Robert Wood Johnson Foundation

Trust for America's Health
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ISSUE BRIEF

Bending the Obesity Cost Curve in Massachusetts:

REDUCING THE AVERAGE BODY MASS INDEX IN THE STATE BY 5 PERCENT COULD LEAD TO HEALTH CARE SAVINGS OF MORE THAN $5 BILLION IN 10 YEARS AND $14 BILLION IN 20 YEARS

The number of obese adults has grown dramatically in Massachusetts over the past 15 years, and is expected to grow significantly in the next 20 years.

However, by using evidence-based strategies to improve nutrition and increase physical activity in our schools, neighborhoods and work places, Massachusetts could significantly reduce obesity-related diseases and health spending.

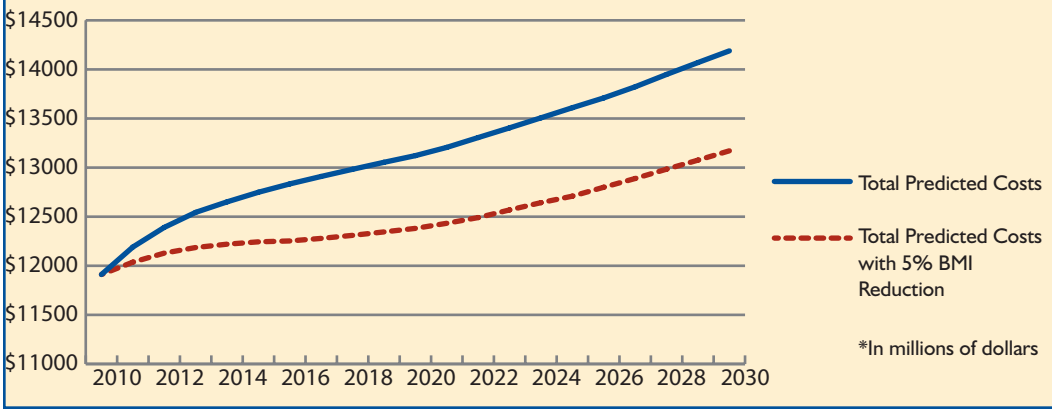
A new analysis commissioned by the Trust for America's Health (TFAH) and the Robert Wood Johnson Foundation (RWJF) and conducted by the National Heart Forum (NHF) found that if Massachusetts could reduce the average body mass index (BMI) of its residents by only 5 percent, the state could help prevent thousands of cases of type 2 diabetes, coronary heart disease and stroke, hypertension, cancer and arthritis, while saving millions of dollars. For a six-foot-tall person weighing 200 pounds, a 5 percent reduction in BMI would be the equivalent of losing roughly 10 pounds.[1]

Body mass index (BMI) is a calculation based on an individual's weight and height:

$$\textbf{BMI} = \frac{\text{(Weight in pounds)}}{\text{(Height in inches) x (Height in inches)}} \times 703$$

Obesity is defined as an excessively high amount of fatty tissue in relation to lean tissue. An adult is considered to be obese if his or her BMI is 30 or above.

PROJECTIONS FOR ANNUAL OBESITY-RELATED HEALTH SPENDING IN MASSACHUSETTS, 2010-2030



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Obesity-Related Health Care Costs in Massachusetts	
Potential Savings by 2020 if BMI is Reduced by 5% (cumulative)	Potential Savings by 2030 if BMI is Reduced by 5% (cumulative)
$5,045,000,000	$14,055,000,000

Potential Health and Cost Savings by Top Obesity-Related Health Problems					
	2010 Number of Cases	Potential Cases Avoided by 2020 if BMI is Reduced by 5% (cumulative)*	Potential Cost Savings by 2020, if BMI is Reduced by 5% (cumulative)	Potential Cases Avoided by 2030 if BMI is Reduced by 5% (cumulative)	Potential Cost Savings by 2030, if BMI is Reduced by 5% (cumulative)
Type 2 Diabetes	483,855	77,206	$1,656,000,000	155,532	$5,436,000,000
Obesity-Related Cancers*	102,436	6,851	$250,000,000	13,109	$489,000,000
Coronary Heart Disease & Stroke	375,028	65,085	$2,358,000,000	138,075	$5,918,000,000
Hypertension	1,258,549	75,888	$340,000,000	135,308	$952,000,000
Arthritis	1,270,472	40,777	$439,000,000	76,086	$1,257,000,000

2010 baseline for potential cases, costs and savings
* National Heart Forum provided the total cases and cases avoided per 100,000 people, and TFAH used the state's 2011 census data to translate to the full population-based estimates.
^ Top obesity-related cancers include endometrial (uterine), esophageal, kidney, colon and post-menopausal breast cancer.

Adult Obesity Rates in Massachusetts			
Obesity Rate in 1995	Obesity Rate in 2011	Projected Obesity Rate in 2030 based on current trajectory*	Projected Obesity Rate in 2030 if BMI Decreased by 5%*
11.6%	22.7%	48.7%	42.4%

*All ages, all genders, adjusted for self-reporting bias.

PEER-REVIEWED PROJECTIONS OF FUTURE TRENDS

The analysis is based on a model developed by researchers at the National Heart Forum (NHF). Micro Health Simulations used the model in a peer-reviewed study, "Health and Economic Burden of the Projected Obesity Trends in the USA and UK," published in 2011 in *The Lancet*.[2] The full methodology is available in Appendix C of the *2012 F as in Fat* report (available at www.healthyamericans.org).

All models have limitations in forecasting the future, but they help predict the trajectory of trends based on past data. Trends can, of course, change significantly over time for a variety of reasons. However, having a sense of potential scenarios is particularly helpful to understanding patterns, such as potential growth rates for diseases and costs projections, which can inform policy priorities and decisions.

The NHF study published in The Lancet in 2011 developed national projections for adult obesity in the United States and the potential growth in related disease rates and costs between 2010 and 2030, using data from the National Health and Nutrition Examination Survey (NHANES).

The NHF study found the number of obese Americans could grow from 32 percent now to around 50 percent (+/- 5 percent) in 2030.

Based on the predicted rise in obesity, researchers found the baseline potential growth in related costs could be $66 billion (+/- 45 billion). Within the potential range, it could be as low as $21 billion or as high as $111 billion.

In addition, due to expected increases in obesity, the projected baseline estimates for:[3]

- The number of new cases of diabetes could be 7.9 million (+/- 1.6 million) per year, which means it could be as low as 6.3 million or as high as 9.5 million;
- The number of new cases of chronic heart disease and stroke could be 6.8 million (+/- 1.5 million) per year, which means it could be as low as 5.3 million or as high as 8.3 million; and
- The number of new cases of cancer could be 500,000 (+/- 0.1 million) per year, which means it could be as low as 400,000 or as high as 600,000.

The projections in the state-by-state analysis featured in the *2012 F as in Fat* report are considered to be marginally more accurate than those reported in the national study, because the state-by-state study is based on data from the Behavioral Risk Factor Surveillance System (BRFSS) instead of NHANES. BRFSS provides more data points than NHANES (10 versus seven), which enables researchers to estimate projections more precisely.

EFFECTIVE WAYS TO REDUCE OBESITY

According to the U.S. Centers for Disease Control and Prevention (CDC), more than half of all Americans live with a preventable chronic disease, and many such diseases are related to obesity, poor nutrition and physical inactivity.[4]

A wide range of studies have found that effective disease-prevention programs in communities can improve nutrition, increase physical activity and reduce obesity rates.

- CDC's Community Preventive Services Taskforce conducts a systematic review and evaluation process to determine effective programs and policies for improving health and preventing disease. The results, published in the Community Guide for Preventive Services, feature a series of evidence-based, community approaches to increasing physical activity, promoting good nutrition, lowering diabetes rates and reducing obesity. The approaches include improving the built environment by building sidewalks and increasing access to parks; starting workplace wellness programs; and increasing physical activity in schools.[5]
- The Compendium of Proven Community-Based Prevention Programs by The New York Academy of Medicine (NYAM) includes a summary and examples from an extensive literature review that NYAM conducted of peer-reviewed studies evaluating the effectiveness of community-based disease-prevention programs.[6] NYAM identified 84 articles, including programs that can directly reduce obesity and obesity-related diseases.
- In 2011, the American Heart Association (AHA) published a review of more than 200 studies and concluded that most cardiovascular disease can be prevented or at least delayed until old age through a combination of direct medical care and community-based prevention programs and policies.[7] Some of the key findings included:[8]
  - Every $1 spent on building biking trails and walking paths could save approximately $3 in medical expenses.
  - For every $1 spent in wellness programs, companies could save $3.27 in medical costs and $2.73 in absenteeism costs.
  - Some interventions have been shown to help improve nutrition and activity habits in just one year and had a return of $1.17 for every $1 spent.
  - Participants in community-based programs who focused on improving nutrition and increasing physical activity had a 58 percent reduction in incidence of type 2 diabetes compared with drug therapy, which had a 31 percent reduction.

ENDNOTES

1 **The BMI of a 6-foot (72-inch) tall, 200-pound person is calculated as follows:**
BMI = (Weight in Pounds / (Height in inches x Height in inches)) x 703
BMI = (200/(72 x 72)) x 703
BMI = 27.12

A 5% reduction in BMI for this individual would be:
5% of Original BMI = Original BMI * 5%
5% of Original BMI = 27.12 x 0.05
5% of Original BMI = 1.36

The individual's BMI after the 5% reduction would be:
Reduced BMI = Original BMI – 5% of Original BMI
Reduced BMI = 27.12 – 1.36
Reduced BMI = 25.76

The individual's weight after reducing his/her BMI to 25.76 would be:
Reduced BMI = (Reduced Weight/(Height in Inches x Height in Inches)) x 703
25.76 = (New Weight/(72 x 72)) x 703
Reduced Weight = 189.96

The number of pounds the individual lost by reducing his/her BMI by 5% would be:
Pounds lost = Original Weight – Reduced Weight
Pounds lost = 200 – 189.96
Pounds lost = 10.04 pounds

2 Wang YC et al. Health and Economic Burden of the Projected Obesity Trends in the USA and the UK. *The Lancet,* 378, 2011.

3 Note: Hypertension and arthritis were not included in The Lancet study, but were included in the state-by-state analysis. Potential new cases of hypertension and arthritis were calculated using the same process as used for diabetes, chronic heart disease and stroke and cancer.

4 Kung HC, Hoyert DL, Xu JQ, and Murphy SL. *Deaths: final data for 2005. National Vital Statistics Reports 2008.* Atlanta, GA: Centers for Disease Control and Prevention, 2008. http://www.cdc.gov/nchs/data/nvsr/nvsr56/nvsr56_10.pdf (accessed July 14, 2010).

5 *Community Guide to Preventive Services.* U.S. Centers for Disease Control and Prevention, 2011. http://www.thecommunityguide.org/index.html (accessed January 17, 2012).

6 *A Compendium of Proven Community-Based Prevention Programs.* New York, NY: The New York Academy of Medicine, 2009.

7 Weintrub WS et al. AHA Policy Statement: Value of Primordial and Primary Prevention for Cardiovascular Disease. *Circulation,* 124: 967-990, 2011.

8 Busko M. "As treatment costs soar, AHA preaches prevention as savvy investment." *Heartwire* July 26, 2011. http://www.theheart.org/article/1256761.do (accessed January 11, 2012).