ISSUE BRIEF
The Massachusetts Health Policy Forum

Overweight and Obesity in Massachusetts:

Epidemic, Hype or Policy Opportunity?

Omni Parker House Hotel
Alcott Room
60 School Street
Boston, MA

Tuesday, January 23, 2007
8:00 am to 8:15 am – Breakfast
8:15 am to 11:30 am – Presentation and Discussion Featuring:

Philip W. Johnston, Chairman, Massachusetts Health Policy Forum

Elizabeth Goodman, M.D., Director, Child and Adolescent Obesity Program, Tufts-New England Medical Center and the Floating Hospital for Children

Eileen Kennedy, D.Sc., Dean of the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy, Tufts University

Paul Campos, J.D., Professor of Law, University of Colorado

Kelly Brownell, Ph.D., Professor, Psychology, Epidemiology and Public Health and Director, Rudd Center for Food Policy and Obesity, Professor, Yale University

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Overweight and Obesity in Massachusetts: Epidemic, Hype or Policy Opportunity?

Executive Summary

In 2005, more than 56 percent of Massachusetts adults were overweight, a 40 percent increase from rates reported in 1990. Overall, nearly 21 percent of Massachusetts adults are obese. Both Blacks and Hispanics in the state are more likely than whites to be both overweight and obese, whereas Asians are the least likely to be overweight or obese. Nationally, rates of overweight and obesity are even higher. Obesity is a risk factor for multiple serious health problems in adults, including heart disease, hardening of the arteries, high cholesterol, high blood pressure, certain types of cancer, stroke, diabetes, muscle and bone disorders and gallbladder disease.

In Massachusetts, it is estimated that direct costs for obesity-related medical expenditures came to a total of $1.8 billion (4.7% of total medical expenditures) in 2003. Medical expenditures for obese people are estimated to be 25–27% higher than normal weight people, and 44% higher among people who are very obese. Costs are largely attributed to higher rates of coronary heart disease, hypertension and diabetes, and longer hospital stays. Indirect costs associated with obesity approached $3.9 billion in 1995 reflecting 39.2 million lost workdays, 239 million restricted activity days, 89.5 million hospital bed-days, and 62.6 million physician visits.

Causes of obesity include the wide availability of unhealthy foods, increased consumption, changing eating habits, high-calorie beverages, advertising and lack of physical activity. Although a number federal, state and local programs, policies and initiatives aimed at curbing the obesity epidemic have been implemented, more needs to be done. What is the responsibility of government in curbing the obesity epidemic, and how much of the burden should be left up to the individual? These important questions will be discussed at the *Massachusetts Health Policy Forum* on January 23, 2007.

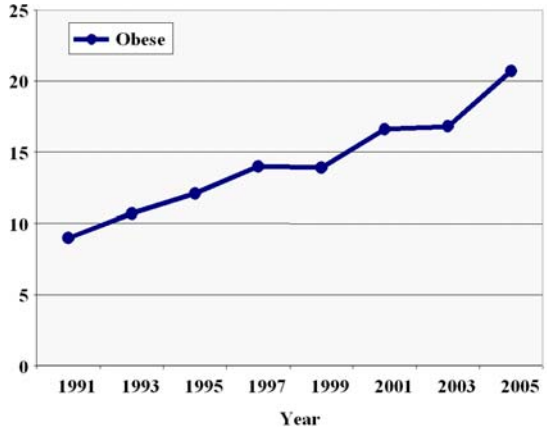
Introduction

Overweight and obesity continue to climb steadily in the United States among both adults and children, increasing the risk for a host of physical, psychosocial and economic problems. This paper, details the issues associated with being overweight or obese, with a focus on Massachusetts. The discussion begins with a general description and definition of this public health epidemic. Next, an examination of factors that contribute to overweight and obesity and associated costs to individuals, families and society is given, followed by a discussion of programs and policy options, both nationally and in the Commonwealth that are aimed at addressing this crisis.

Extent of the Problem

In 2005, more than 56% of Massachusetts adults were overweight, a 40% increase from rates reported in 1990. Rising rates of obesity are depicted in *Figure 1: Trends in Obesity Among Massachusetts Adults, 1991 - 2005.*

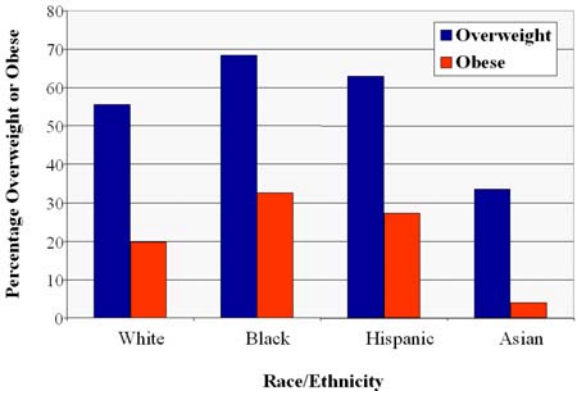
Figure 1: Trends in Obesity Among Massachusetts Adults, 1991 - 2005



Adapted from the Massachusetts Department of Public Health, A Profile of Health Among Massachusetts Adults, 2006 (available at http://www.mass.gov/Eeohhs2/docs/dph/behavioral_risk/report_2005.pdf, accessed 10/31/06)

Overall, nearly 21 percent of Massachusetts adults are obese (BMI of greater than 30 – see insert *Definition of Overweight and Obesity*). Men are more likely than women to be both overweight (66%) and obese (23%). Young adults, aged 18 – 24 years, are the least likely to be overweight (39%) and obese (18%). On the other hand, adults aged 45 – 54 years are the most likely to be overweight (65%) and obese (26%).* Among minority populations, the problem is even more severe than it is for Whites, as shown in *Figure 2: Percentage of Overweight and Obese Adults in Massachusetts by Race/Ethnicity*. Both Blacks and Hispanics are more likely to be both overweight and obese, whereas Asians are the least likely to be overweight or obese.[1]

Figure 2: Percentage of Overweight and Obese Adults in Massachusetts by Race/Ethnicity, 2005



Adapted from the Massachusetts Department of Public Health, A Profile of Health Among Massachusetts Adults, 2005 (available at http://www.mass.gov/Eeohhs2/docs/dph/behavioral_risk/report_2005.pdf, accessed 10/31/06)

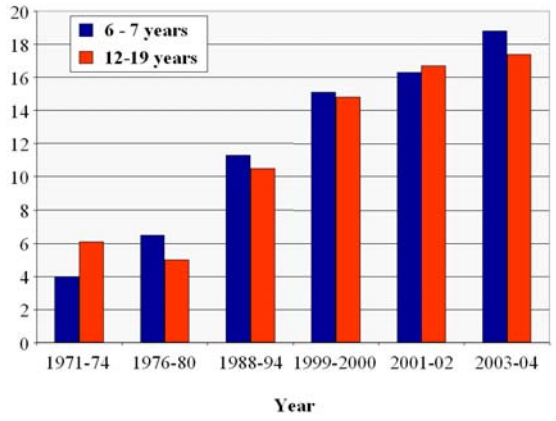
Two thirds of adults in the United States are overweight and nearly one-third are obese.[2, 3] Obesity alone has more than doubled in the last three decades. Mississippi has the highest rate of obesity in the nation, whereas Massachusetts has the second lowest rate. Even though overweight and obesity rates in Massachusetts are lower than the national average, increases over time mirror those of states with much higher rates.[4]

Overweight is not as prevalent among children and adolescents as it is among adults, but increasing rates are of concern because overweight or obese children are more likely to be obese as adults.[5-7] Therefore, if child and adolescent overweight and obesity rates continue to increase, it is likely there will be an even greater percentage of overweight and obese adults in the future.[8] Among high school youth, 27% of students were overweight or

* Based of self-reported heights and weights

obese.* This is a significant increase from 1999, in which 23% of students were overweight or obese.[9] For children 6-11 years of age, obesity has nearly tripled in the last three decades. Among adolescents ages 12 to 19 years, rates of obesity have increased more than threefold, from 5% in 1976 to 17.4% in 2003-2004.[3, 10] This is shown in *Figure 3: Trends in Overweight among US Children.*

Figure 3: Trends in Overweight Among U.S. Children, 1971 - 2004



Adapted from the National Center for Health Statistics, Prevalence of Overweight and Obesity Among Children and Adolescents: United States, 2003-2004. Available at: http://www.cdc.gov/nchs/products/pubs/pubd/hestats/obese03_04/overwght_child_03.htm. Accessed 9/15/06.

As it is with the adult population, overweight is even higher among low income children, Hispanic males and females, African-American females and children from Southern states.[11, 12] These trends highlight existing disparities in health among American subpopulations, with higher rates of obesity among those with low income and less education.[13-17]

There is a paradox between poverty and obesity, in that those with fewer resources to buy healthy food are actually more likely to be obese.[18-21] This could be the result of a number of factors, including less healthy environments (e.g., supermarkets with inexpensive healthy foods, safe and clean parks and recreation areas, etc.) and increased exposure to fast foods.[22] Furthermore, there is a trade-off between the relatively low cost of high calorie food that is filling, compared to the higher cost of low calorie food that may be less satisfying.[23, 24] Perceived social status[25] and increased stress[26-28] could also contribute to disparities in overweight and obesity seen among various subpopulations.

Definition of Overweight and Obesity

In adults, overweight and obesity are expressed in terms of Body Mass Index (BMI), a ratio of weight to height.† *Table 1: BMI for Height and Weight* (below) categorizes BMI into normal, overweight or obese categories. A BMI in the range of 19 to 25 is normal weight. Adults with a BMI between 25 and 30 are "overweight", and those with a BMI of more than 30 are classified as "obese". At the extreme end, a BMI of 40 or more is called "clinically severe" or "extreme obesity", and carries a high risk for associated health problems.

† For more explanation about BMI, see http://www.cdc.gov/nccdphp/dnpa/bmi/index.htm

Table 1: BMI for Height and Weight

BMI	19	20	21	22	23	24	25	26	27	28	29	30	35	40
Height (feet/inches)	Weight (lb.)													
	Normal						Overweight					Obese		
4’ 10”	91	96	100	105	110	115	119	124	129	134	138	143	167	191
4’ 11”	94	99	104	109	114	119	124	128	133	138	143	148	173	198
5’	97	102	107	112	118	123	128	133	138	143	148	153	179	204
5’ 1”	100	106	111	116	122	127	132	137	143	148	153	158	185	211
5’ 2”	104	109	115	120	126	131	136	142	147	153	158	164	191	218
5’ 3”	107	113	118	124	130	135	141	146	152	158	163	169	197	225
5’ 4”	110	116	122	128	134	140	145	151	157	163	169	174	204	232
5’ 5”	114	120	126	132	138	144	150	156	162	168	174	180	210	240
5’ 6”	118	124	130	136	142	148	155	161	167	173	179	186	216	247
5’ 7”	121	127	134	140	146	153	159	166	172	178	185	191	223	255
5’ 8”	125	131	138	144	151	158	164	171	177	184	190	197	230	262
5’ 9”	128	135	142	149	155	162	169	176	182	189	196	203	236	270
5’ 10”	132	139	146	153	160	167	174	181	188	195	202	207	243	278
5’ 11”	136	143	150	157	165	172	179	186	193	200	208	215	250	286
6’	140	147	154	162	169	177	184	191	199	206	213	221	258	294
6’ 1”	144	151	159	166	174	182	189	197	204	212	219	227	265	302
6’ 2”	148	155	163	171	179	186	194	202	210	218	225	233	272	311
6’ 3”	152	160	168	176	184	192	200	208	216	224	232	240	279	319
6’ 4”	156	164	172	180	189	197	205	213	221	230	238	246	287	328

Adapted from The Partnership for Healthy Weight Management, http://www.consumer.gov/weightloss/bmi.htm

The BMI as a measure of overweight and obesity is imperfect in that it does not capture significant individual differences. For example, the BMI as it is currently used does not take into account individual body types, age, gender or race differences, and may not be an appropriate measure for people under 5 feet or those who are extremely muscular. Nevertheless, this is the simplest standard measure used to screen individuals for over-weight and obesity. The classification of overweight and obesity has changed over time. In 1989 the NIH reduced the limits categorizing people as either overweight or obese. With this change, the number of people classified as overweight or obese in the U.S. nearly doubled, although the risks associated with the new overweight classification were only modest. [29] Automatic BMI calculators are widely available on the internet. The term “obese” is not officially used for children and adolescents under 20 years of age. However it is commonly used in scientific literature and in popular press and media to refer to children that are greater than or equal to the 95th percentile and will be used throughout this paper.

Costs and Consequences of Overweight and Obesity

Overweight and obesity impose major and growing costs to individuals, health care systems and society. "Costs" are considered broadly to include obesity-related illnesses, death and economic costs as well as social costs and overall well being. The discussion in this section reviews costs of obesity to adults, children, and society.

Obesity-related Illnesses: Obesity is a risk factor for multiple serious health problems in adults, including heart disease, hardening of the arteries, high cholesterol, high blood pressure, certain types of cancer, stroke, diabetes, muscle and bone disorders and gallbladder disease.[30-37] It is also associated with neurological,[38] lung,[39-41] kidney,[42] hormonal[43] and sleep disorders.[34] The likelihood of experiencing two or more of these conditions increases with greater BMI.[36]

Similar to adults, obese children and adolescents also have higher rates of illness and health care costs than normal weight children. These include muscle, bone, joint, neurological, lung, digestive and hormonal[44] and sleep disorders.[39] Overweight and obese children are also more likely to develop risk factors for adult disease.[45-48] This has important implications for long term health care needs and related costs.[49] For example, hardening of the arteries has been found in people as young as 15 years old, which could lead to early heart disease.[50] Another complication of obesity is early puberty in adolescent girls[43, 51] which may increase risk for endometrial cancer later in life.[52, 53]

Death Rates*:* The impact of obesity on premature death is more difficult to determine. Researchers have calculated that obesity may decrease life expectancy by 2 to 13 years.[54, 55] And if obesity starts at a younger age, there is even a greater risk for early death.[55] National estimates of premature deaths due to obesity in 2004 ranged from 400,000 to 112,000.[56, 57,58, 59] Although there is a wide discrepancy in these estimates, the CDC maintains that overweight and obesity are major public health concerns.[60]

Economic Costs: Economic costs include both direct health care costs, such as inpatient and outpatient visits, pharmacy and laboratory costs, and indirect costs, such as loss of productivity due to restricted activity and lost work days.[61, 62] Among adults, direct health care costs increase proportionally with obesity.[63] Medical expenditures for obese people are estimated to be 25–27% higher than normal weight people, and 44% higher among people who are very obese (i.e., with a BMI of more than 35).[61, 64, 65] A recent study found for every unit increase in BMI between 25 and 45, medical costs increased by 4% and pharmaceutical costs increased by 7%. Most of these costs were attributed to diabetes and heart disease.[66] A sustained 10% weight loss among obese persons could save $2200 to $5300 per person in lifetime medical costs for diseases linked to obesity.[67]

The percentage of obese Medicare patients with five or more severe health conditions nearly tripled between 1987 and 2002, and spending for this group increased by 350%, more than double the rate of increase for overweight or normal weight people.[68] Costs are largely attributed to higher rates of coronary heart disease, hypertension and diabetes,[65] and longer hospital stays.[69] Seventy percent of diabetes risk is due to excess weight; costs related to diabetes and overweight came to $98 billion in 2001.[70]

Overall estimates of overweight and obesity-related costs vary substantially depending

upon methods used in the calculations. In Massachusetts, it is estimated that direct costs for obesity-related medical expenditures came to a total of $1.8 billion (4.7% of total medical expenditures) in 2003.[71] The Surgeon General's *Call To Action to Prevent Overweight and Obesity* estimates that direct and indirect obesity-related costs are $117 billion per year in the U.S.[72] Other national estimates of medical expenditures related to overweight and obesity range from $78 billion[73] to more than $238 billion annually,[74] representing 5.5 to 9.1 percent of the total health care budget.[30, 62, 73, 75] As obesity continues to climb, so does the need to expand services and facilities in hospitals and other health care settings in order to accommodate the needs of obese patients and reduce the strain and injury to health care providers. Bariatric or weight loss units are emerging throughout the country with the goal of providing specialized medical and surgical care for obese patients. These units, which require specially trained staff, house oversized equipment, such as lifts, beds, operating tables, doorways and bathrooms, and must be accredited to meet the physical, medical, and psychological needs of obese patients.[76, 77]

Indirect costs impose substantial burdens on employers and individuals and may be more significant than direct costs.[78] Obese people have lower workforce participation[79] and higher rates of absenteeism. Sick leave, disability, injuries, and health care claims than normal weight individuals.[80, 81] Lost productivity increased by 50% from 1988 to 1995, as a consequence of obesity. Indirect costs associated with obesity approached $3.9 billion in 1995 reflecting 39.2 million lost workdays, 239 million restricted activity days, 89.5 million hospital bed-days, and 62.6 million physician visits.[62]

There are significant obesity-related costs in pediatric health care as well. Obesity-related hospital charges among children and adolescents increased from $35 million during 1979-1981, to $127 million during 1997-1999, representing more than a threefold increase in healthcare costs related to childhood obesity. [82]

Economic cost data are relevant to any discussion of public policy intervention because such costs are not borne only by affected individuals. Approximately half of obesity-related costs are among Medicare and Medicaid beneficiaries. The costs of treating obese Medicare recipients has gone from 9.4% of Medicare expenditures in 1987 to 25% in 2002.[68] This may increase even further since Medicare has recently begun paying for bariatric (weight loss) surgery.[73] Similarly, costs to private insurance companies as well as to employers result in substantial burdens not only on those institutions, but on the public in the form of increased premiums.

***Psychosocial Costs**:* In addition to increased illness, death and economic costs, obesity exacts profound social costs in quality of life for both children and adults. Obese children and adolescents tend to have poorer body images[44] and lower self esteem[83] than their normal-weight peers.[84] Obese adolescents experience more social isolation,[85] have a higher risk for mistreatment by peers and have fewer dating opportunities, which may subsequently contribute to emotional and psychological difficulties.[86] In a Child Well-being Index developed by Duke University, gains made in child health, such as decreases in infant mortality and low birth weight, were overshadowed by increased rates of child and adolescent overweight and obesity.[87]

Overall, overweight and obese people experience widespread stigmatization and prejudice. For both adolescents and adults, overweight is associated with fewer years of education,[85] a decreased likelihood of marriage for both men and women, lower household income, higher rates of poverty for women [88] and decreased economic mobility [44, 89] compared to normal weight people. Whether obesity leads to poorer socio-economic outcomes, or whether lower socio-economic status leads to obesity, is not clear.

Causes of Obesity

On the most basic level, overweight and obesity result when energy consumed is greater than energy expended. Accordingly, many of the most popular and traditional interventions for obesity are aimed at changing personal behavior. In keeping with traditional American values, personal choice and individual responsibility factor heavily into treatment modalities, public health interventions and policy discussions and options. Yet individual behavior is largely dependent on broader social, economic, political and environmental contexts in which people make decisions.

Increased production and marketing of convenience foods, trends to consume more foods away from home, and a culture in which physical activity continues to diminish, all contribute to choices and behaviors. Some research suggests that policies targeting the larger external environment in conjunction with programs aimed at changing personal behavior, such as altered food consumption patterns and increased physical activity at work, in schools and during leisure time, are critical to fighting the obesity epidemic, and may ultimately have a more profound impact than programs designed to change individual behavior.[92]

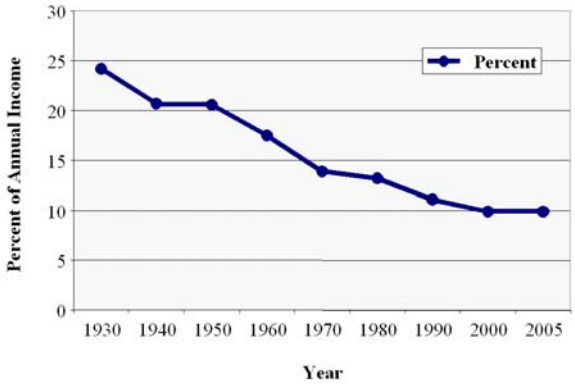
Changes in the Food Environment: An area that has gained significant attention is the role of the environment and its possible impact on rising obesity rates. Food availability, advertising, and federal food and agriculture policies can be viewed as both contributors to obesity as well as opportunities to make significant public health policy changes. Advances in technology and changes in the economic environment over recent decades have greatly impacted the food environment and dietary intake. Due to improvements in agriculture, food production, transportation, safety and storage, unhealthy foods are readily available. These foods appeal to most people and are relatively inexpensive. Compared to a century ago, there exists a plentiful supply of inexpensive, convenient, highly palatable, calorie-dense foods.[90] A number of policy advocates describe this as a "toxic environment," in which an abundance of messages to eat more and an environment built for convenience further contribute to an energy imbalance.[90, 91]

Beverages: Another area gaining significant attention in recent years is the consumption of soft drinks, which increased by 135% between 1977 and 2001.[92] Soft drinks are now the single largest source of calories in the average American diet.[93] Teenagers, particularly males, consume more than three servings of soft drinks per day on average,[94] and these drinks account for 12% to 15% of their total daily energy.[95] The three categories of "sweets and desserts," "soft drinks" and "alcoholic beverages" combined contribute nearly 25% of calories consumed in the typical American diet.[93] In a 2004 national survey across 27 states, sweetened beverages were available in 95.4% of public schools. These beverages included soft drinks, sports drinks and fruit drinks that were not 100% juice. In Massachusetts, 86.4% of public schools allowed such sales.[96]

Increased Consumption: Changes in the types of foods and high availability of food has led to increased consumption. Government reports suggest that between 1985 and 2000, the average daily intake of calories increased by 12%, or roughly 300 calories.[97] Using the conventional notion that an increased consumption of 3500 calories will result in a weight gain of one pound, this equals roughly 31 pounds per year of body weight for the average individual. Most of this increase in calories is from refined grains, added fats and added sugars, while people continue to consume too few whole grains, fruits and vegetables.[97] Several trends can account for this. First, food is more affordable than it used to be. Second, consumers are more likely to eat away from home, and third, portion sizes are much larger than in the past. The fourth trend is that healthy food is not so readily available in poorer neighbor-hoods. Each of these trends will be discussed in more detail.

The first trend is the lower cost of food. The percent household income spent on food has declined steadily since 1930, from 24.2% to 9.9% in 2005. This is depicted in *Figure 4: Trends in Percent Annual Disposable Household Income Spent on Food, 1930 – 2005*.[98] The most inexpensive foods and beverages are often those that nutritionists warn us to consume only in moderation. These items are highly processed, high in fat, sugar, sodium and calories, and low in essential nutrients and fiber.

Figure 4: Trends in Percent Annual Disposable Household Income Spent on Food, 1930 - 2005

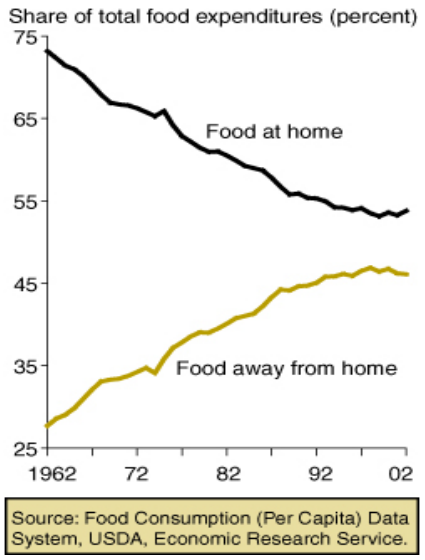


Adapted from United States Department of Agriculture ERS. Food CPI, Prices and Expenditures: Food Expenditures by Families and Individuals as a Share of Disposable Personal Income, 2006: Table of food expenditures as a percent of income for both foods at home and foods away from home, 1929-2005.

The low cost and wide availability of non-nutritious foods and beverages is in part due to agricultural and infrastructure subsidies. These subsidies reduce costs to farmers, food producers and ultimately to consumers, particularly for crops and commodities that are widely used in snacks and convenience foods and meats, such as corn for high fructose corn syrup and soy for animal feed.[99-101] Originally designed to guarantee the nation's food supply, such subsidies are now thought to contribute to America's expanding girth. Government subsidies, both direct and indirect, for whole grains, fruits and vegetables, lean meats and less processed foods are considerably less, rendering these foods more expensive, and oftentimes less available to consumers.[102]

The second trend that contributes to increased consumption is that consumers have been progressively eating more meals and snacks away from home.[103] Between 1962 and 2002, foods eaten at home have decreased by 25%, while foods eaten away from home have increased by 23%, to nearly 50%, as shown in *Figure 5: Americans are eating out more*.

Figure 5: Americans are Eating Out More



From Kuchler, F., Obesity and the Law of Unintended Consequences, Amber Waves, 2005. http://www.ers.usda.gov/Amberwaves/June05/Features/ObesityPolicy.htm

Foods eaten away from home are largely comprised of convenience foods, snacks and beverages as well as meals eaten in fast-food and family-style restaurants.[104, 105] Eating out may also be at least partly to blame for the increase in calorie consumption mentioned earlier, since foods in restaurants are generally higher in calories and come in larger portions than foods eaten at home. Similar to adults, children consume nearly twice as many calories when eating out as compared to eating at home.[106]

Third, portion sizes have also increased in fast food establishments,[107] and now exceed federal standards for many products.[104] From a marketing perspective, this makes sense. The actual cost of food is minimal compared to fixed costs of labor and other costs. If the extra costs to "supersize" gain a proportionally larger market share for a particular product, then the investment is profitable.[100] At the same time, consumers are extremely sensitive to price, and prefer to buy products that maximize perceived value.[108-110] As portion sizes increase, so does consumption[111] and therefore caloric intake. In other words, when portion sizes are doubled or tripled people will consume more, even if they do not eat everything in the package or what they are served. Increased consumption is therefore "good for business,"[112] but also creates a conflict between profit-making and good health.

A fourth trend is the lack of accessibility to healthy, nutrient-dense foods in poorer neighborhoods. This is largely due to a lack of supermarkets that carry affordable fruits, vegetables, lean meats and low fat dairy products[113] and proportionately more convenience stores, fast-food establishments and liquor outlets.[113, 114] As the number of supermarkets increase within geographic living areas, consumption of healthier foods, including fruits and vegetables, also increases.[115]

Lack of Physical Activity: Decreased physical activity, which leads to lower energy expenditure, is also a major contrib.-utor to the obesity epidemic. Reports from the Surgeon General and the Healthy People 2010 report describe the links between physical inactivity and obesity.[116, 117] Causes of physical inactivity include increased video and TV watching, limited or no access to exercise facilities, and environments that are not conducive to exercise.

In 2004, nearly 48 percent of adults in Massachusetts reported that they did not engage in regular physical activity.‡ The distribution of adults who are physically active varies by regions, with only 45 percent of adults in the North East engaging in physical activity three or more times per week compared with 56 percent in the Metrowest region.[1]

Figure 6: Percentage of US and Massachusetts Adults Reporting No Physical Activity By Race, 2004 shows that these numbers are even worse for Blacks (58%) and Hispanics (56%) in Massachusetts and Nationally.

Figure 6: Percentage of US and Massachusetts Adults Reporting No Physical Activity by Race, 2004

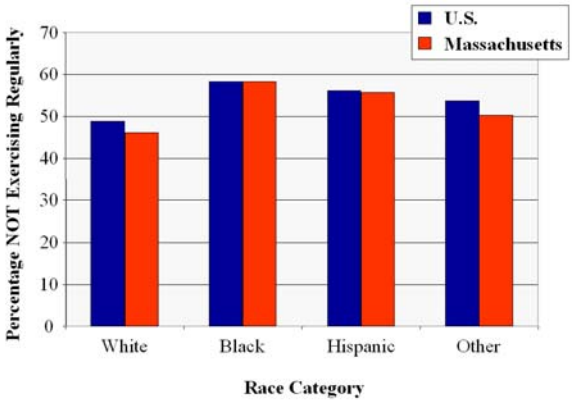


Figure 6 adapted from The Behavioral Risk Factor Surveillance System (BRFSS) 2004 (available at www.apps.nccd.cdc.gov/brfss, accessed 9/29/06)

Policies that support and promote physical activity in schools, work places and neighborhoods might go a long way to curbing increases in overweight and obesity. Neighborhood factors can have a direct influence on whether or not residents engage in exercise such as walking and other types of activities. However, the challenge is that physical activity is likely to continue to decline in neighborhoods with persistent crime rates and low access to recreation areas, disproportionately impacting low income groups.[118, 119] Residents living in a neighborhood that is "walkable" are more likely to walk,[118] and to have lower BMI[120] on average than residents of neighborhoods that are not conducive to walking.

For adolescents, exercise is likewise influenced by environmental factors. For example, adolescents' participation in physical education (PE) classes and use of community recreation centers have been linked to increased physical activity. Although adolescents are more likely than adults to engage in physical activity three or more days weekly, this varies by race. In Massachusetts, white students are more likely to report moderate physical activity (26%), compared to Black (14%) or Hispanic (17%) students.[9]

These disparities are concerning, but so too is the lack of progress toward improved exercise and dietary practices among Massachusetts teens. The Massachusetts Department of Public Health is concerned that, although progress has been made in important areas of adolescent risk behavior, such as substance abuse, violence and suicide, similar gains have not been realized in terms of dietary practices and physical activity. In fact, rates of overweight and obesity among adolescents continue to increase. This has led MDPH to recommend strengthening programs and policies that promote healthy eating and physical activity. [9]

***Television Viewing and Advertising**:*
There is a positive correlation between hours of television viewing and several risk behaviors for obesity. For example, watching two hours or more of television per day has been associated with sedentary

‡ The Behavioral Risk Factor Surveillance System (BRFSS) defines this as 30 or more minutes of moderate activity on five or more days per week, or 20 or more minutes of vigorous physical activity at least three days per week.

lifestyles, poor diet and increased overweight and obesity.[121, 122] Among young children, having a television in the bedroom significantly increases both television viewing time and the odds of being overweight.[123] Sitting in front of the TV or computer screen ("screen time") increases sedentary behavior and therefore the likelihood of being overweight.

Although screen time alone is associated with sedentary behavior, high-intensity advertising of processed and fast foods and beverages has a tremendous impact on increasing consumption of these products.[124] The association is particularly strong among children[125-127] and the amount of food advertising viewed by children on television is linked to being overweight.[128, 129] It is estimated that children see approximately 40,000 advertisements on television every year, mostly promoting cereal, candy and fast foods.[130] In her book, *Food Politics*, Marion Nestle points out that "nearly 70% of food advertising is for convenience foods, candy and snacks, alcoholic beverages, soft drinks, and desserts, whereas just 2.2% is for fruits, vegetables, grains, or beans" (p. 22).[100]

When it comes to food advertising, the Federal Trade Commission (FTC) and the Food and Drug Administration (FDA) are responsible for ensuring that advertising is not deceptive, but these agencies do not address issues of health quality of the products themselves.[124] The Department of Health and Human Services and the Federal Trade Commission as well as numerous trade associations have recently come out in favor of voluntary standards,[131] but critics argue that self-regulation does not adequately limit promotion of unhealthy products to children.[132]

Although food industries are currently spending less on television advertising of unhealthy products to children,[131] some suggest that advertising has merely shifted from TV ads to other types of promotions.[131] For instance, children are exposed to product promotions in schools, where beverage companies have developed contracts that exclude other vendors. These companies advertise heavily to gain name-brand recognition, promote brand loyalty, and in exchange provide schools with much needed money and supplies.[133] Beverage contracts are offered to school districts as lucrative deals. However, a recent multi-state study found that most contracts raise only about $18 per student per year and that the majority (67%) of the revenue goes to the beverage companies and not the schools.[134]

Given the volume of exposure that children have through media, the internet, schools and music, and the impact of advertising on consumption and obesity, this is an area where policymakers have proposed policy changes. The Center for Science in the Public Interest has published guidelines that define healthy foods, encourage marketers to support parental discretion, develop reasonable package sizes, reformulate products to comply with healthy standards, and limit or eliminate the use of schools for promotional purposes.[135]

Policies and Initiatives to Decrease Obesity

A number of policies have been proposed and initiatives implemented, at both federal and state levels, to decrease rates of obesity. Yet it is hard to point to any real success in reversing the current obesity trend. Systematic and comprehensive tracking and evaluation of programs is sorely lacking, making it impossible to identify successes or areas needing improvement.[136] The following section highlights a few policies and initiatives. Both federal and state initiatives can set nutrition guidelines and standards

and develop resources for both individuals and population groups.

Federal standards, for example, include the U.S. Dietary Guidelines and the Food Pyramid, which are used to regulate federally funded programs such as the National School Lunch Program, and the Women and Infants Supplemental Food Program (WIC). The federal government has also required all schools that participate in the School Lunch Program develop and implement a Wellness Policy that addresses nutrition standards, nutrition education and physical activity. A plethora of resources were made available to assist states and individual schools in writing the policy, but less has been offered for actual implementation and evaluation of these standards. At the state level, departments of education, public health and agriculture may provide further guidance, and individual bills addressing issues of nutrition and physical activity have been introduced in most states (see *Table 2: State Childhood Obesity Laws*).

Advocates for government intervention and regulation claim that since the government assumes many of the costs of overweight and obesity in terms of long-term health care costs and disability, it is obliged to intervene on behalf of citizens. Those who support a public policy approach maintain that the current food environment represents market failure because there is a lack of balance: environmental factors that promote overeating and lack of exercise are often beyond an individual's conscious control.[100]

Opponents, however, maintain that such controls are unnecessary or more appropriately applied at the local level, where local governments, administrators, and parents can design regulations to meet their particular needs within the confines of their specific resources. Furthermore, opponents of federal and state action argue that the market responds to demand, pointing to the proliferation of low-fat and low-carbohydrate products over recent years. Under this theory, education and information will change demand for foods of low nutrient density and create demand for healthier fare, if that is what the public really wants. Industry will subsequently respond by producing a healthier food environment.[137] Nevertheless, a number of federal and state policies and initiatives have been considered and implemented, and some of these are described below.

Federal Policies

US Dietary Guidelines/Food Pyramid:
Established in 1980, the Dietary Guidelines make recommendations for dietary practices for healthy Americans to reduce the risk for major chronic diseases. The Guidelines form the foundation for U.S. nutrition policy, such as informing regulations for school nutrition programs, military food service programs, and food labeling.[138] The Food and Drug Administration began to educate the public about the dangers of trans fat by requiring that food manufacturers list trans fats on their nutrition labels beginning in January of 2006.

The Food Pyramid is used to translate the Dietary Guidelines into a practical tool that individuals can use to make appropriate food selections. Originally introduced in 1992, it has recently been revised and is now available in an interactive online form, "My Pyramid.gov."[139] This format allows individuals to input personal information on age, sex and activity level to obtain customized advice. It also includes recommendations on physical activity.

USDA Food and Nutrition Services - National School Lunch (NSLP) and National School Breakfast Programs (NSBP): The NSLP and NSBP are federally assisted school meal programs designed to provide nutritious meals in public and nonprofit private schools across the country. Although local and state-sponsored school nutrition programs began in the late 1800's, federal sponsorship was authorized in 1946 as a matter of "national security" after young men were rejected for service from World War II because of nutritional deficiencies.[140] In 2006, the USDA estimates that it served over 5 billion lunches (59% were free or reduced-fee) at a cost of $7.35 billion, and 1.7 billion breakfasts (81% free or reduced-fee) at a cost of over $2 billion. In addition to cash reimbursements for meals, the federal government spent $10.2 billion on commodity supplements for school meal programs.[141] NSLP and NSBP meals must meet nutrition standards based on Dietary Guidelines, limiting total fat and saturated fat and providing 1/3 of daily requirements for certain nutrients.

Wellness Policies: All school districts participating in the NSLP or NSBP programs were required to have a Wellness Policy in place by fall of 2006.[142] The Wellness Policy must address nutrition standards for all foods and beverages available in schools, nutrition education, physical activity and after-school activities. A wide variety of public and private resources have been made available to assist individual school districts.

The Fresh Fruit and Vegetable Program (FFVP): is a component of The Child Nutrition and WIC Reauthorization Act of 2004 that promotes healthy eating at school. Through the FFVP, 14 states and 3 Indian Tribal Organizations are subsidized to offer free fresh fruits and vegetables and dried fruit throughout the school day.

Healthy People 2010: Healthy People promotes population-based health objectives in a number of key areas. Its overarching goals are to "Increase quality and years of healthy life", and to "Eliminate health disparities."[116] Healthy People 2010 includes objectives for nutrition and obesity. These objectives are often used by both states and communities in developing statewide and local policies and programs.

Team Nutrition: Team Nutrition promotes good nutrition and physical activity in schools and child nutrition programs by offering curricula, technical assistance and other resources for food service personnel, child care workers, parents and educators.[143] All resource materials are based on the *Dietary Guidelines for Americans* and *My Pyramid*.

School Health Index (SHI): The SHI is a tool for schools to assess their health and

safety policies and programs. Results can be used to develop and implement a School Improvement Plan.[144]

Federally funded Statewide initiatives: Currently 28 states are federally funded to develop science-based nutrition and physical activity programs.[145] Massachusetts received funding four years ago and facilitated the development of the Massachusetts Partnership for Healthy Weight (discussed below) in addition to implementing a number of overweight/obesity prevention initiatives.

*The Centers for Disease Control and Prevention (*CDC) maintains a website on overweight and obesity with extensive information and resources for individuals, organizations and programs.[146]

Medicare coverage: Medicare now authorizes surgical treatment of obesity when BMI is greater than 35 and the patient has at least one illness related to his or her obesity, for which previous treatment has been unsuccessful.[147]

The Institute of Medicine of the National Academy of Sciences: In 2005 the IOM published a comprehensive analysis of childhood obesity. The report developed a broad array of strategies to combat the epidemic and made specific recommendations to policymakers, health professionals, schools, the private sector, and the public.[129] An updated report is slated to be published in late January which will outline a set of recommendations for nutrition and physical education standards in schools.

State Policies

Despite that fact that overweight and obesity is highest among adults, state level policies focus primarily on children and schools. Other policy proposals include access to healthy foods, creation of physical environments conducive to exercise and provision of nutrition information in restaurants. Legislation designed to control the food environment, particularly in schools, has both supporters and opponents.

Overview: In the past year, 32 states introduced legislation dealing with health or physical education in schools. Twenty eight states considered legislation designed to influence nutritional standards for all school foods and beverages. Seven states introduced legislation that would increase access to fresh produce through school garden programs and farm-to-school programs. And 12 states proposed bills that would require BMI tracking in schools.[148, 149]

Table 2: State childhood obesity laws, lists the broad categories of policies and the states in which those policies are being considered or have become law. These laws generally require that schools track BMI, improve nutrition standards and food labeling, physical activity and nutrition education.

Legislation that is larger in scope, aimed at curbing the obesity epidemic across demographic lines, is being considered in a number of states. Bills include measures to improve access to fresh produce for elderly and low income people (e.g., WIC recipients), introduced in 7 states. Mandates requiring insurance coverage for medical and surgical treatment of obesity as a legitimate disease were passed in 7 states and are being discussed in 9 other states. Four states are considering taxes for high fat, high sugar (energy-dense) foods and beverages, the revenue from which would be funneled back into public health campaigns promoting good nutrition. Although 9 states and Washington D.C. have introduced legislation that would require restaurants to post nutrition information on menu items, none of this legislation has been signed into law.

Table 2: State Childhood Obesity Laws

Type of Legislation	Being Considered	Enacted
School Nutrition Standards	Alabama, Alaska, Hawaii, Indiana, Iowa, Massachusetts, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, North Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Vermont, Virginia	Arizona, Arkansas, California, Colorado, Illinois, Kansas, Kentucky, Louisiana, Maine, Maryland, New Mexico, North Carolina, Oklahoma, Rhode Island, South Carolina, Texas, West Virginia
Nutrition Education	Massachusetts, Minnesota, Missouri, New Hampshire, New Mexico, New York, Ohio, Oklahoma, Pennsylvania, Vermont, Virginia	California, Colorado, Illinois, Kansas, Maine, South Carolina, Texas, West Virginia
Body Mass Index	Alaska, Arkansas, Connecticut, Georgia, Iowa, Maine, Michigan, New Jersey, New York, North Carolina, Oregon, South Carolina, Texas	Missouri, Tennessee, West Virginia
Physical Activity	Alabama, Alaska, Massachusetts, New York, North Carolina, Ohio, Oregon, Tennessee, Virginia	Arizona, Arkansas, California, Colorado, Illinois, Kansas, Kentucky, Louisiana, Missouri, Montana, New Hampshire, New Mexico, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, West Virginia
Nutrition Information on School Menus/ labeling	California, Illinois, Massachusetts, New York	Colorado, Kentucky, Maine

Adapted from NCSL: Childhood Obesity – 2005 Update and Overview of Policy Options (available at www.ncsl.org/programs/health/ChildhoodObesity-2005.htm)

Other measures include developing or improving access to safe public areas that promote physical activity and fitness, including safe walking and biking areas, introduced in 11 states. A number of advocacy groups have attempted litigation, similar to tobacco lawsuits, to force corporate responsibility in food and beverage production and advertising. In reaction to this litigation, 22 states have passed laws to prevent suing food and beverage companies for damages related to obesity. Sixteen additional states are considering such actions.[148]

Industry groups are beginning to respond to potential litigation by developing policies, known as industry self-regulation, that address public concerns. For example, the American Beverage Association recently

developed "school beverage guidelines" that promote consumption of healthy beverages in schools. This policy was made public shortly before an impending lawsuit. Advocates fear, however, that such initiatives take only the minimal action required to avoid litigation, are not enforceable, and may develop public relations campaigns that disguise real issues. In the case of ABA, the policy restricts sweetened caloric beverages to 50% of available drinks at the high school level. This policy, along with companion guidelines for competitive foods sold in schools has been endorsed by President Clinton's Alliance for a Healthier Generation Foundation and the American Heart Association as exemplary industry self-regulation.[150]

Whether or not such industry self-regulation can be effective at the local level is unclear. For example, New York City has made headlines in a proposed amendment to the Health Code requiring all city restaurants to "phase out artificial trans fat" over six months. Prior to the amendment, the city provided a yearlong educational and training program intended to promote "voluntary" changes, but this was largely ineffective in reducing trans fats served in restaurants. For this reason, the Department of Health and Mental Hygiene proposed a citywide law that would reduce trans fats to less than 0.5 grams per serving in all New York City restaurants by 2007.[151]

Massachusetts: Massachusetts legislators have also proposed a number of policies. In the 2005-2006 legislative session, at least 38 bills were introduced that addressed nutrition, physical activity or obesity, most of them focusing on schools. Four bills dealt directly with food labeling and content in public schools, and one bill required food provided in schools "…must meet nutritional standards appropriate to a healthy diet for a child." Both nutrition and physical education requirements were defined in two bills, and one would require that students learn about "social and cultural messages" as they relate to food and eating choices. One bill would mandate nutrition classes only.

Legislation introduced by Representative Peter Koutoujian on behalf of the Public Health Committee, provided very specific guidelines on healthy food. The bill also requires that the DPH and the DOE create guidelines for treating eating disorders. This bill would establish a mechanism for collecting data on trends in obesity and overweight among children and a campaign aimed at reducing obesity through a number of initiatives. Although none of these bills were enacted, it is expected that many will be reintroduced this session.

Current Programs and Initiatives in Massachusetts

Massachusetts is home to many programs and initiatives that are striving to improve nutrition, increase physical activity and decrease the obesity epidemic. These are sponsored by public offices as well as private institutions, and are often partnerships or collaborations among one or more agencies. Several of these programs and initiatives are described below.

The Massachusetts Department of Public Health (MDPH): The Nutrition and Physical Activity Unit (NPAU) works within the MDPH and with public and private partners to identify opportunities for collaboration and program integration. Attention is placed on ensuring constancy of messages and promoting policy and systems changes that support access to healthy foods and opportunities for physical activity. Resources, statistics and links are available

on its web page.[152] The unit also sponsors several programs that promote messages about nutrition and physical activity. For example, the *5-a-Day program* encourages consumption of 5 or more servings of fruits and vegetables per day. In collaboration with the National Cancer Institute and the Produce for Better Health Foundation, MDPH supports training and development of a resource directory.

Through the NPAU, funds are provided for the various programs that address obesity and overweight. The following estimates do not include funding of programs such as Adult Diabetes Control or Heart Disease and Stroke initiatives "that also affect obesity and healthy nutrition. Support directly by the state Department of Public Health for programs and initiatives related to obesity and physical activity (including nutrition education and breastfeeding activities), from both state and federal dollars, is approximately $7.3 million annually, with almost 70% of the total ($5.1 million) from various federal grants (federal WIC and Chronic Disease Prevention and Health Promotion). The majority of the state funds ($2 million) come from the state Nutrition/WIC account, with some from smaller state accounts. The number of persons reached with these programs in total is impossible to quantify, as most focus on public and provider education, awareness, and other initiatives that do not involve direct client services" [153]

The *Overweight-Obesity Prevention and Control Initiative (OPCI),* a program of the MDPH NPAU, promotes proper nutrition and physical activity through state and local program and policy support. These include wellness programs for Police and Firefighter departments in 5 communities; the YMCA Overweight Prevention Initiative in 5 communities; and Healthy Choices, a collaborative with Blue Cross Blue Shield of Massachusetts in 115 middle schools. Other programs include an Elder Health Initiative, Action for Community-Centered Elder Nutrition Training (ACCENT); a collaborative with the Executive Office of Elder Affairs (EOEA), Action for Boston Community Development (ABCD) sponsored in 9 communities; *Mass Moves,* an initiative to increase awareness on the importance of and opportunities for physical activity across the state of Massachusetts; and development of a wellness toolkit for worksites.[152]

The Women, Infant and Children Special Nutrition Program (WIC), is a federal supplemental food program designed to ensure proper nutrition for low to moderate-income pregnant, breastfeeding and postpartum women and children under 5 years old. In Massachusetts, which serves 201,364 beneficiaries annually,[153] WIC has taken steps to address overweight and obesity in early childhood. These initiatives include nutrition messages promoting healthy weight, posters, training curricula, healthcare provider kits and parenting projects. Nearly $2 million federal dollars and $3.7 million from the state were spent in FY 2005 on the Nutrition Education and Breastfeeding program. Massachusetts WIC utilizes data from the Pediatric Nutrition Surveillance System & Prenatal Nutrition Surveillance System to monitor trends in overweight and obesity among infants and children.[154]

The Massachusetts Partnership for Healthy Weight (MPHW): MPHW is a statewide coalition dedicated to promoting optimal health by preventing and reducing overweight and obesity among all residents of Massachusetts. The partnership is committed to changing physical and social environments, public policies, and

healthcare systems to increase opportunities for physical activity and improved nutrition. The Partnership's action plan for the state of Massachusetts, the Health of Massachusetts: A Coordinated Response to Overweight and Obesity, provides objectives for planning nutrition and physical activity interventions within schools, workplaces, organizations, health care settings, as well as for individuals and families.[155-157]

Massachusetts Action for Healthy Kids (MAFHK): Massachusetts AFHK is the state affiliate of the national AFHK that focuses on improving nutrition and fitness of children in schools. MAFHK developed, and updates yearly, the *Massachusetts A La Carte Food & Beverage Standards to Promote a Healthier School Environment*, a tool that recommends standards for foods and beverages in schools outside of school meal programs. This includes suggestions for alternatives or replacements for foods and beverages high in sugar, fat and calories and low in nutrition.[158] Massachusetts AFHK also produced Massachusetts Profiles, which provides statistics on health and fitness indicators for the state of Massachusetts,[159] and has partnered with the John Stalker Institute at Framingham State College and the Massachusetts Department of Education to develop the "A-List" (see below).

The Massachusetts Public Health Association (MPHA): MPHA advocates both statewide and locally for childhood obesity prevention programs and policies. MPHA helped draft and promote legislation to ban the sale of high-fat, high-sugar foods and sweetened beverages in public schools. MPHA has provided nutrition education to over 55,000 children in elementary and middle schools across the state; offers technical assistance to school districts in the implementation of school wellness policies; assists local schools and communities with childhood obesity prevention initiatives; and has worked with statewide and regional coalitions on obesity prevention. Publications to decrease childhood obesity include "The Health of Our Children: Who's Paying Attention?"[160] and "Community Action to Change School Food Policy: A Toolkit."[161]

John Stalker Institute of Food and Nutrition (JSI) at Framingham State College: The JSI has produced a comprehensive guide to assist schools in developing, implementing and revising their Wellness Policies. In conjunction with the Massachusetts Department of Education, JSI offers a Certificate in Excellence in Child Nutrition for Food Service Directors program to improve the capacity of school food service departments to improve school nutrition environments.

In addition, JSI offers accredited online professional development courses for educators that include topics on nutrition and physical activity, food allergies, the US Dietary Guidelines and the Food Pyramid, cultural foods and Body Mass Index. The "A-List" provides a list of vending and snack products that meet the standards specified in the Massachusetts AFHK A La Carte Food & Beverage tool mentioned above.[162]

Blue Cross Blue Shield of Massachusetts (BCBS): BCBS sees the benefit of promoting wellness to all residents in the state. In collaboration with Shaw's Supermarkets and Star Markets, it has developed the *Jump Up & Go!* program designed to help schools, communities and clinical practices develop and implement healthy lifestyle habits through promoting good nutrition and physical activity.[163] *Jump Up & Go!* also utilizes the 5-2-1 message: eat 5 or more servings of fruits

and vegetables every day, limit television viewing and screen time to 2 hours or less, and exercise vigorously at least 1 hour per day. 5-2-1 has been widely publicized and used by numerous fitness and wellness initiatives across the state. From 1998 through 2003, $2 million was invested in this program, and BCBS estimates that by 2008, another $10 million will be invested in *Jump Up and Go!*

BCBS funds middle schools across the state through the *Healthy Choices* program (in partnership with MDPH), provides educational materials for teachers, a toolkit for physicians, physician continuing education courses, pediatric materials, community-based grants and toolkits for parents. BCBS of Massachusetts also reimburses or provides discounts for individual nutrition counseling, fitness training and some alternative therapies that promote wellness. Its website provides links to helpful information to increase physical activity and promote positive nutrition practices.[164]

The Massachusetts Coalition on Obesity Prevention and Education (COPE): was founded in 2000 by the Harvard Prevention Research Center, the Massachusetts Public Health Association and the Massachusetts Legislative Children's Caucus. Coalition members come from public health, education, advocacy and community-based organizations in Massachusetts. The coalition is dedicated to reducing the prevalence of childhood obesity in Massachusetts by translating current research into action. COPE holds a yearly educational session for legislators on issues of nutrition and physical education.

Summary

Across the country, including in Massachusetts, rates of overweight and obesity are rising rapidly among children and adults. A number of chronic illnesses, such as heart disease, cancer, arthritis, and diabetes are linked to obesity. The consequences of this epidemic impose significant personal, economic and societal costs. Furthermore, rising obesity rates in children are concerning since obese children are at greater risk of developing risk factors for adult disease. There are also significant disparities in rates of obesity among minority populations who may not have equal access to healthy, low cost foods.

While the burden of overweight and obesity are clear, the underlying causes are complex. Some of these causes include increased caloric intake, more foods eaten away from home, increased portion sizes, changes in the food environment, high-intensity food advertising and factors that contribute to decreased physical activity. These myriad causes will likely render any single action or policy ineffective at curbing this significant public health problem.

There are arguments both for and against regulating the food environment. Advocates for government intervention maintain that, because of the enormous costs to society, interventions should be broadly targeted. Policies focusing on environmental factors move the issue beyond individual control to include neighborhoods, communities, and both public and private institutions. Opponents view legislation as interfering with, not only individual rights but also with market forces that could change to meet the

demand of more health-conscious consumers. A paradigm of "individual choice and personal responsibility" allows market forces to respond to rising obesity rates by changing supply in response to consumer demand. This perspective precludes government intervention.

Policy makers at national, state and local levels are beginning to address the obesity epidemic by enacting or considering various types of legislation. Nevertheless, these efforts to date have had a limited impact on rising rates of obesity.

Massachusetts is considering several bills addressing health education, physical activity and nutrition in schools. There are a number of programs currently in place aimed at reducing obesity and overweight among Commonwealth residents. Nutrition and fitness education initiatives, infra-structure changes that would reduce barriers to good health, and school programs are just some of the ways that Massachusetts is working toward reducing overweight and obesity. However, the magnitude of these programs, in terms of funding and reach, may not match the severity of the problem.

There are significant public health and economic consequences associated with overweight and obesity in the Commonwealth. What follows from this paper is the question of what should be done? What is the proper role for public policy and education? What is the responsibility of government? What is the responsibility of individual citizens? These important questions will be discussed at the *Massachusetts Health Policy Forum* on January 23, 2007.

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