Exploring a Multi-Disciplinary Approach to Overweight and Obesity in the United States

Expert Panel: Exploring the Cultural Context of Food, Physical Activity and Physical Inactivity

Prepared for the Centers for Disease Control and Prevention by the Academy of Educational Development

September 7 & 8, 2005

Overview of the Obesity Epidemic

OVERVIEW OF THE OBESITY EPIDEMIC

A Growing Epidemic

There is no question that America faces a growing epidemic of overweight and obesity. In 1991, only four states had obesity prevalence rates above 15%. Today, 20 states have rates of 15-19 percent; 29 states have rates of 20-24 percent; and one state reports a rate of more than 25 percent.[1] Indeed, in our contemporary culture, nearly two out of every three adults are either overweight or obese.[2] Among adolescents, the prevalence of overweight has nearly doubled over the last two decades.[3]

This document is intended to provide you with a brief overview of the epidemic. It begins with a description of the uneven burden obesity is placing on American society. It continues with descriptions of the epidemic's impact on children together with the cost it is accruing to our nation. Brief summaries of causality associated with genetics, nutrition environments, and physical activity environments follow. It concludes with a short statement on the current national response to the epidemic.

An Epidemic of Disparities

As with other public health concerns, obesity and overweight do not equally affect all populations in this country. The prevalence of obesity is estimated to be 50 percent higher in Mexican American and African American women than in non-Hispanic white women.[4] The prevalence of overweight in Latino and African American children is currently two to four times greater than the prevalence of overweight in non-Hispanic white children.[5] Considering all racial and ethnic groups together, women of lower socioeconomic status (having an income of less than 130 percent of the poverty threshold) are approximately 50 percent more likely to be obese than those of higher socioeconomic status.[6]

It is important to note that these disparities occur within the context of a variety of inequities that plague our nation's health. As the Agency for Healthcare Research and Quality's (AHRQ) recently released National Healthcare Disparity Report indicates, racial and ethnic minorities and individuals of lower socioeconomic status are at risk for a lower quality of and a reduced access to health care.[7] For instance, people from relatively lower socioeconomic backgrounds are less likely to obtain recommended diabetic services and more likely to end up hospitalized for diabetes and its complications; racial and ethnic minorities and individuals of lower socioeconomic status are less likely to have a regular source of care.[8] These gaps in care can lead to significant morbidity, disability, and lost productivity for individuals. They are likely to result in increased health care costs both for these individuals and for the public at large.[9]

Although the general status of disparities in health outcomes and care are significant, they are more alarming in the context of predicted demographic shifts. According to the 2000 Census, the U.S. population is becoming more diverse all the time—racial and ethnic minority populations are growing faster than the majority population. Indeed, the U.S. Bureau of the Census projects that by 2050, nearly one out of every two Americans will be a racial or ethnic minority.[10]

Together, these three factors—racial and ethnic variations in the incidence and prevalence of overweight and obesity, health care disparities, and demographic trends—present substantial challenges for the conduct of long-term obesity prevention planning.

Simply stated, prevention efforts will have to respond to an epidemic whose most affected populations are rapidly growing. Moreover, these populations, who often suffer from a minimal access to or lower quality of health care services, will have dramatically increased need for those very health care services because of the adverse health outcomes of their overweight and obesity.

An Epidemic in Our Children

Children and adolescents represent populations of particular concern in the obesity epidemic. In 1999, 13 percent of American children ages 6 to 11 years old and 14 percent of American adolescents ages 12 to 19 years old were overweight (BMI values at or above the 95th percentile of sex-specific growth charts). These rates have nearly doubled for youth and tripled for adolescents over the past two decades.[11]

Research to date indicates that there may be three important times of increased obesity risk for children: during gestation and early infancy, during the period of adiposity rebound (the point at which BMI increases after its lowest point in childhood—typically between the ages of 5 and 7), and during adolescence.[12] If obesity develops during the latter two periods, the likelihood is substantial that it will transfer into adult years. When obesity exists at the age of 7, the likelihood of persistence into adulthood is about 41 percent.[13] This estimate increases to an alarming 80 percent when obesity is found to exist in adolescence.[14]

This growing problem of obesity and overweight in children and adolescents poses significant health risks. For example, overweight children and adolescents are more likely to experience hypertension, type 2 diabetes, pulmonary complications, abnormal growth acceleration, psychosocial issues, and musculoskeletal problems than children who are at a healthy weight.[15]

The link to type 2 diabetes, an illness associated with cardiovascular disease, stroke, limb amputations, kidney failure and blindness, is especially alarming. Once considered non-existent in adolescents, prevalence has now increased to the point where the American Diabetes Association reports that type 2 diabetes may actually account for up to 45 percent of newly diagnosed cases of diabetes in children and adolescents.[16] In fact, some studies suggest that one in three healthy children born in 2000 will develop diabetes unless they start eating less and increasing their physical activity. The odds are even worse for Black and Hispanic children: Nearly half will develop diabetes in their lifetimes.[17]

Counting the Costs

These figures come at a high cost to our society. People who are overweight or obese are more likely to experience illnesses such as hypertension, type 2 diabetes, coronary heart disease, psychological disorders, osteoarthritis, and sleep apnea than people who are at a healthy weight.[18] The risk of death also increases with increasing weight.[19]

The financial realities associated with these consequences are staggering. The epidemic was estimated to account for $78.5 billion in 1998 health care costs ($92.6 billion in 2002 dollars), an amount representing just over 9 percent of total U.S. medical expenditures that year.[20] Approximately half of these costs were paid by Medicaid and Medicare.

Employers and businesses also incur major costs to treat obesity-related health problems, mostly in terms of lost productivity and higher health and disability insurance

costs. Based on annual numbers for 1994, estimated costs associated with lost productivity related to obesity include:

- Workdays lost related to obesity: 39.5 million (50 percent increase since 1988)
- Physician office visits related to obesity: 62.7 million (88 percent increase since 1988)
- Restricted activity days related to obesity: 239 million (36 percent increase since 1988)
- Bed-days related to obesity: 89.5 million (28 percent increase since 1988)[21]

The graying of America also has implications for financial costs associated with obesity. Approximately one-quarter of the obese population is 65 and older, many of whom will suffer from "obesity-attributable chronic diseases " Consequently, it is most likely that medical spending to treat elderly obese people will be higher than spending on obese people who are not elderly [22] This possibility combined with the general aging of the American population, raises significant problems for the financing of health care in the future.

Seeking Answers – **Personal Behaviors in a "Toxic Environment"**

How did we get here? We know that the prevalence of overweight and obesity was relatively static through the early 1980s. And yet, since then, prevalence has doubled in adults, doubled in children ages 6 to 11, and tripled in adolescents ages 12 to 19. These changes come at high personal cost to those involved. They are directly related to a number of chronic diseases and are associated with painful social stigma. So why have so many people gained so much weight? What has happened in a span of only 25 years?

On its face, the root of the dilemma may seem simple—poor nutrition choices combined with a sedentary lifestyle However, we know that a multitude of factors are at play. The apparent simplicity masks a far greater complexity of competing physiological and behavioral influences The fundamental reality is that personal choices are rooted in a dynamic interplay between genetic determinants and socio-culturally adjusted nutrition and physical activity environments that have overwhelmed the majority of Americans, even despite the pain of social stigma and chronic disease that obesity carries with it.

These environments are the results of far-reaching developments. Interactions between efficiency-oriented agricultural policies, widespread consumer demand (driven in part by heavily engrained cultural norms), and industry profit incentives have yielded an abundant food supply and an increasing variety of highly processed foods (often high in fat, sugar, and calories) that are widely available and heavily promoted.

Environmental changes also have led to a significant decline in the amount of physical activity required on a daily basis. Urban sprawl has encouraged the development of communities centered around the automobile. Physical education classes are now rarely required in schools, and labor-saving devices abound.

These are only a few of the causes that have led to what leading nutritional experts term a "toxic environment," an environment that is now capable of overwhelming natural biological responses associated with energy regulation The following sections illustrate the complexity of this causal structure. They do not paint a comprehensive picture, but they highlight the diversity of etiological factors that must be addressed when devising a broad-scale, long-range obesity prevention strategy.

Genetics

Genetics play an undeniable role. They affect factors such as food preferences, feelings of hunger or fullness after eating, metabolic rates, the conversion of excess calories to body fat, and difficulty or ease of weight loss.[23,24] Research has indicated that as much as 25 to 40 percent of the variability in body weight can be explained by genetics.[25] Indeed, studies of twins have shown that anywhere from 50 to 70 percent of an inclination toward obesity may be inherited.[26]

However, a variety of publications also note that the recent rise in overweight and obesity over the last two decades has overwhelmed genetic influences.[27,28,29,30] As the Institute of Medicine wrote in a 1995 report, "There has been no real change in the gene pool during this period of increasing obesity. The root of the problem, therefore, must lie in the powerful social and cultural forces that promote an energy-rich diet and a sedentary lifestyle."[31] This phenomenon has led many to focus on the environmental forces contributing to the epidemic. Acknowledging that more can be learned from biological influences, increasing attention has been given to the environment in which these internal determinants function. As a well known obesity expert has said, "Genes load the gun, the environment pulls the trigger."[32]

Nutrition Environments

Nutrition environments have changed over time and have generally encouraged Americans to increase consumption of energy-dense foods. Factors associated with these environments include an increase in eating away from home, rising dollars spent on food advertising and promotion, changes in nutritional choices over time, socioeconomic variables, changes in foods available at school, and steadily increasing portion sizes. All of these trends result in a general increase in caloric intake. Descriptions of each of these factors are given below.

Eating Out: In general, foods eaten outside the home tend to be higher in fat and lower in other nutrients than food prepared in the home, and Americans are eating out more than ever. Nearly half of all meals are now consumed outside the home.[33] Options for other-than-meal eating outside the home also are increasingly ubiquitous. One key example is that food is now available 24-hours-a-day in locations previously unrelated to eating, such as gas stations, drugstores, and school hallways.

Food Advertising and Promotion: Spending by food companies on advertising and promotion continues to climb. Food advertising and promotional expenditures have increased 50 percent over 1990 levels.[34] Food manufacturers, retailers, and food service organizations spent $11 billion in 1997 on mass media advertising, an amount second only to expenditures by the automotive industry.[35] The food industry currently spends an additional $22 billion on trade shows, supermarket "slotting fees," incentives, and other promotions targeted to consumers.[36] About $10-$15 billion is spent on food advertising and marketing directed at young people.[37] These amounts should be contrasted to the total amount that the U.S. Department of Agriculture spent on nutrition education, evaluation, and demonstration in 1997: $333.3 million, or 3 percent of what the food industry spent during that same period.

Nutrition Choices: Food choices today are too often skewed toward the calorie-dense but nutritionally limited. For example, individual soft drink consumption more than doubled between 1970 and 1997[38] (each 20 oz. bottle of regular cola contains no nutrients and about 17 teaspoons of sugar)[39]. Due in part to this increase, the average

American consumer now digests about 30 more pounds of sugar per year than he or she did two decades ago.[40] At the same time, fruit and vegetable intake remains below recommended levels. In 1998, more than 75 percent of American adults consumed fewer than the recommended 5 portions of fruits and vegetables per day.[41] Today, less than 15 to 20 percent of school children get adequate servings of fruits and vegetables.[42]

Socioeconomic Status: Populations of lower socioeconomic status tend to confront higher barriers to nutritious eating Lower income neighborhoods have up to 30 percent fewer supermarkets than do higher-income neighborhoods, and most low-income families do not live within walking distance of a supermarket.[43] Neighborhood stores, often the alternative to supermarkets, sometimes charge prices up to 48 percent greater than those of chain supermarkets [44]

School Nutrition: Many schools' revenue streams now include incentives to sell high-fat and high-sugar foods and beverages, which counteract the schools' efforts to provide healthful breakfast and lunch choices. Budget cutbacks have forced schools to consider alternative funding opportunities offered by the food industry By 1999, 95 percent of 345 California schools were generating revenues through the sale of branded fast foods as a la carte items for lunch[45]; 240 districts in thirty-one states now have exclusive "pouring rights" arrangements with soft-drink companies, establishing beverage-sale targets per student in exchange for up-front funding [46]

Portion Sizes: Portion sizes have been steadily increasing in prepackaged products and restaurant servings. A 20-oz. soda is now the norm. The typical hamburger in 1957 weighed 1 ounce and had 215 calories; the typical hamburger of today weighs 6 ounces and has 618 calories.[47] "Bigger" has grabbed consumer attention with food products like the "Big Mac", the "Extreme Gulp", "Biggie Fries", the "Whopper", and the "Beast." The increase in portion sizes away from home also has helped to distort our sense of what constitutes a "normal" portion when we eat at home.

The Result? Americans are eating more food and, consequently, more calories. The U.S. food supply increased from 3,300 calories per capita in the 1970s to 3,800 in the 1990s—self-reported caloric intake increased from an average of about 1,800 calories per day in the 1970s to 2,000 calories per day in 1996.[48] These statistics represent a range of increase in caloric intake from 11 to 13 percent over two decades.

Physical Activity Environments

Environments for physical activity also have changed over time A number of factors have come together to encourage less physical activity. These factors include technology advances, changes in occupational activities, increases in television viewing, trends in transportation and urban planning, socioeconomic variables, and reductions in broad physical education programming. All of these result in an increasingly sedentary lifestyle for most Americans. These factors are described below

Technology Advances: Americans are expending less energy in daily living now than they did before. Technology has created many time- and labor-saving products. We now have access to mechanical toothbrushes, electric can openers, electronic garage door openers, power steering, elevators, escalators, dishwashers, power lawn mowers, and television remote controls, to name just a few innovations. Over days, weeks, months and years, the cumulative effect of these and other devices may have a significant impact on how much energy we expend through our own muscle power

Occupational Activities: Americans are working less physically strenuous jobs than they used to. As our economy has shifted from an agricultural and industrial emphasis to a high-tech and service focus, we have begun to move less and sit more. For example, in recent decades, the number of people working in agricultural roles has decreased 63 percent while the number employed in finance positions has increased 26 percent.[49] A 2002 study by the National Bureau of Economic Research finds "that a worker who spends her career in a sedentary job may end up with as much as 3.3 units of BMI more than someone in a highly active job."[50]

Television Watching: Americans watch a lot of television. Today, the average American watches between 3 and 4 hours of TV each day. It is estimated that by age 70, the average person will have spent 7 to10 years of his or her life watching television.[51] Children graduating from high school today are now expected to have accumulated more hours in front of the TV than in school (this figure does not include hours spent with video games and computers).[52] For many, especially children, entertainment by TV has taken the place of more physically active forms of entertainment, such as playing outside

Transportation/Urban Planning: Americans are driving more and living in communities with fewer physical activity opportunities. Urban sprawl has pushed people further from work and shopping areas, leading to auto-centric transportation and urban planning systems that make it easier to travel by car. The number of children who walk or bike regularly to school is down 66 percent from 30 years ago.[53] Vehicle miles traveled per household increased by 29 percent between 1983 and 1990.[54] Some suburban developments lack sidewalks, which discourages walking. The number of trips made by foot has dropped by 42 percent in the last 20 years.[55] These figures are supported by an automotive industry that spends more than any other industry on mass media advertising, accounting for 18 percent of a $73 billion market.[56]

Socioeconomic Status: Opportunities for physical activity appear to be concentrated in higher-income and higher-education segments of the population. Recent data indicate that playgrounds in areas of relatively low socioeconomic status are likely to have significantly more hazards per play area than those in higher socioeconomic areas.[57] Research also indicates that low socioeconomic status neighborhoods are likely to have significantly fewer resources for physical activity, such as parks, sport facilities, community centers, or walking/biking trails.[58]

Physical Education: Physical education in the schools is declining. Financial realities have led to cuts in physical education programs. Daily participation in high school physical education classes fell to 29 percent in 1999 from 42 percent in 1991.[59] In 2000, Illinois was the only state to require daily physical education in all schools.[60]

The Result? Our sedentary lifestyles mean that we move less. Fewer than one-third of American adults engage in recommended amounts of physical activity.[61] Forty percent of adults in the United States engage in no leisure time physical activity.[62] Almost half of all children do not engage in regular physical activity.[63]

National Attention—National Response

Although the increase in obesity has been occurring steadily over a period of 20-30 years, the widespread national attention to the severity of the problem is recent. In a one-year period in 1999-2000, news coverage of obesity topics in selected national papers numbered only 395 articles. In the same period in 2002-2003, the number jumped 12-fold to more than 4,700 articles. In 2004, almost any newspaper on any

given day will feature articles attesting to the prevalence and severity of the obesity epidemic in our nation.

National media attention to the problem has been matched with an extensive array of recommendations and calls to action. The scientific, academic, policy, and political communities have issued recommendations for addressing the obesity epidemic that encompass the need for broad-based individual and environmental change throughout all sectors of our society. Recommendations include programs and policies in all settings (family, community, schools, workplaces, media, and clinical) and address a range of intervention approaches from education and information, to structural change in food and physical environments, to policy, regulation and economic approaches.

Within the last five years, an extensive array of new programs have been introduced in the public and private sectors. These new initiatives include media campaigns such as VERB and the new DHHS campaign "Small Steps," CDC funding to states and partners for nutrition and physical activity interventions, the STEPS initiative, the Robert Wood Johnson Active Living by Design Initiative, Shape Up America and many others (see Appendix A: A Review of National Level Programs and Planning Initiatives).

A vast science supports our current knowledge of obesity and obesity prevention including molecular, genetic, behavioral, environmental, clinical and epidemiologic studies. Several ongoing initiatives are assessing the state of this science.

One of these is the CDC-funded systematic review and application of the Community Guide rules of evidence to obesity prevention research in school, community and workplace settings. Preliminary reports from this review indicate a range of findings from setting to setting. In some conditions reviewers found insufficient evidence to determine the effectiveness of interventions. In other conditions reviewers found sufficient evidence, and in others found strong evidence to determine the effectiveness of the interventions. The author appropriately cautions that:

- Insufficient evidence of effectiveness does not equal evidence of ineffectiveness.
- Many promising ideas now being explored are relatively new and thus are underrepresented in the review.
- Further research is required to determine the effectiveness of (several) interventions.

Based on this systematic review the author identifies gaps in research and recommends areas for future research.

Areas for further research have been extensively detailed in a second ongoing assessment, the recently released draft Strategic Plan for NIH Obesity Research. This plan presents an ambitious set of recommendations for future research to prevent and treat obesity and includes recommendations for behavioral, environmental, pharmacologic, surgical and other medical studies

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