



Bethel School Health Information Report 2007

A Report from the Communities and Schools Together (CAST) Project¹

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Overview

Investigators on the Communities and Schools Together project (CAST) worked for several years with the Bethel School District prior to the beginning of the study. Discussions with personnel focused on the need for comprehensive understanding of school environments and educational processes related to the high risks of obesity among district children (see Body Mass Index Study below). School nurses completed a Bethel Wellness Needs Assessment that queried teachers, parents, and students about their health concerns and priorities for the district, described below. Researchers and project school planning members also compiled information on student demographics, schedules for PE and recess, class instruction on nutrition and exercise health, and child transportation patterns to and from school (e.g., walking/biking). We also completed a pilot cafeteria plate waste study in the spring of 2007. Results of the Bethel School District health assessment and wellness policy development are described here for school and community reference.

The Bethel School Context

Bethel School District is located in Eugene, Oregon and serves approximately 6,000 students (3,000 elementary school children). Bethel has a growing proportion of students with English as a Second Language, one of the larger proportions of students eligible for free or reduced lunches in Lane County (46.8%), and a growing proportion of students with English as a Second Language (ESL) (Oregon Department of Education, 2007). At the same time, the district's scores on statewide assessments in elementary school are higher than the average for the state, reflecting the district's commitment in using researched instructional methods to improve reading and math (Oregon Department of Education, 2007). Ironically, the district's high commitment to academic achievement is indicative of the challenges schools face in integrating obesity prevention efforts into already tight teaching schedules.

Body Mass Index Study of Bethel School Children: BMI Project (AY 2005–2006)

Ideally, obesity is best diagnosed based on the percentage fat mass (% FM)—methods available through in vivo assessment of % FM. This method, however, is expensive, time-consuming, and cumbersome in school settings. Other various anthropometric measures such as skin-fold thickness, body mass index (BMI), and weight for height ratios have been used as indirect measures of obesity. Of these measures, BMI has been shown to have a relationship with body fat mass in children (Goran, Driscoll, Johnson, Nagy, & Hunter, 1996; Hannan, Wrate, Cowen, & Freeman, 1995; Pietrobelli, Faith, Allison, Gallagher, Chiumello, & Heymsfield, 1998) and is a convenient measure to perform in both field and clinical settings. BMI is a number calculated from a child's weight and height. Overweight among children (BMI \geq 95%) is increasing rapidly. Recent data show that the proportion of overweight² children in the U.S. has increased from 7% in 1980 to 18.8% in 2004 (CDC, 2007). Given this rapid change it behooves states and local counties to initiate obesity monitoring systems to track these population risks.

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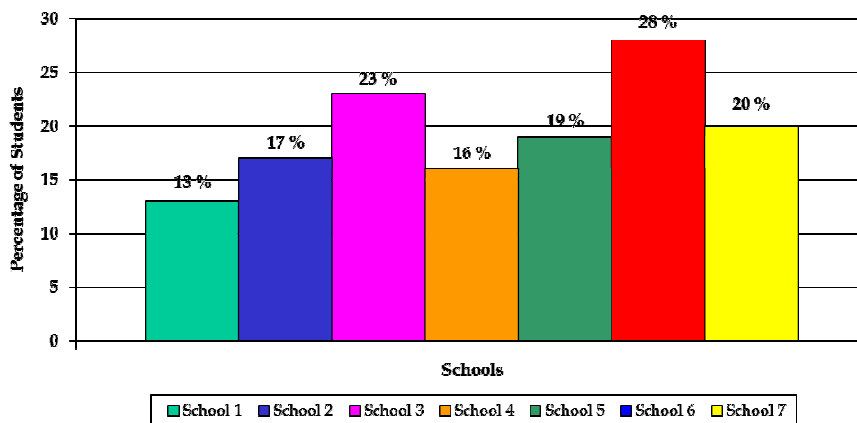
²At the time this work was conducted, CDC used the category of *at risk for overweight* (\geq 85 percentile to $<$ 95 percentile) for what is now termed *overweight* and *overweight* (\geq 95 percentile) for what is now referred to as *obese* range of height/weight ratios for children and adults. For the purposes of this report, we use the older terminology, which was current at the time we developed this compilation of information with the Bethel School District.

However, while national level surveys have been conducted at the school and community levels, obesity risk screening in schools and school districts in Oregon is inconsistent. This situation diminishes the capacity of educational systems to promote reforms to address these epidemic health concerns. We could find only two current estimates of childhood obesity risk in Oregon—one through the Kaiser Family Foundation (2007), and the other through a statewide survey of adolescents called Oregon Healthy Teen Survey (OHT) (Oregon Center For Health Statistics, 2006). Data from Kaiser reported that 24.3% of Oregon’s children 10–17 years of age fell in the overweight or obese category (BMI \geq 85%). This was less than the national average of 31.6%. The OHT study found that 10.5 % of 8th graders were obese and an additional 15.3% were overweight. At the same time, 10.6 % of 11th graders were obese and an additional 13.1% were overweight (Oregon Center For Health Statistics, 2006). These data provide limited information on the prevalence of overweight among Oregon youth. Much more consistent, systematic public health screening is needed to ensure adequate information is available to guide obesity prevention efforts in Oregon and nationally.

Given this limited information available on child obesity for Lane County, Oregon, Dr. Moreno-Black, in collaboration with a local nonprofit agency (Lane Coalition for Healthy Active Youth) and Lane County Department of Public Health, initiated a study requesting voluntary sharing of height and weight data on school children from Lane County schools (Body Mass Index Study; Moreno-Black & Brooks, 2006). All elementary and middle schools in the county were asked to provide height and weight data on children for analysis. Using CDC values (BMI \geq 95%), data showed that the county appears to be similar to slightly higher than national child obesity levels. However, a significant number of schools (39%) had 20% or more students in the overweight (BMI \geq 95%) category.

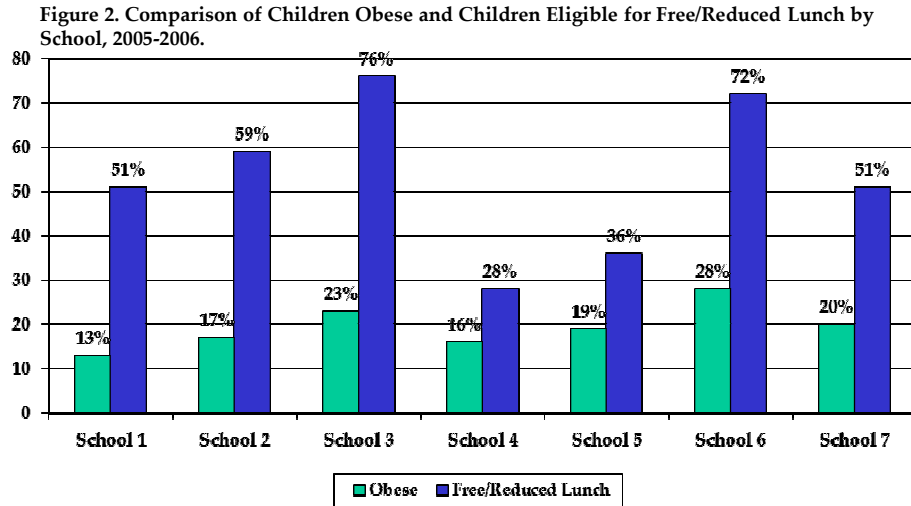
Data from the Bethel School district indicated that an average of 18% of the district’s children were overweight and 21% were obese (Figure 1). The range of the percent of children in the total sample that fell in the obese (\geq 95%) category varied among the schools from a low of 13% to a high of 28% (a range described below with Bethel schools). Four of the seven district schools fell above the national average of 18.8 % (CDC, 2006).

Figure 1. Percent of Bethel Students in CDC Obese Category (BMI \geq 95%) by School, 2005-2006.



Similarly, there was considerable variation among the seven elementary schools in terms of the percentages of *obese* and *overweight* children. When the two categories were combined, the percent of students with obesity health risk ranged from 29% to 43%. Thus, the combined *overweight* and *obese* proportion of student health concerns presented an even more critical situation.

A comparison of the percent of children in the overweight category with the percent of children receiving free or reduced meals (Figure 2) showed a pattern of low SES combining higher proportions of overweight children. This trend is not unexpected since much of the recent literature indicates poverty and obesity are often highly correlated (Miech, Kumanyika, Stettler, Link, Phelan, & Chang, 2006; Vieweg, Johnston, Lanier, Fernandez, & Pandurangi, 2007).



Bethel School Wellness Survey Data

A Bethel School District Wellness Plan was developed over an 18-month period and was completed in 2005. The Bethel Health team surveyed K–12 teachers in the district on factors in school environments and educational instruction related to child health. Teacher responses were aggregated across elementary (K–5), middle (6–8), and high school (9–12) teachers, so results do not apply exclusively to elementary schools. Table 1 summarizes teacher responses to 12 questions related to child nutrition and health in the schools, and 11 questions related to physical education. Questions were asked to elicit respondent perceptions and satisfaction regarding current school health instruction and practices. A large percentage of responses fell in the “Don’t know” category. Also, the largest percentage of high priority ratings were in the *Food and Health* category regarding quality school meals. Responses showed very low confidence in student ability to recognize variety and moderation in food consumption, selecting a variety of foods from different food groups, and being able to explain how healthy eating habits lead to wellness.

In Bethel schools, physical education is teacher-led instruction. Planning time for PE, classroom size, lack of professional development opportunities, curriculum that met Oregon educational benchmarks, and promotion of family and community activity programs rated low as being in place within schools. Still, over 56% of responses placed a high priority on children and youth getting the recommended amount of PE time in schools. The recommended amount of time indicated for PE in the survey (e.g., 60–90 minutes a week) is currently what is scheduled in Bethel. Yet, this does not meet current standards of 60 minutes a day for preadolescent daily physical activity (Corbin, Pangrazi, & Le Masurier, 2004), or the increasing recognition that children at this age may actually require 2 hours per day of moderate to vigorous physical activity to reach the proper threshold of activity for their physical development needs (Pangrazi, 2007).

Table 1. Teacher School Wellness Survey Responses on Health/Physical Education/Nutrition Education

Question	Current Curriculum				Total # Responses Per Category	Priority Level		
	% Responding in Place	% Responding "Partially" in Place	% Responding Not in Place	% Responding "don't know"		% High	% Medium	% Low
<i>Food and Health</i>								
Health Education is taught in all grades	20.86%	27.81%	22.99%	28.34%	162/187	38.89%	44.44%	16.67%
Students recognize importance of variety, moderation in food consumption	7.65%	41.53%	30.60%	20.22%	167/183	60.48%	33.53%	5.99%
Students choose variety of foods from different food groups	9.14%	34.41%	27.42%	29.03%	169/186	57.40%	33.73%	8.88%
Students advocate for more fruits and vegetables at school	17.11%	26.20%	11.76%	44.92%	158/187	50.00%	39.24%	10.76%
Students explain how healthful eating habits can lead to wellness	7.57%	35.68%	23.78%	32.97%	161/185	52.17%	37.27%	10.56%
A variety of healthful foods are provided in the breakfast program	22.16%	35.68%	12.43%	29.73%	145/185	69.66%	20.00%	13.10%
Adequate time is given for students to eat breakfast	49.20%	20.86%	6.42%	23.53%	155/187	35.48%	34.19%	30.32%
A variety of foods are offered in the school lunch program	50.26%	35.98%	3.17%	10.58%	154/189	56.49%	26.62%	16.88%
Adequate time is given for students to eat lunch	70.05%	19.79%	4.81%	5.35%	149/187	39.60%	27.52%	32.89%
Meals include appealing, low fat choices	21.93%	44.92%	16.04%	17.11%	152/187	68.42%	21.05%	10.53%
Food purchasing and preparation are designed to reduce fat content	10.59%	25.29%	17.06%	47.06%	139/170	61.87%	27.34%	10.79%
A la carte offerings include healthy food and beverage choices	22.65%	32.60%	22.65%	22.10%	139/181	62.59%	24.68%	12.95%
<i>Physical Education/Activity and Health</i>								
Elementary, high school students get recommended PE time (grades 1-5: 60-90 min. a week; high school: 2 semesters)	37.22%	15.00%	22.78%	25.00%	142/180	56.34%	24.65%	19.01%
Daily schedules conflict with recommended amounts of PE	17.92%	27.75%	26.01%	28.32%	132/173	41.67%	34.85%	23.48%
Class content is based on ODE PE curriculum goals and standards	15.82%	28.25%	15.82%	40.11%	130/177	42.31%	38.46%	19.23%
Planning time is adequate to prepare for PE classes	16.38%	11.86%	36.72%	35.03%	135/177	49.63%	34.07%	16.30%
PE resources (texts, materials) are adequate for planning, instruction	17.28%	27.78%	18.52%	45.68%	134/162	40.30%	38.06%	21.64%
District offers adequate opportunity for PE professional development	14.12%	24.86%	22.60%	38.42%	126/177	34.92	46.03%	19.05%
PE class size is adequate for quality instruction	18.50%	27.75%	31.21%	22.54%	135/173	48.15%	34.07%	17.78%
Gym or similar space is available for scheduled PE classes	67.05%	15.91%	6.82%	10.23%	135/176	37.78%	26.67%	35.56%
Equipment is adequate for PE instruction	37.29%	33.90%	6.21%	22.60%	135/177	42.22%	34.07%	23.70%
Faculty/staff use practices promoting active versus sedentary participation	21.14%	36.00%	14.29%	28.57%	134/175	35.82%	40.30%	23.88%
Faculty/staff promote participation in family, community activity programs	10.92%	25.29%	27.01%	36.78%	132/174	30.30%	46.21%	23.48%

Bethel School Demographic and Scheduling Data

Table 2 displays school level demographic information on Bethel elementary school children for each of the seven elementary schools during the 2006–2007 academic year. School number 3, with the highest proportion of minority children, also had the highest percentage of at-risk for overweight and overweight status children (displayed in Figure 2 above in the Body Mass Index Study). Also, 81.8% of the children were eligible for free or reduced lunch. Nurses volunteered to do a random one-day classroom check with all third and fourth grade classrooms to see how many children walked or rode their bike to school that day. Three quarters of the children indicated they either rode the bus or were driven to school. School nurses also queried all third and fourth grade classrooms one day during spring on child transport patterns. Nurses asked each classroom of students to give a show of hands for each student who either walked or biked to school (including a few who skateboarded), took the bus, or were transported by car. A low of 13% of children from one school walked or biked to or from school on that given day, with a high of 36% at one school. On average, over 75% of students were bussed or driven to or from school.

Table 2. Bethel Demographics

School	Grade Range	% Minority	% Underweight	Normal	At-Risk	Overweight	Total At-Risk and Overweight	Mt/Exceed Reading	Mt/Exceed Math	Enrollment	# Free	# Reduced	Pcnt 2007	1 Day % Walking or Biking to school
1	K-5	18.8	3%	57%	18%	22%	40%	93.0%	95.0%	426	172	39	49.5%	36.0%
2	K-5	28.8	6%	55%	19%	21%	40%	85.0%	83.0%	352	165	35	56.8%	21.0%
3	K-5	38.1	2%	55%	21%	22%	43%	91.0%	90.0%	388	264	42	78.9%	24.0%
4	K-5	13.9	1%	61%	17%	21%	38%	91.0%	96.0%	442	92	32	28.1%	18.0%
5	K-8	13.2	1%	58%	24%	17%	41%	90.0%	90.0%	693	183	25	30.0%	34.0%
6	K-5	18.8	3%	68%	16%	13%	29%	93.0%	93.0%	308	145	46	62.0%	30.0%
7	K-8	20.7	2%	60%	16%	22%	38%	95.0%	94.0%	742	285	74	48.4%	13.0%
District								91%	92%	3351	1306	293	48%	25.5%

School schedule information was compiled by school administrators, teachers, and researchers. This information showed additional variation between schools and classrooms on the amount of time scheduled weekly for physical education. Researchers found that schools offered between 50 to 180 minutes of classroom-based PE to students each week, and fifth graders tended to have a longer block of PE time each week than students in lower grades. Also, only a few elementary teachers, informally queried on the health content in their instruction, indicated that they taught any classroom nutrition or health-related curriculum at all in their classrooms. Consistent feedback from administrators, teachers, and staff relayed the strict regime of instruction teachers must follow to support and boost academic achievement for related testing. One response to the School Wellness Survey expressed the educational challenges teachers are experiencing in the school district in providing physical education, nutrition, and health instruction: “Let’s see. What’s more of a priority—meeting state benchmarks or teaching health education, nutrition or PE. I’m required to teach 2+ hours of language arts (reading/writing) and 1+ hour of math. This doesn’t leave a lot of time. I have 30 minutes of music or PE and about 20 minutes for science or social studies. Then there’s the transition and behavior time, and the library thrown in. Health education is not high on the priority list—reading is the priority, then math. Parent education needs to be addressed if life style changes and diet changes are to be successful. I’m looking at the whole school picture. I have no idea

what anyone else is doing. Nothing is officially in place, we seem to put little value on this, but it is of concern to me. It is certainly not a well-integrated, defined curriculum.”

Awareness of these school-based challenges in addressing obesity issues among their children has been a major factor in our efforts to develop academic partnership with the school district to bolster health change among their students.

Cafeteria Behavior and Food Waste Pilot Study

From the perspective of school nutrition, establishing baseline knowledge of the macronutrient consumption patterns occurring in the schools and among children is critical for evaluating the effects of interventions on diet behavior change. A close examination of what children are truly offered, how children choose their food, and what they do and do not eat is essential for developing a successful program for encouraging healthy eating.

We completed data collection on a Bethel cafeteria waste study with lunchroom observations in five of the seven elementary schools and interviews with food service staff and food service director (Plate Waste Study; Johnson-Shelton & Moreno-Black, 2007). The school district has adopted a main lunch program that includes four to five entrée choices and a variety bar. The main lunch always includes a vegetarian option and a choice of yogurt. Children also select two food items from a variety bar to add to their main lunch. Variety bar contents change daily, but include fresh fruit and uncooked vegetables such as broccoli, cauliflower, celery, and tomatoes; canned fruit such as peaches, pears and applesauce; and items such as pickles, pasta salad, and cheese. Schools vary in how they reinforce and monitor children in the required selection of two variety bar items. The pilot study school was one that monitored and required compliance by students. Preliminary observations showed that children often chose large quantities of some items but consumed small amounts.

Our plate waste study was conducted with one full third grade ($n = 64$ enrolled students) at a Bethel elementary school. Main menu items that day included a turkey wrap, mashed potatoes with chicken gravy, pizza, a cheese quesadilla, and a cheese sandwich. In our assessment, plate waste was examined for 52 children who ate school lunch (11 children ate bag lunches and 2 were absent from school). Variety bar food items were weighed before third grade classrooms took lunch and before the next grade level began their food servings. All main menu

items were also weighed. When children were released for recess, they all placed their trays with all their leftover food on a table set up at the back of the cafeteria. The research team then sorted and weighed all discarded food.

Table 3. Variety Bar Consumption Pattern

Variety Bar Items	Amount			
	Amount Taken (oz.)	Discarded (oz.)	Amount Eaten (oz.)	% Consumed
<i>Fruit</i>				
Bananas	63.8	28	35.8	56%
Canned Pears	77.85	10.55	67.3	86%
<i>Vegetables</i>				
Corn	6.8	3.3	3.5	51%
Mushrooms	0	-	-	-
Zuchinni	0	-	-	-
Peppers	0.65	0	0.65	100%
Broccoli	1.7	1.6	0.1	6%
Pickles	14.15	2.3	11.85	84%
Carrots	1.85	1.85	0	0
Lettuce	5.35	2	3.35	62%

consumed 2.4 ounces on average. Although all children took the required number of food items,

they showed resistance to the fresh vegetables. The canned corn, lettuce, and carrots selected weren't eaten and the small amount of fresh broccoli taken was hardly touched. Canned fruit and pickles were consumed the most. The large amount of banana waste was actually due to skin weight.

For the main menu meal, children chose a turkey sandwich at about the same rate as the higher fat selection of mashed potatoes with chicken gravy (Table 4). Also, all children, no matter what they selected in the main meal, were offered a whole wheat roll. Without further assessment, it is unclear whether the high reliance on bread, other starches, and dairy were atypical for that day or not.

Table 4. Main Menu Items Chosen by Students (n = 52)

Menu Items	Chicken Gravy & Mashed Potatos		Turkey Sandwich		Cheese Sandwich		Cheese Quesadilla		Wheat Roll		Yogurt		Crackers		Plain 2%Milk		Chocolate 2%Milk	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
	13	25.00%	19	36.54%	3	5.77%	6	11.54%	32	61.54%	3	5.77%	3	5.77%	4	7.69%	22	42.31%

Results of the plate waste analysis for main menu items is displayed in Figure 3. Chocolate milk was discarded in greater proportion than any other food on the menu, with plain milk second. Milk accounted for two thirds of the grade's food waste in the study. Ironically, a discussion with the food service director revealed that the district had discontinued chocolate milk for a time to reduce sugar in children's cafeteria diet. It was introduced again when children did not increase use of plain milk to meet school nutritional requirements.

This pilot study also included a macronutrient analyses of the main menu meals offered to students and consumed (e.g., fats, sugar, sodium, carbohydrates, and protein consumption patterns). This preliminary analysis (Table 5) of the menu items indicated the items being offered met or exceeded the District Nutrition Service's goals and, in fact, were often very high in saturated fat. Since food waste was high in this group it is unclear how well student nutritional needs were actually being met.

Figure 3. Main Menu Items Not Consumed (Plate Waste).

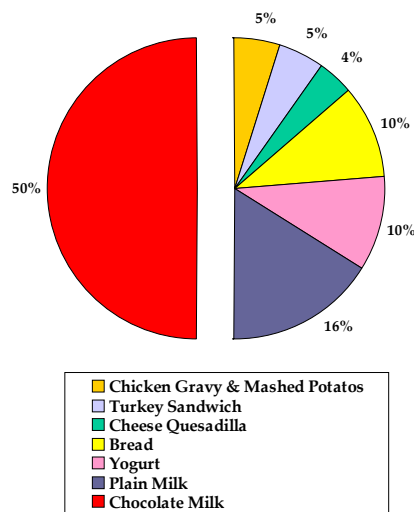


Table 5. Bethel Pilot Plate Waste Micronutrient Analysis

Nutrient	# Students (n = 52)	Serving Size	Value	% RDA Goal	% Bethel Nutrition Services Goal*	% USDA Menu Goal**
Main Course						
Chicken gravy	25	6.60 oz				
Calories			214.3	14%	32%	32%
Calories from fat			84.7	20%		1
% Cals S-Fat			2.7	18%	100.80%	-
Protein			14.67g	71%	157%	147%
Turkey sandwich	33	3.98 oz				
Calories			200	13%	30%	30%
Calories from fat			27	6%		1
% Cals S-Fat			0	-	-	-
Protein			17.00g	82%	182%	170%
Cheese sandwich	3	3.48 oz				
Calories			280.32	19%	42%	42%
Calories from fat			114.36	27%		1
% Cals S-Fat			57	34%	340%	-
Protein			13.82g	67%	148%	138%
Cheese Quesadilla	3	2.23 oz.				
Calories			166.7	11%	25%	25.10%
Calories from fat			68.34	16%		1
% Cals S-Fat			38.7	29%	290%	-
Protein			8.16g	39%	88%	82%
Yogurt	5	8.01 oz				
Calories			210	14%	31%	32%
Calories from fat			18	4%		1
% Cals S-Fat			9	7%	70%	-
Protein			9.00g	44%	96%	90%

Findings in this pilot plate waste study support the view that children are under-consuming fresh fruit and vegetables. While carbohydrates were strongly promoted in the school lunch, it appears they were rejected at similar rates found in other studies (Whatley et al., 1996). The pilot Bethel plate waste study did reveal the need for further research and information sharing with schools, and represents an opportunity for nutritional intervention to make a substantive contribution to children’s food experiences and choices for healthy diets. The data derived in the study support the validity of teacher perceptions that students in Bethel schools lack the knowledge and corresponding personal awareness to connect diet decisions with wellness.

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