



# Healthy Generations

From Maternal & Child Health, Division of Epidemiology, School of Public Health at the University of Minnesota

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## Epidemiology of Obesity

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Obesity is a major public health problem in the United States. The alarming increase in the prevalence of obesity over the last few decades has raised concerns about associated health risks for children, adolescents, and adults. Obesity is considered the second leading cause of preventable death in the United States. Recent data suggest that the estimated number of annual deaths in the US due to adult obesity approaches 300,000<sup>1</sup>. Persistence of this trend, particularly among youth, could lead to further increases in the number of people affected by obesity-related health conditions and premature mortality. Prominent among the health risks associated with obesity are hypertension, type 2 diabetes mellitus, dyslipidemia, stroke, gallbladder disease, osteoarthritis, sleep apnea, respiratory problems, and certain cancers (e.g., endometrial, breast, prostate, and colon). Obesity is also associated with psychosocial problems such as binge eating disorder and depression. Furthermore, individuals who are obese are adversely impacted by social bias and discrimination.

### Definitions of Overweight and Obesity

The terms obesity and overweight are often used interchangeably, but they are distinct conditions. Obesity refers to excess adipose tissue, while overweight refers to excess weight for height. Because it is difficult to obtain direct measures of obesity and since body weight tends to be highly correlated with adiposity (degree of body fatness), weight-for-height measures are generally used to classify overweight and obesity in adults and youth.



### Children and Adolescents

Defining overweight or obesity in children and adolescents is complicated by the normal processes of growth, pubertal development and body composition changes. No standard definition exists for child or adolescent obesity. Classifications that have been used include weight-for-height percentiles, relative weight, percent of ideal body weight, skinfold measures, and Body Mass Index [BMI]. BMI is currently the most accepted and widely used measure. For adults, BMI criteria has been based on mortality or mortality outcome research, however no risk-based criteria has

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### Editor

Childhood obesity is the topic of the fall edition of Healthy Generations. I was pleased to have the help of Dr. Jamie Stang, Project Director in Public Health Nutrition, in editing this issue that features the works of four MCH faculty and staff members. Nancy Sherwood alerts you to the increasing prevalence of childhood obesity and the danger it poses for our youth. Dianne Neumark-Sztainer applies an ecological model to examine risk factors associated with childhood obesity. Mary Story and Marsha Davis consider the strengths of school- and community-based programs that address childhood overweight and obesity. The Partners in Health section highlights Eau Claire, Wisconsin's Childhood Nutrition Coalition, facilitated by Cheryl Yarrington.

Additional resources related to childhood obesity have been collected on the internet. Resources include PowerPoint presentations and fact sheets (<http://www.epi.umn.edu/mch/pages/hgrsorc2.html>). The videoconference associated with this issue will be held on October 19 from 1-3 p.m. In addition to numerous Minnesota sites, Madison, WI will also host a site (see page 2 of this issue). Here you will have the chance to speak with the authors featured in this issue. If you are not able to attend the videoconference, free videotapes of the event can be requested from Jan Pearson ([pearson@epi.umn.edu](mailto:pearson@epi.umn.edu) or call 612.626.8644). Tapes of the previous conference on adolescent tobacco use can also be requested.

I welcome any feedback or comments about Healthy Generations and related activities. Previous letters to the editor have been posted at <http://www.epi.umn.edu/mch/pages/hgletter1.html>. You can contact me at [meschke@epi.umn.edu](mailto:meschke@epi.umn.edu) or call 612.625.4891. To join our list of subscribers please contact Jan Pearson at [pearson@epi.umn.edu](mailto:pearson@epi.umn.edu) or call 612.626.8644.

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## Healthy Generations Videoconference Child Obesity

October 19, 2000  
1-3 p.m.

Minnesota Sites:

**Douglas County**  
809 Elm Street,  
Alexandria

**Freeborn County**  
203 W. Clark Street,  
Room 241, Albert Lea

**Hubbard County**  
301 Court Avenue,  
Park Rapids

**Koochiching County**  
715 4<sup>th</sup> Street,  
International Falls

**Pennington County**  
1st and Main,  
Thief River Falls

**Renville County**  
500 E. DePue - 3<sup>rd</sup> Level,  
Olivia

**Rock County**  
204 E. Brown,  
Luverne

**Roseau County**  
606 5<sup>th</sup> Avenue SW,  
Room 20, Roseau

**St. Louis County  
Courthouse**  
301 1<sup>st</sup> Street, Virginia

**Stearns County**  
Room 21,  
705 Courthouse  
Square, St. Cloud

**Winona County**  
202 W. 3<sup>rd</sup> Street  
Winona

**MDH Metro Square Annex**  
Building 130 E. 7th Street,  
3rd Floor, St. Paul

Wisconsin Site:

**The Pyle Center**  
702 Langdon Street  
Madison, WI

Registration is limited by site, so register early. To register for one of these sites contact Jan Pearson by phone (612.626.8644) or email (pearson@epi.umn.edu)

Please visit (<http://www.epi.umn.edu/mch/pages/hgvideo2.html>) for any changes to these sites.

been established for youth, as it is difficult to link youth weight status to chronic disease outcomes. Adult BMI criteria utilize a single cutoff value for both sexes and all ages, which is inappropriate for children and adolescents who are experiencing growth and body composition changes. Because BMI changes dramatically with age during childhood and adolescence, BMI needs to be assessed using age-specific reference curves. Gender-specific values are also needed for adolescents because of differences in body composition and timing of puberty. During puberty, males increase lean body mass (muscle and bone mass) and decrease the amount of body fat, whereas females develop greater stores of fat.

The release of the revised National Center for Health Statistics (NCHS) and the Centers for Disease Control (CDC) growth charts incorporating smoothed gender- and age-specific BMI percentiles based on data from National Health Examination Survey [NHES] and National Health and Nutrition Examination Study [NHANES] will provide a useful reference for describing weight status in children and adolescents<sup>2</sup>. It has been suggested by US expert panels that for clinical evaluation of obesity and epidemiologic application, overweight in youth be defined as a BMI greater than the 95th percentile for age using national reference population data<sup>3</sup>. Youth between the 85th and 95th percentile are considered at risk of becoming overweight.

### Prevalence of Obesity: National Trends Among Children and Adolescents.

Regardless of the method used to classify overweight or obesity, studies have shown high prevalence estimates among children and adolescents, and that rates have increased dramatically since the mid 1960s and continue to rise<sup>4,5</sup>. NHANES data indicate the prevalence of overweight (BMI at or above the 95th percentile) among youth doubled from 1976-1980 to 1988-1994, increasing from 8% to 14% for 6-11 year olds and from 6% to 12% for 12-17 year olds<sup>5</sup>. Currently about 11% of US children and adolescents are overweight, and an additional 14% have a BMI between the 85th and 95th percentiles indicating they are at risk for becoming overweight.

Data suggest that the prevalence of obesity is increasing across all populations in the US, however, epidemiological data show that certain subgroups of individuals are at particularly high risk of obesity. National data show few gender differences in obesity rates among children and adolescents. Males tend to

have slightly higher rates of overweight compared to females (e.g., 15% for males compared to 14% for females)<sup>6</sup>. Differences in overweight prevalence by race and ethnicity, however, have been observed. In NHANES III, overweight prevalence among youth was considerably higher for male and female Hispanics, and African American girls compared to whites. For example among 6-11 year olds, 16% of black girls, 14% of Hispanic girls, and 9% of white girls were overweight. Among males aged 6-11, 17% of Hispanic boys were overweight compared to 10% of white and 12% of black boys. Other studies have shown excessively high prevalence estimates of obesity in American Indian youth<sup>5</sup>. In a recent survey of over 12,000 American Indian youth aged 5-17 years of age in the Northern Plains area, 22% of the males and 18% of the females were overweight (BMI > 95th percentile)<sup>7</sup>.

### Persistence of Childhood Obesity

Whether childhood-onset obesity leads to an increased likelihood of obesity in later life is an important issue with clinical implications. The likelihood of persistence of obesity from childhood to adulthood is related to the degree and duration of obesity, family adiposity and age of the child. The likelihood of an overweight infant becoming an overweight adolescent or adult is small. Less than 15% of overweight infants and only about 25% of overweight preschool children will remain overweight into adulthood<sup>8</sup>. Obesity is more likely to persist if it is present during the adolescent years. In general, the later into adolescence overweight persists, the more severe the degree of obesity, and the presence of parental obesity, increase the likelihood that obesity will persist in adulthood. A recent Washington state study tracked 850 infants over 21-29 years. Among obese 6 year olds about 50% remained obese. By the age of 10-14 years, 80% of obese children with at least one obese parent remained obese.<sup>9</sup>

### The Etiology of Obesity

Obesity and overweight are multi-determined chronic problems resulting from complex interactions between genes and an environment characterized by energy imbalance due to sedentary lifestyles and ready access to an abundance of food. Research suggests that obesity runs in families and that some individuals are more vulnerable than others to weight gain and developing obesity. Genetic susceptibility toward overweight has been proposed to occur through several mechanisms, including low resting metabolic rate, low level of lipid

oxidation rate, low fat free mass, and poor appetite control<sup>10,11</sup>. Genetic research holds considerable promise for understanding the development of obesity and identifying those at risk for obesity. However, the rapid increase in rates of obesity and overweight have occurred over too brief a time period for there to have been significant genetic changes in the population. Although body weight regulation is primarily regulated by a series of physiological processes, it is also influenced by behavioral and environmental factors<sup>12,13</sup>. Recent epidemiological trends in obesity have been linked to behavioral and environmental changes that have occurred in recent years. The increasing proportion of calories from fat and increased calories of the diet in combination with reductions in physical activity levels and increases in sedentary behavior have been implicated as significant contributors to the obesity epidemic<sup>12,13</sup>.

### Future Directions

Importantly, dietary and activity behavioral risk factors are modifiable and can be targets for change in obesity prevention and treatment efforts. Since treatment of obesity in adults is largely unsuccessful, the prevention of obesity beginning with school-age children may be the most effective means of dealing with the problem. Programs that encourage prevention of overweight through promoting regular physical activity and healthy eating patterns are needed. Since little research has been conducted on the primary prevention of obesity, there is an urgent need for studies in this area, particularly with sub groups at high risk for obesity.

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## Risk Factors for Childhood and Adolescent Obesity

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Prevalences of obesity among children and adolescents in the United States are high and are rapidly increasing<sup>1,2</sup>. Multiple factors



contribute to the onset and maintenance of obesity among children and adolescents. In order to reverse the trends of increasing prevalences of obesity, prevention and treatment interventions need to be implemented that

address the multi-factorial etiology of obesity. This article summarizes some of the major factors known, or hypothesized, to be associated with childhood and adolescent obesity.

### An Ecological Approach

An ecological approach may be used to present and discuss key factors associated with childhood and adolescent obesity<sup>3,5</sup>. In Figure 1, distal factors (i.e., social norms/national policies, community factors, and institutional factors) and more proximal factors (i.e., intra-personal (e.g., social interactions) and inter-personal factors (e.g., personality characteristics)) are shown to be correlates of childhood and adolescent obesity. The application of the ecological approach in examining correlates of obesity is

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valued because it emphasizes the multi-factorial etiology and the need for multi-level interventions. It also emphasizes the large role that societal, community, and institutional factors play, and thus takes some of the blame off of the overweight child for his/her condition. The larger arrows suggest that the main direction of influence is from the distal factors to the proximal factors, e.g., the availability of fast-foods restaurants in a community is likely to influence food intake patterns of adolescents. However, there are also smaller arrows going in the opposite direction suggesting bi-directionality of influence, e.g., family practices of eating-out in fast-food restaurants will lead to their proliferation within the community. Some of the key factors from within each of the domains shown in Figure 1 are discussed below.

**Social Norms/  
National Policies**

The ecological approach emphasizes the importance of the broad social/physical environment of individuals and its influence on individuals' health-related behaviors and conditions<sup>3</sup>. Perhaps one of the largest changes over the past century within the United States and other westernized countries has been the increased use of technology. Clearly, technological advances have improved our quality of life; however these advances have also contributed to the increased prevalence of obesity via increases in food availability, changes in the types of available foods, and steep decreases in the amount of physical activity that is needed for survival. While technological changes are unlikely to be reversed, other factors that appear to be contributing to obesity are modifiable. Food advertising on television often targets children and adolescents, urging them to consume foods high in sugars and fats. Pricing strategies are not supportive of consuming a healthier diet; subsidization of fruit, vegetables, low-fat foods, and whole grains could lead to increased consumption of these foods. Finally, social norms about eating practices may be placing children and

adolescents at increased risk for obesity. For example, social norms within the US promote eating out of the home, and food eaten away from home is generally higher in calories and fat than food consumed at home<sup>6,7</sup>. Social norms regarding thinness may be helpful in preventing obesity for

some individuals if they lead to the adoption of healthful eating and physical activity patterns; however they may have detrimental effects if they lead to extreme weight-control practices or diet-binge cycles.

**Community Factors**

Community factors appear to contribute to obesity onset among children and adolescents and may be key explanatory factors for the large disparities between youth of different socio-economic backgrounds. An important community-level factor that may decrease the level of physical activity among youth is the actual, or perceived, safety level of being outside. Parents who perceive their community to be unsafe due to traffic or crime may be less likely to permit their children to play outside; watching television may indeed be a safer activity. Other important community factors that may influence physical activity levels among youth include the



availability of community sports programs and affordable and accessible child/teen-oriented physical fitness centers. Local food stores and restaurants may influence the types and amounts of foods consumed by youth. Children and adolescents from lower socio-economic backgrounds have increased prevalences of obesity. Communities with predominately lower socio-economic populations may be less likely to be perceived as safe or to offer appropriate physical fitness facilities for youth. Fast-food restaurants may be more common in these communities and fresh produce may be less available than in communities serving higher socio-economic populations. These types of factors demonstrate the importance of community-based interventions aimed at youth obesity prevention that address the needs of specific communities.

## Institutional Factors

Factors within school health-care settings, and other institutions may also be contributing to childhood and adolescent obesity. Schools, and in particular school food services, are often forced to rely on revenues from vending machines and ala carte cafeteria food options that are not regulated for nutrient composition (as are school food meals). Decreased opportunities for learning about healthful eating and developing food preparation and purchasing skills may also be contributory factors. Institutional factors placing youth at increased risk for low levels of physical activity include declines in physical education requirements, lack of a focus on life-long and fun physical activity within school physical education classes, and a lack of sensitivity to the needs of overweight students who may not be physically fit. For some overweight or weight-conscious girls, girls-only physical education classes may be more suitable than mixed-gender classes. Factors within other institutions, such as health-care settings and restaurants, may also be placing youth at increased risk for obesity. For example, lack of or reimbursement for obesity prevention and treatment services may be a contributing factor and needs to be addressed immediately in light of the high prevalence of childhood and adolescent obesity and its impact on psychosocial and physical health. Restaurant policies that may also influence obesity include pricing strategies that encourage the consumption of large portions, excessive fat used in cooking, free refills on soda pop, and advertising techniques aimed at children and adolescents.



## Interpersonal Factors

Significant others within a child's life may also have a large impact on his/her eating practices and level of physical activity. The impact of the family is key throughout infancy, childhood and adolescence while the potential impact of peer norms increases as children enter adolescence. Food availability and accessibility within the home and family meal patterns have been identified by adolescents as strong influences on their eating behaviors<sup>8</sup>. Overcontrolling infant and child feeding patterns that discourage internal regulation of energy intake may also increase a child's risk for obesity<sup>9,10</sup>. Parents need to provide healthful food choices but should allow children to assume control of how much they consume. Decreased parental

physical activity and increased television viewing may place children at increased risk for inactivity. Although parental involvement is key to obesity prevention and treatment, parents' busy and demanding schedules need to be taken into account in making recommendations to parents. Parents of overweight children face the challenge of assisting their children in developing healthful eating and physical activity to avoid further excessive weight gain, providing them with social support to face weight-related stigmatization, and helping them to develop a positive self-esteem.

## Intrapersonal Factors

Research clearly indicates that genetic factors strongly influence obesity onset<sup>11</sup>. Although genetic factors alone can not explain the large increase in the prevalence of childhood and adolescent obesity, it appears

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# Frustrated by the current state of health of American families?

Help make a difference. Consider a graduate degree in Maternal and Child Health [MCH] in the Division of Epidemiology, School of Public Health at the University of Minnesota.

**What is MCH?** Maternal and child health focuses on promoting and preserving the health of families, including mothers, children, and adolescents.

**Who should apply?** People who want to positively influence health outcomes of mothers, children, and families in the United States should apply. Your interests might include developing and evaluating MCH programs: working collaboratively with multidisciplinary professionals from communities, public and private organizations and agencies, clinicians, policy makers, and researchers to develop innovative initiatives for health promotion; and /or managing programs that serve the needs of MCH populations.

The Masters in Public Health [MPH] in MCH is an appropriate degree for you if you are planning to proceed to a Ph.D. degree in biological or behavioral Epidemiology. These degrees are also available at the University of Minnesota.

**Why Minnesota?** The MCH major is nationally recognized as one of 13 federally funded training programs. The multidisciplinary MCH faculty has expertise in epidemiology, medicine, nursing, psychology, nutrition, family studies, and health education. They work collaboratively with faculty throughout the School of Public Health and University, with particular strong linkages with the Adolescent Health Program in the Medical School, the School of Nursing, Department of Family Social Science, and Institute of Child Development.

MCH faculty focus their research, teaching, and community services expertise on reproductive and perinatal health, family planning, child, adolescent, and family health promotion, risk reduction, and resiliency; child and family adaptations to chronic health conditions; and preventative interventions in the areas of adolescent pregnancy, childhood obesity, and fetal substance exposure. The faculty's research and community service activities afford additional opportunities for student training.

**For further information** – call 612.626.8802 or 1.800.774.8636; email [gradstudies@epi.umn.edu](mailto:gradstudies@epi.umn.edu); or check out [www.epi.umn.edu/mch](http://www.epi.umn.edu/mch) and [www1.umn.edu/twincities/](http://www1.umn.edu/twincities/).

that interactions between genetics and environmental factors may be key. For example, a child with a genetic disposition towards obesity, who is raised within a family in which high-fat foods are commonly consumed and within a community where it is not safe to play outside, is likely to become overweight. Eating behaviors that may place youth at increased risk for obesity include binge-eating (sometimes due to restrictive dieting), consumption of fast-foods that tend to be high calorie, meal skipping, and excessive consumption of soda pop and snack foods. Research has not consistently shown that overweight youth eat more than non-overweight youth<sup>12</sup>. In part, this lack of association may be due to under-reporting of food intake by overweight youth<sup>13</sup>. However, inconsistent associations between eating behaviors and obesity may also be due to differences in genetic dispositions for obesity. Research has more consistently shown that low levels of physical activity are associated with higher levels of obesity and that increasing physical activity can increase weight loss in children<sup>14</sup>. High levels of inactivity, such as television viewing may also be placing youth at risk for obesity. National data show that the average amount of television viewing is about five hours per day among children aged 10-15<sup>15</sup>. In the end, the child's intrapersonal factors, including genetic disposition, eating practices, and physical activity behaviors will determine whether or not he/she will be overweight. However, through this ecological perspective, it becomes clear that eating and physical activity are largely influenced by the child's distal and more proximal environments. In order to decrease childhood and adolescent obesity, the individual and his/her different environments need to be targeted.

### Conclusions

In conclusion, it is clear that numerous factors contribute to childhood and adolescent obesity. Specific etiological factors differ across youth; for some children, genetic factors may be the primary contributors, while for other children, environmental factors are stronger contributors. A review of the scientific literature suggests that there has been a shift in beliefs about key etiological factors over the past twenty years, with more emphasis being placed on the interaction between genetic dispositions towards obesity and environmental factors that provide increased opportunities for overeating and underexercising. Less emphasis is being placed on psychological factors that could place one at greater risk for overweight and

obesity. The emergence of genetic research over the past 20 years and the changing nature of obesity, along with increased prevalences, appear to be key factors leading to this shift in thinking<sup>16</sup>. The use of an ecological approach for examining risk and protective factors is helpful in that it reminds us that numerous factors need to be taken into account in understanding the etiology of obesity and in developing appropriate interventions. In order to reduce the prevalence of obesity among children and adolescents, concerted public health interventions at the individual, familial, school, health care setting, community, and national levels that aim to decrease risk factors for obesity are needed.

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## Programs and Policies to Prevent Child and Adolescent Obesity

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### Introduction

The dramatic increases in obesity rates that have occurred in the last few decades across almost all populations and age groups make prevention of obesity a public health imperative. Early prevention of obesity in childhood and adolescence is an important goal<sup>1,2</sup>. Children who become overweight during childhood are more likely to be overweight as adults, obesity in parents is a major risk factor for the development of obesity in their children<sup>1</sup>, and treating obesity in adults is very difficult.

The literature on obesity prevention has suggested that specific behaviors may be associated with obesity: consumption of a high-fat diet, overconsumption of energy, and physical inactivity<sup>2,3</sup>. Thus, the key interventions for preventing and treating obesity are increasing physical activity and consuming a healthful diet. Decreasing excess fat consumption, increasing fruit and vegetable intake and decreasing excessive soft drink and other high sugar, low nutrient beverages are important dietary targets. Increasing children's physical activity and decreasing sedentary behaviors such as television watching, is critical in considering prevention approaches because physical activity is a major component of energy expenditure. The potential of primary prevention of obesity hinges on helping young people and their families develop new lifestyles and creating supportive environments where healthful eating and physical activity can be promoted.

Obesity prevention programs can be delivered through a variety of channels, especially schools and communities. However, to complement strategies that focus on individual and/or family behavior change, environmental and policy interventions must also occur<sup>4</sup>. Environmental and policy approaches can address societal-level contributors to over-consumption of calories and physical inactivity. These approaches might include strategies directed at food advertising and marketing practices, food labeling, subsidization of healthy foods, and community and neighborhood design to

construct more safe walkways and bicycle paths. This article focuses on community and school based interventions and policies to prevent child and adolescent obesity.

### School-Based Approaches

Schools have the potential to make valuable contributions to both the prevention and the treatment of childhood obesity. More than 95% of youth, ages 5-17 are enrolled in school, and no other institution has as much continuous and intensive contact with children during their first two decades of life. The combination of classroom health education, physical education programs, food service, health services, and family contact make schools a viable forum for providing obesity interventions in a comprehensive manner. School-based obesity interventions can include both primary and secondary prevention approaches. Primary prevention efforts focus on the prevention of the onset of obesity and target the whole population (i.e., aimed at all children). Secondary prevention or high-risk interventions target overweight youth.

Three major components within schools have potential for contributing to the primary prevention of obesity: the physical education program, classroom health education, and the school food service. Since children eat one to two meals per day in school, the school cafeteria can provide a natural environment where children are exposed to and learn healthful eating patterns. Physical education classes could be a major resource for increasing energy expenditure in students, as well as creating expectations and social norms for frequent and regular physical activity. In addition, school facilities such as gyms and swimming pools could be open after school and weekends and serve as a community resource. Classroom health education could help youth develop the

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knowledge, attitudes and behavioral skills needed to establish and maintain healthy eating and a physically active lifestyle.

Secondary prevention efforts are also feasible in school settings. Schools have access to school nurses who can provide screening, counseling and continuum of care. Currently, more than half (59%) of all states fund school-based or school-linked health clinics that provide primary care and preventive services to students<sup>5</sup>. These clinics offer potential for serving overweight youth. The results of school-based interventions for the treatment of obesity are encouraging. A recent review found that in 11 of 12 school-based studies, the intervention group had a significantly greater reduction in percentage of overweight compared with the control group<sup>6</sup>. School-based programs for overweight children need to be aware of and concerned with the potential harmful effects of interventions, such as labeling and stigmatization. Programs also need to be careful in the types of messages that are taught in order to

avoid weight preoccupation and unhealthy weight control behaviors.

The following guidelines have been suggested for developing school-based obesity prevention or reduction programs<sup>7</sup>: 1) interventions should include components directed at both food intake and energy expenditure; 2) the dietary and physical activity components of the intervention should include parental involvement and behavioral and environmental modifications; 3) the physical activity should emphasize continuous, lifelong self-management skills and energy-expenditure activities rather than competitive activities characteristic of many physical activity programs in schools; 4) school food service personnel should be involved in food purchasing and food preparation; 5) skills on self-monitoring of both food intake and physical activity should be developed in youth, for reinforcement and feedback; and 6) peers should be involved to help build both a supportive social climate and social norms for healthy eating and physical activity.

Students are receptive to participating in school-based programs. As part of a comprehensive needs assessment on school-based obesity programs, we conducted in-depth interviews with overweight adolescents, primarily white and African American, from public high schools to determine their level of interest in participating in school-based weight control programs and to gather their recommendations for developing such programs<sup>8</sup>. The majority of overweight adolescents expressed interest in participating in a school-based weight control program provided it was done in a supportive and respectful manner, offered fun activities, was informative, was sensitive to the needs of overweight youth, and did not conflict with other activities. Table 1 lists the specific recommendations made by the students.

We also conducted 25 focus groups with the general student population in grades 7-12 to gather recommendations for obesity prevention programs<sup>9</sup>. Students were interested in healthy lifestyle promotion and wanted fun and interactive activities within a supportive environment. Activities mentioned included strength training, in-line skating, yoga, hiking, dance, step aerobics, water aerobics, basketball, and swimming. Many students also thought that programs offered within school settings should be available to all interested students, irrespective of weight status.

### Examples of School-Based Obesity Programs

**Pathways** is a multi-center school-based intervention aimed at reducing the alarming increase in the prevalence of obesity of American Indian children<sup>10,11</sup>. It is designed as a randomized study, involving about 2,000 third grade children in 41 schools (21 intervention schools and 20 control schools) in seven different American Indian communities. There are four University field centers and a coordinating center. The University of Minnesota, Division of Epidemiology field center is working with the Lakota on the Pine Ridge and Rosebud reservations. Dr. Mary Story is the Principal Investigator of the University of Minnesota field center.

Pathways, funded by the National Heart Lung and Blood

Table 1.

### Ten Main Recommendations from Overweight Youth for School-Based Weight Control Programs

1. Have a leader who understands the difficulties faced by overweight teens. Try to have a leader or co-leader who is or has been overweight.
2. Provide a supportive, caring, and accepting environment for the participants.
3. Have discussions on non-weight related issues aimed at helping the participants to feel better about themselves. Relate to the participants as teens, not as overweight teens.
4. Make the program FUN! Avoid sitting around too much and have lots of physical activity.
5. Offer out-of-classroom and out-of-school activities such as walking in the park, going to YWCA as a group, playing softball, jazzercise classes, shopping together, and healthy picnics.
6. Include activities aimed at increasing nutritional knowledge and skills including food tasting, food preparation, and identification of low-cost foods.
7. Be sensitive to the social stigma associated with being overweight in program recruitment and planning.
8. Try to reduce "technical" barriers to participating by offering the program at a convenient time, at no cost, and by providing transportation if necessary.
9. In program evaluation, assess improvements in self-perceptions, eating and skills behaviors, and perceived social support from the group in addition to weight loss and maintenance.
10. Involve youth in all stages of planning - prior to program implementation and throughout the program.

Institute, is an 8-year, 2-phase study. The 3-year feasibility phase was to plan, develop, pilot test, and assess the feasibility of conducting the full-scale study. The full-scale study phase began in 1996 and will be completed in 2001.

The primary objective of the Pathways intervention is to implement a culturally appropriate school-based intervention program that promotes healthy eating and increases physical activity to prevent obesity. It consists of four components: physical activity, food service, classroom curriculum, and family involvement. The 3-year intervention (3rd, 4th, 5th grades) began for 3rd grade children in Fall, 1997, following baseline data collection. The primary aim is to reduce average percent body fat in intervention school children. Secondary outcomes include physical activity, dietary intake, and knowledge, attitudes, and behavior. The results of this study should answer a number of questions about the effectiveness of school-based obesity primary prevention programs.

**New Moves** is a school-based intervention designed to help overweight adolescent females adopt healthy physical activity and eating behaviors, develop a positive self-esteem, avoid unhealthy weight control behaviors and help them function in a society geared to value thinness. New Moves will be offered to overweight females for credit during school hours as an alternative to the regular physical education program. The program includes physical activity, nutritional guidance and social support components. The program which starts Fall 2000 in the Twin Cities area will include daily activities during one school quarter and booster activities during three school quarters. A randomized study design is being used to evaluate the program. Outcome measures include body mass index, body fat, physical fitness, eating and physical activity behaviors. The program is funded by the American Heart Association and Dr. Dianne Neumark-Sztainer is the Principal Investigator.

### **Community-Based Approaches**

Community-based programs can implement strategies for obesity prevention, such as more intensive physical

activity, nutrition education and providing healthy snacks. Settings such as after-school programs, clubs, youth organizations, churches, housing projects, and recreation and park facilities can be used. Thus, the framework for community-level obesity prevention programs for young people are already in place. More than 17,000 national and local youth organizations operate in the US, providing a safe haven for youth after school and on weekends<sup>12</sup>. 4H is one of the largest youth organizations, involving almost 6 million youth in just about every county in the country. YWCAs, YMCAs, recreation and park organizations, and scouts account for millions more youth, staff, and volunteers. The Boys and Girls Clubs serve more than 2.4 million youth at more than 1800 club sites. They have opened up club sites in more than 200 housing projects, as well as in malls, homeless shelters, and on Indian reservations. Girls Inc. serves more than 350,000 young girls at more than 1000 sites<sup>13</sup>.

Most health promotion programs for children and adolescents are provided in school settings, yet community programs represent untapped potential for interventions to help youth acquire, maintain, or increase positive health behaviors related to eating and physical activity. Community programs can be tailored to respond to the diverse needs, characteristics, values, and preferences of different ethnic, gender and age groups. Unlike many schools, community programs can design and deliver culturally-specific interventions.

General concerns about community-based obesity prevention programs include how to design and implement cost-effective programs accessible and appealing to youth. Interventions will need to be powerful enough in intensity and duration to produce changes in eating and physical activity behaviors.

### **Examples of Community-Based Programs**

The California Adolescent Nutrition and Fitness (CANFit) Program empowers youth-serving, community-based organizations to develop and implement nutrition education and physical activity programs for ethnic

adolescents from low-income communities<sup>14</sup>. Currently, 22 organizations in California have received CANFit Program funding and support to plan or implement nutrition education and physical activity programs. Through a competitive grant process and using a capacity building model, the CANfit Program attempts to change the community context by improving access to healthier food choices and safe, affordable physical

## **Specialized training available in Maternal and Child Nutrition.**

The University of Minnesota Leadership, Education and Training (LET) Program in Maternal and Child Nutrition offers graduate education opportunities in maternal and child nutrition. Areas of specialization include: maternal, infant, child and adolescent nutrition; childhood obesity prevention and intervention; eating disorders prevention; school/community nutrition intervention programs; and nutrition epidemiology.

A combined masters degree (MPH) and dietetic internship program is available for individuals who have completed an approved didactic program.

Traineeships are available to RDs who pursue a MPH or PhD degree in public health nutrition. Applicants must be US citizens to apply for traineeships. Traineeships are funded by the U.S. Maternal and Child Health Bureau, Health Resources and Services Administration, U.S. Department of Health and Human Services. All traineeships provide tuition assistance and a monthly stipend. In addition to traineeships, scholarships and research assistantships are available for MPH and PhD students.

Information on the MPH program in public health nutrition can be obtained by contacting Shelley Cooksey, graduate studies coordinator, at [cooksey@epi.umn.edu](mailto:cooksey@epi.umn.edu) or 612/626-8803.

Information on MCH nutrition traineeships can be obtained by contacting: Jamie Stang, Ph.D., MPH, RD via telephone: 612-626-0351 or e-mail: [stang@epi.umn.edu](mailto:stang@epi.umn.edu)

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# News

from the Minnesota Department  
of Health

## HEALTHY MINNESOTANS AND YOUTH RISK BEHAVIOR ENDOWMENT EFFORTS OF THE MINNESOTA DEPARTMENT OF HEALTH

*Healthy Minnesotans Public Health Improvement Goals 2004:* The Minnesota Department of Health publishes statewide goals reflecting the public health needs identified by people throughout Minnesota. These public health goals provide a common direction for public and private entities that work to improve the public's health. There are 18 goals in total. A number of the goals provide direction for addressing the prevention of childhood obesity. To view or download a copy of the goals, see [www.health.state.mn.us/divs/chs/phg/intro.html](http://www.health.state.mn.us/divs/chs/phg/intro.html).

*Strategies for Public Health: A Compendium of Ideas, Experience and Research from Minnesota's Public Health Professionals:* This resource is a compilation of public health interventions, or key strategies, that can be implemented to address important public health problems. The strategies are intended to be used in conjunction with Healthy Minnesotans: Public Health Improvement Goals 2004. A number of the strategies provide direction for addressing the prevention of childhood obesity. To view or download a copy of the strategies, see [www.health.state.mn.us/divs/chs/phs/phs.htm](http://www.health.state.mn.us/divs/chs/phs/phs.htm).

*Minnesota Youth Risk Behavior Endowment:* This new Minnesota Department of Health initiative will provide resources for local public health agencies for improving the health of Minnesota's youth. The goal of the program is to reduce youth risk behaviors (other than tobacco use) and to increase the capacity for youth, adults, communities, and systems to effectively support youth health and healthy development. The endowment focuses on the reduction of the behaviors that contribute most toward poor health among youth and across the lifespan. The behaviors of focus are alcohol and other drug use; sexual behaviors that may result in pregnancy, HIV, and STI's; violence; suicide; physical inactivity; and poor eating behaviors. To view or download a copy of the Minnesota Youth Risk Behavior Endowment Resource Directory, see [www.health.state.mn.us/divs/fh/chp/yrbdirectory.htm](http://www.health.state.mn.us/divs/fh/chp/yrbdirectory.htm).

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activity opportunities and enabling adolescents to have the decision-making skills and social support necessary for making healthy nutrition and fitness choices. Examples of CANfit grantees' projects include: 1) a 10-week Afrocentric curriculum for a girls' after school program that focuses on self-esteem, body image, healthy eating, cooking, and physical activity (hip hop dance); 2) a nutrition and physical activity program for youth and their parents attending Saturday Korean Language schools in Los Angeles; and 3) Latino youth in a soccer league worked with a local health department to train team coaches and parents in sports nutrition. The CANFit Program provides an example of a promising model for working within the context of youth-serving organizations in low-income, ethnic communities to promote healthy behaviors and prevent obesity.

The purpose of GEMS (Girls Health Enrichment Multi-site Study) is to develop and evaluate a community and family-based behavioral intervention to promote healthful eating and physical activity behaviors of 8-10 year old African American girls to reduce their risk for obesity and associated health problems. The setting of the program will be Twin Cities community centers that serve African American youth. GEMS is funded by the National Heart, Lung, and Blood Institute of NIH. The intervention being developed through the University of Minnesota, Division of Epidemiology in collaboration with community groups, will take place after school, two afternoons a week. The program will be piloted in March 2001 for 12 weeks.

### Parent Involvement

Parent participation and involvement is critical in school and community obesity prevention programs. Parents of children need to be involved in obesity intervention efforts to make healthy changes in the home and reinforce and support healthy eating and regular physical activity.

While it is important to involve parents in children's programs for diet and physical activity, little is known about how best to involve families to promote change. Parent involvement in school-based programs has been modest and the activities are of low intensity (e.g., homework activities with the child). When activities are of higher intensity,

(e.g., attend events outside the home) family participation rates are extremely low. It appears that family interventions work best among families who have a heightened perceived need to desire change (e.g., families with elevated risk for disease and obesity), when the programs can be tailored to specific characteristics of the family, and when activities involve the families at a higher level and can be completed in their home over an extended period of time<sup>15</sup>.

### Environmental & Policy Approaches

The rapid increases in obesity rates over recent years have occurred in too short a time for there to have been any significant genetic changes within populations. This suggests that the primary cause of the rapid rise in obesity lies in environmental and societal changes related to food intake and physical activity behaviors<sup>3</sup>. An increased availability of palatable, inexpensive calorie-dense food, aggressive and sophisticated food marketing in the mass media, supermarkets, and restaurants and the large proportion of food served outside of the home driven by time pressures and convenience needs, all promote high caloric consumption. Likewise, technological advances and mechanization have limited the necessity of physical activity required to function in society. The increased reliance on cars, and other automated transport devices like escalators and elevators, as well as labor-saving devices at home and in the workplace, and sedentary leisure pursuits of television watching and computer use have all contributed to a decline in physical activity.

Public health strategies to prevent obesity should work towards producing an environment that supports healthy eating and physical activity throughout the entire community<sup>16</sup>. The implementation of such an approach will require general acceptance that prevention of obesity is not just the responsibility of individuals, their families or health professionals but will require a commitment from all sectors of society and structural changes in society.

While strategies to address the environmental influences of obesity have not been empirically tested, several approaches have been proposed<sup>3,4,17</sup>. Low-income communities in particular need supportive environments with improved

access to healthier food choices, and safe, affordable physical activity opportunities. Physical activity opportunities include accessible neighborhood centers with facilities for physical activity, community sports and recreation programs, well groomed playgrounds and recreation fields with adequate equipment, and hiking, bicycling, and fitness trails. Healthy eating opportunities include high quality and affordable fruits and vegetables and lower fat food choices in grocery stores, local farmers' markets, community gardens, and healthy foods in vending machines.

Prime areas for broad environmental change action include exploring 1) transportation and urban design policies (e.g., safe walkways and cycle paths); 2) regulations (e.g., limit and regulate food advertising to children, require chain restaurants to provide calorie information on menus and nutrition labeling on wrappers); 3) economic incentives (e.g., subsidies for fruit and vegetables, food pricing incentives, incentives for bike paths, recreation centers); 4) food and nutrition guidelines and policies (e.g., nutrition policies in schools; food products); 5) taxes (e.g., remove sales tax on exercise equipment, tax soft drinks and other high sugar, high fat low nutrient-dense foods to fund health behavior campaigns); and 6) promotion and education (e.g., media campaigns, school programs) <sup>3, 4, 17</sup>.



Environmental change strategies remain relatively unexplored and research and evaluation is needed. Innovative studies should be carried out to determine the feasibility, acceptability and effectiveness of various approaches and target groups.

Community action efforts for social change should also be considered for obesity prevention programs. Lessons learned from past successful social change campaigns to address other public health problems (e.g., poor immunization rates, drunk driving, seat belt usage, reducing youth access to tobacco, breastfeeding) should be identified and considered in the design of public health strategies for obesity prevention and widespread change in eating and physical activity behaviors. Several large-scale community change projects have been implemented and carefully evaluated in the area of alcohol, drinking and driving, tobacco, drug abuse prevention and cardiovascular

disease risk reduction<sup>18-21</sup>. Community-change strategies have targeted multiple levels of action-through schools, parents, community ordinances, and other dimensions of public policy, institutional policies and practices, and social networks. These community change strategies may have relevance for obesity prevention programs and should be examined.

### Summary

The key interventions for preventing and treating obesity are increasing physical activity and consuming a healthful diet. Schools and communities offer a wide array of opportunities in which to implement obesity prevention efforts. To complement strategies that focus on individual and/or family behavior change, environmental and policy interventions must also occur. The challenge of helping young people adopt healthful eating patterns and regular physical activity to achieve and maintain healthy weights will require a multifaceted community-wide effort.

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## “Partners in Health” – Eau Claire Area Childhood Nutrition Coalition

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The Eau Claire City-County Health Department in Wisconsin spearheaded a community effort to improve the nutrition and health of children in January 1998. A collaborative effort between the Health Department, Marshfield Clinic, Melfort Clinic, Family Medicine Clinic, Sacred Heart Hospital, Luther Hospital, Eau Claire WIC Program, Head Start, and UW-Extension formed to identify the perceived needs of children in our community and to strategize about providing nutrition education.

Input from coalition members, media surveys, day care parents' surveys and health department staff was incorporated in a plan of action for professional and community education. Preschool children were designated as the target population. The Coalition identified the increasing rate of childhood obesity as its major health concern. The prevalence of weight for height > 95% in Eau Claire county is 7.3% among preschool children. These data were collected through the Centers for Disease Control (CDC) Pediatric Nutrition Surveillance System. The prevalence of obesity in our community has been steadily increasing among preschool children over the past 3 years. The theme, "Eat Well Play Hard", was chosen to promote healthy nutrition and physical activity for local children.

The Eat Well Play Hard campaign is promoted with the help of its mascot, Corky Carrot. A display board featuring Corky Carrot and his friends is used in local libraries and Head Start Programs. Corky promotes eating more fruits and vegetables, increasing physical activity and making low fat choices to children. UW-Extension and Head Start have developed a curriculum for use with the display and plan to provide Corky Carrot display kits for each Head Start Program in Eau Claire.

In addition, a media campaign based on quarterly themes was initiated. The themes for 2000 were Fast Foods at Home, Low Fat Eating - Dairy Products, Physical Activity for Children, and Fruits and Vegetables for Good Health. Media contacts are conducted through the local newspapers, television and radio.

The Coalition also publishes two quarterly newsletters. The community newsletter is for parents. Distribution occurs through the Health Department, WIC Program, Day Care Centers, Head Start Programs and Medical Clinics. Reproducible master copies are provided to the Head Start Programs and Medical Clinics where multiple copies are printed for affiliated families. The Coalition also publishes a quarterly newsbrief for community health care professionals. Coalition members who are experts in the quarterly topics write the professional newsbrief. The Childhood Nutrition Coalition has been successful in locally promoting a consistent message about healthy eating and physical activity for children. Consistent messages from medical clinics, the health department, day cares, and WIC and Head Start programs have been helpful to parents.

Other community health professionals have expressed an interest in promoting corresponding topics with their populations. Quarterly topics will be developed for 2001 with additional partners. Representatives from the Office on Aging, Health Promotion Action Team of Healthy Communities, Hunger Coalition of Eau Claire and the Dairy Council will our community education efforts. This will expand the Coalition's focus.

The development of a Childhood Nutrition Coalition enables community partners to promote consistent messages. Once a network of partners and a public health goal are determined, nutrition education themes can be chosen and implemented. In the future, this Coalition plans to promote further initiatives such as the revised CDC growth charts and guidelines.

