

The Costs and Benefits  
of Implementing  
Proposed Legislation  
to Curb Obesity  
in Maine

---

**Paul Bachman MSIE  
David G. Tuerck, PhD**





The Beacon Hill Institute at Suffolk University in Boston focuses on federal, state and local economic policies as they affect citizens and businesses. The institute conducts research and educational programs to provide timely, concise and readable analyses that help voters, policymakers and opinion leaders understand today's leading public policy issues.

This report is the product of the Beacon Hill Institute alone and does not necessarily represent the views of Suffolk University.

**The Beacon Hill Institute for Public Policy Research  
Suffolk University**

**8 Ashburton Place**

**Boston, MA 02108**

**Phone: 617-573-8750 Fax: 617-720-4272**

**[bhi@beaconhill.org](mailto:bhi@beaconhill.org)**

**<http://www.beaconhill.org>**

**ISBN 1-886320-28-4**

# Table of Contents

Executive Summary .....	4
Introduction .....	5
The Legislative Bills .....	7
Restricting Advertising to Children .....	7
<i>Potential Impact</i> .....	7
<i>Cost to Maine</i> .....	9
<i>Conclusion</i> .....	9
Nutritional Information on Menus and Menu Boards .....	9
<i>Potential Impact</i> .....	9
<i>Cost to Maine</i> .....	10
<i>Conclusion</i> .....	12
BMI Assessments .....	12
<i>Potential Impact</i> .....	12
<i>Cost to Maine</i> .....	13
<i>Conclusion</i> .....	14
Minimum Physical Activity Requirements in Maine Schools .....	14
<i>Potential Impact</i> .....	14
<i>Cost to Maine</i> .....	16
<i>Conclusion</i> .....	16
Cost Assessments .....	16
Alternative Roadways .....	17
Comprehensive Employee Health Program Addressing Obesity .....	17
Conclusion .....	17
Endnotes .....	19
About the Authors .....	25

## Table of Tables

Table ES1: Summary of the Cost and Effectiveness of Proposals to Combat Obesity .....	5
Table 1: Costs to Implement Nutrition Labeling by Restaurants (\$) .....	11
Table 2: Time Maine Students Spend in Physical Education Class .....	15
Table 3: The Cost to Hire New Physical Education Teachers .....	16

## Executive Summary

The number of Americans considered obese has surged over the past few decades, prompting the Surgeon General to declare, “Overweight and obesity have reached nationwide epidemic proportions.”<sup>1</sup> The “epidemic,” its related health problems and subsequent effect on health care costs, has garnered attention in the media and among public policy makers—including state lawmakers in Maine.

In 2004, the Maine Legislature established the Commission to Study Public Health, a panel to examine “the causes of obesity and methods to decrease the cost of health care and increase the public health.”<sup>2</sup> In January 2005, the commission issued 27 recommendations for curbing obesity; legislators subsequently incorporated them into five legislative bills, which are currently under consideration before the Maine House of Representatives and Senate.<sup>3</sup> The bills attempt to curtail obesity rates in Maine through legislative action. They also place new burdens on the resources of businesses, public schools and state agencies.

Prudence argues that the state’s elected representatives should consider these burdens before passing these bills. At the very least, they should seek to answer two questions: Can they reasonably expect the measures contained in the bills to reduce obesity rates in Maine? And will the benefits of achieving the expected reduction in obesity rates exceed the costs – as measured in terms of time and resources, to affected state agencies, businesses and public schools – of passing the bills?

In this report, the Beacon Hill Institute (BHI) endeavors to provide answers to these questions. We focus on four major programs contained in the bills: limiting the advertising and promotion of “unhealthy” foods and beverages to children, conducting Body Mass Index (BMI) measurements, setting minimum physical activity requirements for children in public schools, and requiring

chain-restaurants and public schools to include nutritional information on menus and menu boards.

We perform qualitative and, where possible, quantitative analysis on the plans contained within the legislative bills to determine how effective they will be in reducing obesity in Maine and how costly they will be to implement. We also provide cost estimates for two additional proposals contained in the legislation: dedicating one-percent of the Department of Transportation’s allocation from the Highway Fund to build “alternative roadways,” and dedicating one-half-percent of employee health insurance premiums to support employee health and wellness. Table ES1 contains a summary of our findings.

We estimate that it will cost \$57.4 to \$58.3 million in the first year to implement the six proposals. Determining the effectiveness of some proposals proved difficult since many obesity programs, both public and private, have been implemented only recently, leaving a void of data for analysis, thus making the analysis better suited to a qualitative framework.

- The proposal to increase physical activity requirements for children in public schools offers the best hope of curtailing obesity and of improving the overall health of Maine’s school children, but it also carries with it the highest implementation cost, at \$54 million.
- The proposal to require the labeling of nutritional information on menus and menu boards offers little hope for reducing obesity rates, and will cost restaurants and public schools between \$712 thousand and \$1.6 million.
- The current clinical evidence shows that the proposal to include BMI assessments and behavioral interventions as part of state health



**Table ES1: Summary of the Cost and Effectiveness of Proposals to Combat Obesity**

Proposal Target	Impact on Obesity	Group Incurring Costs	Cost to Implement (\$)
Restrict advertising to children	Small to modest, but results are contested	Maine Broadcasters Children’s programs	NA
Posting nutritional/caloric Information on menus and menu boards	None to small, inconclusive	Restaurants	369,840 -793,040
		Public Schools	341,705 - 807,131
Sub-total	NA	NA	711,545 - 1,600,171
Increase physical activity in public schools	One lb of body weight burned every 3.5 to 17 weeks	Public Schools	54,277,984
Conduct BMI measurements in public schools	Uncertain, depends on the actions of parents	Public Schools	368,000
BMI assessment & consultations for state health insurance coverage	Modest to strong additional weight loss	State government of Maine, dependents of state employees	NA
Construction of alternative roadways	NA	Department of Transportation	1,200,000
Portion of state employee health insurance premium dedicated to health and wellness	NA	State Health Care Fund	875,000
<b>Total Cost</b>			<b>57,432,529 - 58,321,155</b>

insurance programs will provide a modest-to-strong impact on those covered, but the cost remains uncertain.

The other proposals claim only small-to-modest evidence that they will reduce obesity, though at lower costs, in dollar terms, than the minimum physical activity requirement plan.

We conclude that the bills currently before the legislature will have little impact on obesity rates or on the public health of Maine’s citizens. Furthermore, they will pose a heavy financial burden for Maine’s voters and taxpayers. Maine’s legislature needs to carefully deliberate these findings before approving any of the obesity related bills.

**Introduction**

Obesity occurs when an individual retains an excessively high amount of body fat or adipose tissue, relative to lean body mass.

A person is identified as obese if he or she has a body mass index (BMI) above 30 kg/m<sup>2</sup> and as morbidly obese if he or she has a BMI of over 40 kg/m<sup>2</sup>.<sup>4</sup> As an extreme form of being overweight, obesity can pose serious health problems for those individuals afflicted.

Obesity and overweight conditions result from an energy imbalance—on a daily basis more calories are consumed than are burned through physical activity. Thus, poor nutrition and/or physical inactivity are the factors most responsible for the prevalence of obesity today. Other underlying factors including psychosocial, emotional and genetic factors, also contribute to obesity.<sup>5</sup>

Biological factors can increase one’s risk of obesity in a given environment. Since different individuals’ bodies react differently in the same environment, genetics has a role in causing obesity. Typically, members of the same family will have similar body types, but since families also share eating habits and lifestyles, it is difficult to isolate genetic factors. The most important genetic factor contributing to



obesity is the speed of an individual's metabolism. Speed of metabolism affects the amount of fat stored in the body. There are also some rare diseases that lead to obesity, such as Cushing's syndrome. In the United States, obesity rates are higher among African-Americans and Mexican-Americans than among other groups (though this could result more from socioeconomic status and environment than biological factors). Despite genetic factors, people genetically predisposed to obesity can prevent obesity through healthy behavior, just as those not predisposed are still susceptible if they engage in unhealthy habits.<sup>6</sup>

Aside from biology, one's behavior significantly determines one's weight. High caloric intake has helped give rise to obesity, as consumers display an increasing preference for food with little nutritional value, but high in fat content. Moreover, portion sizes in restaurants and at home appear to have increased greatly over the past two decades. Consumption of large portions and empty calories leads many people to overeat.

Along with improper eating, more sedentary lifestyles cause a greater energy imbalance. Busy lives leave people with less time to devote to exercise. Also, technology (cars, computers, cell phones, etc.) has allowed less active lifestyles to become common for many people; the shift to a service economy has moved workers out of jobs requiring physical exertion and into sedentary desk jobs.

Children with busy parents fail to eat nutritious meals at home and often occupy themselves with TV and videogames rather than physical activity. These children are especially prone to obesity, given their unhealthy diets and lack of exercise.

Prevention and treatment of obesity focus on the energy imbalance between food consumption and physical activity. To avoid becoming obese, it is important to

maintain a daily balance between the amount of energy one consumes in food and the amount one burns through physical activity. The initial treatment goal for obesity is a ten-percent reduction in body weight over a six month period. This can be accomplished by creating a calorie deficit of 300 to 1,500 calories per day depending on the sex and weight of the individual. (A deficit of 3,500 calories translates to a loss of one pound of body weight.) After the initial six months, the rate of weight loss will generally decline due to a reduction in a person's energy expenditure experienced at lower weights.<sup>7</sup>

The traditional methods to achieve a calorie deficit involve behavioral programs that combine diet and exercise and are followed up with weight maintenance programs to prevent the lost weight from being regained. Increasingly obese individuals that fail to lose weight through diet and exercise opt for radical measures involving drug therapy and surgical procedures.

The incidence of obesity, and related health conditions, in the United States has exploded in the last few decades. Approximately 187 million (60%) adults are overweight or obese in the United States, of which 60 million are considered obese and 9 million severely obese.<sup>8</sup> Moreover, obesity-related diseases claim the lives of an estimated 300,000 Americans each year and cost \$117 billion annually in related health care spending.<sup>9</sup> According to *Health Report*, an obese person will spend, on average, 37% more on health care costs than a non-obese person.<sup>10</sup>

The Surgeon General included obesity as one of the "Leading Health Indicators in Healthy People 2010, the Nation's health objectives for the first decade of the 21<sup>st</sup> century."<sup>11</sup> Obesity has been associated with over thirty medical conditions, including, but not limited to, diabetes, asthma, liver disease and heart disease. Studies have shown that weight loss of about 10% can lead to improvement of such conditions.<sup>12</sup>





Maine has not escaped the obesity “epidemic.” Currently, Maine has the highest obesity rate in New England: 59% of adults are overweight or obese, and 15% of youth are overweight.<sup>13</sup> Maine has the 43<sup>rd</sup> highest obesity level in the country (19.9%), the 10<sup>th</sup> highest overweight high school level (12.8%), and the 5<sup>th</sup> highest overweight level for low-income children ages 2-5 (15.6%). Subsequently, in 2003, Maine spent \$273 per person on obesity-related costs; this is the 17<sup>th</sup> highest amount in the U.S.<sup>14</sup>

## The Legislative Bills

In 2004, the Maine Legislature established the Commission to Study Public Health, a panel to examine “the causes of obesity and methods to decrease the cost of health care and increase the public health.”<sup>15</sup> In January 2005, the Commission issued 27 recommendations for curbing obesity; legislators subsequently incorporated them into five legislative bills, which are currently under consideration before the Maine House of Representatives and Senate.<sup>16</sup> The bills attempt to curtail obesity rates in Maine through legislative action. They also place new burdens on the resources of businesses, public schools and state agencies.

The bills take a multi-faceted approach to address obesity in Maine. However, the very diffuse nature of this approach indicates a lack of focus that could lead to a dilution of the resources available to combat obesity. Conversely, by targeting very narrow segments of Maine’s population, the recommendations leave a large portion of the populace outside the effective scope of the initiatives. The unfocused and segmented nature of the Commission’s approach to reduce obesity endangers the overall effectiveness of the legislation.

BHI has identified four major proposals contained in the legislation for our analysis: limiting the advertising and promotion of “unhealthy” foods and beverages to children, conducting Body Mass Index (BMI) measurements, setting minimum physical activity requirements for public

schools, and requiring restaurant chains and public schools to include nutritional information on menus and menu boards. In the process of attempting to curtail obesity rates, the Commission’s proposals will place restrictions and obligations on businesses, schools and state agencies which will generate additional costs with little effectiveness in preventing obesity.

### *Restricting Advertising to Children*

LD (Legislative Document) 796, section 10, limits advertising of unhealthy foods and beverages directed at children. It directs the Attorney General to determine, by January 31, 2006, if the State may legally restrict television advertising aimed at children 12 years old or younger for foods and beverages deemed not healthy by the Department of Health and Human Services. If the Attorney General determines that the State may legally restrict advertising, then the Department of Health and Human Services shall evaluate whether such a restriction should be implemented. Section 3, subchapter 9, § 6661, point 4 of LD 796 prohibits advertising on school grounds for foods and beverages, other than healthy food and beverages, after September 30, 2007.<sup>17</sup> We sidestep the question of the legality of LD 796 and focus instead on the potential cost and effectiveness of such restrictions.

### *Potential Impact*

There exists an abundance of academic literature investigating the effects of advertising on children. Unsurprisingly, most studies find modest-to-strong evidence that advertising directed at children, like advertising directed at adults, is effective in determining the preferences of children—otherwise advertisers would abandon the practice as unproductive.<sup>18</sup> However, the finding that advertising affects children’s choice does not constitute a link between food advertising and obesity.



The Office of Communications (OfCom), an independent authority created by the British government to regulate that country's communications industry, issued a report in July of 2004 that analyzed the role of television advertising in the rise of childhood obesity in the United Kingdom.<sup>19</sup> The research "shows 'modest direct effects' of television advertising on food preference, consumption and behavior."<sup>20</sup> The study finds that "when television advertising is put in the context of other influences...it does have an impact on food choice among both parents and children, but it is small compared to other influences" like family eating habits, exercise, parents' demographics and school policy.<sup>21</sup> The report also notes the lack of current research evaluating the effectiveness of existing bans of food advertising on television and finds that the conclusions of existing research are "at best unclear and contested."<sup>22</sup> As a result, OfCom ruled out a ban on television advertising of "junk food and drink," noting that a total ban would be "ineffective" in tackling childhood obesity.<sup>23</sup>

The limited reach of any television advertising restriction scheme imposed by Maine lawmakers poses additional problems that blunt its potential effectiveness. Forced by the jurisdictional limits of Maine's laws, any restrictions proposed by the state would cover advertising only on Maine television stations; leaving the vast majority of the communications industry and sizable segments of the television broadcasting market, in particular, unaffected by the legislation.

National television broadcasters, including satellite broadcaster DirecTV and other nationwide networks, would avoid the restrictions by bypassing Maine's commercial television stations and broadcasting directly to viewers. The restrictions would fail to reach, not only national broadcasts, but also advertising

conducted by other, increasingly popular communications media, including the Internet, which compete with television for the attention of children. Restrictions would also miss advertisements displayed on billboards, in magazines, at the point of sale and other low technology advertising methods. Regional advertisers could escape any restrictions by simply shifting their business to broadcasts originating in states bordering Maine, such as New Hampshire and Massachusetts, while reaching television audiences in Maine. As a result, only Maine's eleven local television stations and their employees would fall under the ban's reach and suffer any ill effects from lost revenues; while the larger advertising markets would remain unaffected.

Section 3 of LD 796, which bans advertising of "unhealthy" foods and beverages on school grounds, suffers the same limitations as the television advertising restrictions: it leaves many alternatives open to advertisers wishing to reach children. Furthermore, the proposal leaves school officials with the specific technical challenge of blocking advertisements on the Internet. Are these advertisements considered to be on school grounds, therefore subject to the ban? If so, they need to be blocked, if not, they compromise the effectiveness of a ban.

Advertising bans instituted by other governments provide some insight into their potential impact in Maine. Greece, Norway and Sweden have implemented restrictive bans on all advertising directed at children. In Sweden, the effectiveness of the ban was weakened by the efforts of advertisers to circumvent the regulation. Some advertisers simply shifted the focus of their ads away from children and toward the family, while highlighting features that appeal to children.<sup>24</sup> Greece witnessed a significant decline in children's programming after its ban went into effect—to the detriment of children,





television stations and children's television programmers.<sup>25</sup>

### *Cost to Maine*

The vague language and narrow focus contained in LD 796, specifically "advertising of foods and beverages that do not fit the definition of healthy foods and beverages adopted by the Department of Health and Human Services," creates a data problem for conducting analysis of that specific market segment (advertising of unhealthy foods and beverages directed to children in Maine). The lack of data for such a small fragment of the market leads us to pursue a qualitative approach to assessing the costs of advertising restrictions.

The migration of advertising dollars to sources outside the jurisdiction of Maine would hurt any children's television programs produced and broadcasted locally in Maine. The restrictions would choke off a vital source of advertising dollars to local children's programs, ultimately reducing the amount of children's programming—a phenomenon Greece witnessed after implementing similar advertising restrictions.<sup>26</sup>

Local producers of foods and beverages that might be designated "unhealthy"—candy shops and ice cream parlors—and wish to advertise during children's television programs would also suffer under proposed advertising restrictions. These businesses would face a harder climate under which to expand their customer base or open new locations in other Maine cities, restraining the growth of employment and the economy. Since larger companies will be able more easily to avoid any restrictions by moving their advertising spending to broadcasts originating outside Maine and other media, the price of the restrictions will be borne by the homegrown companies and television stations.

### *Conclusion*

Restrictions on television advertising of "unhealthy" foods and beverages in Maine would impose losses on some local businesses. The ease of circumvention by other businesses would, on the other hand, make it unlikely that the restrictions would have any effect on obesity.

### *Nutritional Information on Menus and Menu Boards*

Bills LD 110, LD 134 and LD 796 require the posting of nutritional or caloric information on menus or menu boards. LD 110, which recently failed to win passage in the Maine Legislature, requires restaurants "having 20 or more locations under the same name nationally" to provide caloric information on menus or menu boards by January 1, 2006.<sup>27</sup> Section 6 of LD 134 § 1515 goes further by requiring the cafeterias, snack bars and vending machines under the purview of the Maine Department of Labor's Division of the Blind and Visually Impaired (DBVI) to "perform nutritional analysis on all major-selling food items and post caloric and nutritional information."<sup>28</sup> And LD 796 § 6661 places the most onerous requirement on the food service programs of the public schools by not only requiring food analysis, but also the posting of age-appropriate daily values for total calories, saturated fat percentages and content of sodium, sugar and total carbohydrates by the end of August, 2007—although LD 796 only requires caloric information to be posted on school menu boards.<sup>29</sup>

### *Potential Impact*

The practice of placing nutritional and caloric information on food product labels is not new. A voluntary program was in place for packaged foods sold in the United States from 1973 until 1990, when the Nutritional Labeling and Education Act (NLEA) was enacted into law. The NLEA requires mandatory nutrition labeling for



almost all packaged food and strict regulation of nutrient content and health claims. In addition, it also requires a new format for the nutrition information panel called "Nutrition Facts," standardization of serving sizes, and strict regulation of the use of descriptors and explicit health messages.<sup>30</sup>

Acting Food and Drug Administration Chief Lester Crawford, speaking to the World Obesity Congress and Expo, provided his own assessment of the effect of nutrition labeling on obesity: "What we did in making nutrition labeling mandatory did not help obesity. The first thing we notice is this contradiction about the fact that we had mandatory nutrition labeling for ten years, and the situation got steadily worse during that time."<sup>31</sup>

Advocates of nutrition labeling in restaurants might argue that the number of meals Americans are eating at restaurants has increased, along with the number of calories and fat consumed away from home. Therefore, an increasing portion of the meals consumed by Americans escape the NLEA requirements, weakening their effect. What do the results from nutrition labeling programs at venues that serve meals away from home reveal about the link between food labeling and the food choice of consumers?

Several studies have sought to ascertain the effect programs that post nutritional and caloric information on menus and menu boards have on the eating choices of customers. One paper reviewed the results from individual studies of twenty nutritional labeling programs implemented at catering services in workplaces, public eating establishments and universities.<sup>32</sup> The authors report that "most of the studies reviewed demonstrate some positive short-term benefits from [labeling] schemes." On the other hand, said the same authors, the labeling programs "may not have an immediate effect on food choice." The lack of follow-up studies, they said, made it

difficult to conclude that the labeling programs resulted in long-term behavior changes.<sup>33</sup>

The review found similar results when investigating a nutritional labeling program in vending machines. They report, that "when [the] snack proportion was changed to increase the availability of healthy snacks, total sales dropped: healthy snacks were unpopular."<sup>34</sup> Furthermore, when nutritional information was placed on the vending machine overall sales increased, "but mostly for the less healthy snacks, so this was unsuccessful in changing snacking habits."<sup>35</sup>

Another study reviewed in the paper, used questionnaires to assess the customer response to the labeling program. They found that while 90% of respondents were positive about the menu labeling schemes, 70% of the respondents said the plan had not influenced their food choices. Another study echoed these results with 94% of respondents wanting food information at work, but only 41% reporting that the labeling program had changed their food choice behavior.<sup>36</sup>

Any positive effect food labeling might have on obesity rates in public schools would be further eroded by the less than full participation rate of students in the food service programs at school. According to the Maine Department of Education, Child Nutritional Services, roughly 67 % of students participate in the school lunch program, while the other 33% bring their own food.<sup>37</sup> Thus, the 33% of students that eat outside the school lunch programs would see no benefits from a nutrition labeling scheme.

#### *Cost to Maine*

Chain restaurants in Maine would incur several costs to comply with the food labeling requirements: the cost to have the



**Table 1: Costs to Implement Nutrition Labeling by Restaurants (\$)**

Restaurant Type	Nutritional Analysis	Printing New Menus	New Menu Boards	Total Costs
Fast Food	124,200-248,400	NA	86,940-248,400	211,140-496,800
Sit-Down	105,800-211,600	52,900-84,800	NA	158,700-296,240
<b>Total</b>	<b>230,000-460,000</b>	<b>52,900-84,800</b>	<b>86,940-248,400</b>	<b>369,840-793,040</b>

nutritional analysis completed, the cost of printing new menus for sit-down chains and the cost to purchase new menu boards for fast food outlets.

Estimates to provide the nutritional analysis run from \$50 to \$100 to analyze an item for calories only and between \$220 and \$650 for a full nutritional analysis.<sup>38</sup> Software programs are also available that allow food service employees to perform the nutritional analysis themselves. The programs cost \$595 to \$699 each, not including time and money required for training and preparation time to conduct the analysis.<sup>39</sup>

Prices for printing the laminated menus typically found in sit-down restaurants range from \$250 to \$400 for a supply of 100, depending on style and quality.<sup>40</sup> Menu boards found on Yahoo Shopping, normally used by fast food restaurants, were found to cost between \$350 and \$1,000, also depending on size and style.<sup>41</sup>

Altogether, these costs represent a substantial burden to the effected chains. The *Ruby Tuesday* restaurant corporation, with over 700 locations, cited cost as a reason for abandoning their own pilot program of providing nutritional information on menus. The company subsequently moved its nutritional information off the menus and placed a separate nutrition guide on each table.

According to the Maine Restaurant Association, approximately 460 of the 3,691 individual restaurant locations currently operating in Maine meet the criteria for the labeling requirements. We estimated the total cost of restaurants complying with the regulations in terms of printing menus,

purchasing new menu boards and conducting the nutritional analysis for all 460 locations. The results are displayed in Table 1.<sup>42</sup> The cost to conduct nutritional analysis, print new menus and purchase new menu boards would total between \$369,840 and \$793,040 or between \$804 and \$1,724 per location.

Maine's public schools would bear some of the same costs experienced by the restaurants outlined above. According to the Child Nutrition Services Team at the Maine Department of Education, 40% of Maine's 283 school districts currently conduct nutritional analysis on meals provided in school and 169 districts do not.<sup>43</sup> Of the districts that currently provide nutritional analysis, most utilize the software programs. As noted above, software programs cost \$595 to \$699 each, not including training and preparation time, while menu boards start at \$350. Based on these figures, we estimate that it will cost Maine school districts a total of \$100,555 to \$118,131 to purchase the software, and another \$241,150 to \$689,000 to purchase new menu boards for a total of between \$341,705 and \$807,131 in additional costs to Maine's public schools.<sup>44</sup>

School districts will also bear additional costs from lost productivity as food service employees undergo training to use the software and they experience a learning curve in the period immediately after training. The productivity losses, in this case, remain difficult to quantify, yet one can be certain they will pressure already tight school budgets.



Labeling requirements would also pinch scarce resources at the Department of Health and Human Services (DHHS). The Eating and Lodging program at DHHS will bear the new responsibility of enforcing the labeling requirements through inspections. The department will either need to hire more inspectors or face a reduction in the number of inspections it conducts each year. According to the Maine Legislative Office of Fiscal Program Review, LD 110 would cause a minor increase to the general fund and any “additional costs to the Department of Health and Human Services in implementing this bill can be absorbed by the department utilizing existing resources.”<sup>45</sup> Therefore, a drop in the number of restaurant inspections in Maine can be expected if such a measure is enacted.

### *Conclusion*

The failure of the existing NLEA mandatory nutrition labeling program to curb the surge in obesity rates combined with the results from studies of food labeling programs point to the futility of any future mandatory nutrition labeling requirements in Maine or elsewhere. Thus, we conclude that any future attempt to require chain restaurants and public schools to provide food labeling on their menus or menu boards would produce little or no impact on obesity rates in Maine. Yet, chain restaurants would incur implementation costs up to \$800,000 or over \$1,700 per location; and public school districts would need to spend up to \$800,000 to cover their implementation costs. This combination of a weak, if dubious, effect and assured costs leads us to the conclusion that nutrition labeling should not be part of any plan to reduce obesity in Maine.

### *BMI Assessments*

The current legislative package dictates BMI measurements for narrow segments of Maine’s population. LD 796 § 6662, section 1 proscribes annual BMI measurements for public school students in kindergarten, and

grades one, three, five, seven and nine to be conducted by trained school nurses or physical education teachers. The information must then be disaggregated by age, gender, and school and electronically transmitted to the Department of Education. The department must analyze the data and report the findings to school administrative units annually and the legislature every three years.<sup>46</sup> The bill also stipulated that each school shall provide a confidential report to the parents of students who participate in the BMI assessment.

LD 134 § 1515, section 7 calls for insurance carriers currently providing coverage to state employees, retirees, or “MaineCare” participants to estimate the cost savings of including the following as part of the insurance coverage: BMI assessments, counseling and behavioral interventions of anyone with a BMI of 30 or more (considered obese), and evidenced-based interventions (drugs and surgery) for anyone who is over the age of 44, with a BMI of at least 25, and has been diagnosed with pre-diabetes. Section 8 of the bill directs the Department of Professional and Financial Regulation, Bureau of Insurance to encourage all insurance carriers in Maine to provide incentives for their “insureds [sic] to engage in” the above.<sup>47</sup>

### *Potential Impact*

The National Institutes of Health (NIH), in their clinical guidelines for the treatment of obesity, recommend BMI assessment as cost effective and accurate.<sup>48</sup> The authors use evidence from non-randomized trials and observational studies to support the recommendation. In light of the NIH recommendation, we conclude BMI assessment should be the preferred method to measure body fat content and screen for obesity.





The use of BMI assessments contained in the legislative bills differs in the type and intensity of the follow-up procedures available to BMI assessment recipients and therefore their impact on reducing obesity. The BMI assessments to be conducted in schools provide a report to parents, while the use of assessments envisioned for health insurance coverage options include more intensive regiments of counseling and behavioral and evidence based interventions.

The BMI assessment program for public schools, as outlined in LD 796, instructs each school to send a confidential report to the parents of students in kindergarten, and grades one, three, five, seven and nine. The assessments would be completed every other year, and would discontinue after grade nine; providing ample time for students to gain weight in the interim periods. The confidential BMI assessment report provided to the parents would contain the student's weight, height and BMI, an explanation of BMI, a suggestion that parents seek a primary care physician's evaluation and the implication of the report for nutrition and physical activity with reference to community health programs. The program leaves any further follow-up steps in the hands of any obese student's parents. So one must ask: If the parents of obese children engage in behavior that may have lead to the obese condition of their children in the first place, will the school BMI report prompt them to take the necessary steps to alter the lifestyles of their families and effect weight loss in their children?

The significance of a family approach to treating obesity is supported by a long term study of obesity in children that champions "the importance of family involvement in reducing the progression of obesity it remains unclear that parents will take the necessary steps to treat obesity in their children."<sup>49</sup> Arkansas is the only state to implement a BMI assessment program similar to that envisioned for Maine; its first

assessments and reports to parents were completed in 2004—leaving us insufficient information to evaluate the program's success. The novelty of the policy to require public schools to measure students' BMI indexes challenges our ability to make a meaningful determination of the program's likely impact on obesity rates in Maine's public school children.

A richer body of evidence exists to evaluate the effectiveness of the more intensive follow-up regimens envisioned for health insurance providers to state employees and programs. The evidence provided by the NIH Clinical Guidelines suggests that behavior therapy, when used in combination with traditional methods (diet and exercise), affords participants significant additional weight loss in the short term (1 year), and therapy can be effective in the long run if continued beyond the short-term time frame.<sup>50</sup> In some studies, subjects lost an additional 2.2 to 22 lbs when contact with a therapist continued; yet subjects gained weight, regardless of time frame, when therapy stopped.<sup>51</sup>

"Evidenced-based" interventions, such as weight loss drugs and surgery, produce some of the best short-term results. Results from studies cited in the NIH Clinical Guidelines, show that drug therapy, in combination with diet and exercise, produces modest additional weight loss in the short term. The difference in the amount of weight lost between weight loss drugs and a placebo ranged from 4.6 to 6.2 lbs.<sup>52</sup> Surgery produced the most dramatic weight loss results. Patients with a BMI index over 35 kg/m<sup>2</sup> who participated in the studies reviewed by the NIH lost between 110 and 220 lbs within a year after surgery.<sup>53</sup>

#### *Cost to Maine*

The public schools of Maine will incur costs to conduct the annual BMI measurements



of their students. These costs will derive from the need to train personnel, purchase equipment, conduct the measurements, process and transmit the data to the Department of Education and produce and mail the letters to parents. The BMI program in Arkansas public schools, which recently completed its first round of assessments, serves as a good baseline to estimate the cost of the program outlined in LD 796. In calculating the cost of administering the Maine program we adjusted the initial Arkansas program cost—\$3.00 per student—upward to \$4.00 per student—reflecting a higher cost of living in Maine and the decentralized reporting responsibilities in the Maine program.<sup>54</sup> We estimate the first year costs to administer the BMI assessment program in Maine to come in at \$368,000, including training, equipment and processing the first year of the program.<sup>55</sup>

The Maine program may also enjoy the one-third to one-half drop in second year costs anticipated by the directors of the Arkansas program due to reduced training and equipment expenditures. Thus, the outlays for the program's second year would fall to between \$184,000 and \$245,000.<sup>56</sup>

The cost to health insurance companies of providing BMI assessments and behavioral and evidence-based interventions remains unclear. To date, only BlueCross BlueShield of North Carolina has announced they are offering health insurance coverage similar to those described in LD 796.<sup>57</sup> The company estimates that it would have saved \$83 billion in 2003 alone had the coverage been in place, but it has not calculated the costs of providing the coverage thus far.<sup>58</sup> Prompted by the recent decision by Medicare to recognize obesity as a disease, several large insurance companies began covering gastric bypass surgery. However, comprehensive plans like that of BlueCross BlueShield of North Carolina remain scarce, leaving us without a baseline to estimate the costs to Maine's health insurance providers.<sup>59</sup>

### *Conclusion*

The proposal to require BMI measurement programs in public schools places an additional responsibility on the public education system of Maine. Demands for monies to fund this program will divert resources from other administrative and teaching activities. The program's impact on obesity will depend on what actions, if any, are taken by the parents of obese students who receive the report. The costs to provide the additional coverage for obesity treatments has yet to be calculated by the few insurance firms that cover weight-loss and obesity intervention programs and therefore at this time remain unknown.

The uncertain nature of the effectiveness of the proposal to conduct BMI measurements in schools and the unknown costs of including BMI measurements and obesity treatments in the health insurance coverage of state employees and those citizens covered by "MaineCare," cast doubt on the wisdom of these bills.

### *Minimum Physical Activity Requirements in Maine Schools*

L.D. 796 § 6663 establishes minimum requirements for physical education for Maine public schools. The bill requires elementary and middle school student to participate in 150 minutes of physical activity per week, in addition to recess, and high school students to participate in 220 minutes of physical activity per week.<sup>60</sup>

### *Potential Impact*

The link between obesity and a lack of physical activity is well established in the medical literature. In its Clinical Guidelines, the NIH states, "physical activity contributes to weight loss, both alone and when it is combined with dietary





**Table 2: Time Maine Students Spend in Physical Education Class**

School Level	Current (minutes/week)	LD 796 (minutes/week)	Difference (minutes/week)	Percentage Increase	Additional Calories Burned (per week)
Elementary	47	150	103	219%	249-295
Middle	101	150	49	49%	205-242
High	72	220	148	206%	814-962

therapy.”<sup>61</sup> The report assigns the statement an evidence category of A, meaning the findings are consistent across a substantial number of studies involving substantial numbers of participants.<sup>62</sup> The document recommends that “physical activity should be an integral part of weight loss therapy and weight maintenance.”<sup>63</sup> The link between physical activity and obesity remains consistent throughout the obesity literature, thus the proposal has a high probability of reducing obesity in the school children of Maine. How much weight loss can we expect?

The loss of one pound of body weight equates to 3,500 calories, and thus an individual needs to create a calorie deficit, the difference between calories consumed and expended, of 3,500 for each pound of weight lost.<sup>64</sup> Therefore, any increased physical activity resulting from the implementation of LD 796 must create a calorie deficit of 3,500 calories to achieve one pound of lost body weight—other things being equal.

BHI conducted a survey of public elementary, middle and high schools in Maine to determine the current number of minutes the students participate in physical education class. The results are presented in Table 2 above.<sup>65</sup>

The survey results show that Maine students, at all three levels of schooling, currently participate in fewer minutes of physical activity, on average, than prescribed in LD 796. The largest difference occurs in high school, followed by elementary school and middle schools registering the smallest deficit. The survey results confirm that implementing the

physical activity requirements under LD 796 will increase the number of minutes students participate in physical activity—providing a sufficient condition for achieving weight loss or the prevention of further weight gain. According to our calculations, high school students would achieve the equivalent of one pound of weight loss—or prevent one pound of weight gain—approximately every three and one-half to four weeks of the school year. Elementary school students would attain the same benefit in roughly 12 to 14 weeks, and middle students would see the same results in 14 to 17 weeks.<sup>66</sup>

Indirect benefits also result from increasing the time students spend participating in physical activity at school. If school officials choose to extend the school day to accommodate the extra time—at least for the students and physical education instructors—then students will have less time available to spend consuming extra calories and partaking in the sedentary activities of watching TV and playing video games. However, if officials, especially in high schools, were allowed to include the time students participate in sports teams, formal and intramural, toward their calculations of time spent in physical activity the bill’s impact may be weaker.

The requirement under LD 796 that sets minimum standards for the amount of time students participate in physical activity will, on average, increase the time students spend in physical activity, and thus provide a positive impact on obesity in the school children of Maine. However, the benefits will not accrue cost-free.



**Table 3: The Cost to Hire New Physical Education Teachers**

School Level	Percentage Increase in PE class time	Current PE Teachers	New PE Teachers Needed	Average Salary & Benefits (\$)	Total Cost in Salaries (\$)
Elementary	219	381	836	34,468	28,814,425
Middle	49	220	107	34,931	3,724,341
High	206	303	622	34,931	21,739,218
	NA	904	1565	NA	54,277,984

\*Numbers in table do not exactly match due to rounding.

### *Cost to Maine*

The costs to implement the minimum physical activity requirements derive from the need to increase the number of physical education teachers.

In 2004, Maine’s public schools had an enrollment of 202,701 students, (grades K through 12) and employed 904 full-time health and physical education (PE) teachers.<sup>67</sup> In order to comply with LD 796 and maintain the current amount of time PE teachers spend teaching classes and the current average PE class size, schools would need to increase the number of PE teachers on staff in the same proportion that they need to increase the number of minutes their students spend in PE class—see column labeled “percentage increase” in Table 3.

As Table 3 shows, school officials in Maine would need to add another 1,565 PE teachers to their staffs at a cost of \$54 million in salaries and benefits.<sup>68</sup>

This figure probably represents the high end of any range of estimates, and a number of actions could be taken by school officials to mitigate this cost. The average PE class size could be allowed to increase, part-time PE teachers could be hired, parent volunteers could be utilized in a less formal environment than PE class and current time students spend in intramural and/or inter-scholastic sports programs could be included in the calculation of time spent participating in physical activity.

Finding the time to allocate toward the extra physical activity required will also pose a

challenge to school officials. They essentially have two choices: extend the school day or reduce the time students spend participating in academic activities—both come at a price. Extending the school day will necessitate additional operating funds, could engender anger in school staffs, while reducing the time spent participating in academic activities will likely jeopardize the academic quality of those activities.

### *Conclusion*

Increasing the amount of time students, or anyone, spend participating in physical activities will provide a positive impact on reducing obesity rates in Maine’s school children. Our analysis shows that implementing the related provisions of LD 796 would, on average, increase the amount of time students participate in moderate physical activity, and thus its enactment will also, everything else equal, have a positive impact on obesity in Maine. Moreover, this is the only recommendation by the Commission to Study Public Health for which we can make the previous statement with confidence. Nevertheless, these results can only be achieved at a significant cost, in time and money, to the public schools of Maine. We implore legislators to use caution in considering the passage of this portion of the bill.

### **Cost Assessments**

BHI has calculated the cost to implement two additional proposals within the legislative package that reassign portions of state funds toward specific activities to



promote the health of state employees and citizens.

### *Alternative Roadways*

LD 439 compels the Commissioner of Transportation to direct the amount equal to one percent of the state highway funds for the construction, repair and maintenance of “alternative roadways.”<sup>69</sup> According to the Highway Fund estimates displayed on the Department of Transportation website, the amount will total \$2.4 million for the 2004-05 biennium, or \$1.2 million per year, and will necessitate a reduction in spending elsewhere by the Highway Fund or an increase in fund revenues.<sup>70</sup>

### *Comprehensive Employee Health Program Addressing Obesity*

Section 4 of LD 134 details the implementation of a comprehensive, population-based approach to addressing obesity-related risk factors. The bill calls for the program to include the creation of one or more full-time positions within State Government and the dedication of at least 0.5% of annual health insurance premiums for all state employees to support employee health and wellness.<sup>71</sup>

These provisions of LD 134 will involve the dedication of new state resources or the diversion of existing ones. The dedication of 0.5% of the employee health insurance premiums would total \$825,000, based on current insurance premium figures from the Department of Administrative and Financial Services. To estimate the cost of hiring of one or more full time positions, we assume one position at the cost of \$50,000 in salary and benefits.

## **Conclusion**

The skyrocketing of obesity rates in the United States and the health problems related to obesity have alarmed public health officials in recent years. Public policy makers are especially concerned by the healthcare cost estimates associated with obesity running over \$100 billion per year for United States. The problem of obesity has been clearly articulated in the media, however the actions that public policy makers should take to curb obesity remain less clear.

The recommendations issued by the Commission to Study Public Health and the subsequent legislation filed to implement them attempt to address the growth of obesity rates in Maine. Our analysis indicates that there is little clear evidence that the major policies proposed by the legislation, while well intended, will reduce or slow the growth of obesity rates in Maine. Furthermore, these policies will produce costs for the voters and taxpayers. Maine’s legislature needs to carefully deliberate these findings before approving any current or future obesity related bills.

□





## ENDNOTES

<sup>1</sup> Office of the Surgeon General, United States Department of Health and Human Services, "The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity 2001," (Rockville, MD: 2001), Publication No. 02NLM: WD S9593 2001, v.

<sup>2</sup> Maine. 2004. "Resolve, To Study Obesity and Methods To Decrease the Cost of Health Care and Increase the Public Health." Revised Statutes. Chapter 95, sections: 1-10

<sup>3</sup> The bills are LD (Legislative Document) 110, LD 134, LD 439, LD 645 and LD 796.

<sup>4</sup> Body Mass Index (BMI) is a mathematical calculation used to determine whether a patient is overweight. BMI is calculated by dividing a person's body weight in kilograms by their height in meters squared (weight [kg] height [m]<sup>2</sup>) or by using the conversion with pounds (lbs) and inches (in) squared. This number can be misleading, however, for very muscular people, or for pregnant or lactating women. Source: American Obesity Association, "What is Obesity?" Internet, available at [http://www.obesity.org/subs/fastfacts/obesity\\_what2.shtml](http://www.obesity.org/subs/fastfacts/obesity_what2.shtml), accessed February 4, 2005.

<sup>5</sup> Dora Anne Mills, "Obesity in Maine: A Policy Approach," *Maine Policy Review*, Spring/Summer 2004, 34.

<sup>6</sup> Obesity Association, "AOA Factsheet: Obesity in the U.S.," Internet, available at: [http://www.obesity.org/subs/fastfacts/obesity\\_US.shtml](http://www.obesity.org/subs/fastfacts/obesity_US.shtml), accessed January 15, 2005.

<sup>7</sup> United States Department of Health and Human Services, Public Health Service, National Institutes of Health, National Heart, Lung, and Blood Institute, "Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults," (Washington D.C: 1998), NIH Publication No. 98-4083, xix.

<sup>8</sup> Ibid.

<sup>9</sup> Alan Greenblatt, "Obesity Epidemic: Can Americans change their self-destructive habits?" *CQ Researcher*, (Washington, D.C. 2003), volume 13, No. 4, 73

<sup>10</sup> American Dietetic Association, "Costs of Obesity Continue to Grow," Internet; available at [http://www.eatright.org/Public/index\\_13338.cfm](http://www.eatright.org/Public/index_13338.cfm), accessed on February 1, 2005.

<sup>11</sup> Office of the Surgeon General, "The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity 2001, p. v

<sup>12</sup> American Obesity Association, "AOA Factsheet: Obesity in the U.S." Internet, available at [http://www.obesity.org/subs/fastfacts/Health\\_Effects.shtml](http://www.obesity.org/subs/fastfacts/Health_Effects.shtml), accessed January 15, 2005.

<sup>13</sup> Centers for Disease Control, National Center for Chronic Disease Prevention and Health Promotion, "Overweight and Obesity: State Programs," Internet, available at [http://www.cdc.gov/nccdphp/dnpa/obesity/state\\_programs/maine.htm](http://www.cdc.gov/nccdphp/dnpa/obesity/state_programs/maine.htm), accessed January 15, 2005.



<sup>14</sup> Trust for America 's Health, "Maine Ranks 43<sup>rd</sup> in Nation for Obesity, New Report Finds State and Federal Obesity Policies are Failing," Internet, available at <http://healthyamericans.org/reports/obesity/release.php?StateID=ME>, accessed January 19, 2005.

<sup>15</sup> Maine. 2004. "Resolve, To Study Obesity and Methods To Decrease the Cost of Health Care and Increase the Public Health." Revised Statutes. Chapter 95, sections: 1-10.

<sup>16</sup> The bills are LD (Legislative Document) 110, LD 134, LD 439, LD 645 and LD 796.

<sup>17</sup> Maine. 2005. LD 796, "An Act To Implement the Recommendations of the Commission To Study Public Health That Concern Schools, Children and Nutrition," Internet, available at <http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280015569&LD=796&Type=1&SessionID=6>, accessed January 18, 2005.

<sup>18</sup> Gerald Hastings, "Review of Scientific Research Evidence on the Effects of Food Promotion to Children," Brussels, October 29, 2004, Internet, available at [http://europa.eu.int/comm/health/ph\\_determinants/life\\_style/nutrition/documents/ev\\_20041029\\_co12\\_en.pdf](http://europa.eu.int/comm/health/ph_determinants/life_style/nutrition/documents/ev_20041029_co12_en.pdf), accessed February 5, 2005.

<sup>19</sup> The Office of Communications, United Kingdom, "Childhood Obesity – Food Advertising in Context," July 22, 2004, Internet, available at [http://www.ofcom.org.uk/research/consumer\\_audience\\_research/tv/food\\_ads/report.pdf](http://www.ofcom.org.uk/research/consumer_audience_research/tv/food_ads/report.pdf), accessed February 15, 2005.

<sup>20</sup> Ibid., 13.

<sup>21</sup> Ibid., 20.

<sup>22</sup> Ibid., 20.

<sup>23</sup> Tom Leonard, *The Daily Telegraph*, Internet, available at <http://spinwatch.server101.com/modules.php?name=News&file=article&sid=136>, accessed February 20, 2005.

<sup>24</sup> Sarah Johnson, "Countering the Obesity Epidemic: Policy Proposals for a New Century," April 28, 2003, Internet, available at <http://leda.law.harvard.edu/leda/data/569/Johnson.html>, accessed February 26, 2005

<sup>25</sup> Ibid.

<sup>26</sup> Ibid.

<sup>27</sup> Maine. 2005. LD 110, "An Act To Implement the Recommendations of the Commission To Study Public Health Concerning Chain Restaurants Internet," available at <http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280014640&LD=110&Type=1&SessionID=6>, accessed January 20, 2005.





<sup>28</sup> Maine. 2005, LD 134, "An Act To Implement the Recommendations of the Commission To Study Public Health," Internet, available at <http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280014707&LD=134&Type=1&SessionID=6>, accessed January 18, 2005.

<sup>29</sup> Maine. 2005. LD 796, "An Act To Implement the Recommendations of the Commission To Study Public Health That Concern Schools, Children and Nutrition," Internet, available at <http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280015569&LD=796&Type=1&SessionID=6>, accessed January 18, 2005.

<sup>30</sup> Rodolfo M. Nayga, Jr. "Nutritional Labels, Health Claims, and Consumer Diets," presented at the Food Labeling Conference, Washington D.C. March 2003, Internet, available at <http://www.farmfoundation.org/projects/03-65Naygapaper.htm>, accessed February 15, 2005.

<sup>31</sup> The Center for Consumer Freedom, "FDA Chief Labels CSPI-Favored Obesity Solution Ineffective," Internet, available at [http://www.consumerfreedom.com/news\\_detail.cfm/headline/2602](http://www.consumerfreedom.com/news_detail.cfm/headline/2602), accessed February 28, 2005.

<sup>32</sup> M. Holdsworth & C. Haslam, "A Review of Point-of-Choice Nutritional Labeling Schemes in the Workplace, Public Eating Places and Universities," *Journal of Human Nutrition & Dietetics*, vol. 11, Issue 5, p. 423-445, Internet, available at <http://0-www.blackwell-synergy.com.library.law.suffolk.edu/links/doi/10.1046/j.1365-277X.1998.00124.x/full/>, accessed February 15, 2005.

<sup>33</sup> Ibid.

<sup>34</sup> Ibid.

<sup>35</sup> Ibid.

<sup>36</sup> Ibid.

<sup>37</sup> Maine Department of Education, "School Food Service Reimbursement- ED288- School Breakfast, Lunch, After School Programs, and Milk Data Report," Internet, available at [http://thor.dafs.state.me.us/pls/doe\\_sfsr/sfsrdev.ed288n\\_copy.ed288n\\_parameters](http://thor.dafs.state.me.us/pls/doe_sfsr/sfsrdev.ed288n_copy.ed288n_parameters) Under "Meals Served to Children" the total student participation for lunch was retrieved for each month and then divided by the number of school days for the respective month to obtain an estimation of the total number of students that purchased lunch for each month from February through January 2004-2005. We calculated the average for the ten months (136,434) and divided it by the total number of students enrolled in Maine schools (202,710) to determine the percentage participation rate as 67%.

<sup>38</sup> Sharon B. Eskin and Sharon Hermanson, "Nutrition Labeling at Fast-food and Other Chain Restaurants," AARP Public Policy Institute, (Washington DC: July 2004), 5.

<sup>39</sup> See Nutrikids website available at <http://www.nutrikids.com/OrderForm.pdf>, and ESHA website available at <http://www.esha.com/products/foodprosql/fpsqlpricing>, accessed February 20, 2005.



<sup>40</sup> Quotes found at Koolprint.com and Bristol Advertising & Printing; Internet, available at <http://www.koolprint.com/Menu-printing.asp> and <http://www.ebaprinting.com/menus.html>, accessed on February 20, 2005.

<sup>41</sup> Yahoo Shopping, Internet, available at [http://shopping.yahoo.com/search?yit=Ano8BxE3QpHsQ68y\\_45yrbF0A; ylu=X3oDMTA4Mm84YjyBHNIYwNz30?p=menu+boards&did=&sp=pall&X=2](http://shopping.yahoo.com/search?yit=Ano8BxE3QpHsQ68y_45yrbF0A; ylu=X3oDMTA4Mm84YjyBHNIYwNz30?p=menu+boards&did=&sp=pall&X=2) accessed February 25, 2005.

<sup>42</sup> We used census data for the number of food service establishments in Maine in 1997. NAICS codes 722211, 722212, 722213, 7223, 7224 were used to represent the number of fast food establishments in Maine (1461 of 2719, or 54%), and the NAICS code 7221 for sit-down establishments (1258 of 2719 or 46%). These percentages were applied to the 460 affected locations from the Maine Restaurant Association to obtain a breakdown of 248 fast food restaurants (.54\*460) and 212 sit-down locations. Therefore, 248 restaurants would need to buy new menu boards and 212 would need to print new menus. For the nutritional analysis we assume that the locations will use a consulting service costing \$50 to \$100 for the caloric analysis; and each location is assumed to have an average of 20 menu items for analysis and only half of the locations would need to conduct the analysis due to some chains using redundant menus at multiple locations. Therefore our equations are  $\$50 \times 20 \times 230 = \$230,000$  and  $\$100 \times 20 \times 230 = \$460,000$ . For menu boards the equation are  $\$350 \times 248 = \$86,800$  and  $\$1,000 \times 248 = \$248,000$ , and menu printing cost equations are  $\$250 \times 212 = \$53,000$  and  $\$400 \times 212 = \$84,800$ . Source: United States Census Bureau, 1997 Economic Census: Accommodation and Foodservices- Maine, Internet, available at [http://www.census.gov/epcd/ec97/me/ME000\\_72.HTM#N722](http://www.census.gov/epcd/ec97/me/ME000_72.HTM#N722) accessed February 10, 2005.

<sup>43</sup> The percentage was obtained by phone from the Child Nutrition Services Team at Maine Department of Education, The number of school districts was obtained from the Internet, available at <http://www.maine.gov/education/eddir/05summry.htm>, accessed on February 12, 2005.

<sup>44</sup> To calculate the cost of new menu boards we multiplied the number of schools in Maine (689) by the cost of new menu boards (\$350-\$1000). The Maine Department of Education, "October 1, 2004 Public School Enrollment by Grade," Internet, available at, <http://www.state.me.us/education/eddir/05summry.htm>, accessed January 20, 2005.

<sup>45</sup> Office of Fiscal Program Review, "Fiscal Note," Internet, available at <http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280014640&LD=110&Type=2&SessionID=6>, accessed February 25, 2005.

<sup>46</sup> Maine. 2005. LD 796, An Act To Implement the Recommendations of the Commission To Study Public Health That Concern Schools, Children and Nutrition, Internet, available at <http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280015569&LD=796&Type=1&SessionID=6>, accessed January 18, 2005.

<sup>47</sup> Ibid.



<sup>48</sup> United States Department of Health and Human Services, "Clinical Guidelines," p. 56-57.

<sup>49</sup> Ibid., 11.

<sup>50</sup> Ibid., 51.

<sup>51</sup> Ibid., 50.

<sup>52</sup> Ibid., 54.

<sup>53</sup> Ibid., 54.

<sup>54</sup> Robert Capriccioos, "Arkansas Gets Serious About Kids," Connect for Kids, June 28, 2004, Internet, available at [http://www.connectforkids.org/articles/arkansas\\_kids\\_health](http://www.connectforkids.org/articles/arkansas_kids_health), accessed January 4, 2004. The \$3.00 was also confirmed by a phone call to the Arkansas Center for Health Improvement, which is administering the Arkansas BMI Assessment Program. Arkansas figure was increased by \$1.00 to reflect cost of living differences between the states (\$0.50), and unlike Arkansas, Maine will process the reports at individual schools instead of a central location like the Arkansas Center for Health Improvement (\$.50).

<sup>55</sup> The Maine Department of Education, "October 1, 2004 Public School Enrollment by Grade," Internet, available at <http://www.maine.gov/education/enroll/aproct/2004/octpbg04.htm>, accessed January 20, 2005 The Total number of students for grades K, 1, 3, 5, 7, 9 (92,031) was multiplied by \$4.00 per student to obtain the total cost to implement the BMI assessments per year (\$368,124).

<sup>56</sup> A representative from the Arkansas Center for Health Improvement indicated drop in costs during a phone conversation.

<sup>57</sup> Rob Stein, "N.C. Health Insurer to Offer Coverage for Weight Problems: Obesity a Public Health Crisis, Firm Says," *Washington Post*, October 13, 2004, P.A02, Internet, available at <http://www.washingtonpost.com/wp-dyn/articles/A28015-2004Oct12.html>, accessed February 15, 2005.

<sup>58</sup> Ibid.

<sup>59</sup> Several phone calls were made to both Blue Cross Blue Shield of Maine and North Carolina. Messages left with representatives at both companies have not been returned to date.

<sup>60</sup> Maine, LD 796.

<sup>57</sup> Health, National Heart, Lung, and Blood Institute, "Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults," NIH Publication No. 98-4083, (Washington D.C: 1998), p 77

<sup>62</sup> Ibid., xiii.

<sup>63</sup> Ibid., 80.



<sup>64</sup> Ibid., 75, see also [http://www.med.umich.edu/1libr/sma/sma\\_weight\\_sma.htm](http://www.med.umich.edu/1libr/sma/sma_weight_sma.htm)

<sup>65</sup> BHI conducted a survey of 96 public schools in Maine (33 elementary, 33 middle, 30 high) to obtain the number of minutes per week students attend physical education class, the number of physical education teachers on staff, the student population, and the number of minutes students are allowed for lunch for these schools. The data was used to estimate an average for each type of school; this figure was subtracted from the required minutes stipulated in LD 796 to obtain the difference. The average weights (using the 50th percentile) for boys and girls at 8 years old for elementary school (55 lbs), 12 years old for middle school (95 lbs) and 16 years old for high school (125 lbs) were obtained from the Centers for Disease Control website <http://www.cdc.gov/nchs/about/major/nhanes/growthcharts/charts.htm#Set%201>. These ages were used as a proxy for the median age at each school. The weights and the difference in time of physical activity were put into the calorie burning calculator at the website <http://www.caloriecontrol.org/exercalc.html> and the number of calories burned for two “moderate” physical activities, “walking briskly” and “playing soccer,” were used to calculate a range of calories that would be burned under the additional minutes of physical activity required under LD 796.

<sup>66</sup> Calculation: (3500 calories to lose one pound of body weight)/ (number calories burned per week from the increase in physical activity) = number of weeks to lose one pound of body weight.

<sup>67</sup> Maine Department of Education Data Center, Internet, available at <http://www.maine.gov/education/enroll/aproct/2004/octpbg04.htm>, for student data and <http://www.maine.gov/education/data/staff/04/SubjectAreaTaught.htm>, for teacher data <http://www.state.me.us/education/data/staff/04/AverageSalaryByTrainingAndExperience.htm>.

<sup>68</sup> The average salary figures for elementary and secondary school teachers with a Bachelors Degree and 0 years experience from the Maine Department of Education, “2003-2004 Average Salary by Training and Experience of Full-Time Public Classroom Teachers in Maine,” Internet, available at <http://www.state.me.us/education/data/staff/04/AverageSalaryByTrainingAndExperience.htm>. The benefits figure is based on the total benefits expenditure for 2003-2004 divided by the total number of teachers for 2003-2004 to obtain the average benefits per teacher. The calculation is \$168,278,893 benefits/19,241 teachers = \$8746 per teacher. The Department of Education, “State and Local Expenditure Trends- By Function,” Internet, available at <http://mainegov-images.informe.org/education/data/sfinstatewide/StateLocExpByFunction.pdf>, and <http://www.maine.gov/education/data/staff/04/SubjectAreaTaught.htm>, accessed February 15, 2005.

<sup>69</sup> Maine, LD 439, “An Act To Implement the Recommendations of the Commission To Study Public Health Concerning Alternative Roadways,” Internet, available at <http://janus.state.me.us/legis/LawMakerWeb/externalsiteframe.asp?ID=280015569&LD=796&Type=1&SessionID=6>, accessed February 1, 2005.

<sup>70</sup> Maine State Legislature, Office of Fiscal and Program Review, “Highway Fund Allocations 2004-2005 Biennium 2004 – 2005,” Internet, available at <http://www.state.me.us/legis/ofpr/04hftoc.htm>, accessed and confirmed by phone February 17, 2005.

<sup>71</sup> Maine, LD 134, “An Act To Implement the Recommendations of the Commission To Study Public Health,” Internet, available at <http://janus.state.me.us/legis/LawMakerWeb/summary.asp?ID=280014707>, accessed January 18, 2005.



## About the Authors

### **Paul Bachman MSIE.**

Mr. Bachman is an Economist at the Beacon Hill Institute for Public Policy Research at Suffolk University and an Adjunct Professor of Economics at the university. He has conducted research on Massachusetts state tax policy, public construction project costs and New Hampshire state government reform for the Beacon Hill Institute

### **David G. Tuerck, PhD.**

Dr. Tuerck is Executive Director of the Beacon Hill Institute for Public Policy Research at Suffolk University and Chairman of the Economics Department at Suffolk University. He holds a Doctorate in Economics from the University of Virginia. His dissertation director was James M. Buchanan, Nobel Laureate in Economics.

The authors would like to thank Alla Raykin for her contributions to this study.



The Beacon Hill Institute at Suffolk University in Boston focuses on federal, state and local economic policies as they affect citizens and businesses. The institute conducts research and educational programs to provide timely, concise and readable analyses that help voters, policymakers and opinion leaders understand today's leading public policy issues.

This report is the product of the Beacon Hill Institute alone and does not necessarily represent the views of Suffolk University.

© 2005 by the Beacon Hill Institute at Suffolk University  
ISBN 1-866320-28-4

Beacon Hill Institute at Suffolk University  
8 Ashburton Place  
Boston, MA 02108

Phone 617-573-8750; Fax 617-720-4272;  
e-mail [bhi@beaconhill.org](mailto:bhi@beaconhill.org); web [www.beaconhill.org](http://www.beaconhill.org)



**The Beacon Hill Institute for Public Policy Research**  
**Suffolk University**  
**8 Ashburton Place**  
**Boston, MA 02108**  
**Phone: 617-573-8750 Fax: 617-720-4272**  
**[bhi@beaconhill.org](mailto:bhi@beaconhill.org)**  
**<http://www.beaconhill.org>**

**ISBN 1-886320-28-4**

**\$15.00**