medical models and individual behavioral change strategies have demonstrated a limited impact on slowing the increasing population rates of childhood obesity. Models that rely on environmental change may have greater potential to affect these rates – these models attempt to change the conditions or environments where children live and play by offering increased access to affordable healthy foods and opportunities for physical activity. Environmental change models may also support individual treatment or behavioral change strategies by providing a healthy environment in which children can easily practice these individual changes. In addition, and more importantly, environmental changes have the potential to *prevent* children from becoming overweight or obese by providing them with healthy nutrition and physical environments at a young age. It is generally acknowledged that obesity prevention efforts need to start early with a focus on children. With about 53,000,000 children attending school or day care every day, schools are a logical starting point in developing strategies to prevent childhood obesity. Schools, where children spend an average of 6 hours daily, 5 days a week, for the majority of the year, represent a critical location for environmental intervention to prevent overweight. The majority of US children attend school, most children eat one or two meals a day at school, and schools have traditionally provided opportunities for physical activity. Schools are uniquely positioned to reinforce both the healthy eating and physical activity behaviors that children need throughout their lives.

b. Trends in School Obesity Prevention Policies

A focus on models for changing the school food and physical activity environments must consider the administrative and financial structures controlling these elements of the school community. Unfortunately, school food service is caught between the competing responsibilities of serving children nutritious foods and running a financially solvent food service business. School food services are typically required to be self-supporting; they do not receive subsidies from the school general fund. School food service does receive federal reimbursement for the USDA regulated School Lunch and Breakfast programs, but this is insufficient to cover the costs of feeding children. Recent studies have shown that schools in California and across the country are relying heavily on sales of unregulated competitive foods—foods sold a la carte, in vending machines, in school stores, or as part of school fundraisers—in order to generate the additional income needed to offset the inadequate reimbursement they receive for the USDA-approved cafeteria menu offerings (Fox, 2001). A case-study analysis of 10 school districts in California found that a la carte sales accounted for between 7% and 12% of a district food service's operating budget (Samuels & Associates, 2001). A study conducted by the Public Health Institute showed that 95% of responding California school districts reported selling fast foods as a la carte items (Craypo, 2002). The most common fast foods sold as a la carte items were identified as pizza, cookies, chips, and burritos. A USDA analysis of dietary intake data showed that children who ate the National School Lunch Program (NSLP) meal had higher intakes of vegetables, milk, dairy products, protein rich foods and many nutrients, and lower intakes of added sugars than children who did not participate in the NSLP (Mathematica, 2001). Many of the children not buying the NSLP meals were instead buying the a la carte foods.

In response to this situation, nutrition and physical activity policies are springing up in school districts large and small. Likewise, legislative proposals are being considered at the state and federal levels to address the presence of unhealthy foods and lack of opportunities for physical activity in schools.

c. National Evaluation and Measurement Meeting on School Nutrition and Physical Activity Policies

The Robert Wood Johnson Foundation along with The California Endowment, as part of their strategic planning efforts on childhood obesity prevention, recognized the need for evidence and models for developing effective nutrition and physical activity policies in schools. They contracted with Samuels & Associates to organize a meeting on the evaluation of school food and physical activity policies in order to inform and stimulate the development of evidence-based policies. A group of nationally recognized researchers, public officials, public health practitioners, and policymakers gathered in San Francisco on May 6 and 7, 2004, to explore the best methods for evaluating the impact of school nutrition and physical activity policies on the school environment, student food consumption, physical activity patterns, and obesity rates.

The purpose of the meeting was to develop standard evaluation designs and measures for assessing school nutrition and physical activity policies and their impact on the school environment, and the resulting impact on student consumption and physical activity patterns, and obesity rates. Evaluation results will provide an understanding of what it takes to change school

food and physical activity environments and what types of outcomes can realistically be expected. Standard evaluation designs and a framework for evaluating nutrition and physical activity policies will provide decision makers across the country with the evidence and information they need to support changing the school nutrition and physical activity environment to protect children's health. Additionally, researchers, schools and communities will have a model for assessing the implementation and effectiveness of policy change.

The meeting aimed to accomplish the following objectives:

- To accelerate learning among meeting participants and their colleagues
- To develop recommendations for the best research objectives, outcome measurements, instruments, and methods of assessing the impact of school food and physical activity environmental change on students and the school community.
- To identify effective methods of disseminating tools and findings from school policy evaluations.
- To encourage the implementation and evaluation of school nutrition and physical activity policies across the country.
- To set the stage for ongoing networking among teams working to evaluate school nutrition and physical activity policies across the country.

The meeting started with a day of presentations and group discussion. Speakers provided background on legislative policies, reviewed primary research objectives, considered realistic short and long-term outcomes, identified methods for measuring changes to the school environment and student dietary intake and activity levels, and offered strategies for disseminating evaluation tools and findings. A second half-day was devoted to workgroups that focused on identifying evaluation questions and measures for assessing policy impact. Participant contributions expanded the group's understanding of school nutrition and physical activity policies and advanced participants towards the goal of generating a framework for evaluating school food and activity environmental change. This report is a summary of the content presented, major points of discussion, and provides recommendations for an evaluation framework.

d. Presenters

The authors of this report thank the following individuals for participating in this meeting and providing material for this report.

- **Peggy Agron**, MA, RD
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  Samuels & Associates
- **Marion Standish,** JD
  The California Endowment

II. SCHOOL NUTRITION AND PHYSICAL ACTIVITY POLICIES

Clarifying what is meant by policy

Despite the consensus among participants that school nutrition and physical activity policies are critically important to examine, participants had questions about the specific content, structure and purpose of these policies. Are the policies unwritten practices that schools have translated into operating procedures? Are they codified? If so, what do they say? Who is responsible for implementing and enforcing them? Will the policies be responsible for and judged against reduced obesity rates? These questions point out that before we begin to talk about evaluation we must have a clear picture of what we want to evaluate and by what standard we will be measuring policy impact.

Schools that have taken action on changing the nutrition and physical activity environment have done so without a road map, guided by a pioneering spirit, and motivated by concerned parents and community members. Often schools are faced with opposition from industry, elected officials, students and some community members. The types of actions taken have varied widely as leaders have made compromises and done what they could to create conditions in schools that would promote students' health.

Identifying who initiated the policy

Policies have been developed and implemented at the state and local levels to restrict certain foods or beverages, to set nutrient standards for foods sold outside school meal programs, to set state physical education hours requirements or to provide guidance and direction for local school boards. The National Conference of State Legislatures has developed a tracking system for school obesity prevention policies (ncsl.org). The comprehensive listing provides a brief description of bills being considered by state legislatures as well as the bill's sponsor and status. Examples include: the legislatures in 14 states have considered proposals that call for a modification or revision of the contents of vending machines (Howley, 2004); California Senate Bill 19 (SB19) passed in 2001, but has not been fully implemented due to funding requirements. SB19 set minimum nutrition standards for foods sold in elementary and middle schools in California; the California State Legislature in 2003 passed legislation eliminating sweetened beverages from all elementary and middle school campuses; the Hawaii legislature introduced a proposal requiring 200 minutes of physical activity per 10 school days for grades 1-6 and 400 minutes per 10 school days for grades 7-12. At the local level, school districts such as Los Angeles, San Francisco, and Oakland, have created policies that banned sodas and/or regulated food sales based on nutritional content. Written district-wide nutrition policies such as these have been approved by school boards and handed down to school officials to implement. Many policies are in the process of being instituted currently and the impact of the policy on the school environment, student eating behaviors, and the rates of obesity remains to be seen.

Understanding the policy components

A knowledge of the components and requirements of policies is necessary for understanding why some policies have been easier to enact, have student and administrative support, or are less of a financial burden to the school. The ultimate school and individual-level outcomes achieved by a policy change are influenced by particular policy elements, including: the decision-making body that wrote the policy and their relationship with the school community, administrative

specifications for implementation, and preparation and training for individuals responsible for and affected by the policy. Policy makers and administrators must have the complete picture of policy development and implementation in order to assess, first, whether a policy has brought about the intended changes, and second, whether the changes impact student health outcomes. The following section outlines the types of policies being developed by school districts and state governments across the country.

a. Types of School Food Policies

i. National Meal Program: The USDA is the government agency charged with providing school meals as part of the federally funded reimbursable meals program. Any consideration of policies to influence the quality of the food served in schools must look here (among other places) for opportunities for change.

Policies related to the National School Lunch/Breakfast Programs include:

- Increase the level of outreach to promote the USDA regulated meals to all students, especially those eligible for free and reduced price meals
- Improve access to the cafeteria and cafeteria conditions to make mealtime environments more pleasant and attractive to all students
- Include nutrition information in the cafeteria to promote healthy choices
- Offer foods from farmers' markets and/or salad bars
- Invest in food service facilities improvements to make cooking facilities suitable for preparing healthy foods
- Offer universal school breakfast program in which all students in low-income schools receive a free breakfast
- Improve meal content and quality by including fresh fruits and vegetables, foods lower in fat and sugar, and smaller portion sizes, in order to meet current dietary recommendations
- Assure that foods and beverages sold as part of school meals meet the National School Lunch/Breakfast Program requirements/standards

ii. Competitive Foods: Competitive foods are sold outside the National School Lunch/Breakfast Program. Examples of competitive foods include items sold in vending machines, at snack bars, or in school stores. Strategies to change competitive foods include:

- Adopt nutrient standards (acceptable and unacceptable items) for competitive foods
- Eliminate sales of foods that do not meet specified nutrient standards
- Place restrictions on when and where certain foods and beverages can be sold
- Include specific foods, such as fruits and vegetables, in competitive food options
- Adopt limits on the advertising and marketing of food and beverages in schools
- Prohibit schools from forging exclusive contracts with food and beverage companies
- Place all foods and beverages sold on campus under the control of Food Services
- Provide funding and incentives to initiate changes
- Implement funding requirements to offset revenue losses

iii. Community and School Events: It is often the case that school organizations and programs need to raise money for materials and activities by selling food and beverages at school, after school, or in the community. These foods are typically not nutritious and usually high in sugar, fat, sodium or calories. When sold during a meal period, fundraising foods are considered competitive foods. Some schools have considered implementing policies to control the sale of foods sold as fundraisers by school groups.

Policies include:

- Require that foods sold for fund raising purposes meet specified nutrient standards
- Restrict the times and places where foods can be sold
- Authorize only certain groups to sell foods and beverages as fundraisers
- Require a school official to approve all foods and beverages sold by student organizations
- Ensure that foods and beverages sold for fundraising do not encroach on Food Service sales

b. Health Education

Health education is offered as part of the academic curriculum. The effectiveness of health education programs is influenced by: the amount of time available for health education during the school day, staff and financial resources, and access to sound health information. Nutrition and physical activity instruction fall under the umbrella of health education. In order to be effective, schools need a coordinated curriculum in nutrition and physical activity that focuses on implementing evidence-based curricula that include proven behavior change strategies.

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i. Nutrition Education: Policies to improve nutrition education include:

- Incorporate nutrition education into health education and science curricula
- Provide age-appropriate nutrition education to all grades
- Adopt evidence-based curricula shown to change eating behaviors
- Align curriculum content with health education standards
- Assure that qualified instructors deliver nutrition education
- Coordinate curriculum with healthier foods served in the cafeteria and on school grounds
- Participate in a coordinated school garden program that is integrated with Food Service
- Coordinate curriculum with nutrition information available in cafeterias
- Assure that schools have adequate financial and staff resources to implement curriculum

ii. Physical Education: Funding cuts have had a damaging effect on physical education programs. However, there is a growing demand for improved physical education and opportunities for structured play in schools. Here are some examples of policies that encourage children to be more active during and after school. Elements of physical education policy include:

- Assure that physical education programs, K-12, meet or exceed state requirements
- Assure that policies specify the number of hours of physical education required per week
- Include the CDC guidelines for daily physical activity for school-aged children: 30 minutes of moderate activity or 20 minutes of vigorous activity.[1]

[1] http://www.cdc.gov/nccdphp/dnpa/physical/recommendations.htm

- Assure that students participate in moderate or vigorous activity during PE, either by changing the activities taught during PE or modifying the rules of the games so that students are more active.[2]
- Assure that qualified instructors teach physical education classes, and that instructors participate in periodic in-service training
- Adopt evidence-based curricula with evidence of providing active classes
- Utilize appropriate facilities, equipment, and class size for physical education
- Allow for physical activity opportunities before, during and after school
- Incorporate lifelong personal fitness skills in the PE curriculum

c. Physical Activity

i. Physical Activity Opportunities: There are opportunities for physical activity throughout the school day that should be used more effectively. Especially important are after-school programs and use of public school facilities for the broader community.

- Develop standards for recess in kindergarten and elementary schools; then enforce implementation of those standards
- Provide equipment and supervision to support physical activity before school, after lunch (when lunch break is long enough), and after school
- Collaborate with community organizations to provide organized physical activities for students on campus after school
- Shift resources from athletics programs that serve a few students to intramurals and activity classes open to all students
- Collaborate with community organizations to provide physical activity opportunities for the surrounding community outside of school hours
- Promote active commuting to and from school

ii. School Site Policies: Schools are too often built on the edge of communities, creating barriers to walking and biking to school. School site policies may have detrimental effects on the broader community by stimulating development at the edge of communities that reduces opportunities for active transportation.

- Adopt policies that schools should be built in the center of existing communities so most students can commute actively
- Collaborate with transportation agencies to ensure adequate and safe facilities to support active commuting to and from school
- Collaborate with planning departments and the real estate industry to promote the development of "activity-friendly" neighborhoods around schools

d. Screening and Monitoring

Some policies have put in place systems for monitoring children's health indicators at school. These policies institute procedures for ongoing monitoring of student physical measurements, fitness levels and health status, as well as set guidelines for methods of reporting the data to students and parents in a sensitive and productive manner. Examples include:

[2] ***www.thecommunityguide.org/pa***

- State-wide programs for measuring BMI and reporting results to students and parents
- State-wide school-based *FITNESS*GRAM testing to assess fitness levels and health indicators

e. Staff, Administrative and Student Education

Nutrition and physical activity policies involve training and informing staff, administration, students, and parents about the consequences of the policies. In addition, training individuals responsible for these programs helps with implementation and enforcement. Elements of policies to address these needs include provisions that stipulate the following:

- Inform and educate administrators about the policy
- Equip school officials overseeing policy implementation and enforcement with the knowledge and authority to do so
- Provide information about evidence-based physical activity and nutrition programs and policies
- Train food service staff on necessary procedures and provide additional instruction periodically
- Assure that parents are aware of the policy prior to implementation
- Provide parents with nutrition and physical activity policies and information via mailings
- Encourage staff and administrators to model healthy behaviors
- Provide teachers with materials about nutrition and physical activity
- Train staff on taking accurate measurements for screenings and delivering the results in a sensitive and productive manner
- Specify timelines for initial staff instruction and follow up trainings
- Post policies in public view on campus

Students should be involved in the process of policy development and be educated on the reasons why the policy is important and needed at their school. Student education and involvement in the policy development process will facilitate student acceptance of the policy and help to improve policy implementation. By their involvement in the policy development, students can become advocates for the policy and encourage support for the policy among other students, administrators and school board members (California Project LEAN, 1999).

f. Policy Implementation and Support

The success of nutrition and physical activity policies relies to a great extent on how the policies were implemented. Were all stakeholders involved in developing the policy? Is there financial support? Are there incentives for the activities to take place? Was the policy promoted to the students, faculty, and the community prior to changes being made? An implementation plan is a key component of the policy to insure it is fully enacted with the support of the school and surrounding community. The implementation plan should derive directly from the policy and include the following conditions:

- Specify the support activities required for implementation such as: health education, nutrition education, physical education, cafeteria improvements, outreach activities, fitness report cards
- Identify the person or office responsible for sponsoring, maintaining, monitoring and enforcing the changes outlined in the policy
- Provide a timeline and a target date
- Identify funding sources as needed
- Form a committee to address challenges to policy implementation and reactions of students and faculty
- Engage students and parents in all stages of the policy process[3]

The policies reviewed above have significant resource implications for schools. Schools already struggle to meet state and federal education codes with current funding. Adherence to additional curriculum and food service expenditures will be challenging. In the face of this difficult situation, members of the school community have differing levels of support for nutrition standards and physical activity requirements. Therefore, clear public support for changes, as well as sufficient appropriation of resources, are crucial for successful policy implementation.

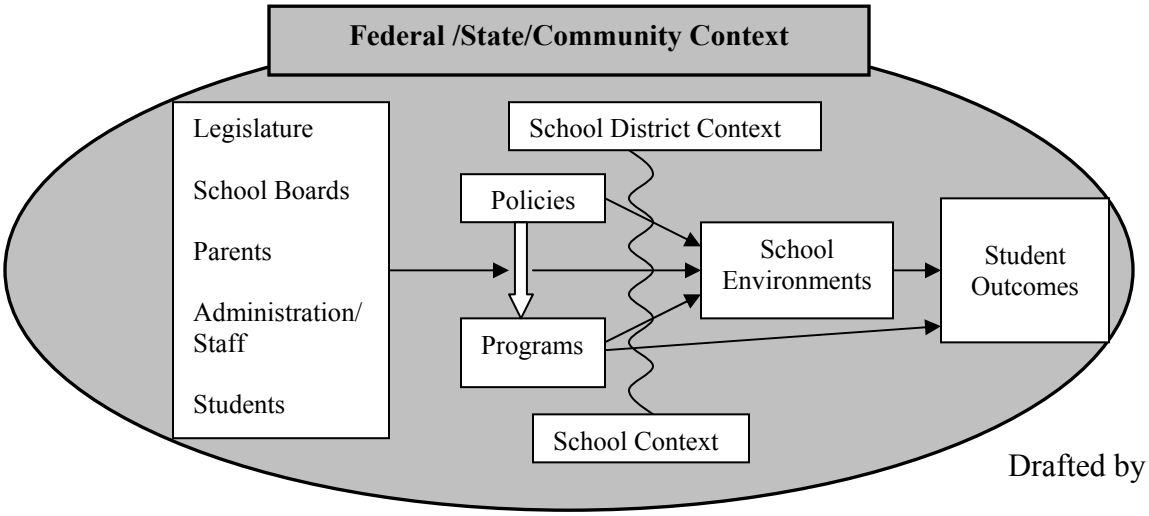
g. Creating a Model for Understanding Policy Hierarchy and Influence

Decisions regarding school nutrition and physical activity policies are made at three levels of government: federal, state, and local. Local control rests with school boards, which are comprised of representatives of the community who make policy decisions for the schools in the district. However, it is at the state level that the responsibility for providing public education rests. Legislation passed by the state legislature, is interpreted by local school boards, and put into practice by school officials. The federal government influences student nutrition at the highest level, as it exercises control over child nutrition programs through the USDA. The USDA administers the national school food program, which provides breakfast and lunch for students who are eligible for free and reduced priced meals.

With coordination and rule-making occurring at all three of these governing levels, changing school policies is complicated and challenging. There are several points at which policies and practices can be initiated, and identifying who is responsible for enforcement and who is ultimately accountable for the changes is confusing. Furthermore, policies from the federal, state, or local authorities sometimes contradict each other, creating more confusion. Attempts to evaluate the implementation and impact of nutrition and physical activity policies must take into account the complexity of stakeholders invested in changing school environments.

There are many permutations of policy components, implementation processes, and sources of policy change. Therefore, a model for understanding the context of these policies, the influence of governing bodies and stakeholders on programs, the environment, and student outcomes is useful in considering approaches to policy evaluation. The following diagram depicts how the pieces of this intricate landscape relate to each other.

[3] Students of San Francisco Unified School District, in a facilitated discussion led by Lori Dorman, Berkeley Media Studies Group, discussed their own experiences with nutrition policy development and implementation in San Francisco's schools and emphasized the importance of this recommendation.



Drafted by Sallis, 2004

Schools and governments are considering numerous nutrition and physical activity policies to help control the rapid rise in rates of childhood diabetes and obesity. The sponsors of these changes as well as stakeholders in the community will be looking for evidence that these policies have made the school environment more conducive to healthy habits and had an impact on student behaviors and obesity rates. Therefore, an understanding of the components of the various policies, the considerations in developing an implementation plan, the key players, and how all these pieces interact is crucially important for creating relevant and informative evaluations. The remainder of this report provides a roadmap for the evaluation of school obesity prevention policies.

III. FRAMING EVALUATION

The causes of obesity are extremely complex and multifaceted, requiring that prevention approaches must be comprehensive and engage communities, schools, families, primary care providers and other institutions in supporting healthy diets and physical activity for all children. Multifaceted, multisector interventions necessitate evaluation designs that measure and capture appropriate outcomes including: process, impact, individual change and environmental change.

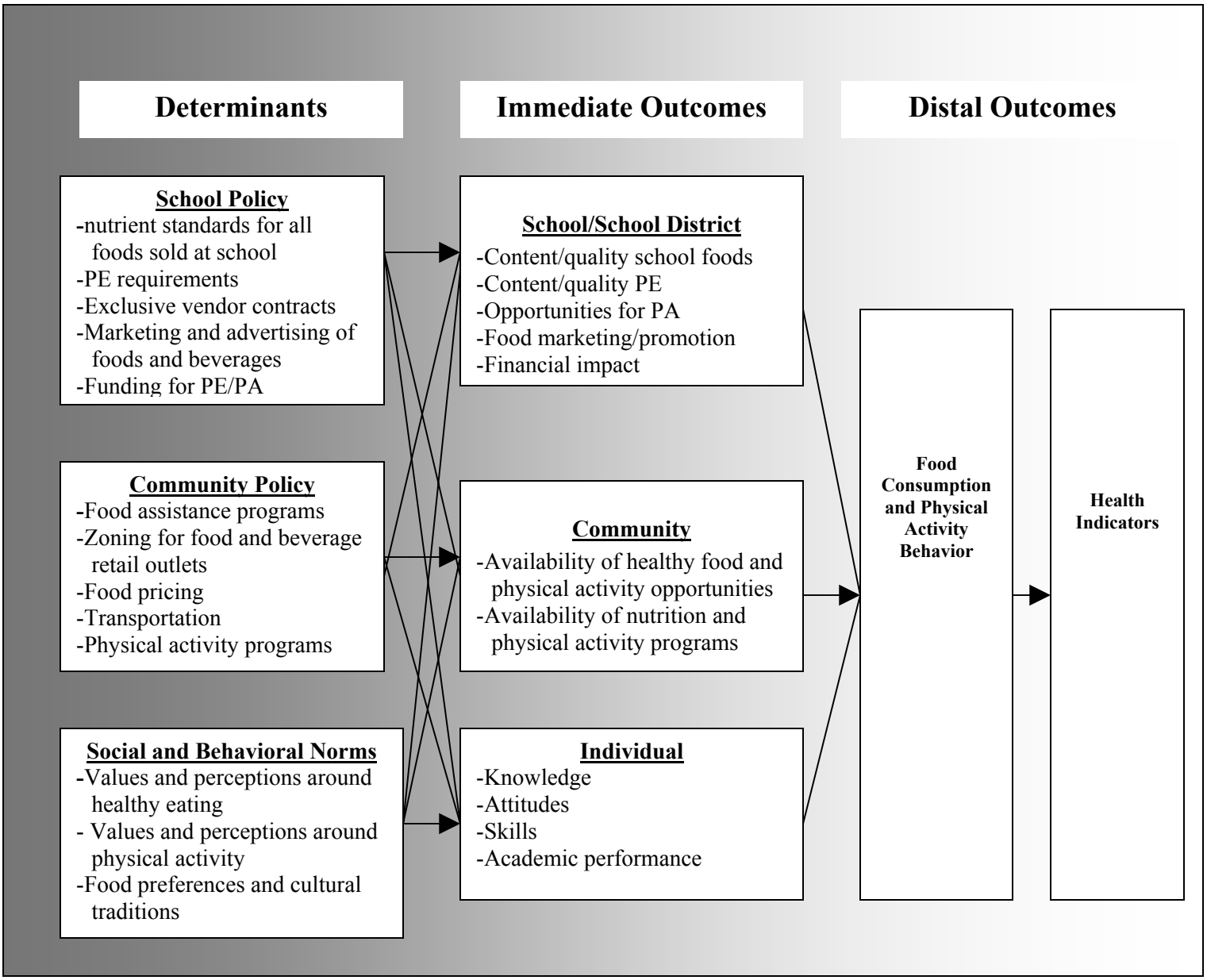
Obesity prevention and evaluation in the context of schools is equally complex. Many factors in the school and community environments influence children's diet and physical activity habits. For this reason it is difficult to show the direct relationship of environmental factors to students' behaviors, and it is equally hard to isolate the effect of specific policy interventions on students behaviors. For example, children's fast food and sweetened beverage consumption is one of the many potential causes of obesity (Lustig, 2001). However, because the relationship between the environment and behavior is so complex, the food and beverage industry argues there is inconclusive evidence suggesting that efforts to restrict fast food and sweetened beverage choices in schools will be an effective obesity prevention strategy. Schools choosing this approach face serious opposition from industry given the level of uncertainty about effective strategies for combating obesity.

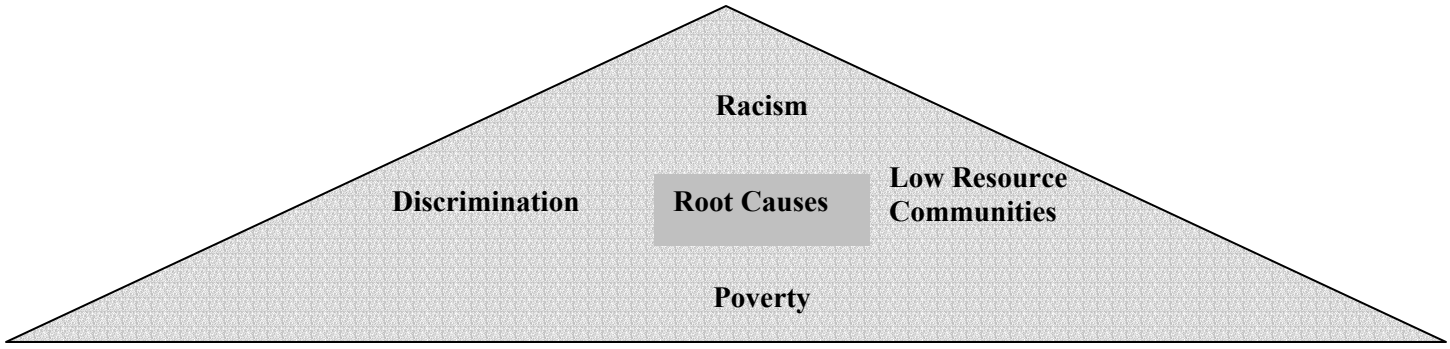
This field is in its infancy, and lacks widely disseminated best practice models that decision makers can look to for assistance. Action for Healthy Kids, a nationwide initiative to decrease incidence of childhood obesity, has produced one of the first sets of criteria that schools can use to evaluate the feasibility of various obesity prevention approaches (Action for Healthy Kids, 2004). However, policy makers need evaluation results to explain the process, benefits and challenges various audiences can expect from school nutrition and physical activity changes. Evaluation results will allow policy makers to better understand the necessary elements of a policy, the subsequent challenges, and realistic outcomes in order to address opposition and garner support for policy changes. The call for more evidence of the effectiveness of schools as a venue for prevention policies, requires a framework for guiding future evaluations. The discussion at this meeting informed the development of the following framework for the evaluation of obesity prevention policy.

a. Evaluation Framework

The following evaluation framework describes the **determinants** that shape policy, the **immediate** outcomes expected in the school environment and community, and for the individual student, the more **distal** outcomes for student health and behavior that are indicators of long-term policy impact. The framework also illustrates the pathways by which determinants, immediate outcomes, and distal outcomes interact and influence each other. Finally, the framework suggests indicators to measure within each of the outcome categories. All of these interacting elements occur within a socioeconomic and demographic context contributing to the root causes of obesity and health disparities. Using this framework, evaluators can see the relationship between the various types of policies discussed throughout this report and the potential outcomes that might be achieved in the school and community environments and how that might impact student health and well-being.

Evaluation Framework





Given the audience for the evaluation, the level of evidence required, and the time allotted for obtaining results, the evaluator may choose to focus on different aspects of the framework. Clearly identifying the determinants will aid in generating research objectives and questions, creating an evaluation design, and choosing the appropriate methods and measurement tools. Assuring that policies have been fully implemented is a critical step in understanding outcomes (there is no point in measuring impact on student behavior if the changes have not been fully implemented). In addition, community factors will influence policy implementation and the impact school-level changes have on students' habits, requiring evaluators to understand and describe the community contextual factors and their relationship to school policies. The framework, ultimately, provides guidance on the sequence of impact and creates a context for designing evaluations and understanding results.

b. Evaluation Players

Agents

A number of organizations and individuals may be responsible for conducting the evaluation of nutrition and physical activity policies:

- State education or health departments may conduct the evaluation of state level policies
- Local advocacy and community organizations involved in the development and passage of a local policy have a vested interest in evaluating the implementation of that policy
- External researchers conduct formal studies on the effects of changing school nutrition and physical activity environments.
- School board members, school business officials, food service directors, and other district personnel have key responsibilities in policy implementation and monitoring, and also play a role in policy evaluation

Audiences

Evaluation results must engage the following audiences by satisfying their specific evaluation objectives.

- ***Foundations:*** Information from the evaluation of a policy can be used to inform future funding efforts of similar school based policies and demonstrate the role that foundations can play in helping schools to make these changes, especially around the need for technical assistance funding to enable the school district to implement the policy.

- ***Policymakers:*** State and local policymakers, such as school board members, could use the information to monitor the implementation of the policy and develop and pass similar policies in different school districts and at the state and federal level.

- ***Advocacy organizations:*** Organizations that advocate for children's health, education, or nutrition and physical activity could use evaluation information to shape and advance policy agendas and to educate policymakers regarding the importance of the changes brought by these policies.

- ***Community organizations:*** Local organizations may be interested in evaluations that can provide the community with information on the health of their students, the role of the school in providing a healthy environment for children, and how communities can use the information to educate, inform and conduct advocacy for additional changes to improve the nutrition and physical activity of the community.

- ***School district personnel:*** District personnel may be interested in the cost and feasibility of implementing the policy within their district. They would also like to know the benefits in terms of improved student health, improved classroom and performance outcomes and the impact on revenues from the sale of foods and beverages used to support student and athletic activities.

- ***School administrators and school staff:*** School site administrators and school staff, who are most directly impacted by policy changes, would like to know the cost and staff time required to implement the policy. They would also like to know the overall feasibility of implementing the policy, the benefits in terms of improved student health, improved classroom and performance outcomes, and the impact on revenues used to support student and athletic activities.

- ***Parents/students:*** The evaluation of these policies can provide important information for families and students – the potential effect on student health and revenues available for student activities may be of interest to parents and students and may influence their support or opposition to the policy.

IV. TYPES OF EVALUATION

Evaluations must be tailored to the purpose for which they were conceived. The section below describes three types of evaluation studies. Taken together, these evaluations provide a comprehensive illustration of school-based policy implementation and short and long term outcomes achieved. However, these studies may also stand on their own, as each describes a particular aspect of school-based policy that could be of interest to different audiences.

a. Policy Evaluation Studies

These studies evaluate the impact of a policy on school foods and physical activity environments. Individual-level measures may not be needed for this type of study. Potential data needed for policy evaluations may include qualitative and quantitative data:

i. Meta policy analysis:

- Policy analysis of "natural experiments" or those school districts that independently (without state or federal mandates or funding) developed and implemented district nutrition and/or physical activity policies.

ii. Correlational analysis:

- Analysis of student self-reported nutrition intake and physical activity, and school district nutrition and physical activity policies to determine relationships between policy and student behavior.

iii. Summative/Process:

- Policy analysis data to determine the key components of the policy to be implemented in the school
- Environmental assessment data to assess the level of policy implementation
- Stakeholder surveys to describe opinions, policy development, perceived success of implementation, and to determine support for the policy
- Student opinions on the policy and implementation strategies

iv. Impact:

- Financial impact data

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b. Research Studies of Policy Impact on Obesity

These studies examine how implementation of a school policy impacts students' health indicators. Individual-level measures are central to this type of study. Potential data needed for these types of evaluations include:

Outcome variables:

- BMI
- Food and beverage consumption data
- Health indicators
- Physical activity and fitness data

c. Surveillance Systems

This type of evaluation involves the tracking of a set of individual and environmental outcomes over time to assess changes occurring due to all influences.

Summative:

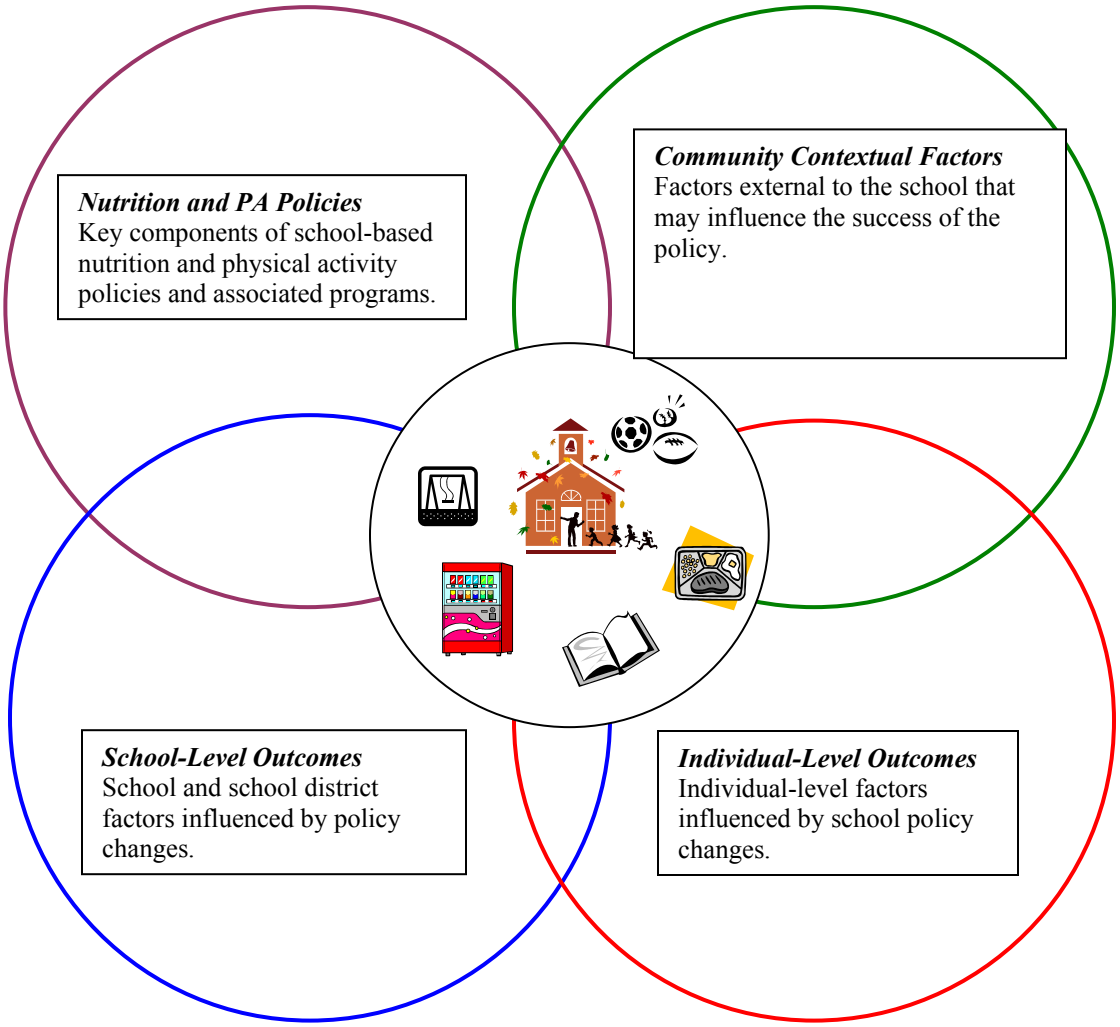
- Environmental assessment data
- Policy tracking

Impact:

- Financial impact data
- Food and beverage consumption data
- BMI
- Blood pressure
- Aerobic capacity/physical activity levels

V. Evaluation Domains for Nutrition and Physical Activity Policies

The following diagram represents the measurement domains to examine for process or impact evaluations, or ongoing surveillance and accountability studies. The diagram describes components within each domain and illustrates how these components influence the school nutrition and physical activity environment as well as how they influence each other across domains.



a. Elements of Nutrition and Physical Activity Policies

This domain describes the key components of school nutrition and physical activity policies that help evaluators understand the elements of a policy to evaluate. A number of the questions to include in a policy review are the following:

- What does the policy restrict or prohibit?
- What does the policy allow?
- What are the criteria for defining acceptable and unacceptable items?
- Are there funding/incentive requirements for implementation of the policy?

- Are there funding requirements to offset revenue loss?
- Are support activities required for implementation of the policy?
- Is there an implementation plan and is the person/office responsible for implementation identified?
- Is there an enforcement mechanism and who is responsible?
- Are there ways for students to circumvent the policy?
- What educational activities aimed at administrators, food service, parents, are needed to get their support and avoid opposition?

Actors and audiences may include: state and local policymakers, researchers, advocacy organizations.

b. School-Level Evaluation Questions and Outcomes

This domain describes the school-level outcomes that refer to many of the changes that occur in the school environment as a result of the policy.

i. Evaluation Questions

Evaluation questions to consider when evaluating school-level environmental changes include:

- What is the degree to which the policy is implemented?
- How does the policy change the foods and beverages available in school?
- How does the policy change the amount and quality of physical education and physical activity on campus?
- How does the policy change the resources available for nutrition and physical activity/physical education?
- How does the policy affect academic achievement?
- How does the policy change revenues generated from food and beverage sales?
- Does the policy allow foods and beverages sold for fundraising to encroach on Food Service sales?
- Does the policy impact school meal participation?
- Does the policy influence how food and beverage revenues are used?
- What other school/district-level policies inhibit/enhance implementation of the policy?
- How does the policy affect school/classroom related behavior?
- What is the perceived importance or acceptance of policy by school administrators, school food service staff, parents, students?
- What are the unintended consequences of the policy?

ii. Outcomes

A number of school-level outcomes should be measured as part of any evaluation of school nutrition and physical activity policies that target changes to the school environment. The measurement of school-level outcomes can demonstrate the ability of the policy to affect changes in the school environment and demonstrate how well a school was able to implement the policy. Because school-level outcomes assess actual policy implementation, they should be measured prior to any measurement of individual-level outcomes. Specific outcomes include:

	School-Level Outcomes	
Content and quality of school foods	**A la carte foods:** sold by food service, vending machines, student stores, and as fundraisers: ▪ Types of foods and beverages ▪ Price of foods and beverages ▪ Portion sizes ▪ Nutrient content ▪ Times for food and beverage sales ▪ Existence of school/district vending contracts	**School meals:** ▪ Frequency of meals ▪ Number of meals served ▪ Ease of access to meal program ▪ Number of students participating in meal program ▪ Nutrient content of menus ▪ Layout of cafeteria and other meal service areas
Marketing of foods and beverages in schools	**Advertisements:** ▪ Vending machines ▪ Score boards ▪ Textbooks covers ▪ Equipment ▪ Materials ▪ Signage ▪ School radio/television channel	**Events:** ▪ Taste tests ▪ Product give-aways ▪ Contests
Financial impact	**Foods and beverages:** ▪ Wholesale purchase cost ▪ Retail price ▪ Sales volume	**Physical activity:** ▪ Athletic department budget ▪ Dollars allocated to competitive vs intramural sports ▪ Dollars for equipment/facilities
Physical education/physical activity	▪ Amount of physical activity required and quality of physical education ▪ Adherence to standards for physical activity and recess (grades K - 6) ▪ Number of trained physical education teachers ▪ Amount of physical education in-service training for teachers ▪ Amount/opportunity for physical activity on school grounds, outside of school hours ▪ Increased opportunities for physical activity throughout the school day ▪ Collaborations with community organizations to provide physical activities on school campus and in the community ▪ Number of students using active modes of transportation to commute to and from school	
Others	▪ Outcomes related to academic success or performance	

iii. Within-School Contextual Factors

A number of factors within the school that are not directly related to nutrition or physical activity may have an influence on policy implementation and school-level outcomes (these contextual factors reside within the school only - they do not include factors within the community surrounding the school). In-school contextual factors may include:

Degree of implementation: The degree and timeframe of policy implementation influences school-level outcomes. If a policy is not fully implemented it is less likely to influence the desired school-level outcomes.

Attitudes toward the policy: The perceptions and attitudes of school and district administrators, including school food service staff, are essential for the success of policy

implementation. Measuring the attitudes of essential district and school staff can help to better understand the support and barriers to policy implementation.

Levels of accountability: If school administrators are responsible for the implementation of the policy and are directly accountable to the district administration or the school board, there is a greater likelihood the policy will be successful.

Resources required for implementation: Schools often require technical assistance or additional resources to implement a policy; if these are not available, policy implementation is likely to be sub-optimal.

Nutrition education and physical activity programs/curriculum: The existence of evidence-based nutrition education and physical activity programs within the school or district may influence school-level outcomes.

Committees or councils: Many policies and school boards call for the formation of committees or councils charged with recommending changes to school nutrition and physical education environments or implementing the policy. Federal policy, under the Child Nutrition Reauthorization Act of 2004, now calls for the formation of such committees at the school district-level. It is important to evaluate the role and effectiveness of these forums in adopting and/or implementing policies.

Open versus closed campus: The existence of an open or closed campus has great influence on student food and beverage purchase patterns. Under an open campus, students are allowed to leave the school grounds during meals. In school districts or schools that have open campuses, a policy change to the foods and beverages sold on campus may result in greater numbers of students leaving campus to purchase items not allowed under the policy.

Student population shifts: Some school districts and schools experience large changes in student population during or between school years. In school districts with growing populations, mobile populations or high drop out rates, the changes in the student population may impact the acceptability of the policy, how the policy is implemented, and school-level outcomes.

Staff turnover rates: The departure of a principal, superintendent, or other supportive key school staff may have an impact on school-level outcomes. Newer school staff may not have participated in the development of the policy, received training on how to implement the policy, nor understand the intent of policy.

c. Individual-Level Evaluation Questions and Outcomes

School nutrition and physical activity policies may impact a number of individual or student-outcomes. This domain describes the individual-level characteristics that may be affected by school policy change.

i. Evaluation Questions

Evaluation questions answered by examination of this domain include:

- How does the policy affect student food and beverage consumption in and out of school?
- How does the policy affect levels of student physical activity in and out of school?
- How does the policy affect student fitness levels?
- What are the student attitudes toward the policy?
- How does the policy affect student weight and BMI?
- What are the linkages between student behavior and changes in the school environment?
- What are the linkages between student behavior and contextual factors?
- What are the unintended consequences of the policy?

ii. Outcomes

While changes to the school environment may be the immediate outcomes resulting from the policies, the long-term goal of these policies is to benefit the health of children and adolescents while they are in school and subsequently in adult life. Assessments of individual-level diet and physical activity related health outcomes focus on student's ***physical health*** and/or on their ***attitudes, knowledge and behavior***. The following section describes the individual-level health outcomes most suited to school-based evaluations.

1. Physical health: Evaluations of nutrition and physical activity policy examine physical health indicators to assess a policy's ability to improve health. Measurement of physical health indicators allow researchers to assess current health status, gauge risk for disease later in life, and measure change in indicators over time to determine the impact of a policy intervention. Physical health assessments include the following:

Health indicators: Blood pressure, blood lipids, and blood glucose may be measured as indicators of health and disease risk. The applicability of these measures to evaluation studies is limited by the following factors: 1) intervention timeframe must be of sufficient intensity and duration to produce an intervention effect on health indicators, 2) most school children have blood pressure, lipid and glucose values within the normal range, making an intervention effect difficult to detect, and 3) health indicators are expensive to measure.

BMI***:*** Body Mass Index (BMI) is the measurement currently used for assessing the growth of children. Although BMI is one of the most commonly used tools to assess children's weight status, BMI offers only a rough estimate of risk for overweight. For an individual child or adolescent, BMI is likely to change over time, moving up or down as height and weight vary in relation to each other and as the child's muscle mass and stage of puberty change. A relatively small percentage of children (probably less than 2%) who have a high BMI actually have a high BMI because of a relatively high amount off muscle tissue or lean body mass, and not because they have increased their adipose tissue. These children are usually easy to identify. Despite its flaws as a diagnostic tool, BMI calculations are useful for surveillance of the weight status of large groups, such as all of the children in a particular grade at a school (Crawford).

Schools must define their objectives when measuring BMI and answer the following questions:

- Are student weight and height measurements being collected for analysis and comparison with measurements from past eras and other locales (e.g. other schools, communities, states)?
- Are schools required to collect BMI measurements on a regular basis?
- To what extent is the school itself prepared to make changes based upon the data it collects?
- Are the measurements being collected in order to provide information to parents?

If the decision is made to notify student's parents, schools must also determine whether the goal of parental notification is treatment or prevention. They must also then decide what to tell parents and whether to notify all parents, or only the parents of children who are overweight (or underweight) or at risk for overweight. In addition, schools must consider what type of action plan or behavioral recommendations will be provided along with the parent notification and what kind of resources will be available for follow up.

Student physical fitness***:*** There are multiple components of health-related physical fitness and these include aerobic capacity, body composition, muscular strength, and flexibility. Fitness measurements not only serve as health indicators but can be integrated with programs to promote regular physical activity among youth, with emphasis on activities that reduce the risk for chronic disease and improve health-related physical fitness.

2. Student knowledge, attitudes and behaviors

Student knowledge and attitudes: In order to fully describe the association between a school policy and student eating or physical activity behavior, it is important to have an understanding of attitudes, perceptions and knowledge, since these factors are the motivators behind student food, beverage and physical activity choices. The level of student knowledge about proper nutrition and physical activity habits can be assessed, as well as student's reactions to the policy. Student acceptance of the policy can often influence how thoroughly a policy is implemented.

Student behavior: School environmental change policies are put in place with the long-term goals of changing behavior in order to eventually improve health status. A frequent objective of evaluations of nutrition and physical activity policies is measuring the impact on student eating behaviors and physical activity patterns. Researchers are interested in the magnitude of behavior change a school policy can achieve during the school day as well as the impact of the policy on student behavior outside of the school setting. Specific outcomes include:

- Student food and beverage consumption patterns
- Student food and beverage purchase patterns
- Physical activity patterns throughout the school day and after school
- Participation in physical education and other physical activity programs
- Quantity and quality of physical education classes

3. **Demographic information:** Participant demographic information needs to be collected from the students' parent. Information collected should include parental education level(s), household income, and race/ethnicity.

d. Community Contextual Factors Evaluation Questions and Outcomes

This domain includes the numerous factors in the community that may influence policy implementation and its subsequent impact.

i. Evaluation Questions

Evaluation questions to consider when evaluating community factors in the context of school nutrition and physical activity policy change include:

- Is there state legislation that addresses school food and beverage sales or physical education?
- What are the ethnic, linguistic, education, and economic demographics within the community?
- Does the community provide access to quality parks, recreation, and after school programs?
- Is there access to healthy food in the surrounding community?
- What is the proximity of school sites to neighborhood stores, restaurants, and mobile food vans?
- Do local public agencies have exclusive contracts with soda companies and fast food vendors?
- What other obesity prevention programs and policies exist in the community? How does education funding impact nutrition and physical activity in the community's schools?
- What are the community social and cultural norms and beliefs surrounding food and physical activity?
- How well does the community facilitate or hinder healthy eating and physical activity during leisure time and as a mode of transportation

ii. Outcomes

Community contextual factors are variables in the community surrounding the school that will influence the impact of the policy. Some aspects of the community contextual environment are more likely to affect school policy changes than others, so it is important to look at these factors to determine which are the most important variables that will influence diet, activity, and obesity. The students' level of interaction with the immediate community and the interrelationship between a policy and the community also play a role in the policy's success.

Prior to a discussion of community factors' influence on school and individual-level outcomes, it is important to define what is meant by community. How community is defined will affect where to draw boundaries for an analysis of contextual factors. Definitions of community include:

- The area geographically surrounding the school
- An area defined by where the school's students live
- Define catchment area for school enrollment.

It is possible to group the community variables into environmental categories as a way of understanding how and where these variables exert their influence. This framework includes community variables that will affect the eating and physical activity habits of the community residents.

- The physical environment: access to safe routes to schools, access to parks and recreation programs, access to unhealthy/healthy foods, density of or proximity to these resources, bikability and walkability of a community, street lighting, street connectivity, population density, fast food outlets, liquor stores.
- The information environment: billboards, retail store marketing, promotions
- The demographic environment: ethnicity, median household income, language spoken and language isolation, education, property value, employment
- The social and cultural environment: social/cultural norms around eating, PA, and body weight, awareness of the problem, civic participation, community leadership, social capital, characteristics of the home, safety or perceptions of safety, crime density
- The resource environment: linkage to health, public health, and programs supportive of healthy eating and PA
- The food policy environment: what's available to schools and stores, food distribution systems

One of the most difficult aspects of assessing community contextual factors is prioritizing the most relevant community factors to examine. The following guidelines should be followed when identifying the priority community factors:

- Set the geographic boundaries around the area defined as the community.
- Determine by consensus which factors may have the most influence on the policy's implementation and success.
- Determine the availability of data and the best way to explore the relationship between the school policy and the surrounding community.
- Determine the appropriate format for presenting the information to the intended audience.

VI. EVALUATION METHODS

Different evaluations are needed for different purposes.. A multi-method research design employing qualitative and quantitative data collection methods is needed to paint a multi-dimensional picture of policy impact in schools. Complementary data collection techniques include:

a. Qualitative:

Environmental assessments
Stakeholder surveys
Focus groups
Policy tracking

b. Quantitative:

Self-report surveys of student health and behavioral outcomes

Food and beverage consumption
Physical activity levels
Secondary data sources (CHIS, BRFSS, NHANES)

Objectively measured assessments of student health and behavioral outcomes

BMI
Blood Pressure
Aerobic capacity/physical activity levels

Review of retail and government-based secondary data on community, school, and student factors

Household characteristics
Food service sales and profit
Demographic characteristics

c. Evaluation Types, Outcome Measures and Data Sources

The following table lists the type of evaluation appropriate for each outcome domain and describes how the type of evaluation drives the outcomes to be assessed and the methods or specific data sources needed to measure outcomes. Please see Appendix A for a descriptive listing of methods for measuring school, individual, and community-level outcomes.

Domain/ Outcome	Evaluation Types	Outcomes / Measures	Data Source	Contacts
Individual Level · Health outcomes · Knowledge, attitudes and behavior	· Impact Research Study · Surveillance Systems	· Physical Health (Blood pressure, BMI, Physical fitness) · Knowledge/ Attitudes · Behaviors (dietary and physical activity) · Demographics · Academic performance	*FITNESS*GRAM; NHIS; BRFSS; YRBSS State surveys (e.g. CHIS, Healthy Kids Survey); focus groups; Youth Food Frequency Questionnaire; PACE; Accelerometers; Pedometers; Household Travel Surveys; Panel Study of Income Dynamics, Child Development Supplement; National Longitudinal Study; Monitoring the Future; SOPLAY	cooperinst.org/ftgmain.asp cdc.gov/nchs/nhis.htm cdc.gov/brfss cdc.gov/HealthyYouth/yrbs/index.htm chis.ucla.edu wested.org/pub/docs/chks_home.html paceproject.org/homepage.html rohan.sdsu.edu/faculty/sallis/SOPLAYprotocol.pdf psidonline.isr.umich.edu monitoringthefuture.org californiaprojectlean.org cnr.berkeley.edu/cwh/index.html
School Level · School policies · Compliance · Financial impact	· Policy Evaluation	· Content/Quality of foods · Presence of foods not adhering to policy · Marketing of foods/beverages · Change in school and/or food service revenues · Proportion of PE time spent physically active Opportunities for physical activity · School contextual factors	School environmental assessments; School health index; Policy tracking; Focus groups; Case studies; Financial impact; SOFIT, Monitoring the Future	Samuelsandassociates.com apps.nccd.cdc.gov/shi fns.usda.gov/fns rohan.sdsu.edu/faculty/sallis/sofitprotocol.pdf monitoringthefuture.org
Community Level · Environmental change · Public support	· Policy Evaluation · Impact Research Study · Surveillance Systems	· Retail density (fast food, grocery stores, liquor or convenience stores) · Walkability / Bikability of neighborhood · Advertising and marketing in and around schools · Park space and availability of activity programs · Neighborhood Safety · Proportion of public supporting school nutrition and physical activity policies	Retail Local Environmental Assessments; U.S. Business Standards Statistics; National Neighborhoods Indicators Project; Walkability/Bikability assessments; State Departments of Transportation; Advertising and marketing environment assessments; City Parks and Recreation Department; School Health Index; Changing the Scene; (CTS); US Census (park files); FBI annual crime report; Opinion polls, special surveys	censtats.census.gov urban.org/nnip apps.nccd.cdc.gov/shi census.gov/index.html fbi.gov calendow.org/news/press_releases/2004/03/main.stm

VII. CHALLENGES

The following challenges were unresolved debates discussed during the meeting.

a. School-Level Challenges

Measuring outcomes at the school- level and the school district-level
Environmental change policy evaluations often require evaluations on two levels: the individual school and the school district. An evaluation focus on the school-level is imperative because this is where the majority of environmental changes take place, where facilitators and barriers to implementation are encountered and where students, staff and parents come in contact with the policy. Evaluations also need to focus on the district-level because this is usually where the individuals most responsible for policy development and implementation reside.

Utilizing school or school district data versus developing new data collection tools
While evaluators like to create data collection tools tailored to specific evaluation questions, this type of data collection is often cumbersome for school personnel. Instead, evaluators need to consider developing data collection tools that use the data available in school systems such as accounting, purchasing, or NSLP participation data.

Measuring changes to school meal programs and a la carte foods
Improvements to the quality of school meal programs may be harder to measure than improvements to a la carte foods. The type of meal service program, food service's meal preparation techniques, and the mechanism used to offer meals to the students all impact the evaluator's ability to analyze changes to the nutrient content of the school meal. Analyzing the nutrient content of a la carte foods is often easier, because the nutrient information is often more accessible and available on prepackaged processed foods. The language and intent of the policy should guide the evaluation design on which foods to assess and the specific characteristics to examine.

Does nutrition and physical activity environmental change affect academic performance?
Schools are interested in how policies may affect academic outcomes – school administrators would like to know if the environmental changes will result in improved academic achievement. While a number of studies have demonstrated that eating breakfast improves test scores, there is little to no research on the effect of improved diet quality (i.e. less fat, less sugar, more fruits and vegetables) on academic performance. Researchers in this field face the challenge of associating academic performance and environmental change.

Stigmatizing overweight children: measuring unintended consequences
Policies designed to reduce the number of overweight children in a school district may unwittingly create an atmosphere that stigmatizes overweight children. Schools must assure that implementation of the policy does not promote negative staff and student attitudes towards overweight students. Evaluators must develop tools to capture issues related to stigmatization of overweight children and report findings back to schools so they can modify approaches to change attitudes.

The food and beverage industry's relationship with school food policy: a positive challenge
The role of industry in school nutrition policy is as yet undefined and at times controversial. Determining the role of industry in this area presents a number of challenges. The key issues for evaluation are:

- The food and beverage industry's influence on evaluation questions
- Industry's willingness to cooperate with interventions.
- Industry's willingness to share data
- Industry's use of evaluation results
- Industry's influence and involvement with policy implementation

b. Individual-Level Challenges

Improvements in student health indicators are the desired long-term outcomes of school environmental change policies. Many school based interventions and evaluations take place over a time period too brief to cause or detect meaningful changes in individual-level health outcome measures such as BMI or blood pressure. Given the amount of time needed to demonstrate changes in individual-level measurements, the benefits of using these outcomes to evaluate the success of policies may be limited.

In order to maximize the potential for measurable change, individual-level outcomes should be measured when it is clear that the policy is fully implemented and that intended environmental changes have been made. If policies are not fully implemented, students will not have sufficient exposure to the changed environment needed to achieve improved health indicators.

For the purpose of assessing the effectiveness of school-based nutrition and physical activity interventions the most appropriate outcome measurements may be intermediate outcomes such as dietary and physical activity behavior. To a large extent it is these behaviors, along with genetic and environmental factors, that will determine long-term health status. Initiating and maintaining healthy behaviors are appropriate goals for school-based interventions.

As part of their school nutrition and physical activity policies, many states and school districts are currently considering whether to institute or expand the collection of height and weight measurements and whether to report this information to parents. To reach an informed decision on *whether* to gather data, authorities must consider not only the logistics of data collection and the expense in a time of restricted education budgets, but also the ways in which the information gathered may be used.

Does changing the school environment lead to change in weight?
The stated intent of most policies aimed at changing the school environment is to decrease availability of unhealthy foods and the increase availability of healthy foods and opportunities for physical activity. The intended, although often unstated, consequence of environmental change is that student behavior changes and results in an impact on student weight. However, schools are only one of the environments that students encounter in their daily activities; the question remains as to whether school-based environmental change is an intervention with enough intensity to produce changes in weight.

Should schools collect BMI as a policy evaluation outcome measure?

The development of many of the policies to change school nutrition and physical activity environments has occurred in response to the increasing numbers of overweight children in the United States. As a result, schools are pressured to demonstrate policy impact on BMI as the primary measure of success.

The cost and benefits of collecting BMI as an outcome measure must be considered carefully when defining the success of policies aimed at changing school nutrition and physical activity environments. Shifts in the percentage of children with elevated BMIs may occur over long periods of time, and collecting BMI over long periods of time may prove financially and logistically impossible for schools or school districts.

As a school considers whether to measure children, it must consider the means by which heights and weights are gathered. Inaccurate information is not useful and can be harmful if reported to individual students and families. Standardized equipment is required and staff must be trained in the methods of precise measurement. Equally important is the need to protect the privacy and self-esteem of the students – schools must avoid encouraging unrealistically thin body images and stigmatizing children who do not possess the current ideal body shape.

It is important to determine how a policy's success will be defined by BMI measurements. If BMI does not change over time, but a school offers more healthy foods and physical activity opportunities - is the policy considered successful?

VIII. RECOMMENDATIONS

a. Evaluators, Policymakers, and School Officials

Evaluations of school obesity prevention policies is critically important to identifying best practice models and to the creation of a body of evidence demonstrating the effectiveness of policy approaches. Researchers, school officials and administrators, policy makers, and foundations need guidance on the development of evaluations of school nutrition and physical activity policies to assure they are implemented correctly and are effectively changing school environments in order to maximize the outcomes leading to obesity prevention. It is with this in mind, that the meeting materials and discussion have been synthesized into the following recommendations. A separate subset of recommendations have been developed for foundations and other funders supporting the evaluation of school obesity prevention policies.

1) Evaluations serve a variety of purposes; therefore the purpose needs to inform the evaluation design.

2) Three distinct purposes have been identified:
   - Monitoring policy implementation
   - Surveillance of current trends in school environments or student behaviors and health measures
   - Scientific studies to measure the impact of school nutrition/PE policies on student health outcomes

3) Evaluation design needs to start with a policy analysis of the policies adopted to prevent obesity.

4) Policy analysis needs to include:
   - Intent of policy
   - Expected changes
   - Implementation process
   - Who is responsible
   - Monitoring/reporting improvements
   - Resources allocated for changes
   - The level of policy implementation

5) Evaluation design needs to measure outcomes that align with the policy intent and expected changes as determined in the policy analysis.

6) Based on the intent of the policy the evaluation design may need to include the measurement of individual, school, and/or community-level outcomes.

7) The evaluation needs to measure the process of implementation and the extent to which the policies have been implemented.

8) Community influences need to be taken into consideration and assessed as to how they support or hinder the policy.

9) Determine the reach and impact of the policy within the school, school district, and community boundaries to define the scope of the evaluation.

10) Determine the most appropriate external factors that may be influencing policy outcomes by conducting a community contextual analysis. Factors might include:
    - Family/social norms
    - Demographic characteristics
    - Availability of parks and recreation areas
    - Availability of goods and services
    - Safety concerns

11) Engage key stakeholders, including school advisory councils, school boards, administrators, teachers, parents, and students in framing the main evaluation questions.

12) Provide evaluation interim and final findings to all key stakeholders in a format that will be useful.

13) Support training and technical assistance and build local capacity to implement and evaluate these policies.

14) Support efforts to disseminate best practices and models to improve the capacity of schools and school districts to implement policies.

15) Facilitate communication among evaluation professionals to expand and improve the quality of evaluations.

b. Foundations and Other Funders

1) Fund evaluation studies in all three of the following categories:
    - Studies to monitor policy implementation
    - Surveillance of current trends in school environments or student behaviors and health measures
    - Scientific studies to measure the impact of school nutrition/PE policies on student health outcomes.

2) Assure that funded evaluations measure outcomes that align with the policy intent and expected changes as determined by policy analysis.

3) Support training and technical assistance to build local capacity to implement and evaluate school policies. Funded activities should include:
    - Development of tool kits
    - Trainings

4) Facilitate communication among evaluation professionals to expand and improve the quality of evaluations. Support the following activities:
    - Journal supplements that focus on evaluating school-based policies, and specifically studies that examine immediate outcomes such as content and quality of school foods, content and quality of physical education, and financial impact of changing school foods.
    - Professional meetings where evaluators can share experiences
    - Create a clearing house for evaluation instruments

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APPENDIX A

A. EVALUATION METHODS

School-Level Methods

Because school-level outcomes focus primarily on changes to the school environment, a mixture of observational and self-reported data should be used. The methods listed below are complementary and should be used together to develop a case study of the school that describes the policy impact on the school-level outcomes.

Environmental Assessment

Monitoring and measuring changes to the school environment are central to any evaluation of policies aimed at changing school foods and physical activity. Environmental assessment tools allow researchers to collect detailed information about the food and physical activity environments. This information can be used to assess changes to the adherence to a policy or environment. Specific variables to measure with an environmental assessment tool may include the following:

Nutrition:

- A la carte foods and sweetened beverages sold
- The locations, times and facilities for a la carte foods and sweetened beverage sales
- The school department or organization responsible for a la carte food and sweetened beverage sales
- Existence of written policies regarding a la carte foods and sweetened beverage sales
- Presence of fundraising practices that include food and sweetened beverage sales
- Current or past corporate contracts or concessions for a la carte food and sweetened beverage sales
- Income generated through a la carte food and sweetened beverage sales
- School meal participation rates

Physical Activity:

- The locations, times and facilities available for physical activity
- Resources devoted to physical education
- Existence of written policies regarding physical education and extracurricular physical activity

Stakeholder surveys

Stakeholder surveys may be conducted in order to more fully describe what happens when a school district adopts a policy changing the nutrition and physical activity environments. Stakeholder surveys can provide information on the following areas:

- History of passage of the policy
- Proponents and opponents of the policy
- School community reaction to the policy
- District staff responsible for implementation of the policy

- Resources available for implementation of the policy and to cover any revenue loss
- Plan for implementing the policy
- Major obstacles to implementing the policy
- Strategies to overcome obstacles
- Relationship with and role of the vending company(ies)
- Role of the school and community environment in increasing physical activity among students

Stakeholders may include school principals, district administrators, school board members, food service directors, appropriate district advisory committee chairs, coaches, teachers, parents, students and school organization representatives. Interviews with these key school community members provide qualitative information about process, outcomes, and impact from the perspective of those most involved and impacted by the policy.

Policy tracking

A policy tracking system is useful to document the types of policies developed by school districts and their path to adoption or rejection by the school board. Data from the tracking system can be used to describe how successful school and district-level policy strategies were at changing the school nutrition and physical activity environment. Policy data may examine the extent to which funding and technical assistance contributed to a school/school district's ability to develop, adopt and implement food, nutrition and physical activity policies.

Types of Studies

Case Studies

A case study design is well suited for large-scale evaluations of nutrition and physical activity policy school-level outcomes. Under the case study method, certain school districts are selected as evaluation districts and a sample of schools is chosen within each district to evaluate policy implementation. The lessons learned and best practices developed through case studies can be used by other districts or schools to develop, implement, refine, and evaluate their own policies.

Financial Impact Analysis

The sustainability of a school nutrition or physical activity policy often relies on the policy's fiscal viability. Many times the success of a statewide or local school nutrition policy is not only based on the degree of implementation, but the degree to which it is financially feasible for the school and/or school district to implement the policy. If the policy imposes school food and beverage changes that result in revenue loss, it may find little support. Analyzing food and beverage sales data can help to address these concerns.

When making changes to competitive foods and beverages sold on school campuses, collecting and analyzing data related to the sales of these items can help answer the following research questions:

- In what way did food and beverage sales change at all venues on campus?
- Did school meal participation rates change?
- What was the impact on NSLP sales?

- What financial loss or gain resulted from the policy and where did this occur?
- If there was a loss, what resources were used to cover the loss?
- If there was a gain, how were profits used?
- What administrative costs were incurred in the process of making these changes?

Existing Data Sources and Tools

There are a number of existing data sets and tools that may be adopted and used to measure school-level outcomes:

- *School Health Index: A Self-Assessment and Planning Guide*. Centers for Disease Control and Prevention. Atlanta, Georgia. 2004. The *School Health Index* (SHI) is a tool to help schools assess their physical activity and nutrition policies and programs based on national standards and guidelines.
- *Changing the Scene: Improving the School Nutrition Environment.* United States Department of Agriculture, Team Nutrition. August, 2000. "*Changing the Scene* (CTS)" includes the Improvement Checklist and Guide to Local Action to help schools examine the school nutrition environment, develop a plan for improvement, and put the plan into action
- *SHPPS: School Health Policies and Programs Study 2000.* Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion, Division of Adolescent and School Health. *Journal of School Health*, Volume 71, Number 7, September 2001. *The School Health Policies and Programs Study* (SHPPS) is a national survey periodically conducted to assess school health policies and programs at the state, district, school, and classroom levels
- Fit, Healthy, and Ready to Learn: A School Health Policy Guide**.** National Association of State Boards of Education, Alexandria, VA 2000. *Fit, Healthy and Ready to Learn* is a guide to help state and local decision makers establish effective policies to help students achieve academically and adopt and maintain lifelong healthy habits. It provides guidance on developing an overall school health policy framework and specific policies to promote physical activity and healthy eating
- Integrated study by USDA of school meal costs**.** (unpublished USDA study, to be released in Summer, 2004). Includes instruments for collecting financial data from school food services

Individual-Level Methods

Physical Health

*FITNESS*GRAM

The FITNESSGRAM field tests are used to measure physical fitness in school-aged children – they are simple to administer but have varying degrees of validity. The quality of measurement depends on training of teachers and their motivation. Fitness testing has two major drawbacks: first, fitness testing inadvertently causes PE teachers to "teach to the test" to improve fitness scores rather than teach lifelong fitness skills; second, children often compare fitness scores and those with low scores may be embarrassed, feel defeated or be teased (Welk).

BMI

BMI is calculated by dividing one's weight in kilograms by one's height in meters squared. The new BMI charts can be accessed at http://www.cde.gov/growthcharts. It is important to be aware that BMI is only a rough estimate of risk for overweight.

Blood pressure

Highly trained staff measure blood pressure using standard medical procedures.

Knowledge, Attitudes and Behaviors

Student focus groups

Focus groups can be used to gather insights into the factors influencing student food, beverage and physical activity choices at schools and the degree of acceptability of the policy among students. The focus groups gather in-depth qualitative data in the following areas:

Nutrition

- Factors that motivate students to consume a la carte foods and sweetened beverages
- Factors influencing student food choices at school
- Student perceptions of health impact of a la carte food and sweetened beverage consumption
- Student perceptions of the social status of free or reduced cost lunches
- Student perceptions of fast food and beverage company presence on campus
- Student perceptions of the food and beverage choices of varsity or professional athletes
- Student perceptions of the importance of non-competitive daily physical activity
- Exposure to marketing and advertising of fast food and sweetened beverages
- Potential strategies for reducing a la carte food and sweetened beverage consumption
- Reaction to changes to a la carte standards and elimination of sweetened beverage sales at school
- Acceptance of replacement foods and beverages
- Student acceptance and perception of policies.

Physical Activity

- Factors influencing participation in PE and in physical activity in and outside of school
- Student perceptions of the health, emotional, and academic impact of physical activity
- Student perceptions of the importance of daily physical activity
- Student perceptions of PE
- Potential strategies for increasing physical activity
- Opportunities in the community and after school for participation in physical activity
- Use of facilities and equipment for physical activity

Self-reported food and beverage consumption

Self-reported food and beverage intake data may be used to describe types and frequency of foods eaten and estimate average daily nutrient intake. Calorie intake estimates provide information on the relative contribution of certain foods and beverages to overall intake. This information allows researchers to understand how changes in school foods effect overall student diets. For example, does the removal of sodas from schools result in the students consuming fewer sodas and fewer calories, or do students compensate for the lack of soda at school by consuming increased amounts outside of school, maintaining a steady calorie intake?

The Youth Food Frequency Questionnaire was designed to be self-administered by children 9-18 years of age. It takes 20-30 minutes to complete. Validity of the instrument varies depending on the nutrient in question, but validity is similar to the correlations found for adults (Rockett, 1997).

Reliance on self-report of dietary intake after exposure to healthy eating messages may be problematic. Effect sizes for improvements in dietary behavior and physiologic outcomes may be either small or not apparent, compared to gains reported in nutrition knowledge and self-efficacy. Interventions leading to more robust behavioral and health outcomes, as a sequela to gains in knowledge and skills, may require strategies which change food availability in settings beyond the school, and emphasize transfer of newly gained skills to community and home environments. (Robinson, 2004)

Daily activity levels – PACE

There are a number of tools that can be used to measure student daily activity levels, although they vary widely in validity and reliability. One of the most practical self-report measures for daily physical activity may be the PACE+ (Patient-Centered Assessment and Counseling for Exercise Plus Nutrition) physical activity computer-based intervention that includes a 2-item screening tool (PACE+ Adolescent Physical Activity Measure) for the number of days per week students are meeting the 60 minutes of activity per day guideline (Prochaska). This measurement has good reliability and validity and has been used in a large US national sample and in 35 other countries (Prochaska).

Self-report of physical activity levels:

Estimates of physical activity levels from self-reported data appear to be highly inaccurate and are usually overestimated. Youth are poor in recalling physical activity over multiple days and poor in recalling specific activities. Self-reported levels of physical activity have the lowest validity among children under age ten, however, researchers caution that self-reports for physical activity levels should be the last resort data collection method for adolescents as well. Parent or teacher reports are not valid either (Sallis).

Accelerometers

These instruments are the best available measure of physical activity for youth. They are small electronic devices worn on the waist to assess vertical motion and are sensitive to intensity level of activity. They can be worn for many days at one time and can be used with virtually all ages (Welk).

Pedometers

Pedometers are small electronic or mechanical devices that are worn on the waist to count steps. They count cumulative steps and new models have memories for storing data for multiple days. They are *not* sensitive to intensity and are not sensitive to some activities. Pedometers have not been validated for youth and are not well suited for youth, because it is impossible to tell if the device was not worn. The main benefit is their low cost ($10-$20), and their use as an intervention tool (Schneider).

Heart Rate Monitors

These instruments are appropriate for measuring vigorous activity but are poor indicators of moderate intensity activity. They can be useful for short-term assessments, such as during a PE class. Heart monitors can be useful for intervention and educational purposes but are rarely used for program evaluation (Janz).

SOFIT: System for Observing Fitness Instruction Time

This measurement involves direct observation of PE classes by a trained observer to assess student activity, lesson context and teacher behavior based on a system of codes recorded every 30 seconds. SOFIT has good reliability and its validity has been confirmed by heart rate and accelerometers (McKenzie 1991 and 2002).

SOPLAY: System for Observing Play and Leisure Activity of Youth

This measurement requires direct observation of student activity in unstructured recreational settings. It assesses both the number of youth in the setting and their activity levels. An observer codes the activity level (sedentary, walking, very active) of each boy and girl in a defined areas. It has good reliability and its activity codes are comparable to SOFIT. SOPLAY also includes assessment of contextual and environmental variables, such as presence of equipment and supervision (McKenzie 2000 and 2002).

Community Contextual Factors Methods

Community contextual factors can provide information about the environmental context around the school and in the students' homes. The following section lists the methods for assessing community factors and the appropriate data sources.

Methods

- Environmental assessments or physical scans of the community
- Surveys of key leaders, students, parents and members of the community
- GIS mapping can depict what food and physical activity resources exist in a community and how residents are interacting with this environment
- Guidelines for assessing the walkability and bikability of an area: www.bicyclinginfo.org/pdf/bikabilitychecklist.pdf, www.walkinginfo.org/pdf/walkingchecklist.pdf

Existing Data Sources

- The U.S. Census
- U.S. Business Standards Statistics, referencing the zip code, for information about the distribution of food outlets and over an area
- Files mapping parks through the census and municipal agencies such as City/County parks and recreation web sites
- Food and beverage industry marketing or sales data
- The Panel Study of Income Dynamics, Child Development Supplement provides information on how students and their families spend time in and out of school including academic and physical activities (http://psidonline.isr.umich.edu
- The National Longitudinal Study contains geocoding capabilities for information on youth related risk behaviors and television viewing
- The Federal Bureau of Investigation annual crime report (Uniform Crime Report) can be used as a proxy for real or perceived safety
- The Monitoring the Future Studies (www.monitoringthefuture.org) provides information on youth behaviors and perceptions