

Obesity Causes, Related Costs and Tax Consequences:
Recommendations for Maryland Support of Health and Fitness
Improving Activities

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Abstract

Health care costs in the US reached \$2.3 trillion in 2007 even though the US lags far behind comparable industrialized countries in health outcomes. The US is ranked 41st in life expectancy and spends more than 16 percent of GDP on health care. Comparable countries spend only about 10 percent of GDP leaving the US in a poor competitive position. One major driver of the elevated health care costs is obesity and its accompanying expensive adverse health effects. The costs of obesity in Maryland are estimated to exceed \$3.7 billion. Earnings losses alone are likely in excess of \$1 billion which converts into a tax revenue loss of \$56 million just from lost work days by obese employees. Overall tax revenue losses are estimated to exceed \$175 million. Key recommendations from this report are that Maryland should provide tax incentives to support health and fitness improving activities with the goal of reducing the rate of obesity. A tax deduction of \$500 per person is recommended with a higher \$750 deduction for seniors.

Health Care Costs and US Competitiveness

Although it is ranked 41st in terms of life expectancy, the US spends more on health care than any other nation. US health care expenditures reached \$2.3 trillion in 2007, and are expected to reach \$4.2 trillion by 2016¹. By 2005, health care expenditures accounted for 16 percent of GDP but projections indicate that this will rise to 20 percent by 2016. By comparison, Organisation for Economic Development and Cooperation (OECD) data show that health care expenditures for comparable industrialized countries such as Canada, France, Germany and Switzerland, spent from a low of 9.5 percent of GDP in France, to 10.9 percent in Switzerland. These countries all have longer life expectancies than the US which tells us that where we are allocating health care expenditures is not as effective as what could be achieved with better use of the money.² In part because health insurance is tied to employment in the US, the high cost of health care converts directly into a loss of competitiveness for corporations. For example, General Motors estimates that the burden of health care coverage for their employees, adds \$1,500 per vehicle to the price. This provides an obvious price advantage to its foreign competitors and is at least part of the explanation of why American automobile manufacturers are currently struggling.

Health Care Costs and Obesity

The most promising means of reducing the growth in health care costs is to shift the focus from treatment to prevention. In particular, many of the expenditures on health care are preventable results of lifestyle choices. Chief among these are a wide variety of costly ailments that result from excess weight. The most recent US data indicate that

¹ Poisal, J.A., et al, "Health Spending Projections Through 2016: Modest Changes Obscure Part D's Impact". *Health Affairs* (21 February 2007): pp. 242-253.

² US Census Bureau, International Database, 2007.

obesity (Body Mass Index (BMI) ≥ 30) prevalence exceeds 33 percent and more than two thirds of adult Americans are overweight or obese (BMI ≥ 25)³. If present increases in the rate of obesity persist, by the year 2015, half of the population in the United States may be obese. Obesity prevalence in Maryland is close to the national average. Based on the 2007 Behavioral Risk Factor Surveillance Survey (BRFSS) data, Maryland is tied with Arizona, as the 27th highest rate of obesity. Mississippi is ranked first, with the highest rate of obesity, followed by Alabama and Tennessee, while Colorado is ranked 50th, with the lowest prevalence.

Forecasts of expected US obesity rates are shown in Figure 1. The projections indicate that more than 51 percent of the US population may be obese by the year 2016. This is an admittedly startling prediction. Nonetheless, in the short term, obesity prevalence of well over 40 percent within the next five years is entirely plausible. Given the magnitude of the percentages, one might be inclined to treat these projections with skepticism. However, there are subsets of the US population that have already neared the levels projected here. For example, National Health and Nutrition Examination Study (NHANES) data show obesity rates of 36.5 percent for non-Hispanic Black women and 33.3 percent for Mexican-American women. Similarly, the rates of combined preobesity and obesity (BMI ≥ 25) among non-Hispanic Black women, and Mexican-American women were 77.3 percent and 71.9 percent, respectively. Since Maryland is close to the national average, these figures can be directly interpreted as representative of projections for the State.

Obesity is a precursor to a number of costly and serious ailments, including diabetes, cardiovascular disease, and cancer. Recent research also indicates that an

³ Centers for Disease Control and Prevention, 2007.

increase in the early onset of puberty—which is in turn linked to various forms of cancer—is related to the increase in obesity and overweight. When diabetes is combined with poverty, and the associated reductions in access to health care, it becomes a much more disturbing problem. As an example, sixteen to twenty percent of the residents of East Harlem, New York, are estimated to have Type 2 diabetes. Given that the poverty rate in East Harlem is very high, the number of people who are blind, or who have had limbs amputated because of inadequate management of their diabetes is staggering. The single most disturbing fact is that obesity and the resulting diabetes is almost one hundred percent preventable.

The Dollar Costs of Obesity

Beyond the serious human costs, obesity imposes a major financial burden as well. The direct medical costs in 2008, associated with overweight and obesity are estimated to be \$143 billion for the US as a whole. More than half of these costs are borne by publicly funded programs such as Medicare and Medicaid. Consequently, the individual decisions that result in obesity impose financial consequences on society at large. The \$143 billion price tag ignores all of the indirect costs that result from lost workdays, lower productivity while on the job, and other less obvious costs such as the additional expenditures made by hospitals and businesses, to accommodate heavier people. These indirect costs arise in a wide variety of forms. For example, hospital workers are facing more frequent injuries from dealing with heavier patients, which contributes even further to the indirect cost burden.

Obesity also affects workers in a more direct adverse manner. Two recently published studies of the employees of Duke University found a direct positive linear

relationship between BMI, workmen's compensation claims, lost workdays, and medical costs⁴. The types of injuries were also found to be related to BMI.

Since Maryland represents just slightly less than 2 percent of the US population, the direct medical cost burden for the state is approximately \$2.7 billion in 2008. It is true that the growth in prices of medical services has outstripped the general level of inflation and is expected to continue doing so. However, putting aside the effects of inflation, Figure 2 shows direct medical cost projections of obesity and overweight for the US in constant 2008 dollars, and the projections are far from comforting.

One other exacerbating factor is that the fraction of those who are above a healthy weight is trending toward a greater proportion of obese individuals with BMIs above 30, relative to those who have BMIs between 25 and 30⁵. Those with higher BMIs have disproportionately higher incremental health care costs. Consequently, the growth in medical costs associated with overweight and obesity are likely to accelerate if preventive measures are not taken.

Estimating the Indirect Costs of Obesity

The indirect costs of obesity are admittedly more difficult to measure. However, there are some existing estimates and indicators. For example, the National Institute of Diabetes and Digestive and Kidney Diseases estimates that obese workers lose one week of work per year as a result of weight related health problems. And, a firm with 1,000 employees loses \$285,000 a year due to obese—not overweight—workers. Absenteeism

⁴ Luigi Ferrucci, MD, PhD; Dawn Alley, PhD (Eds). "Obesity, Disability, and Mortality A Puzzling Link". *Archives of Internal Medicine*. 2007;167(8):750-751.

Ostbye T, Dement JM, and Krause KM. "Obesity and Workers' Compensation Results From the Duke Health and Safety Surveillance System". *Archives of Internal Medicine*. 2007;167:766-773.

⁵ Stanton KR, Acs ZJ. The infrastructure of obesity and the obesity epidemic: Implications for public policy. *Applied Health Economics and Health Policy*. 2005; 4:139-146.

accounts for about 30 percent of the loss⁶. A significant portion of the costs of obesity are a result of diabetes. In a 2007 study, reported by the American Diabetes Association, the indirect costs of diabetes resulting from increased workdays lost, lowered productivity, disease-related unemployment disability, and losses due to early mortality were estimated to be \$58 billion. Adjusting this figure based on Maryland's fraction of the population, the indirect costs associated with diabetes are approximately \$1.1 billion. On this basis, the overall cost of obesity to the State of Maryland is in all likelihood greater than \$3.7 billion.

Another point of reference is provided by a 2006 study of the impact of obesity in New Mexico⁷. This study estimated that the impact of lost business output, employment and income resulting from obesity, on the economy of New Mexico, was \$1.3 billion dollars, or 2.5 percent of the state's gross product. Ignoring the fact that New Mexico has a lower obesity rate than Maryland—New Mexico is ranked 38 versus Maryland's 27—and adjusting based on the populations of the two states, this also yields an estimate of \$3.7 billion for the cost to Maryland. Adjustments based on gross state product lead to a much higher \$4.7 billion estimate, largely because GDP per capita is much higher in Maryland than in New Mexico.

In 2007, the average weekly earnings in Maryland were reported by the Maryland Department of Labor, Licensing and Regulation as \$928. Average employment is 2.9 million. On that basis, if 33 percent of the population is obese, then the lost wages due to one week's health related absence is approximately \$0.6 billion. Obesity is related to a

⁶ The Fattening of America: How the Economy Makes Us Fat, If It Matters, and What to Do About It. Finkelstein, Eric A. and Laurie Zuckerman, John Wiley and Sons. 2008.

⁷ Eldo E. Frezza, Mitchell S. Wachtell, and Bradley Ewing, "The impact of morbid obesity on the state economy: an initial evaluation". *Occupational Health News Summaries*, 2006.

one-week increase in absenteeism, but this \$0.6 billion figure ignores the likely result that being overweight, but not obese, is also linked to a significant incremental loss of workdays. On that basis, the probable loss of earned income resulting from weight related health problems is probably closer to if not greater than \$1 billion.

Tax Consequences

To this point, we have estimated that the earnings losses alone for Marylanders are likely near \$1 billion. Based on an estimated average tax rate of 9 percent, lost tax revenue associated with this billion-dollar cost is \$90 million. This represents only part of the loss however. From the New Mexico study cited in footnote 7 above, the tax revenue losses were estimated to be \$48 million. Adjusting this figure on the basis of Maryland's much higher gross product, the estimate for Maryland is in excess of \$175 million.

Taking a slightly different approach, and concentrating only on the lost workdays, yields another measure of the potential gains. According to our estimate of more than \$1 billion lost to obesity, a program that could reduce worker absenteeism by 3.5 days could generate an attractive gain. Average weekly earnings in Maryland currently stand at approximately \$928 per week, or \$186 per day. Ignoring any improvements to those who are overweight, rather than obese, this means that 33 percent of the employed workforce could work an additional 3.5 days per year if participating in a health and fitness program. The employed workforce is approximately 2.9 million so the lost workdays for the obese segment only, is just over 3.3 million worker days. At the average daily rate of \$186, this means the value of unnecessary lost days is \$622 million. At an estimated state and local tax rate of 9 percent, this represents a tax revenue loss of \$56 million. With only a modest twenty percent participation in fitness programs, the gain to Maryland's

economy from lost workdays recovered is approximately \$124 million or \$11 million in tax revenues recovered. Again, this is a very conservative estimate since only the obese, and not the overweight are included in this calculation.

By The Numbers

US Health Care Expenditures	2007: \$2.3 trillion Projected 2016: \$4.2 trillion or 20 percent of GDP
US Direct Medical Costs of Overweight and Obesity	2008: \$143 billion
Maryland Indirect costs of Diabetes	2007: \$1.1 billion
Maryland Overall Costs of Obesity	2007: \$3.7 billion
Value of One Week's Wages Lost Due to Obesity in Maryland	2007: \$0.6 billion
Overall Estimated Weight Related Absenteeism Wage Losses in Maryland	2007: \$1 billion
Maryland Estimated Overall Tax Revenue Losses Due to Absenteeism	2007: \$175 million

The Infrastructure of Obesity

There are many factors that contribute to the obesity problem. They range from environmental factors to changes in behavioral patterns, and it is likely that the current problem is the combined result of several of these. However, taken in its most elementary form, excess body weight results from individuals taking in more calories than they are expending. On the intake side of the equation, there have been significant changes in consumption patterns over the past few decades. In terms of kilocalories per person per day, there has been a noticeable upswing in daily intake since the late 1970s. During the 1950s and 1960s, the value is in the range of 3,200 to 3,300 kilocalories per day, but by 1999, it had increased to the 3,700 mark. Beyond the actual scale of the addition to daily intake, there has also been an accompanying shift in terms of the fraction of daily calories

consumed as traditional meals, to a much greater emphasis on snacks, fast food, and in general, more processed foods. There is some sense that Americans have become more sedentary over the past few decades, even though the evidence of a reduction in caloric output is not as clear as the evidence indicating higher consumption levels. Although the additional 300 to 400 kilocalories cannot be easily expended by more strenuous work or exercise,⁸ any increase to activity level has been shown to be of benefit in reducing obesity. The conclusion to be drawn is that if we are to reduce obesity prevalence, the most promising strategies ought to address both caloric intake and physical activity. Overall, the goal should be to alter behavior in a manner that over the long term will sustain healthier choices in terms of smoking cessation, more exercise and sensible eating. Although there are other health and fitness improving strategies and programs that could be leveraged, many Maryland health clubs have already taken a proactive role in this approach by incorporating nutrition programs into their overall fitness regimens, making them an excellent example of the types of programs that could lead to health benefits and health care cost reductions.

Support for Health and Fitness Programs

There are many variants of wellness programs and other approaches to improving health and fitness. Many include health screening components as well as exercise and nutrition behavior improvement strategies. The physical health benefits of exercise are extensive. As one example, 'metabolic syndrome' is a group of risk factors that include high blood pressure, high cholesterol, high blood sugar, and obesity. A 10-year study conducted at the University of Western Ontario, London, Canada, involving 297 healthy

⁸ US Department of Agriculture, Major Trends in Food Supply, 1909-1999, *Food Review*, 23:1 January 2000.

but sedentary adults, aged 55 to 75, found “that those who began a regular exercise program decreased their risk of developing 'metabolic syndrome,' a risk factor for heart disease and diabetes”⁹. During the study, only 11 percent of the people who were engaged in regular exercise developed metabolic syndrome, while 28 percent, who were not exercising developed it. Even moderate levels of exercise have been shown to provide significant health benefits. In a study conducted in the UK, individuals were randomly assigned to three different groups. One group exercised by walking briskly for 30 minutes, 5 days per week. A second group walked briskly for 3 days per week and the control group did not walk. Both walking groups experienced reductions in blood pressure, and reduced waist and hip girth over the twelve week study¹⁰. Exercise is also a key factor in managing type 2 diabetes¹¹.

Perhaps less well-known, improved physical fitness extends to better mental health as well, which further supports the cost benefit analysis of encouraging physical activity. For example, as one measure of mental wellbeing, research conducted by Sainsbury, the UK grocery conglomerate, reported that children who exercise only once a week or less are four times as likely to say they are unhappy and five times more likely to say they have few or no friends, as those in their cohort who exercise more often. The link between exercise and endorphin production and accompanying mental health benefits in adults has also been widely reported. It goes without saying that the direct costs of treating and managing mental health problems are very large already and

⁹ Petrella, J., C.N. LAttanzio, A. Demeray, V. Varallo and R. Blore. “Can Adoption of Regular Exercise Later in Life Prevent Metabolic Risk for Cardiovascular Disease?” *Diabetes Care* 28:694-701, 2005.

¹⁰ Tully, M.A., M.E. Cupples, N.D. Hart, J. McEneny, K.J. McGlade, W.S. Chan, I.S. Young, “Randomised controlled trial of home-based walking programmes at and below current recommended levels of exercise in sedentary adults”, *Journal of Epidemiology and Community Health*, 2007;61:778-783.

¹¹ Conn, V.S., A. R. Hafdahl, D. R. Mehr, J. W. LeMaster, S. A. Brown and P. J. Nielsen. “Metabolic effects of interventions to increase exercise in adults with type 2 diabetes”. *Diabetologia*, 50:5, May 2007: 913-921.

trending upward. And, it would take little heroism to infer that productivity also suffers in the face of depression and other mental health problems.

Although the differential is waning, it is still the case that obesity prevalence is in general, inversely related to income levels. Wealthy people are less likely to be obese. The converse is that the poor are more likely to be obese than the average. There are two potential explanations of the relationship. First, those who become seriously obese generally become too unhealthy to earn high incomes. But, the other explanation is that wealthier people have greater access to health improving activities such as superior health care, health screening, and access to health and fitness clubs and other exercise opportunities.

If limits in access to health improving activities are a root cause of greater obesity among the poor, then this further supports the argument for some form of tax subsidy to health improving activities. Again, the emphasis should be on programs that are geared to the prevention of obesity and other approaches to encouraging healthy lifestyle choices.

Some health and fitness clubs are already providing one model of how the health of Marylanders can be improved. Many of these clubs are focusing on the combined importance of nutrition and exercise. In this way, both sides of the intake and output equation are addressed. The main point to be taken is that the more holistic approach, where eating and exercise behaviors are modified, along with improvements in other lifestyle choices such as smoking cessation are optimal.

Many studies have shown that health and fitness programs have several significant benefits. The benefits include reduced sick leave, reduced health care costs, and lowered workmen's compensation claims. Although the measures vary widely,

reports of absenteeism reductions range from 14 percent, to 45 percent. Other improvements that are more difficult to measure include improved performance in recruitment and retention¹². Perhaps most importantly, many of the benefits reported were measurable within the first six months of implementation of a health and fitness program.

Although obesity prevalence in Canada is much lower than in the US, the evidence in support of fitness programs is very convincing. In particular, the Canadian government's corporate health and fitness program generated \$1.95 to \$3.75 per employee dollar spent¹³. The City of Toronto, after introducing a health and fitness program found that participating employees had 3.4 fewer missed days in the first six months of the program than employees who were not participating¹⁴. Given the higher obesity prevalence of the US, achievements demonstrated in the Canadian evidence are likely well below the potential gains available in Maryland.

Developing an Implementable Program for the State of Maryland

In the current economic climate, state governments are struggling to avoid increasing taxes or drastically slashing expenditures and services. For that reason, even investments that have positive net present values and ought to be undertaken from an economic assessment may fail to receive support if they require significant upfront expenditures or generate tax revenue losses; or the benefits to the investment are far off in the future. Since many of the benefits of health and fitness programs show returns in the first six months, a subsidy focused on improving physical fitness is easily defended.

¹² IRSA, Association of Quality Clubs, "The Economic Benefits of Employee Fitness", 1992, www.fitresource.com

¹³ Dr. Roy Shephard.

¹⁴ http://naturalhealthcare.ca/benefits_of_a_wellness_program.phtml

The single most important point to be taken is that the benefits to exercise in terms of improving all aspects of health, increased productivity, and reductions in health care expenditures strongly support subsidizing health and fitness activities. In our current economic climate, some form of tax subsidy, either in the form of a tax credit, or a tax deduction, has strong potential for encouraging economic growth and increasing Maryland's tax revenues.

Tax Deduction versus Tax Credit

Tax credits and tax deductions can differ in terms of effectiveness and in tax revenue effects. The obvious difference between a tax credit and a tax deduction is that every dollar of a tax credit is fully returned to the taxpayer. A tax deduction on the other hand, is only partly returned to the taxpayer, and the amount will depend on the marginal tax rate of the individual filing the return. For that reason, the dollar amount of a tax deduction must be larger than the dollar amount of a tax credit, to provide the taxpayer with the same dollar amount of subsidy. For example, if a taxpayer with a marginal tax rate of 10 percent claims a tax deduction of \$500, their tax savings will be 10 percent of the \$500 amount, or \$50. For those in lower tax brackets, as is likely for senior citizens for example, the tax effect will be less than \$50.

The variation in tax impact is an important part of the distinction between a tax credit and a tax deduction. Because the tax deduction approach can result in different tax consequences for each taxpayer, it could generate unintended incentives, such as a lower benefit to those with lower incomes. But, any adverse effects on the incentive resulting from income differences can be corrected by linking the amount of the deduction back to income. The negative aspect of linking the size of the deduction to income is that

increasing the complexity of the deduction may reduce the number of people willing to claim it, and consequently it may reduce the effectiveness of the tax incentive.

The differential impact of a tax deduction allows for greater flexibility than can be easily accomplished with a tax credit and this may present an opportunity to maximize the net benefit of the tax subsidy. As a case in point, senior citizens on average require greater expenditures on medical care than younger people. In particular, obese senior citizens are even more likely to require expensive treatments that are the result of their obesity, such as type 2 diabetes and cardiovascular disease. Based on that, efforts geared to improving the fitness of senior citizens may have the most immediate payback in terms of reducing health care costs. Because senior citizens are also more likely to have lower than average incomes, placing them in lower tax brackets, there is a strong argument for providing seniors with a larger tax incentive to encourage them to improve their fitness levels. As an example, suppose that a senior has a marginal tax rate of 5 percent. A \$750 deduction for a health club membership or other expenditure to improve health and fitness would provide the senior with a tax saving of \$37.50. A taxpayer with a marginal tax rate of 13.3 percent on the other hand, would require only a \$500 deduction to receive the same \$37.50 benefit.

Although the example above outlines how the incentives could be structured to provide greater incentives for seniors, it is imperative that we not lose sight of the long-term solution. Even though the short-term cost savings from encouraging seniors to increase their fitness levels may be attractive, the prevention of obesity, by cultivating healthier exercise and fitness choices among our children is crucial, and will ultimately be the most cost effective. Maryland simply cannot afford the health care consequences

of allowing an ever-increasing fraction of the population to become obese adults. The most important key to reducing obesity and the health care cost consequences may well be in focusing on the development of better health and fitness choices among the children. Developing better diet and exercise habits early in life will have the most important impact on health care expenditures in the medium to long term.

One further aspect of the tax incentive for healthy activities is the actual size of the deduction or tax credit. The tradeoff is that a larger incentive will increase participation, and effectiveness. However, especially given the current budget challenges, it is important to acknowledge that a larger incentive may also reduce overall tax revenues in the short term. Although it is difficult to predict the participation rates in any tax incentive program, the following will illustrate the case. Based on a marginal tax rate of 9 percent and a deduction of \$500, the average taxpayer making the deduction would save \$45 on their taxes. Estimating the level of participation in a subsidy program of this type is beyond the scope of this study. However as one example, if only 3 percent of the Maryland workforce claimed this deduction, then the total tax reduction would be less than \$4 million. It is important to note that this completely ignores the gains that are likely to result in terms of productivity increases and reduced absenteeism. And once more, the results to date show that within the first six months, absenteeism is on average reduced by more than 3 days. The reduction in absenteeism alone is according to our estimates above, likely to largely offset any tax revenue reductions from the incentive.

Conclusions

In Maryland, obesity and its related adverse health consequences reduce productivity and tax revenues while simultaneously increasing health care expenditures.

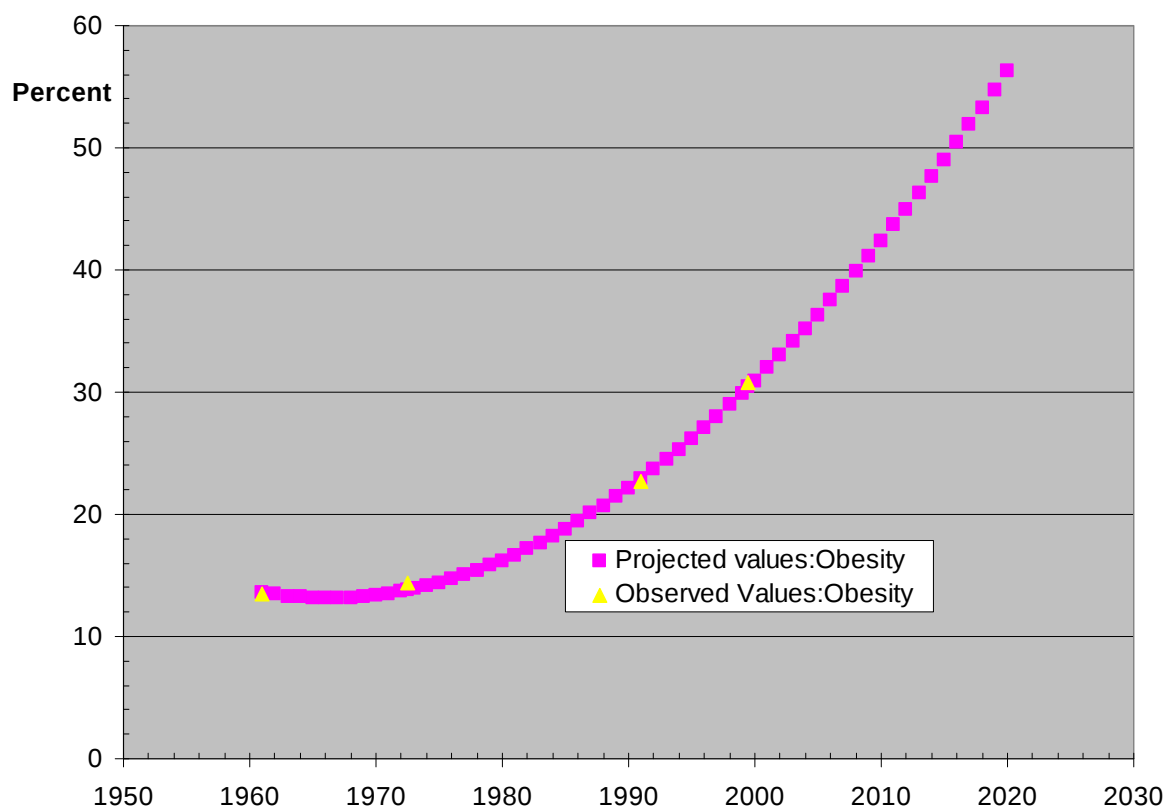
Most of the additional health care cost burden is carried by publicly funded programs such as Medicare and Medicaid. But, even those who are privately insured face higher premiums as a result of the additional cost burden attributable to weight related health problems. These additional health care costs are largely avoidable. Because the cost burden is shared not only by those who are overweight, but also by those who maintain good health, government intervention to improve health and fitness can be easily justified.

Physical activity has been shown to improve overall health in many dimensions, from increased longevity and lowered risk for a wide range of ailments such as cardiovascular disease, type 2 diabetes, and various cancers, to improvements in mental health and reduced worker absenteeism. Many studies show substantial benefits to even modest increases in physical activity with significant and measurable improvements within six months of initiating a fitness program.

Since we all share in the benefits of improved health and fitness, a tax incentive, in the form of a \$500 deduction per person, and a higher \$750 deduction for seniors, is economically supportable. The costs of the deduction are offset by reduced health care costs, reduced worker absenteeism, and overall productivity gains.

There is one final contributing factor that argues for the passage of a tax deduction that is not discussed above. By enacting this type of forward looking legislation, Maryland could easily become a national leader in tackling the obesity problem, which is likely to attract larger numbers of healthy and health conscious employees and in turn, a healthier workforce is likely to attract more employment opportunities.

Figure 1: US Obesity Prevalence (1960-2020)



Source: Stanton, Kenneth R. and Zoltan Acs, “The Infrastructure of Obesity and the Obesity Epidemic: Implications for Public Policy”, *Applied Health Economics and Health Policy*, 2005, vol. 4, issue 3, pp. 139-146

Figure 2: US Projected Obesity Direct Medical Costs (in billions of 2008 dollars)

