Preventing Childhood Obesity:
Individual-based vs. Population-based Approach

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ABSTRACT

Chronic diseases are the number one cause of death and disability in the United States, yet they are among the most preventable. Childhood obesity, in particular, has become an epidemic affecting one third of all children. The complex causality of genetic, environmental, sociocultural, and behavioral factors in the development of childhood obesity make prevention challenging, but essential for managing the rising prevalence of this condition. The individual-based approach to prevention is primarily used by health care providers and targets those with the highest level of relative risk for childhood obesity. The population-based approach addresses the behavioral, sociocultural, and environmental factors that contribute to childhood obesity in populations. This paper aims to describe the advantages and disadvantages of the individual-based and population-based approaches to prevention of childhood obesity, and to determine which approach has the greatest potential to most effectively manage this epidemic.
INTRODUCTION

Advances in modern medicine and public health eliminated many communicable diseases and injuries as causes of disability and mortality in the United States in the twentieth century. Consequently, the infant mortality rate plummeted and life expectancy increased by 30 years since 1900 (CDC, 1999). These public health gains have dramatically changed the population demographic and disease burden in the US. Longer life expectancies result in an aging population with greater possibilities of exposure to risks for chronic health problems. This shift in the relative balance of acute and chronic health conditions is expected to continue at an unprecedented rate (WHO, 2002). Unfortunately, our health care system has not yet adapted to these changing health priorities.

Our current health care system was developed to address acute problems and urgent needs of patients, and to maintain good health through immunizations, well-child checks, and preventive services. Testing, diagnosing, treating symptoms and anticipating cure are traditional characteristics of our health care system. This care model fits the needs of patients experiencing episodic health problems, but with the rising prevalence of chronic conditions, this model falls short (WHO, 2002). Chronic diseases are long-term, complex illnesses that cannot be addressed by this simplistic model of care alone. Long latency periods, cumulative effects of exposure to risks, and the complex causality make preventing the onset of chronic problems particularly challenging. Evidence shows that modifiable risk factors (unhealthy diet, tobacco use, physical activity) combined with non-modifiable risk factors (age, genetics, gender, environmental factors) increase the risk of chronic disease (WHO, 2005).

The individual-based approach presumes that all individuals in a population have some level of risk, but a subset of the population is more susceptible due to greater exposure to risk
factors. The purpose of this approach is to target only those with the highest level of relative risk in an attempt to reduce their risk levels to those of the average population. This approach is most commonly used by physicians or other health care providers seeking to understand why a particular person has a condition, or is at risk for acquiring the illness (Rose, 1985). For most common diseases, there are an identified set of risk factors that deem an individual to be at higher relative risk for developing that disease. The etiology of these risk factors may be genetic, metabolic, hormonal, or behavioral. Individuals with one, or a combination, of these risk factors are likely to be routinely screened for early stages of the disease and educated about ways in which they can modify their behavior to reduce the chances of developing the disease. Onset of disease may be managed by additional patient education and behavior modification, or by medication or surgery. The management action taken is based on the individual’s health, lifestyle, and preferences (Swinburn & Egger, 2002).

The population-based approach attempts to control the determinants of health to lower the average level of risk factors in a population. In contrast to the individual-based approach, this approach is interested in understanding why a particular population has a high (or increasing) prevalence of a disease. The population-based approach seeks to shift the whole distribution of exposure in a positive direction by removing the underlying causes that make the disease common (Rose, 1985). Public health surveillance data, community health assessments, and vital statistics are used by public health to assess risk levels of a population. Environmental, cultural and behavioral influences on health are also considered. Public health agencies and community health organizations develop interventions to address these external effects on individual’s behavior. Population-based interventions may include public education and
environmental or policy change. The goal of this approach is to identify and implement the best long-term strategies to reduce exposure to risk in a population (Swinburn & Egger, 2002).

There are fundamental differences between the individual and population approaches, and both will continue to be needed to improve health. However, given that patients with chronic diseases account for 75% of the nation’s health care spending, it is clear that more needs to be done to prevent these conditions from developing (CDC, 2008a). This paper will describe the advantages and disadvantages of the traditional individual approach versus the population approach to prevention of child obesity. Overweight and obese children are more likely to become obese adults, thus increasing both their medical burden on society and their risk of early morbidity and mortality (Gunnell et al., 1998). Childhood obesity is the focus of this paper because it is the chronic disease that has the most potential to overwhelm our health care system if effective preventive action is not taken.

**RESEARCH METHODS**

Geoffrey Rose’s article *Sick Individuals and Sick Populations* (1985) was used as a starting point for a literature search on the individual and population approaches to prevention. Articles citing Rose’s article were identified using PubMed Central, accessed through the University of North Carolina’s Health Sciences Library, and Google Scholar. Key search words were selected from this set of articles for an expanded literature review on the two different approaches to prevention including: high-risk, individual approach/strategies, population approach/strategies, population-based prevention, risk factors, preventive health services, primary prevention, secondary prevention, and health determinants. This research provided a theoretical basis for prevention approaches to chronic diseases, specifically childhood obesity.
Data and research on the prevalence, causes, and consequences of childhood obesity was gathered from the Centers for Disease Control and Prevention, the World Health Organization, and the Institute of Medicine. General internet searches using Google Scholar and the Google search engine were also conducted. Articles dated after 2002, the year Congress charged the Institute of Medicine with developing a prevention-focused action plan to address childhood obesity, were reviewed for relevance to the topic of this paper. Articles that were referenced in the selected literature were also included in the review. Those published before 2002 were considered and selected if the information included in the article was enduring.

Research pertaining to the individual approach to prevention was gathered from the American Academy of Pediatrics, the National Initiative for Children’s Healthcare Quality, the Improving Chronic Illness Care website, and through searches on PubMed Central, Google Scholar and the Google search engine. Searches were conducted using the following key words: chronic illness/disease, chronic disease management, childhood obesity/overweight, clinical prevention, preventive health services, high-risk approach to prevention, health care delivery, health determinants, individual approach to prevention, and health promotion/education.

Research related to the population approach to prevention of childhood obesity started with the Institute of Medicine’s 2002 report titled *The Future of the Public’s Health in the 21st Century* and literature referenced by the International Obesity Task Force. General searches were conducted through PubMed Central and Google Scholar to identify current articles and publications using the following key search words: childhood obesity prevention, population health, population-based health services/interventions, population-focused strategies, community health, community-based prevention, primary prevention of childhood obesity, social determinants, and health promotion/education. General internet searches were also conducted.
using the Google search engine. Websites were reviewed to determine their relevance to this paper’s topic.

**CHILDHOOD OBESITY**

*Definition*

Body mass index (BMI) is the accepted standard measure of overweight and obesity for children two years of age and older and is calculated from a child’s health and weight (Committee on Nutrition, 2003). The BMI number is plotted on the BMI-for-age growth charts, established by the Centers for Disease Control and Prevention (CDC), to obtain a percentile ranking that indicates the relative position of the child’s BMI number among children of the same sex and age. Children with a BMI-for-age between the 85th and 95th percentile are considered to be at-risk of overweight, and those above the 95th percentile are categorized as overweight (CDC, 2008b).

*Burden of Suffering*

Over the past few decades, the prevalence of obesity, particularly in children, has continued to rise at alarming rates. Between 1971-1974 and 2003-2004, obesity prevalence for children aged 6 to 11 more than quadrupled, increasing from 4.0% in to 18.8%. For adolescents aged 12 to 19, the percentage of those considered overweight increased from 6.1% to 17.4% (Fig. 1) (Hedley et al., 2004).
Figure 1. Prevalence of Overweight* Among U.S. Children and Adolescents (Aged 2 –19 Years National Health and Nutrition Examination Surveys

This chronic condition has also disproportionately affected certain racial/ethnic groups – 27.7% of non-Hispanic black girls aged 12 through 19 years and 19.9% of Mexican American girls had a high BMI for age in 2003-2006 (Fig. 2) (Ogden, Carroll & Flegal, 2008). The steady and significant increase has made obesity the second leading cause of preventable death in the United States, and it may soon overtake tobacco as the primary cause (Mokdad, 2004).

Figure 2. Body Mass Index for Age at or Above the 95th Percentile by Race/Ethnicity in 1999-2006

Childhood obesity poses significant risks to the physical and emotional health, and academic development of our youth; the capacity of our health care system; and the viability of our economy. Overweight and obese children are more susceptible to developing a number of serious illnesses, including heart disease, stroke, asthma, and certain types of cancer. High blood
pressure and type 2 diabetes, previously considered to be “adult diseases,” are now being diagnosed in children. Also, research shows that obese adolescents have up to an 80 percent chance of becoming obese adults (RWJF, 2008). Children who are overweight or obese are often stigmatized and teased. Stigmatization can have a marked impact on childhood psychological development (Morgan, Tanofsky-Kraft, Wilfley, et al., 2002; Puhl & Brownell, 2003) and could explain some of the psychological disorders these children experience, such as depression and suicidal thoughts (Zametkin et al., 2004). Studies have shown that overweight children have poor performance in school and lower expectations for their educational future (Mellin et al., 2002). In a comprehensive study of 11,192 kindergartners, overweight children were found to have significantly lower test scores in math and reading than their non-overweight classmates (Datar et al., 2004). Another study reported that overweight adolescent girls were significantly more likely to report being held back a grade than average weight girls, and overweight adolescent boys were significantly more likely to drop out of school than average weight boys (Falkner et al., 2001).

The economic impact of childhood obesity is staggering. In the United States, the cost of childhood obesity is estimated at approximately $11 billion for children with private insurance and $3 billion for those with Medicaid. Children treated for obesity are roughly three times more expensive for the health system than the average insured child. These children are two to three times more likely than all children to have a hospital stay during the year and experience greater use of physician services (Marder & Chang, 2005). As the number of children being treated for overweight and obesity rises, the strain on our health care system will only get worse.

The Causes
The fundamental cause of obesity is an energy imbalance between calories consumed and calories expended. While this energy imbalance is most commonly caused by consuming a diet high in fat and calories, being sedentary or both, there are a number of factors that can result in weight gain and obesity. Underlying genetic, hormonal, and metabolic conditions can predispose a child to overweight or obesity (The Endocrine Society & The Hormone Foundation, 2008). Low socioeconomic status has been associated with higher risk of childhood obesity due to the affordability of convenience and fast foods versus more nutritious options, and the greater chances of residing in neighborhoods where it is unsafe for children to play (Singh et al., 2008). Environmental factors, such as poor community design, limited access to local supermarkets, and lack of recreational facilities, can also contribute to childhood obesity (Sallis & Glanz, 2006). Parental obesity may increase the risk of obesity by shared familial characteristics in the environment, such as food preferences and behavior modeling (Francis, Lee, & Birch, 2003).

Most of these risk factors alone are insufficient to cause obesity. Obesity is the result of complex interactions between multiple risk factors and across a number of social, environmental, and policy contexts. This multitude of factors contributing to the rising prevalence of obesity makes it difficult to bring under control; therefore, effective and efficient preventive efforts must be the priority (Kumanyika, et al., 2008).

**Approaches to Addressing Childhood Obesity**

*Traditional Individual Approach*
The American Academy of Pediatrics’ (AAP) policy statement on the prevention of pediatric overweight and obesity issued in 2003 recognizes the need to focus efforts on prevention and early identification in children. The strategies proposed by the AAP, along with the American Academy of Family Physicians (AAFP, 2004), for early identification of excessive weight gain include routine assessments of eating and activity patterns in children by health care providers, and recognition of excessive weight gain by using body mass index (BMI). The policy statement emphasizes that interactions between genetic, biological, psychologic, sociocultural, and environmental factors are evident in childhood obesity. It mandates that physicians recognize populations and individuals at risk in the development of effective prevention strategies; however, the level of analysis and interventions are focused at the individual level. Recommended actions for pediatricians and family physicians include encouraging and supporting breastfeeding; encouraging parents and caregivers to promote healthy eating patterns and modeling healthy food choices; routinely promoting physical activity; recommending limitation of television and video time; recognizing and monitoring changes in obesity-related risk factors for adult chronic disease; and advocating for policies support physical activity and nutrition policies at the local, state, and national levels (Committee on Nutrition, 2003; AAFP, 2004). This individual-based approach aims to identify children who are most susceptible to weight gain due to the presence of certain risk factors and to provide them with a targeted intervention.

Advantages of the Individual Approach
Even though it is clear that childhood obesity is caused by complex interactions of multiple risk factors that cannot be independently addressed, there are some important advantages to intervening at the individual level. The first advantage is the potential for identifying a specific cause or problem that a targeted intervention can possibly ameliorate (Rose, 1985). For example, while only a small percentage of childhood obesity is associated with a hormonal or genetic defect, these causes can be identified through a careful history and physical examination, and proper treatment can be prescribed (Moran, 1999). Body mass index provides a measure of success for individual level interventions that can be monitored and tracked over time.

Secondary preventive activities can lead to unhealthy weight control attempts among overweight or obese children and adolescents that can have unintended negative outcomes, such as growth failure, delayed puberty and menarche, and reduced bone density (O’Dea, 2005). Children who are put on a weight loss regimen must be closely monitored by a physician to prevent these adverse consequences from occurring. Although children and adolescents visit physicians less often than other age groups, overweight youth are more likely to visit their primary care physician as compared to non-overweight children (Gauthier et al., 2000). In addition, adolescents have indicated a willingness and desire to discuss weight issues with their healthcare provider (Hodgson et al., 1986; Marks et al., 1983). Physicians can help children and adolescents set small achievable goals that may lead to increased feelings of self-efficacy, which in turn may encourage additional persistence and continued progress (Davis et al., 2007). The individual approach to prevention, whether it is primary or secondary prevention, decreases the risk due to the customized strategies prescribed and the ability to readjust treatment as needed (Fletcher et al., 1999).

Parents often have low levels of recognition of their children’s overweight status and relatively few are concerned about their child’s weight. In a study evaluating parents’
perceptions of their child’s appearance and health, only 36% of parents of overweight children described their children as overweight or at-risk of overweight. Twenty-six percent of parents of overweight children were concerned about their child’s health (Eckstein et al., 2006). Parents also routinely deny that their children are overweight and do not get enough exercise through regular physical activity (Hodges, 2003). Parents do not typically consult an objective tool, such as BMI, to determine if their child is overweight or obese. They may believe that their child’s size is inherited or that they will eventually lose their “baby fat.” Parents may only recognize the problem if their child’s mobility is compromised or if they are teased by other children (Etelson, Brand, Patrick & Shirali, 2003). As more children become overweight and obese, the perception of excess weight as a health problem may become further diluted. Physician recognition of a child’s heightened body mass index may raise awareness of the problem for parents. Only then may they understand the health risks and need to make behavioral changes.

**Disadvantages of the Individual Approach**

There are significant limitations to the individual approach to addressing child obesity. Due to the complexity of contributing factors, accurately predicting risk at the individual level is challenging, if not impossible. Most of the risk factors for childhood obesity, such as parental obesity, low socioeconomic status, and ethnicity, are both unnecessary and insufficient to cause disease; therefore, screening and assessment of an individual’s risk is a poor predictor of disease development (Janes & Pepe, 2008; Rockhill, 2001; Rose, 1985; Wald, 1999). Unfortunately, the best predictor of child obesity may be a BMI between the 85th and 95th percentile for their age and sex, which indicates that the child is at risk of overweight (AAP, 2003); therefore, primary prevention for child obesity is particularly challenging.
Pediatricians are underdiagnosing child obesity, according to a University of Rochester Medical Center study. Between 1997 and 2000, a little more than 7 percent of all kids who were overweight actually got a diagnosis of overweight or obesity (Cook, Weitzman, Auinger, & Barlow, 2005). This may be due in a large part to the lack of evidence for effective interventions delivered in primary care settings (Whitlock, et al., 2005), and the uncertainly about whether intermediate outcomes, such as weight loss or stabilization, lead to long-term health. At this time, it is also unknown whether screening, diagnosing, and treating overweight children could result in potential harms, such as labeling, reduced self-esteem, poor eating habits, eating disorders, or the effects of “yo-yo dieting” (continuing to lose and regain weight) (USPSTF, 2005). Until more research is done to determine how best to manage childhood overweight with limited risks, clinicians will likely continue to be cautious in diagnosing this condition.

There is growing concern that obesity disproportionately affects those who are least able to afford care – children receiving Medicaid and children who are uninsured. Children covered by Medicaid are nearly six times more likely to be treated for a diagnosis of obesity than children covered by private insurance; however, they are also less likely to visit the doctor, which means that the chances for intervening at an individual level are limited (Marder & Chang, 2005). So, not only are opportunities for health promotion missed for at-risk or obese children actually visiting their pediatrician, those who are most in need of prevention or treatment may not have the same chance. These findings demonstrate the limitation of relying solely on the individual approach to prevention of overweight and obesity.

Finally, interventions selected to alter one’s risk are often behaviorally, culturally, and socially inappropriate. Individual health behaviors are often constrained by social norms and environmental factors. Culture influences the attitudes and beliefs toward exercise, food and
nutrition, and body image and self-esteem. Providing information about healthy diet to low-income children and encouraging them to follow nutritional guidelines is unlikely to have much impact if they do not have access to convenient, affordable foods (Peralta, 2003). Ethnic minorities eat foods that are not typically part of the mainstream American diet; therefore, diet suggestions will not likely include these types of foods (Forster-Scott, 2007). Without understanding the extent to which these social and environmental factors influence health behaviors, the responsibility for reducing risk will ultimately rest with the individual (Peralta, 2003).

**Population Approach**

In 2002, the Institute of Medicine published a report titled *The Future of the Public’s Health in the 21st Century*. This report was the output of the Committee on Assuring the Health of the Public in the 21st Century, which was charged to create a framework for assuring population health. Population health, as defined by the Federal, Provincial, Territorial, Advisory Committee on Population Health in 1997, refers to “the health of a population as measured by health status indicators and as influenced by social, economic, and physical environments, personal health practices, individual capacity and coping skills, human biology, early childhood development, and health services.” The Committee found that over 70 percent of preventable death is caused by behavioral and environmental factors, and that health care is just one of several determinants of health (IOM, 2002).

The public health, or population, approach places the individual within the context of the large community that is composed of both sick and healthy patients (Weiss, 1998). It recognizes that health risks are often widely distributed across a continuum, rather than confined to a high-risk group (Rose, 1992). This strategy views the population as the “patient;” therefore, it aims to
reduce the average exposure to common risk factors in order to shift the whole distribution towards lower risk (Rose, 1985). Preventive efforts at the population-level target the behavioral, sociocultural, and environmental factors that contribute to disease and injury in populations. The “causal web” of obesity determinants developed by the International Obesity Task Force illustrates the complexity of issues that must be addressed (Kumanyika et al., 2002):

**Advantages of the Population Approach**

Despite the seemingly simplistic causes of weight gain – an imbalance of calories consumed versus calories expended – there are a multitude of factors that play a role in obesity. “Obesogenic” environments, which are defined as the “sum of influences that the surroundings,
opportunities or conditions of life have on promoting obesity in individuals or populations,” have powerful effects on behaviors (Swinburn, Egger & Raza, 1999). The population approach recognizes the significance of these underlying causes that contribute to unhealthy lifestyles and, therefore, develops preventive strategies to address these risk factors. Interventions targeting risk factors at the population-level have a greater potential for improving the health status of the population as a whole because they target the health determinants that make the disease common (Rose, 1985).

Another advantage of population-based strategies is that they can increase opportunities for healthful eating and physical activity without requiring deliberate action by individuals. Through environmental and policy changes, modifications can be made to facilitate healthier lifestyles, such as providing adequate sidewalks and areas for physical activity, taxation of snack foods, nutrition labeling regulations, and establishing nutritional guidelines for schools. Evidence shows that individual eating and physical activity behaviors are responsive to the surrounding social and physical environmental contexts (Kumanyika et al., 2008). As more people adopt a healthy way of living, these will become the normative choices and more socially acceptable. Once the social norms have shifted to support these healthy choices, maintenance of these behaviors requires less effort from individuals (Rose, 1985).

The population approach also seeks to understand the barriers to behavior change. Despite interest in adopting healthy lifestyles, there are often underlying societal and environmental issues that restrict the ability to change. For example, less than 13 percent of children walked or biked to school in 2004 compared to more than 50 percent who did so in 1969. The main reason for this decline is safety concerns (University of Michigan, 2008). By identifying the underlying concerns associated with active transport to school, the community
can direct their efforts and resources to address these specific concerns. Reducing the number of bus routes and providing bike racks at schools would not adequately address parental fears for children’s safety and, therefore, would be a waste of money. One program that has effectively addressed this safety issue is the Safe Routes to School strategy called the Walking School Bus. Trained volunteers and parents walk groups of eight to 12 children to school every day. In 2006-2007, more than 160 children from six schools in Columbia, Missouri registered for the program and walked to school every day on 14 different routes. Due to the success and increasing demand for the program, the program expanded to benefit students attending 96 schools from across the state in June 2007 (Hubsmith, et al., 2007). Even though some of these changes may require larger upfront investments, the potential for a widespread, long-term impact in the community render these strategies cost-effective.

Another strength of the population approach is that it can help address inequities. Obesity disproportionately affects lower socio-economic status populations who have restricted lifestyle options and are less likely to change behaviors based on health messages. By embedding changes into the environment through policies and regulations, those who may not respond to health messages conveyed in media campaigns can still benefit from this population-wide approach. These strategies are less language dependent and can influence hard-to-reach populations (Swinburn & Egger, 2002). Systemic changes, such as nutritional guidelines for foods served in schools and trans-fat-free French fries at fast-food restaurants, are also more likely to sustain behaviors long-term than health education campaigns.

The population approach can also be used to target subsets of the population who may be at higher risk. Environmental interventions can be designed to reduce barriers to change that disproportionately impact populations with poor health outcomes, such as families with low
socio-economic status. For example, a partnership between the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and local Farmers’ Markets was established by Congress in 1992 to provide fresh, locally grown fruits and vegetables to WIC participants. The WIC Program provides supplemental foods, health care referrals and nutrition education at no cost to low-income pregnant and post-partum women, and infants and children up to 5 years of age, who are found to be at nutritional risk. A 2002 survey conducted by the National Association of Farmers’ Market Nutrition Programs (FMNP) among 24,800 recipients in 30 FMNP’s found that 73 percent of respondents said that they ate more fresh produce than usual because of the program. With children representing over 60 percent of the WIC FMNP percipients, this program has the potential facilitating healthy behavior change for those who need it most (NAFMNP, 2003).

Disadvantages of the Population Approach

Despite the comprehensive, widespread reach of the population approach, there are some important drawbacks. Prevention efforts targeting the population as a whole may not be as effective for those at high-risk for obesity. Even though there is a greater chance of reaching more of the population with these strategies, those who would benefit the most from the intervention may not respond. This leads to the “prevention paradox,” which is described as “a preventive measure which brings much benefit to the population offers little to each participating individual” (Rose, 1985). Unless an individual is specifically targeted as being at-risk for obesity, they may not be motivated to change their behavior. Those that do respond to, or participate in, a community-wide health promotion initiative may have a small risk of becoming obese. So, while more people may get a small benefit from a population-based intervention, those who could benefit the most may not be engaged.
According to social and behavioral science theories, there is not a “one-size-fits-all” model to motivating individual behavior change. Each individual weighs the perceived benefits and risks to adopting a new behavior before deciding whether to take action. Unfortunately, the benefit-to-risk ratio can vary significantly between individuals making it difficult to address all of the perceived barriers to change. Another complicating factor is the recognition that behavior change occurs through a series of stages based on readiness to take action. Some individuals may be aware of their unhealthy behaviors and the need to change, but are not sure how to get started; while others may not perceive that they have a problem and are not ready to change. Developing a population-based strategy that addresses all of these individual determinants can be challenging. Interventions targeting individuals at different stages of change and with different perceptions of personal susceptibility would be necessary to achieve improved health status in the population as a whole.

Another disadvantage of the population approach to prevention is that the expectation of benefit for each individual is small, so it is possible that a small risk can outweigh the benefit (Rose, 1985). Child obesity prevention programs have the potential to further stigmatize children who struggle with their weight (Latner and Stunkard, 2003). Primary prevention programs seek to increase knowledge and awareness of the seriousness of this condition so that the target population will be motivated to make and sustain behavioral changes; however, unless a secondary prevention program is run concurrently for children who are at-risk for or are already overweight, these children may develop greater levels of emotional distress (Kuczmarski, 2002).

When promoting weight loss and increased exercise in a population, there is a chance that some may take the advice to the extreme and develop an eating disorder (Strauss & Mir, 2001).
Messages about restricting portion size and the risks of high-fat diets may not be fully understood and unhealthy habits could be established. For example, when the government issued a seemingly sensible dietary guideline in the late 1970s encouraging people to “control your weight,” there was an exponential rise in disordered eating among young women (O’Dea, 2005). Obese children and their parents may seek “quick fix” fad diets or weight loss pills in response to media reports and other weight control messages, which are inappropriate for growing children (Ikeda & Mitchell, 2001). Without close monitoring by a physician, weight loss plans for children can be very dangerous for their health and growth status (Mallick, 1983).

Another challenge for the population approach to prevention is the difficulty in determining what set of interventions will be effective in shifting the BMI distribution for a whole community. The synergistic effects of multiple interventions complicate the evaluation of specific interventions. Multilevel interventions can partly address this issue, but to date, these studies are few in number (Flynn et al., 2006). Another challenge to identifying “best practices” for population-based prevention is that study designs with the highest internal validity, randomized, controlled trials, may impose limitations on the applicability to other settings (Swinburn et al., 2005; Rosen et al., 2006). Numerous systematic reviews have been conducted on available scientific evidence on obesity prevention, but the number of successful interventions identified is relatively small (Summerbell et al., 2005; Bluford et al., 2007; DeMattia et al., 2007; Doak et al., 2006; Flodmark et al., 2006; Flynn et al., 2006). Efforts to confront this pressing health issue will need to continue despite a lack of evidence, but it is clear that more systematic monitoring and evaluation are needed to ensure that future prevention efforts are effective (Koplan et al., 2006).

**SUMMARY AND RECOMMENDATIONS**
Based on my research and assessment of the individual versus population approaches to prevention of child obesity, it is clear that both strategies are needed to manage this epidemic. Secondary prevention of overweight and obesity for children with an existing weight problem is, and will continue to be, an important strategy in controlling the impact of this disease at an individual level. However, the treatment approach is not sufficient for managing the rising prevalence of this condition due to the lack of awareness and willingness to intervene by health care providers. Complementary population-focused strategies are needed to address the social and environmental determinants contributing to childhood obesity. Changing behavioral norms and shaping the environment to support healthy lifestyles also offers the potential for impacting a larger number of people, particularly vulnerable populations. The individual approach, which is most often used in health care settings, risks missing those who are unable to afford health care; and, unfortunately, this population is most at-risk for overweight and obesity. The advantages and disadvantages of both strategies indicate the importance of an integrated approach to childhood overweight and obesity.

One model that demonstrates the benefits of a multi-faceted and comprehensive approach to obesity prevention is “The New Spectrum of Prevention.” The seven levels of this framework are complementary and when used together produce a synergy that results in greater effectiveness than would be possible by implementing any single activity (Rattray, Brunner, & Freestone, 2002).

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<th>The New Spectrum of Prevention</th>
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<td>Influencing Policy &amp; Legislation</td>
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<td>Fostering Coalitions &amp; Networks</td>
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<td>Changing Organizational Practices</td>
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The four levels at the top of the spectrum are population approaches that enable the effectiveness of strategies oriented to individuals in the bottom three levels. Influencing policy and legislation can impact an entire population by creating an environment that supports healthy lifestyles. By addressing the social and environmental determinants that contribute to the childhood obesity, there is a much greater potential to impact hard-to-reach populations, regardless of individual health motivation. Policies that can reduce risk factors include requiring school physical education classes and health education; taxation of snack foods; restrictions on marketing high-calorie foods to children; and regulations requiring foods served or sold in schools to meet specified nutritional standards (Kumanyika et al., 2008).

Community mobilization is a relatively new concept for public health and was a key component of the 1986 Ottawa Charter for Health Promotion. The Charter stated that “at the heart of [health promotion] is the empowerment of communities – their ownership and control of their own endeavors and destinies” (WHO, 1986). As communities become more diverse and health disparities continue to grow, the traditional prescriptive model of health promotion is no longer appropriate. Each community has unique needs that are best understood by those who reside there. High crime rates may contribute to low levels of physical activity in neighborhoods and parks. Poor public transportation systems may prevent community members from accessing healthier foods at local supermarkets. Engaging community members in the assessment and prioritization of community needs is likely to lead to long-term, sustainable changes that will improve community health.
Building on the model of community mobilization, community coalitions can be a powerful way to bring together stakeholders to coordinate action and implement solutions. One example is the Consortium to Lower Obesity in Chicago Children (CLOCC). This coalition is a “data-driven effort that brings together hundreds of organizations and individuals with a common goal of protecting Chicago children from the effects of the obesity epidemic.” It is led by community leaders in the health sector and guided by community groups from various sectors including medicine, government, corporate, volunteer, academic, advocacy, and others. CLOCC supports programs and initiatives at the individual, family, community and cultural levels to promote healthy and active lifestyles for children aged 3-5 years. This consortium is also actively involved in research and public policy efforts. To date, CLOCC’s measures of success are centered on creating and sustaining multi-level collaborations to address childhood obesity in the Chicago area. Since 2003, CLOCC has expanded to join together 1,900 participants representing over 800 organizations who have the power and resources to confront this complex problem with preventive efforts at multiple levels (CLOCC, 2008).

Changing organizational practices is a setting-based approach that provides similar advantages to those offered by the top level in the spectrum – influencing policy and legislation. The appeal of this strategy is that organizational policies and practices can change the context in which behavior choices are made. For example, schools are ideal settings for addressing childhood obesity since most children attend schools 180 days per year for six or more hours per day from ages five through seventeen (Peterson et al., 2007). Building in opportunities for physical activity, restricting access to vending machines, and establishing nutritional guidelines for foods serves in school cafeterias are examples of positive organizational change.
The bottom three levels of “The New Spectrum of Prevention” support the individual approach to prevention. Providers are defined as individuals who have daily contact with large numbers of people at high risk for injury and disease, according to this prevention model (Rattray et al, 2002). Unfortunately, evidence shows that there is widespread lack of knowledge about the impact of childhood obesity among health professionals, teachers, and parents (Baur, 2007). Health care providers, in particular, lack the knowledge, resources, and skills to engage in effective prevention and treatment of this disease (Story et al., 2002). Building confidence through education is imperative for providers who have the opportunity to intervene at the individual level.

Community education is important for raising awareness of a health issue, such as childhood obesity, and promoting healthy behavior choices. Media campaigns are frequently used to reach a large number of people and have the power to help change social norms. Not only can media advocacy help shape the public’s understanding of health issues, but it can also build a critical mass of people who will be involved in improving community health (Rattray et al., 2002). The Task Force on Community Preventive Services conducted a systematic review of published studies to determine the effectiveness of community-wide campaigns for increasing physical activity levels. In all ten studies reviewed, these campaigns effectively increased the percentage of people who were active, their estimated energy expenditure, and their activity levels (CDC, 2005).

Finally, health education at the individual level seeks to strengthen knowledge about the risks and benefits of certain health behaviors and to provide the skills needed to support positive behavior change. Interventions targeting individuals allow for tailored messages and strategies that can be communicated through education, counseling, and other services to encourage
individuals to change their behavior. However, due to the complexity and impact of social and environmental determinants on individual health behavior, the long-term effectiveness of interventions at the individual level depends on changes at the community level that support healthy lifestyles.

While there are numerous frameworks for health promotion and disease prevention, The New Spectrum of Prevention highlights the need for interventions at both the individual and population levels. The seven levels of the Spectrum take into account the multiple determinants of community health and can be used to develop a comprehensive approach to public health problems. Prevention of childhood obesity needs to be viewed as a collective responsibility requiring the commitment of individuals, families, communities, health care providers, and governments. No single intervention will succeed in reversing the obesity epidemic; instead, a multilevel approach that spans several sectors and engages multiple partners is the strategy with the most potential for combating this disease.

Childhood obesity is just one example of how the health and health care needs of our population has shifted over time. Chronic diseases are now the leading cause of death and disability in the United States, yet they are among the most preventable. Preventing the onset of chronic problems, rather than treating the symptoms, is critical – not only for the health and well-being of our population, but for the substantial impact chronic disease has on our economy, health care system, community, and families. Effective prevention will require a coordinated approach targeting both individuals and populations. If we don’t take action to address the negative trends in the incidence of chronic disease, we risk reversing the public health gains in life expectancy, not to mention quality of life, from the last century.
References


