Bending the Obesity Cost Curve in North Carolina:

REDUCING THE AVERAGE BODY MASS INDEX IN THE STATE BY 5 PERCENT COULD LEAD TO HEALTH CARE SAVINGS OF MORE THAN $7 BILLION IN 10 YEARS AND $21 BILLION IN 20 YEARS

The number of obese adults has grown dramatically in North Carolina 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, North Carolina 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 North Carolina 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

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

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BMI = \frac{\text{Weight in pounds}}{(\text{Height in inches}) \times (\text{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.
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. 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 that 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:

- 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.
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.

\textbf{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.\(^5\)

\textbf{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:\(^8\)

\begin{itemize}
  \item Every $1 spent on building biking trails and walking paths could save approximately $3 in medical expenses.
  \item For every $1 spent in wellness programs, companies could save $3.27 in medical costs and $2.73 in absenteeism costs.
  \item 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.
  \item 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.
\end{itemize}

\section*{Endnotes}

\begin{itemize}
  \item The BMI of a 6-foot (72-inch) tall, 200-pound person is calculated as follows:
    \begin{align*}
    \text{BMI} &= \left(\frac{\text{Weight in Pounds}}{\text{Height in inches} \times \text{Height in inches}}\right) \times 703 \\
    \text{BMI} &= \left(\frac{200}{(72 \times 72)}\right) \times 703 \\
    \text{BMI} &= 27.12
    \end{align*}
  \item The individual’s BMI after the 5% reduction would be:
    \begin{align*}
    \text{Reduced BMI} &= \text{Original BMI} - 5\% \text{ of Original BMI} \\
    \text{Reduced BMI} &= 27.12 - 1.36 \\
    \text{Reduced BMI} &= 25.76
    \end{align*}
  \item The individual’s weight after reducing his/her BMI to 25.76 would be:
    \begin{align*}
    \text{Reduced BMI} &= \left(\frac{\text{Reduced Weight}}{\text{Height in Inches} \times \text{Height in Inches}}\right) \times 703 \\
    25.76 &= \left(\frac{\text{New Weight}}{72 \times 72}\right) \times 703 \\
    \text{Reduced Weight} &= 189.96
    \end{align*}
  \item The number of pounds the individual lost by reducing his/her BMI by 5% would be:
    \begin{align*}
    \text{Pounds lost} &= \text{Original Weight} - \text{Reduced Weight} \\
    \text{Pounds lost} &= 200 - 189.96 \\
    \text{Pounds lost} &= 10.04 \text{ pounds}
    \end{align*}
  \item 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.
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