

# Maine Policy Review

---

Volume 13 | Issue 1

---

2004

## Obesity in Maine: A Policy Approach

Dora Anne Mills

*University of New England*, [doraamills@gmail.com](mailto:doraamills@gmail.com)

Follow this and additional works at: <https://digitalcommons.library.umaine.edu/mpr>



Part of the [Community Health and Preventive Medicine Commons](#), and the [Public Health Education and Promotion Commons](#)

---

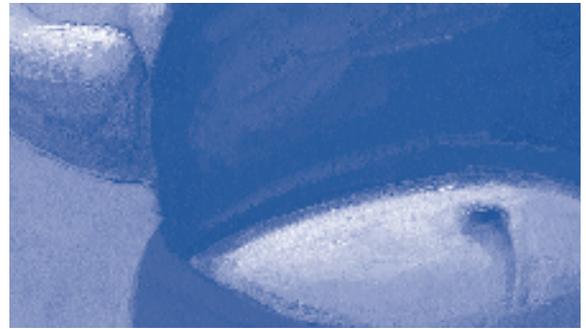
### Recommended Citation

Mills, Dora Anne. "Obesity in Maine: A Policy Approach." *Maine Policy Review* 13.1 (2004) : 28 -47, <https://digitalcommons.library.umaine.edu/mpr/vol13/iss1/5>.

This Article is brought to you for free and open access by DigitalCommons@UMaine.

# Obesity in Maine: A Policy Approach

by Dora Anne Mills



*Compared to earlier generations, Americans are eating more, making poorer nutritional choices, and are less physically active. The result is an “obesity epidemic” facing Maine and the nation. Dora Anne Mills, director of Maine’s Bureau of Health, summarizes the extent, impact, and causes of obesity, and presents policy solutions suggested in public health and medical literature. Because the factors behind the obesity epidemic are so interwoven in the fabric of society, policymakers, businesses and individuals must consider a variety of solutions on the personal, local, state and national levels. Mills warns if we do not act soon, and systematically, “our youth may be the first generation to not live as long as their parents’ generation.”* 🐟

Sponsored in part by:

Maine Health Access Foundation



*Maine Policy Review* is distributed free-of-charge to readers across Maine and New England. The journal is supported entirely by grants, reader contributions, and in-kind support.

## Body Mass Index (BMI) Scale

Underweight	Normal Weight	Overweight	Obese	Morbidly Obese
<18.5	18.5 - 24.9	25.0 - 29.9	30.0 - 39.9	>40

### INTRODUCTION

A century ago, our biggest killers in Maine were tuberculosis, pneumonia, and other infectious diseases such as measles and smallpox. By contrast, in recent years nearly three-quarters of Maine people die from four diseases—cardiovascular disease (heart disease and stroke), cancer, chronic lung disease, and diabetes. These diseases are a leading cause of disability, especially because of their chronicity, and add an estimated \$2.47 billion annually to our health bill in Maine, including \$1.42 billion in direct health care costs.<sup>1</sup>

Tobacco addiction is the leading underlying cause of (and greatly exacerbates) these chronic illnesses. However, recent analyses indicate an epidemic of obesity is overtaking tobacco. It is estimated that obesity—which is related to physical inactivity and poor nutrition—and tobacco each kill about six Maine people every day. Obesity incurs \$0.5-\$1.0 billion in health care dollars every year, or roughly \$400-\$800 per capita per year.<sup>2,3</sup>

In short, changes in our society have resulted in a pendulum swing from a time when malnutrition and being underweight were major public health problems to the present day, where poor nutrition, physical inactivity, and being overweight or obese are major public health problems. This article first depicts the extent of the nation's and Maine's obesity problem, and then discusses the possible roles public policy can play to address this leading public health threat.

### OVERVIEW OF OBESITY

Obesity is best measured by the body mass index, which is a formula that takes into account one's weight and height. An adult is defined as overweight if his or her body mass index falls between 25-30, and is defined as obese if it is 30 or above. A body mass index over 25 is closely associated with increasing morbidity and mortality. In fact, adults with body mass indexes of 30 and above have nearly twice the risk of premature death as compared to those with healthy body mass indexes (20-25).<sup>4</sup>

#### How to Calculate BMI

$$\text{BMI} = \frac{\text{weight (in kilograms)}}{\text{height (in meters)}^2}$$

$$\text{BMI} = \frac{\text{weight (in pounds)}}{\text{height (in inches)}^2} \times 703$$

Or calculate on the Web at:

[www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm](http://www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm)

There are analogous categories for youth, who are deemed "at risk for overweight" if they lie in the 85th-95th percentile of body mass index for their age and gender, and defined as "overweight" if they lie above the 95th percentile of body mass index for their age and gender. In truth, most overweight adolescents become obese adults. In terms of physical appearance, youth from both categories appear overweight and are currently diagnosed with the medical consequences of obesity.<sup>5</sup>

#### *Epidemiology of Obesity in Maine*

An epidemic is a disease or a condition that occurs in greater frequency than usually expected. The frequencies of overweight and obese adults clearly fit these criteria. From 1960-1980, there was little variability nationally in adult obesity rates. However, from 1980-1990, the rates rose moderately,<sup>6</sup> and since 1990, they have risen at alarming rates. As a result, obesity rates among U.S. adults have nearly doubled

FIGURE 1: **Obese Adults, Maine and United States, 1990-2002**

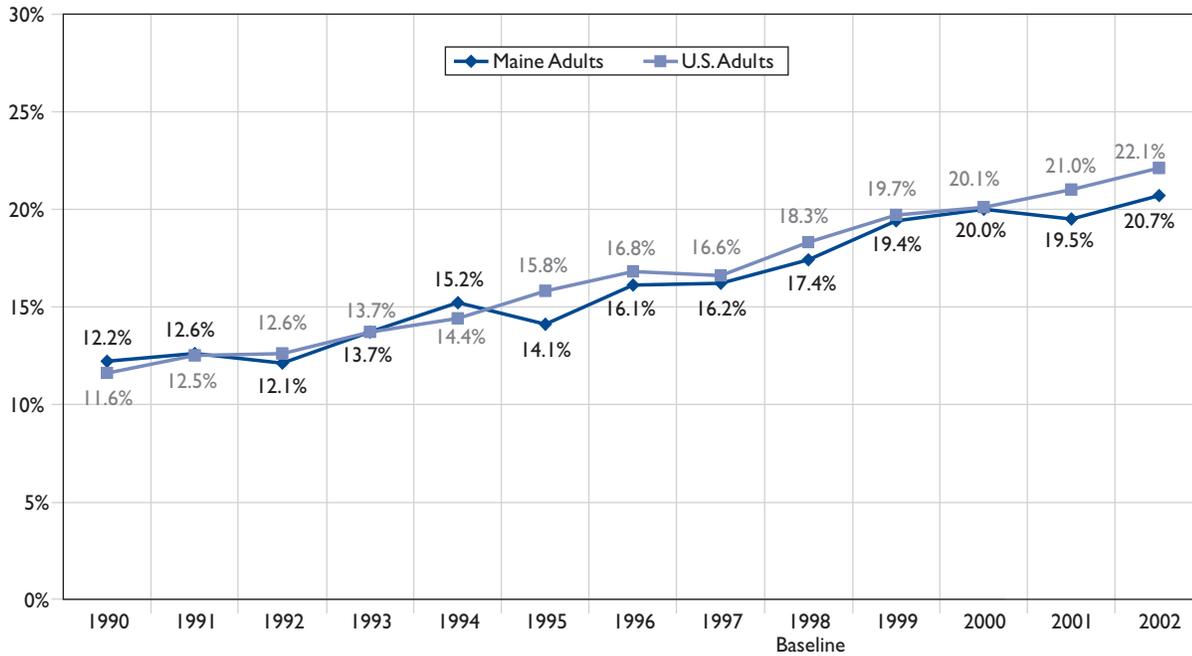
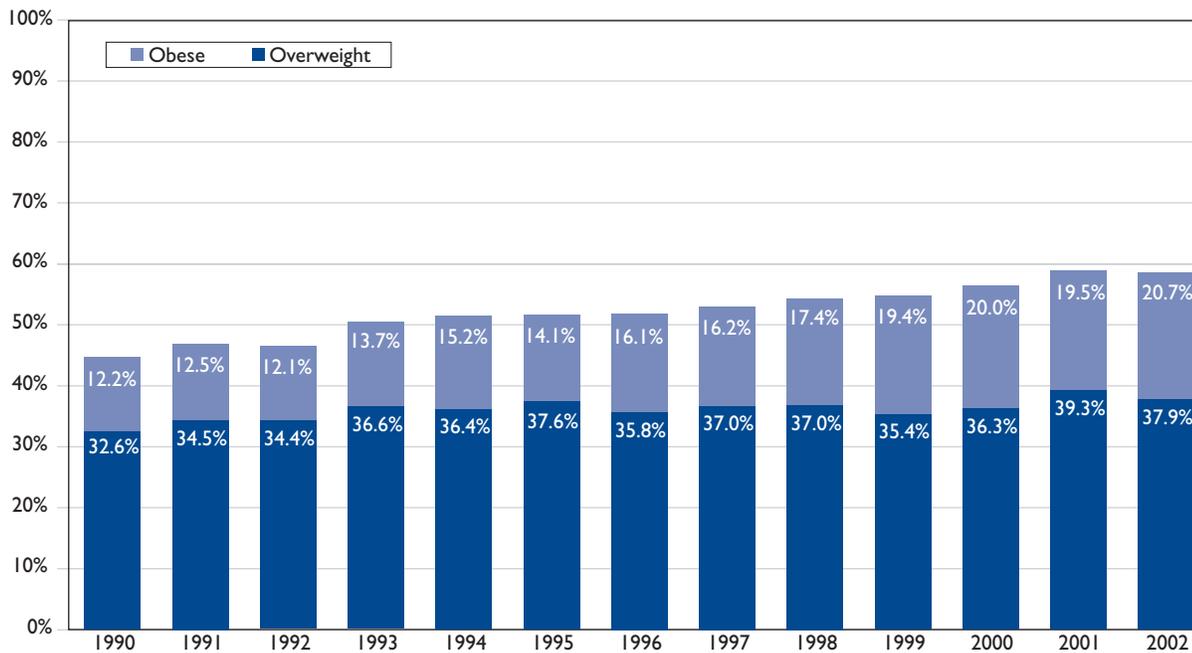


FIGURE 2: **Proportion of Maine Adults Who are Obese or Overweight, 1990-2002**



in 20 years. In Maine, since 1990, obesity rates have risen 75%, from about one in 10 Mainers in 1990 to more than one in five in 2002. Today, in Maine, 59% of adults are either overweight or obese. Moreover, available adult data in Maine are self-reported, and according to national, directly measured surveys, the proportion of overweight and obese adults in Maine and in the United States is probably closer to two-thirds,<sup>7</sup> or 61%. Further, although Maine's rates of overweight and obese adults are comparable to national rates, Maine has the highest rate of adult obesity in New England.<sup>8</sup>

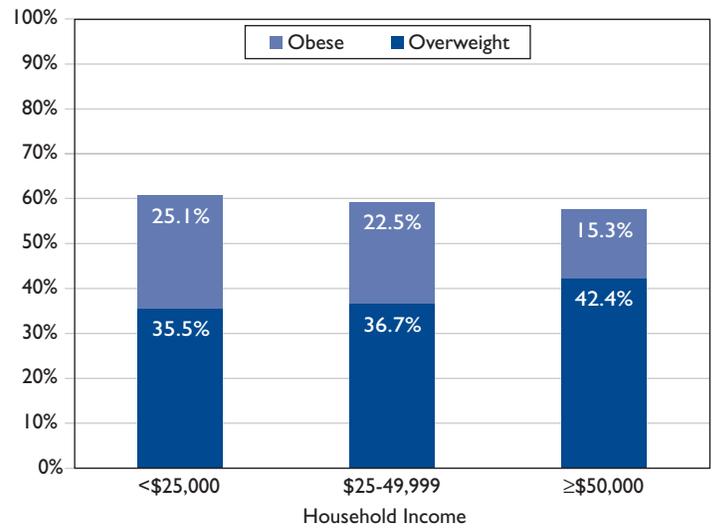
The trends among youth are equally alarming. About one-third of Maine youth have body mass indexes greater than or equal to the 85th percentile, which means they are either overweight or at risk of becoming overweight (though many in the medical field would say youth from both categories are at a minimum obese). Even more alarming, a 2002 survey of kindergarten students conducted in Maine found that 36% of entering kindergarteners had a body mass index that fell at or above the 85th percentile.

Like adult rates, youth rates have increased to epidemic proportions. For instance, in just 20 years, the national rate of overweight children doubled, while the rate of overweight teens tripled.<sup>9</sup> The most currently available comparable data suggest this is true in Maine as well; the 2001 Youth Risk Behavior Survey found that the rate of overweight high school students in Maine was 25%, as compared to 24% nationwide.

Who in Maine is overweight or obese? Similar to others across the nation, Mainers with lower socioeconomic attainment are more likely to be overweight or obese. Sixty-six percent of Mainers with less than a high school education are overweight or obese, as compared to 53% of those with a college degree. Likewise, 25% of Mainers with less than \$25,000 annual household income are obese, as compared to 15% of those with incomes of \$50,000 or greater.

Age also has an impact on body mass index. As we age, especially into our 40s and 50s, our weight tends to increase. As a result, adults ages 50-64 have the highest body mass index in Maine. However, one of the biggest age-related concerns is the steep increase in body mass indexes among our younger populations.

**FIGURE 3: Maine Adults Obese or Overweight, by Household Income, 2002**



**FIGURE 4: Maine Adults Obese or Overweight, by Education, 2002**

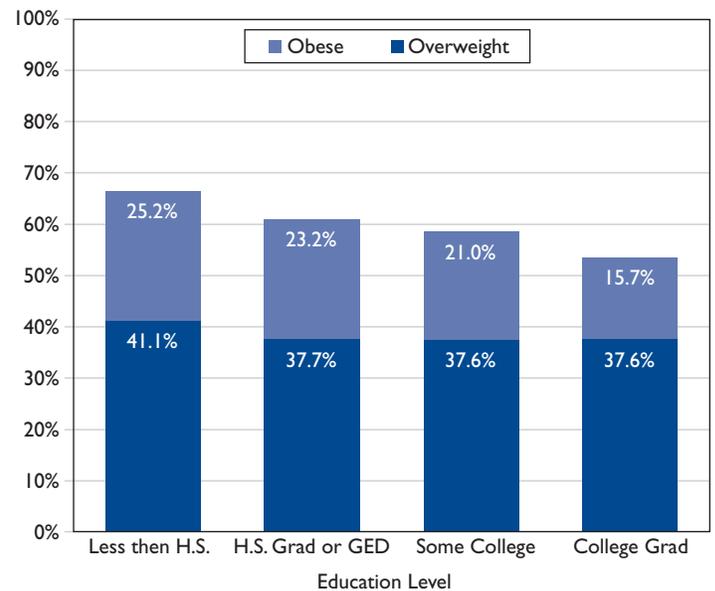
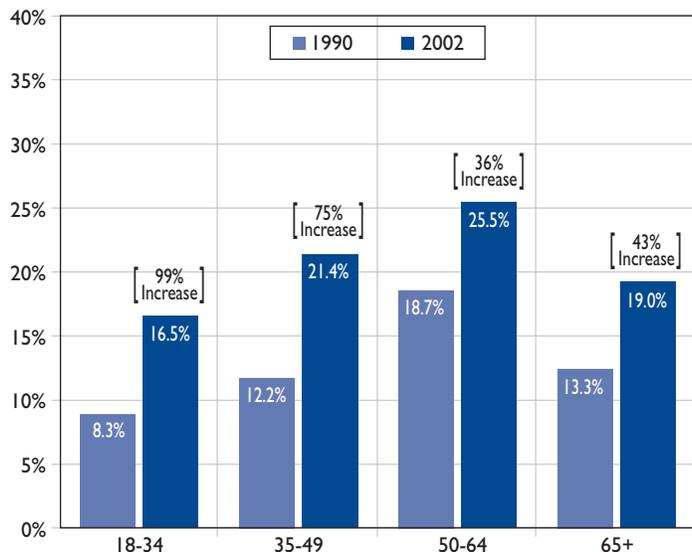


FIGURE 5: **Maine Adults Obese, by Age, 1990 and 2002**



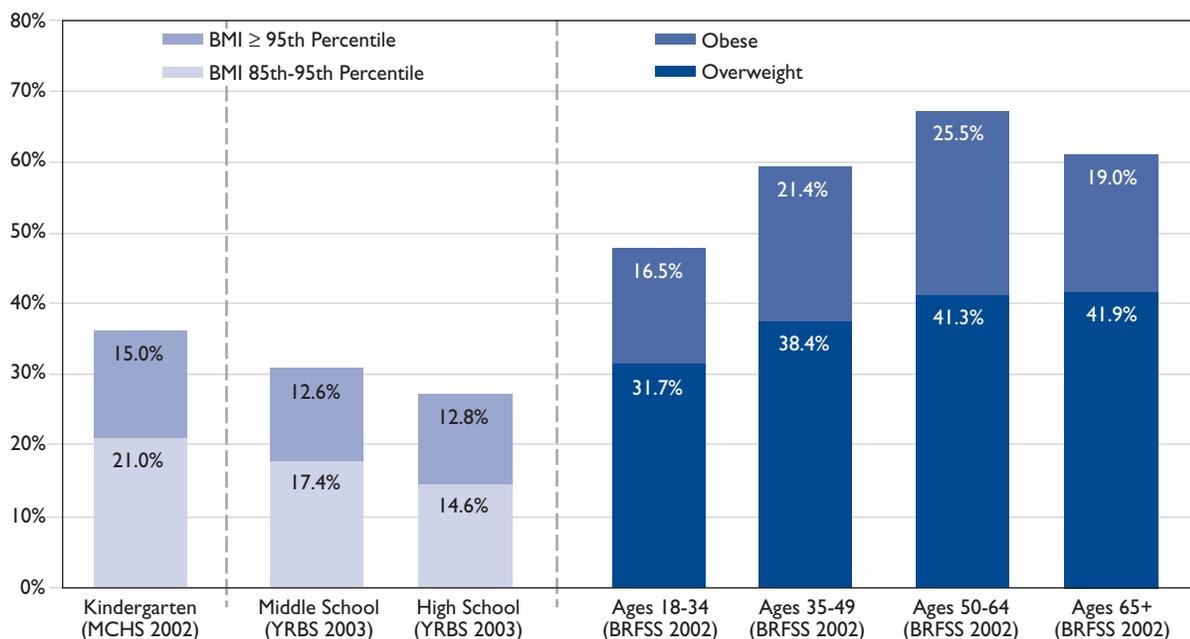
From 1990-2002, obesity rates doubled among young adult Mainers ages 18-34, and increased appreciably among adults ages 35-49. This trend is particularly worrisome when we look ahead to our young adult generation entering their mid-late adult years much heavier than in the previous generation.

In terms of gender, the percentage of Maine men and women who are obese is the same, 21%. However, Maine men are more likely to be overweight (47%) than Maine women (29%).

At first glance there appear to be differences in the rates of overweight and obese adults among geographical regions in Maine (with lower rates in southern Maine). However, when these rates are adjusted for income and age, these differences disappear, and there are no significant regional variations.<sup>10</sup>

In addition, the rates of overweight and obese adults are higher among Maine's disabled population.

FIGURE 6: **Maine Obesity and Overweight Rates by Age**



MCHS=Maine Child Health Survey, YRBS=Youth Risk Behavior Survey, BRFSS=Behavioral Risk Factor Surveillance System

Approximately 20% of Maine adults 20-64 report some type of disability, as do 40% of adults over 64.<sup>11,12</sup> Sixty-seven percent of Mainers who report a disability are overweight or obese, as compared to 56% of non-disabled adults.<sup>13</sup> However, the relationship between obesity and disability is complex; obesity can result in disability and disability can also be a contributing factor to obesity. More needs to be learned about this relationship.

Maine data are limited on the impact of race, ethnicity, and sexual minority status on body mass index. Some data indicate there are lower rates of overweight and obese adults among Maine's racial minorities, but sample sizes are small. It is hoped that further data and analyses will be forthcoming. National data indicate ethnic and racial disparities. For instance, the rates of overweight and obese women who are members of racial or ethnic minority populations appear to be higher than among non-Hispanic white women.<sup>14</sup>

Although current Maine data on specific factors associated with overweight youth are limited, national data indicate that children with a high body mass index often share some characteristics: either one or both parents are overweight or obese; they live in smaller families; they live in poor families; they watch a lot of television; and they consume a high proportion of calories from fat.<sup>15</sup>

### IMPACT OF OBESITY

Obesity has quickly become a leading cause of disease, disability, and death in Maine and the United States. In fact, according to an article in the *Journal of the American Medical Association* in March 2004, from 1990-2000 physical inactivity and poor nutrition have nearly caught up with tobacco as the leading underlying causes of death in the United States, causing almost one in five deaths (17%), compared with tobacco, which is estimated at 18%.<sup>16</sup>

Being overweight or obese is associated with a myriad of diseases, from pregnancy complications to lung problems to heart disease. The higher one's body mass index, the higher is one's risk for disease, disability, and premature death. For instance, people who are obese face nearly double the risk of prema-

ture death from all causes compared to those with a healthy body mass index.<sup>17</sup> Obesity also significantly impairs quality of life.<sup>18</sup>

Indeed, we are seeing increases in many of these diseases concurrent with the unfolding of this overweight/obesity epidemic. For instance, the numbers of people in Maine diagnosed with diabetes has more than doubled, from an estimated 33,000 in 1994 to over 73,000 in 2002. The vast majority of these are type 2 diabetes, which is associated with obesity.<sup>19</sup>

Although the association between obesity and such diseases as diabetes and heart disease appear to be well known and self-evident, some associations are not. For instance, a 2003 study from the *New England Journal of Medicine* showed that being overweight or obese is associated with the risk of death from all cancers and with death from cancers of many specific types. It is estimated that 90,000 deaths due to cancer could be prevented each year in the United States if men and women could maintain normal weight. Overweight and obesity were found to account for an estimated 14% of all deaths from cancer in men, and 20% of those in women.<sup>20</sup>

The impact of being overweight is particularly concerning when one looks at health effects on our youth. For instance, 58% of overweight children, even as young as five, were found to have at least one additional risk factor for cardiovascular disease, and 20% were found to have two or more. These risk factors include high blood pressure, high blood cholesterol, and type 2 diabetes (formally known as adult-onset diabetes, but now found among children).<sup>21</sup> Additionally over the past few years, hospital admissions for diabetes among our youth have doubled, while obesity and gallbladder disease admissions have

### Diseases Associated with Obesity/Overweight

- Heart Disease
- Stroke
- Type 2 Diabetes
- Cancer
- Chronic Lung Disease
- Gallbladder Disease
- Sleep Apnea
- Osteoarthritis
- High Blood Pressure
- High Cholesterol
- Infertility
- Pregnancy Complications
- Gout
- Bladder Control Problems
- Psychological Disorders:
  - Depression
  - Low Self-Esteem
  - Eating Disorders

tripled.<sup>22</sup> Because of this overweight/obesity epidemic, our youth may be the first generation in America to not live as long as their parents' generation.

Though the direct medical consequences of being overweight or obese are often emphasized, psychosocial consequences also are profound for adults and children alike (in fact, one of the most common consequences of being an overweight child is discrimination).<sup>23</sup> Psychosocial effects probably contribute to the psychological disorders and difficulties seen in medical settings among people who are overweight or obese. Indeed, among American children admitted to the hospital, the most common principal diagnoses when obesity is listed as a secondary diagnosis are mental disorders.<sup>24</sup>

Because of this overweight/obesity epidemic, our youth may be the first generation in America to not live as long as their parents' generation.

An analysis of questionnaire responses of very overweight children and adolescents and their parents about health-related quality of life found that overall scores were similar to and sometimes worse than those of children and adolescents diagnosed with cancer, who in a previous study were determined to have the lowest health-related quality of life. These overweight children and adolescents were more likely to report psychosocial health problems compared with their healthy counterparts. They also reported a high rate of absenteeism—an average of 4.2 days per month of school missed.<sup>25</sup>

Finally, not only is the overweight/obesity epidemic having a profound impact on our overall health, it also is placing a burden on our national health bill—costs that we all pay. For instance, using data from several years ago, the direct costs associated with obesity alone were estimated to account for nearly 10% of all U.S. health care expenditures.<sup>26</sup> Most of these costs are due to type 2 diabetes, coronary heart disease, and hypertension.<sup>27</sup>

Here in Maine, it is estimated that we spend roughly \$0.5-1.0 billion in health care dollars<sup>28</sup> to pay for this epidemic. Adult obesity in Maine is estimated to cost 11% of the state's Medicaid expenditures, or roughly \$137 million per year.<sup>29</sup> This is a very conservative estimate of the fiscal impact of high body mass indexes on Maine's Medicaid system when one considers that it relies on 1998-2000 data and that it only analyzes adult obesity, not overweight adults and not youth (who comprise a large proportion of the Medicaid population).

The good news about the impact of obesity and overweight is that even modest weight losses of 5-10% of body weight improve many of the medical indicators affected by being overweight or obese, such as glucose tolerance, high blood cholesterol, and blood pressure.<sup>30</sup>

## CAUSES OF OBESITY

Although there are many underlying factors such as psychosocial, emotional, and genetic factors that may contribute to people being overweight or obese, the two main biological causes are too many calories consumed and/or too few calories expended. In other words, calories in should equal calories out. Therefore, poor nutrition and/or physical inactivity are the two main biological contributors to this epidemic. Indeed, there is much evidence showing that we as a population are consuming more calories and expending fewer of them than in the past.

### *Physical Inactivity*

Changes in our levels of physical activity are easiest to picture when we look at the difference between our society 100 years ago and today. We've moved from walking, with our streets primarily used for pedestrians and horses, to driving in cars to fulfill most of our transportation needs. While 100 years ago our daily lives were spent laboring on farms, most of our jobs now require sitting at a desk. While 100 years ago our playtime was often spent with pets and balls, we now have substituted televisions, video games, and computers.

The proliferation of screen use for entertainment (i.e., television, video games, and computers) and the

loss of walkable communities are two major factors that appear to contribute to our physical inactivity.

**Screen Use.** According to a 1999 Kaiser Family Foundation study, American children ages two-18 spend an average of four hours per day watching television or videotapes, playing video games, or using a computer. Most of this time (more than two hours) is spent watching television. Most alarming, almost one in five children watch more than five hours of television per day.<sup>31</sup> Studies show the prevalence and risk of obesity is highest among those youth with the largest amount of screen time, and that decreasing screen time activities results in decreasing body mass indexes.<sup>32,33,34</sup>

Maine data also confirm this proliferation of screen use. For instance, on an average school day, one in three (32%) Maine high school students watch three or more hours of television. Nearly two-thirds (64%) use a computer for fun or play video games for at least one hour per day.<sup>35</sup>

**Walkability of Communities.** A number of studies point to the environmental influences contributing to physical inactivity. For instance, research shows that people walk more when they live in communities that have greater housing and population density and more street connectivity. People are more active in neighborhoods that are perceived as safe and that have recreational facilities nearby.<sup>36</sup> Studies also show that the absence of public outdoor facilities that promote physical activity (such as trails, basketball or tennis courts, and swimming pools) is significantly associated with the incidence of overweight people.<sup>37</sup>

In 1960, six out of 10 U.S. workers commuted to work by car, and one in 10 walked. In 2000, nine out of 10 commuted to work by car, only three in 100 walked, and only one in 100 bicycled (not asked in 1960).<sup>38</sup> Additionally, today approximately one-quarter of all trips are less than one mile, yet three-quarters of these are accomplished by car.<sup>39</sup>

With the increased use of screens for entertainment and the loss of our walkability infrastructure, the result is that 27% of Maine and American adults report no leisure-time physical activity, and 74% report they

do not engage in the level of leisure-time physical activity recommended by the Centers for Disease Control and Prevention of at least 30 minutes of moderate physical activity on most days of the week.<sup>40</sup>

### *Poor Nutrition*

Changes in our nutrition also are easiest to picture when we look at differences between our society 100 years ago and today. Over the last century we have exchanged a dinner table with mostly locally grown produce and meats for a table with many mass-produced and processed foods that often have added fats and sugars, and are much more cheaply and easily available than fresh produce. Instead of being filled with milk and water, our glasses are more likely to be filled with a variety of sweetened beverages, again, often more cheaply available than milk. We also are more likely to eat outside of our homes. In fact, 48% of the current American family's food budget is spent purchasing meals away from home, comprising one-third of adults' and children's caloric intake in the United States.<sup>41,42</sup>

Data indicate we are consuming more and too many calories. In just 13 years (1984-1997) calories consumed in the United States have increased 15% on a per capita per day basis, with a concurrent decrease in physical activity.<sup>43</sup> If this increase in calorie consumption were accompanied by no changes in calories expended (i.e., physical activity), then an average of about 15-30 pounds would be gained each year by every person in the United States. It is no wonder, then, that this overweight/obesity epidemic has unfolded so quickly over the past 20 years.

How has the type of calorie consumed changed in recent years? Nearly 90% of our increased caloric intake is due to a higher consumption of carbohydrates and fats. Sixty-five percent of the increase in calories is due to higher consumption of carbohydrates such as refined grains and added sugars, and 23% is due to higher consumption of added fats.<sup>44</sup>

Studies also show that with the proliferation of quick service (fast food) restaurants, there also has been some related calorie increases. For instance, a study published in *Pediatrics* showed that an estimated 30% of U.S. children eat fast food in a given day. And, on the

days children eat fast food, an additional 187 calories (kcal) are consumed. Additionally, among young white adults, eating fast food more than twice per week is associated with an 86% increased risk of becoming obese.<sup>45</sup>

**Portion Sizes.** Although there are many nutritional factors that help to explain the increasing rates of poor nutrition among U.S. adults and children, there are several that have been studied and/or well-documented. One—increasing portion sizes—is evident both at home and in eating establishments. There is evidence that factors such as the easy availability of inexpensive high-calorie foods, the increasing variety of palatable foods, the increasing sizes of food units (such as the increasingly larger size of an average cookie, muffin, or bagel today), and the increasing number of meals and calories eaten outside of the home all contribute to the consumption of increasing portion sizes.<sup>46,47</sup>

For example, in 1957, a typical fast-food hamburger contained just over one ounce of cooked meat, compared to six ounces 40 years later. In the 1950s, Coca-Cola was packaged in 6.5 ounce bottles; today, single-serving sizes are typically 12 or 20 ounces. The 7-Eleven Double Gulp is a 64-ounce soda containing close to 800 calories (kcal), which represents more than one-third of the number of calories recommended for a daily intake. Such larger sizes are common in theaters and in retail establishments and often are promoted as bargains—the more you buy, the less you pay per unit.<sup>48,49,50</sup>

Portion sizes that are too large are felt to have a disproportionately deleterious effect on children, who are much more responsive to their environmental cues than adults. As a result, the cues that large portion sizes give them are more likely to elicit overeating.<sup>51</sup>

**Consumption of Soda and Other Sweetened Beverages.** Soda consumption is another factor that has been studied and appears to be one of a number of contributing factors to our poor nutrition, especially among youth. In the United States, the largest source of added sugars is non-diet soft drinks (soda or pop).<sup>52</sup> According to the U.S. Department of Agriculture, 69% of American boys ages 12-19 consume soft drinks on a given day. Among those who drink soft drinks,

an average of 868 cans per year is consumed, 95% of which is non-diet. Among the 62% of girls in this age group who drink soft drinks, an average of 627 cans per year is consumed, 90% of which is non-diet.<sup>53</sup>

Soda consumption is not just an issue among our adolescents. For children in grades 4-6, sweetened beverages now comprise over half of the average daily intake of beverages. Those children with the highest average consumption of sweetened beverages consume 330 more calories per day than those who do not drink sweetened beverages. Consumption of sweetened beverages also is associated with the consumption of high-fat foods and fewer healthy foods such as fruits and milk.<sup>54,55</sup>

Consumption of sweetened drinks in children has been found to be associated with increasing body mass index and obesity.<sup>56</sup> And, recently a study from Great Britain showed that a campaign aimed at reducing soda consumption among youth prevented excessive weight gain.<sup>57</sup>

Although there are a number of other nutrition-related factors linked with the overweight/obesity epidemic, soda provides us with one example of how the complexities of market forces (i.e., relatively high profit margins, youth-oriented mass marketing, resulting high demands) have resulted in beverages such as milk and water being replaced with non-nutritious beverages such as soda. Not surprisingly, analyses suggest that body mass indexes have trended upward with increases in the consumption of fast foods and soft drinks, portion sizes, and food industry advertising (to its current approximate level of \$26 billion annually).<sup>58,59</sup>

## WHAT CAN BE DONE ABOUT OBESITY?

The overweight/obesity epidemic is one of the most complex health issues of our time since it is interwoven throughout the fabric of our society. Although there is much emphasis on the role of personal responsibility, as with most significant and complex public health issues, the environments in which we live, work, play, and attend school contribute heavily to the problem. Therefore, effective solutions will require a balance of personal and societal responsibility.

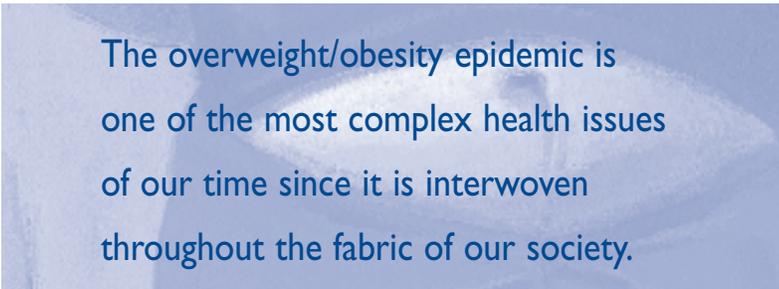
The impact of such social changes cannot be understated. As leading nutrition experts have stated, "...when it comes to obesity, our society's environment is 'toxic.'"<sup>60</sup> Dr. Phil McGraw, a popular author and television host, promotes the idea of people losing weight by creating "no-fail" environments for themselves.<sup>61</sup> However, for many, especially those at highest risk for obesity, it is nearly impossible for them to effectively create such environments. For instance, they may live in unwalkable neighborhoods; they may not have the funds or gas money to join a health club; they may have little flexibility and opportunities at their workplace; and they may not have the funds to purchase enough fresh fruits and vegetables, especially in the winter.

As a senior official at the Centers for Disease Control and Prevention stated, "environmental changes to promote physical activity are essential: we must restore physical education in schools, develop and promote worksite-based physical activity programs, and adopt alternatives to car use in communities."<sup>62</sup> As we enter the demographic explosion of elders, creating communities that promote healthy aging becomes even more important. For individuals, maintaining a healthy weight, engaging in appropriate physical activity, and eating healthy are critical strategies for healthy aging, even if these strategies are started during the elder years. The impact of even mild increases in physical activity and good nutrition in older adults is quick and significant. For instance, one study showed that among adults over 40, for each day of the week they are physically active, health care costs are reduced by 5% within an 18-month period. Therefore, a full week of physical activity results in a 35% reduction.<sup>63</sup>

Thus, there is a wide breadth of social responsibility needed to effectively address obesity. It will take many sectors of society working together to have a substantial impact on this epidemic. For instance, our health care system needs to fully recognize that being overweight or obese is a disease to be screened for and treated using similar strategies to those used for cancer and heart disease. Our workplaces, schools, and places serving elders need to help provide easier opportunities for physical activity. Social norms need to be changed making it more acceptable to remove screens (televisions, video games, computers) from children's

bedrooms, to ensure healthy foods are always available at social and group-eating situations, and to construct walkable streets and neighborhoods.

Similar to the effort launched to combat tobacco use, many have called for a multifaceted, concerted effort to combat obesity. One analysis concluded, "given that such spending [obesity-related] now rivals spending attributable to smoking, it may be increasingly difficult to justify the disparity between the many interventions that have been implemented to reduce smoking rates and the paucity of interventions aimed at reducing obesity rates."<sup>64</sup>



The overweight/obesity epidemic is one of the most complex health issues of our time since it is interwoven throughout the fabric of our society.

#### POLICY SOLUTIONS TO OBESITY

Policy interventions at all levels play a critical role in affecting the social changes needed to re-integrate health into the fabric of our society. The major goal of local, state, and federal policies should be to make it easier for all of us, especially those at highest risk for obesity, to make healthier choices pertaining to physical activity and nutrition. These policies should generally entail an expansion of choices, not limitations.

Policies can achieve results in several ways, including: requiring a behavioral change on the part of individuals (e.g., seat belt laws); directly changing the environment (e.g., water fluoridation); requiring a behavioral change that then changes the environment (e.g., public smoking restrictions); and requiring organizational policy changes that lead to behavioral changes (e.g., insurance mandates to cover nutritional counseling).<sup>65</sup>

In Maine, a number of local policies are promoted by the Healthy Maine Partnerships, a tobacco settlement-funded network of community organizations working to

address tobacco addiction, physical inactivity, and poor nutrition in 31 communities across Maine.<sup>66</sup>

Although a number of potential policies have been proposed to address obesity, what follows are some examples of those suggested in the public health and medical literature.

The major goal of local, state, and federal policies should be to make it easier for all of us, especially those at highest risk for obesity, to make healthier choices pertaining to physical activity and nutrition.

### *Food Policies*

**Healthy Options Food Policies.** Civic organizations and employers can ensure that when food or beverages are served (such as at church coffee hours and social or business club meetings), healthy choices are available. For example, organizations may want to consider adopting a healthy options food policy. This kind of policy does not mean that such foods as donuts and soda cannot be served—they simply give some assurance that healthier options are as easily available.<sup>67</sup>

**Labeling of Foods.** Several national nutrition experts promote improved food labeling with easy-to-read and interpret information on calorie and fat content on food product packaging and/or on menus and menu boards in the case of mass-produced food products distributed and prepared through chain quick-service restaurants. These experts point out that as a result, consumers can be more aware of what they are purchasing at the point of decisionmaking, including the “value” of purchasing larger portions when eating away from home.<sup>68,69,70</sup>

### *Transportation Policies*

**Walkable Neighborhoods.** Neighbors can take measures to calm traffic and make streets more useable for multiple activities besides automobile traffic. Examples include creating more street-side activities, moving chairs and benches next to the street, and placing speed bumps and signs.<sup>71</sup>

**Town Planning.** Town planning boards can implement comprehensive plans that include policies to ensure that new or newly paved streets have sidewalks or paved shoulders, neighborhood traffic is slowed to promote walkability, multi-use trail systems are developed, and sprawl is managed in ways that help build areas for pedestrian use. Many of these strategies also have the secondary effect of promoting community connectivity.<sup>72</sup>

**State and Federal Transportation Policies.** Obesity experts often point to our country’s transportation infrastructure as being car-driven and providing few easy opportunities for walking and biking (the use of “walking” here also means the use of wheelchairs). They point to several initiatives that could help retool our infrastructure. However, since financing these changes requires significant resources, often the funding source is discussed along with the types of infrastructure retooling.

For instance, gas tax-generated transportation funds can be allocated to alternative transportation programs such as multi-use trails and bike/walking lanes on roads. Other suggestions include allocating funds for comprehensive planning to enable communities to develop explicit plans for preventing sprawl and creating more walkable communities. In some states, revenues for such projects come from state gas taxes. Some use an analogy between tobacco taxes used for public health programs to combat tobacco-related diseases and proposals to use gas and soda taxes for initiatives to combat obesity.<sup>73</sup>

Maine’s federal highway funds, generated by federal gas taxes, primarily go to highways, but over the past few years, increasing amounts are spent on

paving shoulders and building sidewalks. In 2003 the Maine Department of Transportation added about 200 miles of new paved shoulders statewide.

Federal enhancement funds also can go towards bicycle and pedestrian projects. However, these funds require state and local matches. In fiscal year 2004, a total of about \$8.6 million was spent in Maine through this program, mainly to build multi-use paths in southern Maine communities such as Augusta, Portland, and Brunswick.<sup>74</sup> Other localities have had difficulties coming up with the required 20% match. The Maine Department of Transportation also has produced bicycle maps and materials to promote multiple uses of our roads and trails.<sup>75</sup>

Jeff Miller, Executive Director of the Maine Bicycle Coalition,<sup>76</sup> comments that “it is imperative that we round out our transportation infrastructure to make it easier for Maine people to use their bikes or feet as part of their daily routine—commuting to work or school, visiting with friends, or running errands at the store. The goal is to bring biking and walking back on par with our car use. The last 40 years of design and construction of our transportation infrastructure has been focused on automobiles, so it is no surprise that we are now so dependent on our cars.”

He adds, “There are a myriad of benefits to bringing walking and biking back on par with car use. For instance, there are social and quality of life benefits such as less sprawl and more connectivity, economic returns [see the 2001 Maine Department of Transportation study which shows that over \$66 million is generated annually from bicycle tourism in Maine annually], and environmental public health benefits from reduced fuel emissions.” He concludes, “It’s time for us to complete the streets so that every roadway in Maine is truly a shared-use facility.”

Maine’s Constitution requires the state’s gas tax revenues be expended solely for highways and bridges as well as traffic law enforcement. It does not allow state gas tax revenue to be used for multi-use trails and other such initiatives.<sup>77</sup> When asked about dedicating some funds from the state’s gas tax for alternative transportation uses, Jeff Miller states, “We need to look at

every opportunity available to us to encourage biking and walking so, in that light, the state gas tax should be fully considered. It also provides a unique and important prospect, especially since it could allow Maine to draw down significantly more federal transportation funds, to give our poorer and rural towns a better chance of building multi-use trails, sidewalks, and paved shoulders. They currently often do not have the matching funds that are required by the federal programs available for these types of initiatives.”

### *School Policies*

**Local Policies.** Schools can implement a coordinated school health program, which is a system designed to connect health with education through eight main policy-related strategies:

- involving youth, parents, and communities;
- implementing comprehensive school health education K-12;
- offering effective physical education and physical activity programs;
- offering school counseling as well as physical and behavioral health services;
- ensuring foods and snacks available at school are nutritious;
- offering worksite health promotion programs for staff;
- ensuring the physical environment of the school and grounds is safe and healthy; and
- creating and maintaining a positive, healthy, and respectful atmosphere at school.<sup>78</sup>

Some examples of specific school policies that have been suggested include: screening children for body mass index with appropriate referrals to health care providers; providing guidelines for parents and children on what is appropriate and healthy for lunches and snacks that are brought from home; eliminating à la carte meals and ensuring that all food and beverages

served or offered are nutritious, balanced, and portioned appropriately; and eliminating advertising in schools.

**State and Federal Policies.** Maine, like many states, has a strong tradition of local control over its schools. However, many in public health have made the argument that a number of school-related policies regarding physical activity and nutrition need to be made at the state or federal level so all children are assured equal access to healthy choices.

A number of schools across the country have changed their policies in terms of what is served in vending machines. Several states and municipalities also have passed or considered policies to remove soda from vending machines, and the Maine Department of Education is promulgating such a rule. The American Academy of Pediatrics urges its members in its policy statement on soft drinks in schools: “Pediatricians should work to eliminate sweetened drinks in schools.” This includes soft drinks and fruit drinks (that are not 100% fruit juice).<sup>79</sup>

Other examples of suggested school-related policies include: requiring the curriculum for health education teachers to include obesity-related subjects; including obesity-related questions to be asked on children’s educational assessment tests; banning private industry advertising in school settings; and requiring the reporting of aggregate (non-identified) body mass index data from certain grades (in order to assist public health officials with assessing the overall progression of obesity).<sup>80</sup>

### *Worksite Policies*

Employers can assure that employees have easy opportunities during the workday to participate in physical activity and good nutrition or related health activities. Examples include:

- allowing flexible breaks or working hours and designating someone to help implement such programs as “Move and Improve” or “March Into May”;
- ensuring healthy foods are easily available where and when food is served;

- allowing onsite Weight Watchers or other such programs;
- participating in worksite wellness programs such as USM’s Lifeline or initiatives suggested by “Good Work!”;
- creating incentives for workers to achieve and maintain a healthy weight;
- ensuring that weight management and physical activity counseling is a member benefit in health insurance contracts;
- providing protected time for lunch; and
- creating work environments such as breastfeeding rooms that promote and support breastfeeding (since breastfeeding is associated with reduced overweight in children).<sup>81,82</sup>

### *Taxation*

Some nutrition experts point out that taxation policies can make healthy foods more affordable and relatively unhealthy foods less affordable. Pricing policies can have an effect by themselves of boosting consumption of healthier foods. For instance, lowering by half the prices of fruits and vegetables in high school vending machines and cafeterias has been shown to double their sales.<sup>83</sup> One such study concluded that “reducing prices on healthful foods is a public health strategy that should be implemented through policy initiatives and industry collaborations.”<sup>84</sup> Another analysis suggests that “the government could adopt policies to decrease the prices of more healthful foods and increase the prices of foods high in energy.”<sup>85</sup>

It has been suggested that taxes be levied on soft drinks (often the syrup is taxed) or candy and on other foods high in calories, fat, or sugar to help fund programs that will in turn address obesity, therefore augmenting any effect of price increases alone. Some suggestions of such programs have included those focused on boosting consumption of healthier foods and physical activity; health programs to help prevent and treat obesity; and programs to help preserve family farms.<sup>86</sup>

A 2000 study published in the *Journal of the American Public Health Association* showed that 18 states had specific taxes on soft drinks and most also included candy and some other snack items. The authors noted that relatively small taxes on these items could be used for public health programs to combat obesity, especially given the hundreds of millions spent on marketing these products that in turn contribute significantly to obesity.<sup>87</sup>

Using 1997 data, one analysis estimated that each of the following examples could generate \$1 billion per year nationally: \$0.0067 (2/3 penny) tax per 12 ounce soft drink; a 5% tax on new televisions and video equipment; and a \$65 tax on each new motor vehicle or an extra penny per gallon of gasoline. The author of this analysis suggests that these taxes in of themselves could promote healthy behaviors and the funds could be used to address obesity in a variety of ways.<sup>88</sup>

### *Policies that Affect Health Care*

State and federal policies can have a significant impact on the way the health care system addresses obesity. Government can exert leverage over the health care system via several means, including:

- through regulatory authorities (e.g., certificate of need approvals, facility and professional licensing, and regulations over the insurance industry);
- the creation of financial incentives (e.g., Medicaid and Medicare reimbursement levels); and,
- provision of government funding for public health programs and medical research.

A number of experts have suggested that government use these tools to address obesity. Some examples include insurance mandates for nutrition and physical activity counseling, and regulatory and/or financial incentives for the health care system to implement effective systems (such as the chronic care model) to address obesity and related chronic diseases.<sup>89,90</sup>

A significant step was taken at the federal level in July 2004 when Medicare announced that it will classify obesity as an illness, thus paving the way for improved reimbursements by this major insurer.

The health care system itself often implements its own policies by changing its current medical standards of care. These standards of care are critical to addressing obesity since they act as a catalyst for much broader changes. First, they can result in obesity being addressed more effectively in the health care setting. Second, they often put pressure on government and societal policy changes. For example, there is a movement in Maine and nationally to start treating body mass index as a vital sign. In other words, whenever a patient interfaces the medical system, his or her body mass index would be measured and noted in the medical record.

...there is a movement in Maine and nationally to start treating body mass index as a vital sign.

### *Limiting Marketing to Children*

A number of experts have started calling for limitations on advertising and marketing to children. For instance, a study on the effects of fast foods on children published in 2004 in *Pediatrics*, the journal of the American Academy of Pediatrics, concluded that "...measures to limit marketing of fast food to children may be warranted."<sup>91</sup> An editorial in this same journal stated: "The nation's children deserve protection from damaging forces. There are early signs of bold action among policymakers to decrease exposure of children to the toxic food and physical-inactivity environment. On the horizon are actions such as removing fast food, snack food, and soft drinks from schools, curbing food advertising directed at children, and enhancing opportunities for physical activity."<sup>92</sup>

The American Public Health Association also issued a policy statement in 2004 calling for legislation to ban food advertising to children from schools and children's television.<sup>93</sup>

After three years' of work, a task force of the American Psychological Association released its find-

ings in 2004, along with a call for new policies to ban advertisements to children less than eight years of age, especially of harmful or unhealthful products. They cited such evidence as:

- the growth in advertising to children to more than \$12 billion annually with comparatively few dollars spent on public health campaigns on such topics as nutrition (only \$1 million is spent nationally on the 5-A-Day Campaign to promote fresh fruits and vegetables to the adult and youth populations);

It took a century for the obesity epidemic to unfold, yet we cannot afford as many years to rebuild health into society.

- increases in children's advertising exposure (such as from bedroom televisions and computers and amount of time using them for entertainment);
- the inability of young children under eight to understand the persuasive intent of advertising, such as to distinguish advertising from program content and to recognize the bias in advertisements;
- evidence that advertisements to children work to influence their purchasing preferences as well as their parents';
- increases in parent-child conflict precipitated by advertising;
- the high percentages of advertisements aimed at children that feature non-nutritious foods, and the association of these products with obesity.<sup>94</sup>

While some have called for broad-based bans on advertising to children, others have recommended that advertising of high-calorie low-nutrient foods be the

focus of restrictions or that broadcasters provide equal time for messages promoting healthy eating and physical activity.<sup>95</sup> Several national nutrition experts point out that young children not only have little capacity to determine the validity of marketing messages but also are disproportionately influenced by their environments.<sup>96</sup>

Promoters of such bans often note that Sweden, Norway, Canada, Australia, and Great Britain already regulate—to some degree—advertisements aimed at children. Sweden's strictest multimedia advertising bans apply to children under 12 years of age, while less strict bans apply to those under 16. Several leading proponents of these types of restrictions feel that without them, children and parents' food choices are defined and limited by the food industry's marketing. In the words of the Swedish government, "children have the rights to safe zones."<sup>97</sup>

## CONCLUSION

It took a century for the obesity epidemic to unfold, yet we cannot afford as many years to rebuild health into our society. We have built obesity into the fabric of our society—into our neighborhoods, our workplaces, and our schools. Obesity is built into our food industry, our transportation infrastructure, and our town planning. Indeed, throughout our communities the cards are stacked against us to make healthy choices.

Many people increasingly are realizing the importance of making lifestyle changes to get to and maintain a healthy weight. However, in order for us to make lifestyle changes, we also need to make community-style changes. Policies are a critical strategy to make these community-style changes.

With the aging of our population (and the capacity for improved physical activity and nutrition to quickly and positively impact the health status of our elders), and with the strong associations of disability and low income with obesity, it is particularly important that organizations working with these populations implement policies that ensure and promote easy access to healthy choices.

The author's desire is that this review of possible policies suggested by the public health and medical

literature will serve as a catalyst for continuing discussions about how we should effectively address this most critical epidemic. Hopefully, policies that are appropriate for Maine will be implemented.

Policy goals to address obesity should primarily focus on building healthier communities. As a result, all of us will have easier access to healthy choices where we live, play, work, and attend school. Indeed, health will be rebuilt into the fabric of our communities, and we will all have improved opportunities to live longer and healthier lives. 🐟



**Dora Anne Mills** is the chief medical officer and director of the Bureau of Health in the Maine Department of Health and Human Services, a position she has held since 1996. She is a graduate of the University of Vermont College of Medicine, Children's Hospital of Los Angeles Pediatric Residency Program and the Harvard School of Public Health. She has practiced medicine in Tanzania, East Africa, Los Angeles, and Farmington, Maine.

## ENDNOTES

1. Bureau of Health, Maine Department of Human Services. 2002 Estimates of Chronic Disease Costs in Maine.
2. Mokdad, A.H., J.L. Marks, D.F. Stroup, and J.L. Gerberding. *Journal of the American Medical Association*. 291 (2004):1238-45.
3. Bureau of Health, Maine Department of Human Services. *Epidemiology Estimates of Health Care Costs of Obesity*. 2003.
4. National Institutes on Health, National Heart, Lung, Blood Institute. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*. U.S. Department of Health and Human Services, Public Health Service. (1998): 23.
5. Lombard, Ken. Maine Medical Center. Information from talk given May 5, 2004 at Women and Obesity Conference, Portland, Maine.
6. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey. "Healthy Weight, Overweight, and Obesity Among U.S. Adults." <http://www.cdc.gov/nchs/nhanes.htm>
7. *Ibid.*
8. Bureau of Health, Maine Department of Human Services and U.S. Department of Health and Human Services, Centers for Disease Control. Behavioral Risk Factor Surveillance System.

9. National Center for Health Statistics, Centers for Disease Control and Prevention. "Prevalence of Overweight Among Children and Adolescents: United States, 1999." <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/over99fig1.htm>
10. Bureau of Health, Maine Department of Human Services. Maine Behavioral Risk Factor Surveillance System. 2002.
11. U.S. Census Bureau 2000 data. <http://www.factfinder.census.gov>
12. Bureau of Health, Maine Department of Human Services. Maine Behavioral Risk Factor Surveillance System. 2002.
13. Bureau of Health, Maine Department of Human Services. Maine Behavioral Risk Factor Surveillance System. 2003.
14. Eberhardt, M.S., D.D. Ingram, D.M. Makuc, et al. *Urban and Rural Health Chartbook*. Hyattsville: National Center for Health Statistics. (2001): 256.
15. U.S. Department of Agriculture. "Profile of Overweight Children." *Nutrition Insights*. Washington: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion. 13 (May 1999). <http://www.usda.gov/cnpp>.
16. Mokdad, A.H., J.L. Marks, D.F. Stroup, and J.L. Gerberding. *Journal of the American Medical Association*. 291 (2004):1238-45.
17. National Institutes of Health, National Heart Lung Blood Institute. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*. U.S. Department of Health and Human Services, Public Health Service. (1998): 23.
18. Fontaine, K.R., and S.J. Bartlett. "Estimating Health-related Quality of Life in Obese Individuals." *Disease Management & Health Outcomes*. 3.2 (1998): 61-70.
19. Bureau of Health, Maine Department of Human Services. Maine Behavioral Risk Factor Surveillance System. 1994-2002.
20. Calle, E., C. Rodriguez, K. Walker-Thurmond, and M. Thun. "Overweight, Obesity, and Mortality from Cancer in a Prospectively Studied Cohort of U.S. Adults." *New England Journal of Medicine*. 348.17 (April 24, 2003): 1625.
21. Freedman, D., W. Deitz, S. Srinivasan, and G. Berenson. "The Relation of Overweight to Cardiovascular Risk Factors Among Children and Adolescents: The Bogalusa Heart Study." *Pediatrics*. 103.6 (1999): 1175-82.
22. Wang, G., and W. Dietz. "Economic Burden of Obesity in Youths Aged 6 to 17 years: 1979-1999." *Pediatrics*. 109.5 (May 2002).
23. Dietz, W.H. "Health Consequences of Obesity in Youth: Childhood Predictors of Adult Disease." *Pediatrics*. 101.3 (March 1998): 518-25.
24. Wang, G., and W. Dietz. "Economic Burden of Obesity in Youths Aged 6 to 17 years: 1979-1999." *Pediatrics*. 109.5 (May 2002).
25. Schwimmer, J.B., T.M. Burwinkle, and J.W. Varni. "Health-related Quality of Life of Severely Obese Children and Adolescents." *Journal of the American Medical Association*. 289.14 (2003):1813-19.
26. Mokdad, A., B. Bowman, E. Ford, F. Vinicor, J. Marks, and J. Koplan. "The Continuing Epidemic of Obesity and Diabetes in the United States." *Journal of the American Medical Association*. 286.10 (2001):1195-200.
27. Wolf, A. "What is the Economic Case for Treating Obesity?" *Obesity Research*. 6.1 (1998): 2-7.
28. Bureau of Health, Maine Department of Human Services 2003 estimates.
29. Finkelstein, E.A., I.C. Fiebelkorn, and G. Wang. "State-level Estimates of Annual Medical Expenditures Attributable to Obesity." *Obesity Research*. 12.4 (January 2004): 4.
30. Koplan, J., and W. Dietz. "Caloric Intake and Public Health Policy." *Journal of the American Medical Association*. 282.16 (October 27, 1999): 1579-81.
31. Kaiser Family Foundation. "Kids and Media at the New Millennium: A Comprehensive National Analysis of Children's Media Use." November 1999. [http://www.kff.org/entmedia/upload/13263\\_1.pdf](http://www.kff.org/entmedia/upload/13263_1.pdf)
32. Robinson, T. "Reducing Children's Television Viewing to Prevent Obesity." *Journal of the American Medical Association*. 282.16 (October 27, 1999): 1561-67.
33. Gortmaker, S.L., A. Must, A.M. Sobol, K. Peterson, G.A. Colditz, and W.H. Dietz. "Television Viewing as a Cause of Increasing Obesity Among Children in the United States, 1986-1990." *Archives of Pediatrics and Adolescent Medicine*. 150 (1996): 356-62.

34. Crespo, C.J., E. Smit, R.P. Troiano, S.J. Bartlett, C.A. Macera, and R.E. Anderson. "Television Watching, Energy Intake, and Obesity in U.S. Children: Results from the Third National Health and Nutrition Examination Survey, 1988-1994." *Archives of Pediatrics and Adolescent Medicine*. 155 (2001): 360-65.
35. Maine Department of Education. Maine Youth Risk Behavior Survey, 2003.
36. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. "Promoting Better Health for Young People Through Physical Activity and Sports: A Report to the President from the Secretary of Health and Human Services and the Secretary of Education." Fall 2000.
37. Catlin, T.K., E.J. Simoes, and R.C. Brownson. "Environmental and Policy Factors Associated with Overweight Among Adults in Missouri." *American Journal of Health Promotion*. 17.4 (March/April 2003): 249-58.
38. Census Bureau, 1960 and 2000 census data. <http://www.census.gov>
39. Koplan, J., and W. Dietz. "Caloric Intake and Public Health Policy." *Journal of the American Medical Association*. 282.16 (October 27, 1999): 1579-81.
40. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Bureau of Health, Maine Department of Health and Human Services. Behavioral Risk Factor Surveillance System, 2002.
41. Clauson, A. "Spotlight on National Food Spending." *Food Review*. 23.3 (2000):15-17.
42. Putnam, J., and J. Allshouse. "Food Consumption, Prices and Expenditures, 1970-1997." U.S. Department of Agriculture, Statistical Bulletin No. 965. April 1999.
43. Blumenthal, S., J. Hendi, and L. Marsillo. "A Public Health Policy Approach to Decreasing Obesity." *Journal of the American Medical Association*. 288.17 (2002): 2178.
44. Putnam, J., L.S. Kantor, and J. Allshouse. "Per Capita Food Supply Trends: Progress Toward Dietary Guidelines." *Food Review*. 23.3 (2000): 2-14.
45. Bowman, S.A., S.L. Gortmaker, C.B. Ebbeling, M.A. Pereira, D.S. Ludwig. "Effects of Fast-food Consumption on Energy Intake and Diet Quality Among Children in a National Household Survey." *Pediatrics*. 113 (2004):112-17.
46. Rolls, B. "The Supersizing of America: Portion Size and the Obesity Epidemic." *Nutrition Today*. 38.2 (March/April 2003): 42-53.
47. Nielson, S.J., and B.M. Popkin. "Patterns and Trends in Food Portion Sizes, 1977-1998." *Journal of the American Medical Association*. 289.4 (2003): 450-53.
48. Young, L.R., and M. Nestle. "The Contribution of Expanding Portion Sizes to the U.S. Obesity Epidemic." *American Journal of Public Health*. 92.2 (2002): 246-49.
49. Nicklas, T.A., T. Baranowski, K.W. Cullen, and G. Berenson. "Eating Patterns, Dietary Quality and Obesity." *Journal of the American College of Nutrition*. 20.6 (2001): 599-608.
50. Nestle, M., and M. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach." *Public Health Reports*. 115 (January/February 2000): 12-24.
51. Rolls, B.J., D. Engell, and L.L. Birch. "Serving Portion Size Influences 5 Year Olds but not 3-Year-Old Children's Food Intakes." *Journal of the American Dietetic Association*. 100.2 (2000): 232-34.
52. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Nutrition and Your Health: Dietary Guidelines for Americans*. 5th ed. Washington, 2000. <http://www.health.gov/dietaryguidelines>
53. U.S. Department of Agriculture, Agricultural Research Service. "Data Tables: Results from USDA's 1994-1996 Continuing Survey of Food intakes by Individuals and 1994-1996 Diet and Health Knowledge Survey." 1997. <http://www.barc.usda.gov/bhnrc/foodsurvey/>
54. Cullen, K., D. Ash, C. Warneke, and C. Moor. "Intake of Soft Drinks, Fruit-flavored Beverages, and Fruits and Vegetables by Children in Grades 4 through 6." *American Journal of Public Health*. 92.9 (2002): 1475-578.
55. Harnack, L., J. Strang, and M. Story. "Soft Drink Consumption Among U.S. Children and Adolescents: Nutritional Consequences." *Journal of the American Dietetic Association*. 99.4 (1999): 436-41.

56. Ludwig, D., K. Peterson, and S. Gortmaker. "Relation Between Consumption of Sugar-sweetened Drinks and Childhood Obesity: Prospective, Observational Analysis." *Lancet*. 357 (February 17, 2001): 505-08.
57. <http://www.bmjournals.com/content/vol328/issue7446/>
58. Dietz, W. "Battling Obesity: Notes from the Front." *Chronic Disease Notes and Reports*. United States Department of Health and Human Services, National Center for Chronic Disease Prevention and Promotion. 13.2 (Winter 2000): 2.
59. Blumenthal, S.J., J.M. Hendi, and L. Marsillo. "A Public Health Approach to Decreasing Obesity." *Journal of the American Medical Association*. 288.17 (November 6, 2002): 2178.
60. Nestle, M., and M.F. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach." *Public Health Reports*. 115 (January/February 2000): 12.
61. McGraw, P.C. *The Ultimate Weight Solution: The 7 Keys to Weight Loss Freedom*. Simon and Schuster, 2003.
62. Dietz, W. "Battling Obesity: Notes from the Front." *Chronic Disease Notes and Reports*. United States Department of Health and Human Services, National Center for Chronic Disease Prevention and Promotion. 13.1 (Winter 2000): 2.
63. Pronk, N.P., M.J. Goodman, P.J. O'Connor, and B.C. Martinson. "Relationship Between Modifiable Health Risks and Short-term Health Care Charges." *Journal of the American Medical Association*. 282: 2235-39.
64. Finkelstein, E.A., I.C. Fiebelkorn, and G. Wang. "National Medical Spending Attributable to Overweight and Obesity: How Much, and Who's Paying?" *Health Affairs*. (May 2000): w3-225.
65. Mensah, G.A., R.A. Goodman, S. Zaza, A.D. Moulton, P.L. Kocher, W.H. Dietz, T. F. Pechacek, and J.S. Marks. "Law as a Tool for Preventing Chronic Diseases: Expanding the Range of Effective Public Health Strategies." *Preventing Chronic Disease*. 1.1 (January 2004): 4. [http://www.cdc.gov/pcd/issues/2004/jan/03\\_0033.htm](http://www.cdc.gov/pcd/issues/2004/jan/03_0033.htm)
66. <http://www.HealthyMainePartnerships.org>
67. <http://www.maine.gov/dhs/boh/hmp/cardiovascularhealth.htm>
68. U.S. Department of Health and Human Services. *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity*. Rockville: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, 2001: 17. <http://www.surgeongeneral.gov/library>
69. Nestle, M., and M.F. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach." *Public Health Reports*. 115 (January/February 2000): 20.
70. Nestle, M. "Increasing Portion Sizes in American Diets: More Calories, More Obesity." *Journal of the American Dietetic Association*. 103.1 (2003): 39-40.
71. "Creating Walkable Communities," produced by the Bicycle Federation of America for the Mid-America Regional Council, December 1998, can be found at <http://www.marc.org/cwctoc.pdf>; <http://www.healthycommunities.org>; <http://www.creativecommunities.com>
72. Resources on these strategies include: <http://www.healthycommunities.org>; <http://www.growsmartmaine.org>; <http://www.sustainable.org>; and <http://www.maine.gov/spo/landuse>
73. *Ibid.*
74. John Balicki, Maine Department of Transportation Bicycle/Pedestrian Coordinator, communication, May 2004.
75. <http://www.maine.gov/mdot>
76. <http://www.bikemaine.org>
77. Constitution of the State of Maine, Article IX, Section 19. <http://www.maine.gov/legis>
78. <http://www.maineacshp.com>
79. American Academy of Pediatrics, Committee on School Health. "Soft Drinks in Schools." *Pediatrics*. 113 (2004): 152-53.
80. Nestle, M., and M.F. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach." *Public Health Reports*. 115 (January/February 2000): 20.
81. For Move and Improve: <http://www.moveandimprove.org>; for March Into May: <http://www.ci.portland.me.us>; for USM's Lifeline Workplace Wellness Services: <http://www.usm.maine.edu/lifeline/work.htm>; and for "Good Work! Linking Health and the Bottom Line: Cost-effective Strategies For Healthier Workplaces": <http://www.healthymainepartnerships.org>

82. U.S. Department of Health and Human Services. *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity*. Rockville: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, 2001: 25. <http://www.surgeongeneral.gov/library>
83. French, S.A., M. Story, R.W. Jeffrey, P. Snyder, M. Eisenberg, A. Sidebottom, and D. Murray. "Pricing Strategy to Promote Fruit and Vegetable Purchase in High School Cafeterias." *Journal of the American Dietetic Association*. 97 (1997): 1008-10.
84. French, S.A. "Pricing Effects on Food Choices." *Journal of Nutrition*. 133.3 (March 2003): 841-43.
85. Nestle, M., and M.F. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach." *Public Health Reports*. 115 (January/February 2000): 21.
86. *Ibid*, 20-3.
87. Jacobson, M.F., and K.D. Brownell. "Small Taxes on Soft Drinks and Snack Foods to Promote Health." *American Journal of Public Health*. 90.6 (June 2000): 854-57.
88. Nestle, M., and M. F. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach." *Public Health Reports*. 115 (January/February 2000): 22.
89. Nestle, M., and M.F. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach." *Public Health Reports*. 115 (January/February 2000): 20.
90. <http://www.improvingchroniccare.org>
91. Bowman, S.A., S.L. Gortmaker, C.B. Ebbeling, M.S. Pereira, and D.S. Ludwig. "Effects of Fast-food Consumption on Energy Intake and Diet Quality Among Children in a National Household Survey." *Pediatrics*. 113 (2004): 112-17.
92. Brownell, K.D. "Fast Food and Obesity in Children." *Pediatrics*. 113 (2004): 132.
93. *2003 American Public Health Association Policies*. <http://www.apha.org/legislative/policy/2003/>
94. Wilcox, B., J. Cantor, P. Dowrick, D. Kunkel, S. Linn, and E. Palmer. "Report of the American Psychological Association Task Force on Advertising and Children: Summary of Findings and Conclusions." February 20, 2004. <http://www.apa.org/releases/childrenads.pdf>
95. Nestle, M., and M.F. Jacobson. "Halting the Obesity Epidemic: A Public Health Policy Approach." *Public Health Reports*. 115 (January/February 2000): 20.
96. Blumenthal, S.J., J.M. Hendi, and L. Marsillo. "A Public Health Approach to Decreasing Obesity." *Journal of the American Medical Association*. 288.17 (November 6, 2002): 2178.
97. Jacobsson, I. "Advertising Ban and Children: 'Children Have the Right to Safe Zones.'" Sweden Institute, 2002. [http://www.sweden.se/templates/Article\\_3143.asp](http://www.sweden.se/templates/Article_3143.asp)