



November 2023

Obesity Economic and Labor Force Impact per Million U.S. Population

Table of Contents

Executive Summary.....	iii
Background	1
Economic and Workforce Implications of Obesity	1
Potential Value of Treating Obesity	4
Recommendations to Improve Access to Obesity Treatment.....	8
References	11

List of Exhibits

Exhibit ES- 1. State Budget Implications of Obesity and Overweight per Million Population: 2022	iv
Exhibit 1. Estimated Economic Burden of Obesity and Overweight per Person-year.....	5
Exhibit 2. Estimated Clinical Benefits of Weight Loss Among Individuals with Obesity.....	6
Exhibit 3. Estimated Cumulative Medical Savings Due to Weight Loss Among Individuals with Obesity..	7
Exhibit 4. Estimated Cumulative Medical Savings Due to Weight Loss Among Individuals with Class III Obesity	7
Exhibit 5. Estimated Statewide 10-year Medical Cost Savings by Weight Loss Scenario.....	8

Supported by Eli Lilly and Company

Executive Summary

Obesity presents a significant public health challenge to communities across the U.S. Recently published state-specific studies on the economic and labor force implications of obesity capture the differences across states in prevalence of obesity, demographics, economic conditions, costs for healthcare services, and state budget implications via the impact of obesity on tax revenue collections and government expenditures.¹ This report presents estimated results per million people in the U.S. using national averages. Results can be scaled to the community or state level to provide an estimate of the impact of obesity to the local economy, workforce, and budget. State's whose prevalence of obesity is higher (or lower) than the national average, or states where prices for healthcare services and average earnings are higher (or lower) than the national average, can expect obesity economic impacts to be greater (or lower) than reported for this hypothetical population of one million.

For a nationally representative sample of one million people, approximately 217,000 (22%) are under the age of 18, 172,000 (17%) are aged 65 or older, and the remaining 611,000 (61%) are adults aged 18-64 who have a high propensity to be in the workforce. This population of 611,000 is the focus of our analysis, as well as a small number of adults aged 65 or older who are in the workforce. Among the adult population aged 18-64, an estimated 197,600 (32%) are categorized as having obesity and 193,600 (32%) have overweight. These high prevalence rates not only increase the risk of additional chronic conditions, such as heart disease, type 2 diabetes, various cancers, and other health conditions, but also pose substantial implications to the economy and workforce. National studies have consistently demonstrated that obesity and its associated health conditions contribute to higher medical expenditures, reduced workforce activity and productivity, increased disability expenditures, diminished quality of life, and premature mortality.

This study estimates the economic and workforce impact of obesity for a population of a million people, as well as the impact on state tax revenue collections and costs. The analysis focuses on adults who are currently part of the workforce or would have been in the workforce if not for having obesity. Modeled healthcare cost implications are for commercially insured adults, including insured state and local government employees, and Medicaid beneficiaries.

Key findings for 2022 include:

- Obesity and overweight reduce economic activity by \$1.3 billion (or 1.7% of gross domestic product [GDP] expected for a population of one million). Over 99% of this economic loss is attributed to obesity, with less than 1% attributed to overweight.
- Obesity and overweight have a detrimental effect on the state budget of \$144.3 million (Exhibit ES-1).
 - State tax revenues are lower by \$60.8 million.
 - State costs for Medicaid, public assistance, and state government health insurance are higher by \$83.5 million.
- Contributing factors to reduced economic activity and detrimental budget implications include:

Obesity and overweight cost per million population in 2022:

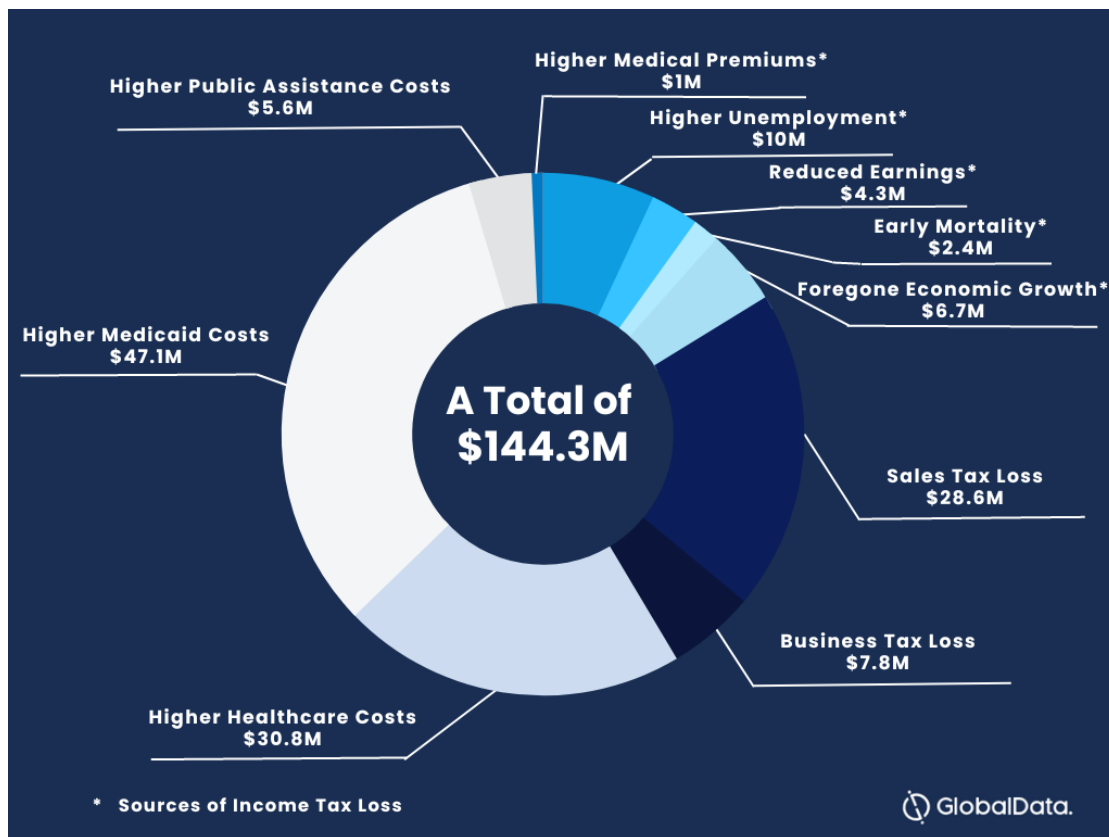
- **\$1.3 billion in reduced economic activity, or 1.7% of estimated GDP**
- **\$144.3 million impact on the state budget**
- **\$134 million in health-related absenteeism and disability costs**
- **9,500 fewer adults in the workforce**
- **9% reduced earnings for women with obesity**

Higher healthcare costs attributed to obesity and overweight total:

- **\$167 million for employers**
- **\$98 million for households with private insurance**
- **\$47.1 million in higher Medicaid costs to the state**
- **\$304 million in federal Medicare and Medicaid spending**

- Obesity raises health-related absenteeism and employer disability costs by \$134 million annually.
- 9,500 fewer adults are in the workforce due to obesity, including 7,900 additional unemployed adults and 1,600 fewer adults from premature deaths.
- Obesity reduces earnings by 9% for women (relative to women with healthy weight).
- Estimates of increased healthcare costs associated with obesity and overweight include:
 - \$167 million for employers and \$98 million for households with private insurance.
 - \$47.1 million in higher Medicaid costs to the state.
 - \$304 million in federal Medicare and Medicaid spending (which we exclude from the overall economic impact number to focus on state workforce and budget implications).
- Under the assumption that consumption/sales and business activities would be higher by the same 1.7% as GDP contribution from this population of one million, then in the absence of obesity and overweight, the state’s consumption/sales tax revenues and business tax revenues would have been higher by about \$28.6 million and \$7.8 million, respectively.
- Among the 7,900 adults without employment attributed to obesity, an additional 1,350 participate in state and local assistance programs who otherwise would not if they were employed. This estimated cost to the state government is \$5.6 million.

Exhibit ES- 1. State Budget Implications of Obesity and Overweight per Million Population: 2022



- Evidence-based approaches to treat obesity include intensive lifestyle modification programs such as the Diabetes Prevention Program², and medical interventions, such as anti-obesity medications and bariatric surgery. In our modeled scenarios, the non-Medicare adult population with obesity has improved access to treatment and achieves weight loss ranging from 5% up to 25%.
 - Under the least aggressive (5%) weight loss scenario, 19% of people with obesity would no longer meet the criteria for obesity. In the most aggressive (up to 25%) weight loss scenario, this percentage increases to 72%.
 - In the most aggressive scenario, over a 10-year period:
 - There would be a decline in incidence of type 2 diabetes onset, stroke, heart attack, coronary heart disease, and overall mortality by 43%, 31%, 29%, 24%, and 4.3%, respectively.
 - Medical costs among the modeled population would decline by \$2.9 billion, or by an average of \$14,558 per person with obesity cumulative over the 10-year period.

In addition to the quantifiable financial and employment-related impacts of obesity examined in this study, there are significant effects of obesity that are more challenging to quantify in economic terms. These effects include:

- **Reduced workforce resilience:** Obesity reduces the available labor force as some jobs have specific weight or physical fitness requirements due to safety concerns or performance expectations. Other jobs require high levels of physical exertion, and obesity can limit mobility, stamina, and overall physical performance, making it more challenging to meet the physical demands of these jobs. This can lead to decreased work efficiency, increased fatigue, and a higher risk of work-related injuries.
- **Stigma and discrimination:** People with obesity often encounter stigma, bias, and discrimination in various aspects of life, including education, employment, healthcare, and relationships.³ These negative experiences may lead to reduced self-confidence and restricted opportunities for social and professional advancement.
- **Health complications, quality of life, and early mortality:** Obesity and its related health conditions can significantly impact mobility, physical functioning, and engagement in daily activities, hobbies, and social events. This may result in pain, discomfort, and limitations in daily functioning, leading to a diminished quality of life. Additionally, obesity is associated with a higher risk of premature mortality.
- **Equity:** Many aspects of obesity disproportionately affect Black/African American, Hispanic, Native American, Alaskan Native persons, and women.⁴⁻⁶

The findings of this study emphasize the substantial economic impact of obesity on individuals, businesses, state, and local government. They underscore the urgency of addressing obesity as a critical public health issue and implementing effective prevention and treatment strategies to mitigate its negative economic impact. Prioritizing efforts to prevent and treat obesity can improve the well-being and economic resilience of individuals, foster a more equitable society, and cultivate a healthier workforce.

Recommendations

Prominent organizations have released evidence-based guidelines that provide valuable guidance for healthcare professionals and policymakers concerning the prevention and treatment of obesity.⁷⁻²⁰ Still, access to and utilization of obesity treatment remains limited. The following recommendations to state policy makers and to employers can increase access to modernized^a and evidence-based obesity care.

^a Modern healthcare leverages science, technology, health capabilities, and cost-effective solutions to enhance quality, efficiency, and delivery of care.

State policy makers

1. **Promote insurance coverage for comprehensive obesity treatment:** State policy makers can demonstrate modern care for obesity by updating health insurance for state employees to cover evidence-based obesity treatments, including intensive behavioral counseling, nutrition support, pharmacotherapy, and bariatric surgery.
2. **Expand Medicaid coverage for obesity treatment:** State policy makers can expand Medicaid coverage to include evidence-based obesity care, including intensive behavioral counseling, nutrition support, pharmacotherapy, and bariatric surgery.
3. **Invest in community-based programs and education campaigns:** State policy makers can invest in community-based programs and infrastructure that serve as an adjunct to access to obesity treatment, ensuring individuals have access to healthy, affordable food and safe, affordable opportunities for being physically active. Education campaigns can increase awareness about the causes of and health risks associated with obesity and promote evidence-based obesity treatments. Investing in community health worker (CHW) programs, for example, can be a cost-effective way to provide outreach and support to address obesity among underserved populations.^{21,22}

Employers

4. **Offer insurance coverage and wellness programs for obesity care at parity with other chronic diseases:** Employers can ensure their health insurance plans cover evidence-based obesity treatments, including intensive behavioral counseling, nutrition support, pharmacotherapy, and bariatric surgery. Employers can implement wellness programs that specifically address obesity prevention and management. These programs can include resources for healthy eating, physical activity initiatives, access to fitness facilities or classes, and weight management support.
5. **Foster a culture of support and inclusion:** Employers can create a culture of support and inclusion that recognizes and accommodates the needs of employees with obesity. This can involve implementing non-discriminatory policies, offering weight bias and stigma training, creating a supportive workplace environment that promotes healthy behaviors such as providing healthy food options, offering opportunities for physical activity, and providing reasonable workplace accommodations for individuals with obesity and related health conditions.
6. **Provide education and resources:** Employers can provide education and resources to employees to educate about the health risks associated with obesity as well as strategies for obesity care and weight management. This can include partnering with their health insurance program and other providers to encourage weight assessments as part of their annual physical, and offer health screenings, health coaching, and other support services.

In summary, for a nationally representative population of one million in 2022, obesity is associated with **\$1.3 billion in lost economic activity** and **9,500 fewer adults** in the workforce. The estimated state **budget impact of \$144.3 million** includes \$60.8 million in lost tax revenues and \$83.5 million in increased costs. The impact would likely be larger in states with higher prevalence of obesity and states with higher cost of living. These numbers understate the total economic implications of obesity as they omit higher federal spending for Medicare and Medicaid costs, as well as the costs among children with obesity. Supporting individuals to treat their obesity has the potential to generate substantial medical savings while also increasing labor force participation and productivity, thereby stimulating significant economic activity.

Background

Obesity presents a significant public health challenge to communities across the U.S. Recently published state-specific studies on the economic and labor force implications of obesity capture the differences across states in prevalence of obesity, demographics, economic conditions, prices for healthcare services, and state budget implications via the impact of obesity on tax revenue collections and government expenditures.¹ This report presents estimated results per million people in the U.S. using national averages. While not as precise as a state-specific study, results can be scaled to the community or state level to provide an estimate of the implications of obesity to the local economy, workforce, and budget. State's whose prevalence of obesity is higher (or lower) than the national average, or states where prices for healthcare services and average earnings are higher (or lower) than the national average, can expect obesity economic impacts to be greater (or lower) than reported for this hypothetical population of one million.

For a nationally representative sample of one million people, approximately 217,000 (22%) are under the age of 18, 172,000 (17%) are aged 65 or older, and the remaining 611,000 (61%) are adults aged 18-64 who have a high propensity to be in the workforce. This population of 611,000 is the focus of our analysis, as well as a small number of adults aged 65 or older who are in the workforce. Among the adult population aged 18-64, an estimated 197,600 (32%) are categorized as having obesity and 193,600 (32%) have overweight. These high prevalence rates have profound implications for the population's health, as obesity and overweight are associated with a range of serious diseases including type 2 diabetes, cardiovascular conditions, certain cancers, and numerous other health complications, resulting in increased medical costs and premature mortality.²³⁻³¹ Studies consistently demonstrate the substantial economic impact of obesity on a national scale, with estimated direct and indirect costs accounting for 2.0% to 3.3% of the country's gross domestic product (GDP).^{32,33}

These national studies underscore the substantial health, social, and economic burden imposed by obesity as well as the detrimental impact on workforce resilience. The objective of this study is to estimate the economic, workforce, and state and local budget implications of obesity within a nationally representative sample of one million people. Reported numbers can be easily scaled to provide an estimate of the implications of obesity for states without state-specific numbers. Our analysis primarily focuses on adults who are currently part of the workforce or would have been in the workforce if not for their obesity. Modeled healthcare cost implications are for commercially insured adults, including insured state and local government employees, and Medicaid beneficiaries. This report provides insight on the significant impact of obesity and provide recommendations for enhancing access to modern, evidence-based obesity care. Through these efforts, we strive to address the multifaceted challenges posed by obesity and contribute to the overall well-being of individuals, the economy, and the broader health of each state's population.

Economic and Workforce Implications of Obesity

A healthy population is vital for driving economic growth as it expands the labor force, enhances productivity, reduces absenteeism and turnover, and allows for resources otherwise spent on healthcare to be allocated to other productive sectors.^{30,34} A healthy and productive workforce creates an appealing business environment for investment, attracting companies that value access to skilled workers, increased productivity, and lower healthcare expenses.³⁵

Analysis of the National Health Interview Survey (NHIS) shows that individuals with obesity have a higher likelihood of unemployment compared to those with healthy weight or overweight, even after considering demographic factors.ⁱ (Healthy weight for adults is defined as having a body mass index [BMI] between 18.5 to <25.0; overweight is defined as BMI between 25.0 to <30.0, and obesity is defined as BMI of 30.0 or higher).³⁶ Men with obesity have 7% lower odds of

being employed compared to men with healthy weight, while women with obesity have 20% lower odds of being employed compared to women with healthy weight. For a population of one million, this translates to 7,900 fewer adults with obesity in the workforce in 2022 due to unemployment compared to a theoretic obesity-free scenario. By analyzing the 2022 Current Population Survey (CPS) data on national average earnings and considering the demographics of individuals who are unemployed due to obesity, as well as estimates that state and local income taxes average 2.1% across the nation³⁷, we found that the absence of these 7,900 individuals from the workforce led to a decrease of \$474.6 million in economic activity and a reduction of \$10 million in state and local income tax revenues.

Our analysis also reveals that women with obesity earn 9% less than women with healthy weight, aligning with published studies.³⁸⁻⁴⁰ The reasons behind this disparity are not fully understood but could be attributed to factors such as reduced working hours, lower-paid occupations due to health issues, or discrimination.⁴¹ In 2022, obesity is associated with \$206.2 million in reduced earnings and \$4.3 million in decreased state and local tax revenues.

Obesity leads to increased health-related absenteeism and disability costs that rise with the severity of obesity, averaging \$907 per employed adult with obesity in 2022.^{30,34,ii} Applied to the modeled workforce, this totals to \$134 million in reduced economic activity. Employers bear a portion of this burden through decreased productivity and higher disability insurance costs, while individuals experience reduced earnings.

The medical costs for adults with obesity and overweight are higher than costs for their peers with healthy body weight. Higher annual costs attributed to obesity (overweight) average \$2,435 (\$224) for private health insurance, \$3,393 (\$917) for Medicaid, and \$2,801 (\$828) for Medicare.^{29,31,ii} Taking into account the proportion of working adults with obesity, employer-sponsored insurance coverage, and the allocation of healthcare costs between employers and employees, overweight and obesity reduce pay by \$115 to \$522 per employee. Using the lower bound of this range, this equates to \$47.9 million in reduced earnings and a \$1.0 million reduction in state and local income tax revenues.

Obesity is associated with a higher risk of various medical conditions and premature death, leading to approximately 1,460 premature deaths per year for the modeled population.⁴² We estimated the demographic distribution of people whose premature death is attributed to obesity using national all-cause mortality data from 2016 to 2021 from the Centers for Disease Control and Prevention (CDC) and attributable fractions to estimate the proportion of deaths attributed to obesity by demographics of the deceased.⁴³⁻⁴⁵ Applying labor force participation rates by demographic, among the premature deaths that occurred during the prior 5 years approximately 1,600 adults would still be in the workforce. The premature deaths of these adults represent a \$113 million loss in state GDP and a \$2.4 million loss in state and local income tax receipts.

The foregone economic activity from the combined impact of reduced employment, premature mortality, lower productivity, and lower earnings means less disposable income for families and businesses. Much of this disposable income would be spent on goods and services in the state and local community, which in turn would create additional jobs and economic activity. The multiplier effect on additional economic activity is calculated based on the proportion of disposable income that people spend versus save, and the proportion of spending that households and businesses spend in the state versus purchases from out-of-state. We use the average US long term savings rate of 8.91% as an estimate of the savings rate.⁴⁶ The proportion of spending that households and business spend in-state is unknown, but conservative estimates of 80% and 40%, respectively, are used.⁴⁷ This leads to a conservative estimate of the state multiplier of 1.4, meaning that each \$100 increase in disposable income to families and businesses would create \$140 in total economic activity in the state. We estimate that the total reduction in economic activity from the combined sources above equates to \$1.3 billion, meaning that in the absence of obesity the GDP for this population of one million could have been 1.7% higher than the level of GDP (\$76.3 billion) that would be expected based on national averages in 2022.⁴⁸

Based on national averages, a population of one million generates state and local sales tax revenues of approximately \$1.7 billion and state business tax revenues of approximately \$457.3 million.⁴⁹ If GDP were 1.7% higher, then under the assumption that sales and business activities would also have been about 1.7% higher in the absence of obesity then

consumption/sales tax revenues and business tax revenues would have been higher by about \$28.6 million and \$7.8 million, respectively. In total, an estimated \$60.8 million in lost income, sales, and business tax revenues attributed to obesity and overweight equates to 1.0% of the expected \$6 billion that a population of one million would contribute to a state's 2022 budget based on national averages.

Higher healthcare costs associated with obesity and overweight increase costs to state and local governments. For adults with private insurance, overweight and obesity are associated with, respectively, \$224 and \$2,435 in higher annual medical costs.^{29,31,iii} Accounting for overweight and obesity rates, estimates that 78% of state and local government employees participate in their employer-sponsored plan, that 34% of participating employees insure a second adult, and that government employers cover approximately 71% of healthcare premiums, state and local governments pay about \$686 extra in healthcare costs attributed to overweight and obesity per participating employee. Among a population of one million, we would expect about 57,700 state and local government employees and \$30.8 million in higher healthcare costs for state and local government employees and their dependents.

Obesity and overweight also raise the cost of care for Medicaid beneficiaries. The added cost for overweight is estimated at \$917 and the added cost for obesity is \$3,393.³¹ On average, states pay 31% of Medicaid costs, with the federal government paying the remainder.⁵⁰ Estimates of overweight and obesity prevalence among a nationally representative sample of adults in Medicaid beneficiaries are 31.5% and 37.9%, respectively. For the modeled population, an additional \$152.3 million in higher Medicaid costs in 2022 is attributed to overweight and obesity, including \$47.1 million as the state's share of Medicaid spending.

Analysis of the NHIS finds that people with obesity who are unemployed have higher participation in state and local public assistance programs relative to people with obesity who are employed. As discussed earlier, obesity is associated with higher rates of being unemployed. Of the estimated 7,900 adults unemployed due to obesity, about 1,350 are participating in public assistance programs who otherwise would not if they were employed. This additional cost to the state government is estimated to be \$5.6 million.

In summary, the economic impact of obesity and overweight in a population of one million is substantial, resulting in 9,500 fewer adults in the workforce, \$1.3 billion in lost economic activity, a reduction of \$60.8 million in state tax collections, and additional state and local government costs of \$83.5 million. These estimates may be conservative, as they do not account for pediatric obesity costs and the less quantifiable impact of reduced productivity while at work (presenteeism³⁰) due to obesity-related health conditions. Moreover, the estimate of foregone economic activity does not consider the potential benefits of reduced healthcare costs and a more resilient workforce in attracting new economic investments.

While this study focuses on costs from the perspective of a state, national studies report that Medicare patients with obesity and overweight experience higher medical costs compared to patients with healthy body weight.³¹ When applied to the 172,000 Medicare beneficiaries that would be expected among a population of one million, along with increased federal costs for Medicaid, it suggests that the federal government's spending on Medicare and Medicaid among the modeled population is approximately \$304 million higher due to obesity and overweight. Furthermore, an estimated \$167 million in additional healthcare expenses by employers and \$98 million in additional healthcare spending by households could be utilized for other purposes.

In addition to the financial and work-related impacts of obesity modeled in this study, additional detrimental impacts of obesity on the population and the workforce are less quantifiable.

- Reduced workforce resilience:** People with obesity and obesity-related comorbid conditions such as type 2 diabetes experienced greater risk of COVID-19 severity, hospitalization risk, and mortality risk which had contributed to slower economic activity.^{51,52} For many occupations, obesity reduces the available labor force. Some occupations have specific weight or physical fitness requirements due to safety concerns or performance expectations. Other occupations require high levels of physical exertion, and obesity can limit mobility, stamina, and overall physical performance,

making it more challenging to meet the physical demands of these jobs. This can result in decreased work efficiency, increased fatigue, and a higher risk of work-related injuries.

- **Stigma and discrimination:** People with obesity often face stigma, bias, and discrimination in various areas of life, including education, employment, healthcare, and interpersonal relationships.³ This can result in reduced self-confidence, and limited opportunities for social and professional advancement.
- **Health complications, quality of life, and early mortality:** Obesity is associated with a higher risk of developing various health complications, including type 2 diabetes, heart disease, stroke, certain cancers, musculoskeletal conditions, and sleep apnea. These conditions can have long-term effects on health, well-being, and life expectancy, impacting both physical and emotional aspects of an individual's life. Obesity and related health conditions can limit mobility, impair physical functioning, and restrict participation in daily activities, hobbies, and social events. These conditions can further decrease quality of life by causing pain, discomfort, and limitations in daily functioning.
- **Equity:** Many aspects of obesity disproportionately affect Black/African American, Hispanic, Native American, Alaskan Native persons, and women.⁴⁻⁶ Women are disproportionately affected by the detrimental impact of obesity on labor force participation and pay. Racial and ethnic minorities experience higher rates of obesity. The detrimental financial aspects of obesity affect household income leading to greater inequities. Obesity, therefore, exacerbates current inequities.

Study findings emphasize the considerable economic consequences of obesity on individuals, businesses, and the state government, highlighting the need to address obesity as a public health concern. It is crucial to implement effective prevention and treatment strategies to mitigate the negative economic impacts. Many communities are currently facing a shortage of workers in various industries, and the projected slow population growth for the working-age population further underscores the importance of maintaining a healthy and available workforce to drive economic growth.

Potential Value of Treating Obesity

To demonstrate the value of treating obesity, we used a published computer simulation model, the Disease Prevention & Treatment Microsimulation Model (DPTMM),⁵³⁻⁵⁷ to quantify the health and economic benefits when adults with obesity reached certain weight loss goals achievable with obesity treatment.^{iv} The simulation uses a constructed population file that is representative of the non-Medicare adult population.^v Weight loss is one component of treating obesity, with weight loss contributing to improvements in blood pressure, cholesterol levels, blood sugar levels, and other health benefits.⁵⁸ Specifically, we modeled scenarios achieving and maintaining body weight loss of up to 5%, 10%, 15%, 20%, and 25% among adult residents with obesity.

Obesity is a complex and chronic disease that requires a multifaceted approach to treatment. Successful treatment of obesity typically involves a combination of intensive lifestyle interventions, behavior modifications, and medical treatments, based on the health care professional's evidence-based assessment of the patient and shared decision making on treatment goals and approach.

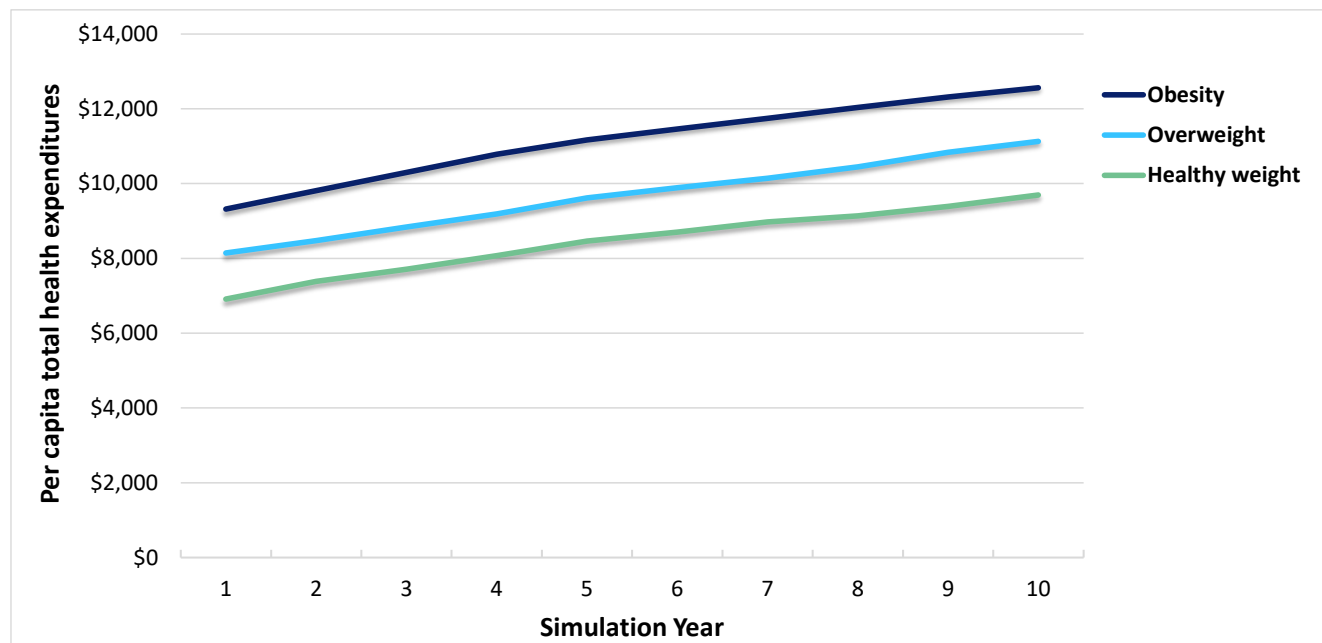
- **Lifestyle and behavioral interventions:** The cornerstone of obesity treatment is intensive lifestyle modification programs, with studies showing average weight loss up to 8% of initial body weight.^{59,60} The Diabetes Prevention Program, for example, is well established as a cost-effective intervention to achieve modest weight management.² The U.S. Preventive Services Task Force recommends that primary care clinicians screen all adults for obesity, and that all adults with obesity be offered intensive multicomponent behavioral interventions.⁶⁰ Programs that offer intensive lifestyle counseling and intervention might include a registered dietitian or other trained professional to help individuals develop a personalized nutrition and physical activity plan that meets their specific needs and goals.

Counseling often includes behavioral strategies such as goal setting, self-monitoring, and problem-solving to help individuals identify and overcome barriers to weight loss.

- **Medical treatments:** Medical treatments may be necessary for individuals with obesity who may not achieve sufficient weight loss through intensive lifestyle interventions and behavior modifications alone. Medical treatments may be part of initial therapy based on the health care professional’s assessment. These treatments include prescription anti-obesity medications and bariatric surgery.
 - **Prescription anti-obesity medications** should only be used under the supervision of a healthcare provider and in combination with lifestyle interventions. Studies indicate that patients who combine anti-obesity medications with lifestyle interventions achieve weight loss that is 3% to 12% higher compared to patients not using such medications.⁶¹ Recent clinical trials have reported average weight loss of 15% to 20%, or even higher in many patients.^{62–65}
 - **Bariatric surgery** may be recommended for individuals with obesity who may not achieve sufficient weight loss with lifestyle interventions and medical treatments or who meet surgical care guidelines.¹⁹ It can help individuals achieve significant weight loss and improve overall health. However, it is a major surgical procedure that carries risks and requires lifelong follow-up care. Different types of bariatric procedures have been associated with an average weight loss of 25% or higher.^{66,67}

Managing obesity can result in substantial long-term economic savings. Our analysis estimates that among the non-Medicare population, adults with obesity are estimated to have on average nearly \$2,700 in excess medical costs annually compared to similar adults with healthy weight over the next decade (Exhibit 1). This estimate is similar to published estimates of \$2,435 higher costs for adults with private health insurance and \$3,393 higher costs for adults on Medicaid.²⁹ The gap in medical spending due to obesity is projected to widen as individuals age, highlighting the long-term consequences of obesity.

Exhibit 1. Estimated Economic Burden of Obesity and Overweight per Person-year



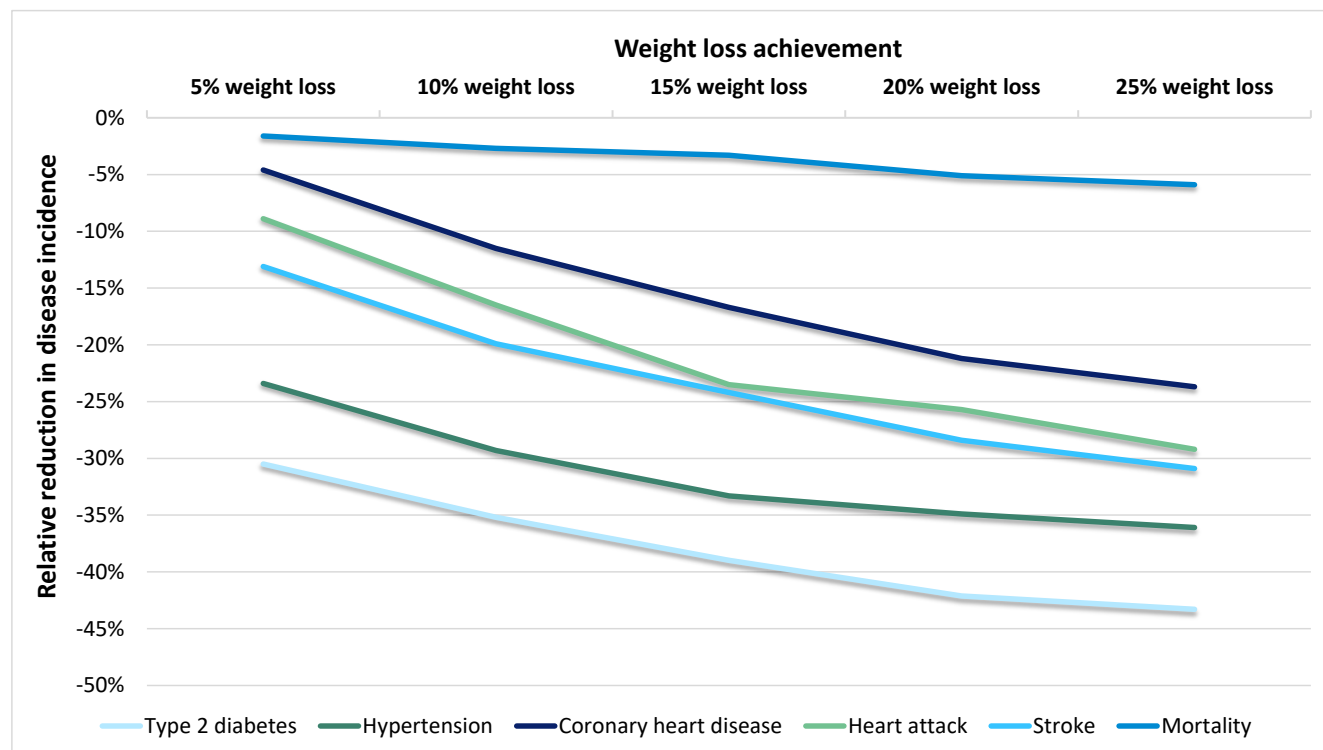
Source: GlobalData Plc.

Significant health benefits can be achieved for adults with obesity by maintaining just a 5% loss of body weight. Over the next 10 years, this modest weight loss could result in a 31% lower incidence of type 2 diabetes, 13% fewer strokes, 9% fewer heart attacks, and a 1.6% reduction in overall mortality among the population with obesity (Exhibit 2). The potential improvements become even more substantial for those who can sustain greater weight loss. For this modeled cohort, sustaining 25% weight loss could potentially reduce the onset of type 2 diabetes by 43%, incidence of stroke by 31%, incidence of heart attack by 29%, incidence of heart disease by 24%, and overall mortality by 5.9%.

These clinical improvements also translate into significant cost savings in healthcare expenditures. Among those who successfully achieve a 5% weight loss in the first year, an average savings of \$314 can be expected. If this weight loss is maintained over the following decade, the cumulative medical cost savings per person could reach \$5,914 (Exhibit 3). Particularly for individuals with a BMI greater than 40 kg/m², sustaining a higher weight loss can lead to estimated savings of \$17,056 in medical costs over the next 10 years (Exhibit 4). For the modeled population with obesity, maintaining a 5% reduction in weight could save \$1.2 billion in medical costs over the next decade. Potential savings rise to \$2.9 billion under the scenario maintaining up to 25% reduction in weight—though many people with obesity will not require the full 25% weight loss to move out of the obesity range (Exhibit 5).

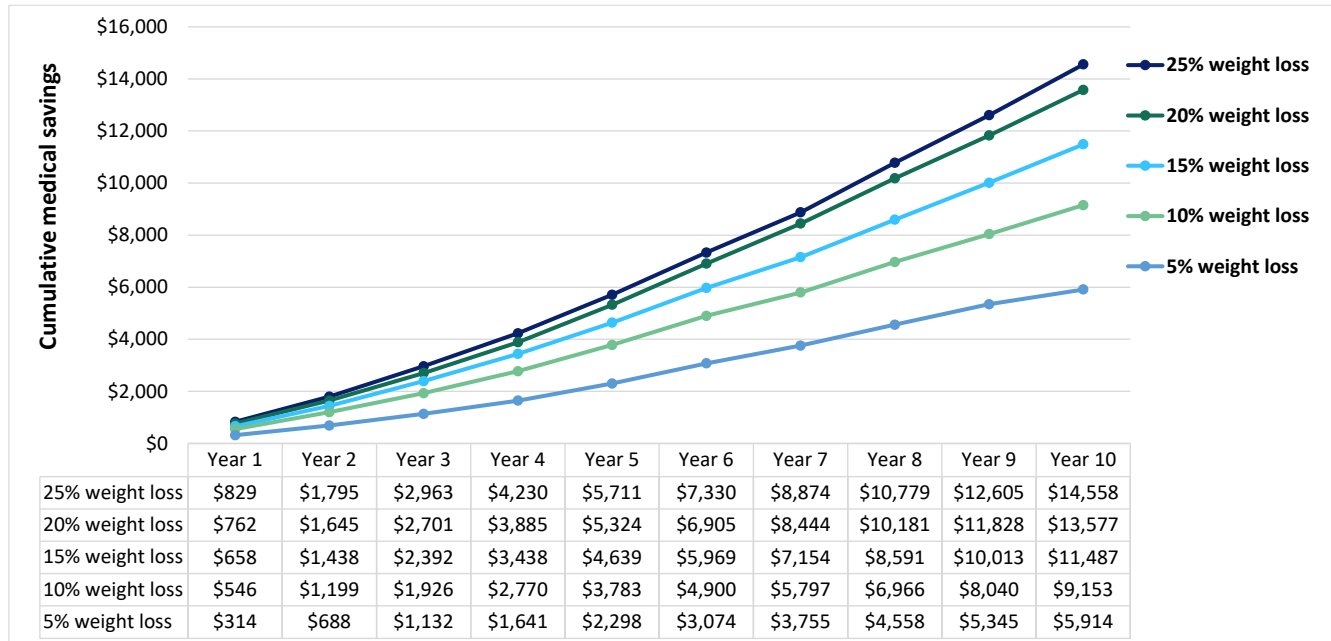
These model results emphasize the importance and substantial benefits of long-term obesity management, particularly for individuals with higher initial BMI. By investing in sustained interventions and support systems, healthcare systems can potentially alleviate the burden of obesity-related healthcare costs over time. Preventing complications associated with obesity, such as type 2 diabetes, cardiovascular diseases, and musculoskeletal disorders, can result in significant savings in medical expenses, hospitalizations, and long-term care. Moreover, a focus on long-term obesity management promotes productivity, reduces absenteeism, and positively impacts workplaces and economies by enabling individuals to lead healthier and more active lives.

Exhibit 2. Estimated Clinical Benefits of Weight Loss Among Individuals with Obesity



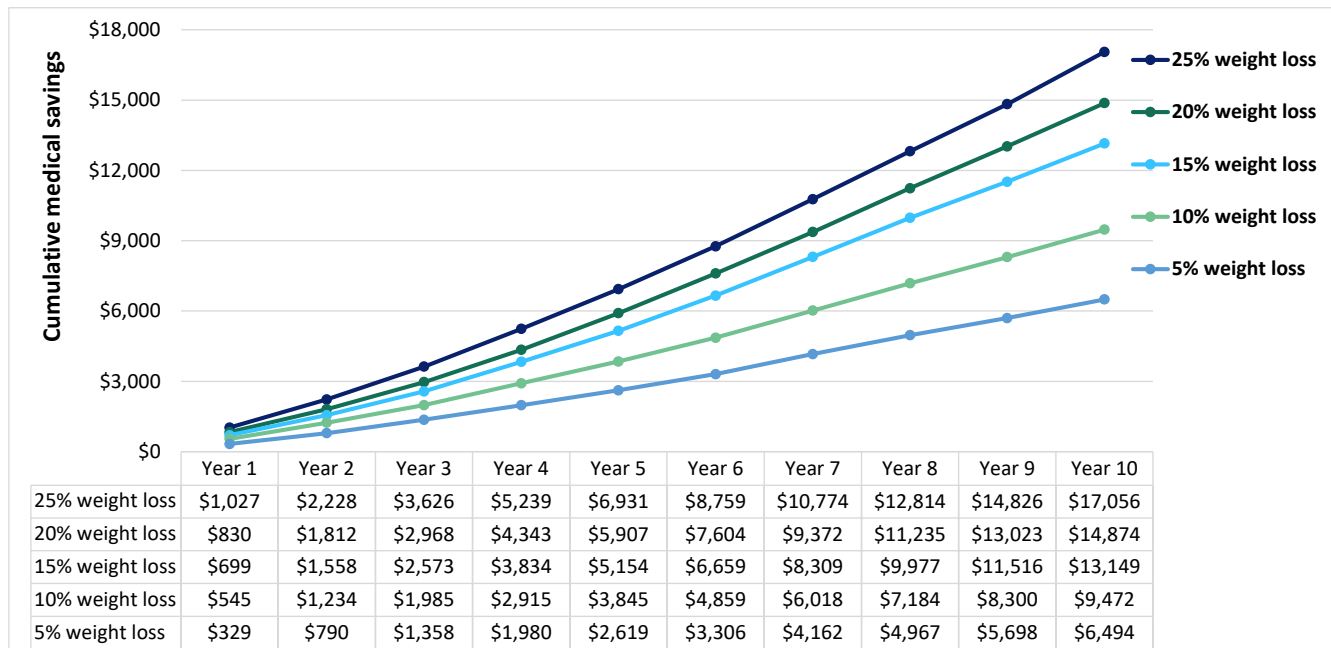
Source: GlobalData Plc.

Exhibit 3. Estimated Cumulative Medical Savings Due to Weight Loss Among Individuals with Obesity



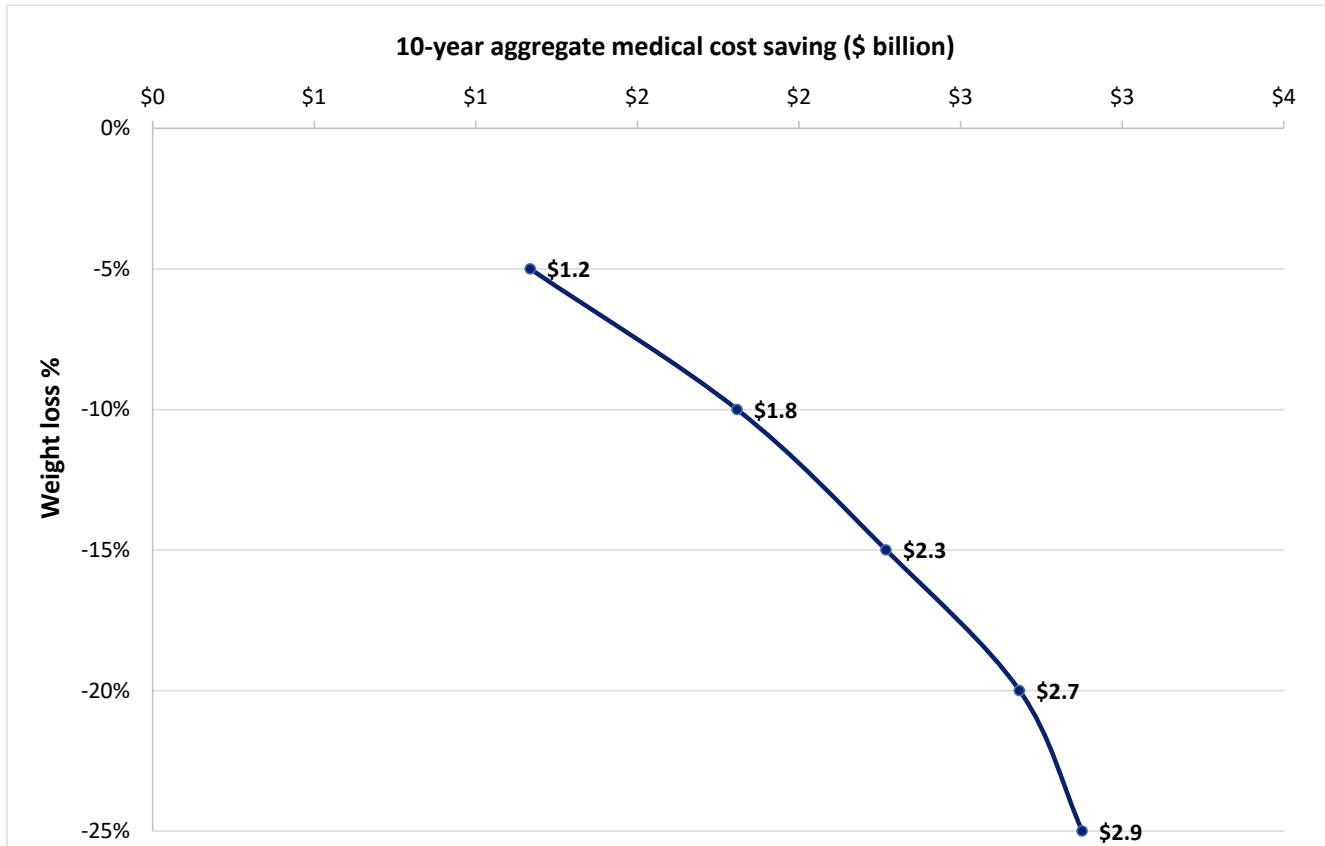
Source: GlobalData Plc.

Exhibit 4. Estimated Cumulative Medical Savings Due to Weight Loss Among Individuals with Class III Obesity



Source: GlobalData Plc.

Exhibit 5. Estimated Statewide 10-year Medical Cost Savings by Weight Loss Scenario



Source: GlobalData Plc.

Note: This chart shows the estimated cumulative savings over 10 years if within a population of one million the adults under age 65 with obesity could achieve body weight loss of 5%, 10%, 15%, 20%, or 25%.

Recommendations to Improve Access to Obesity Treatment

A multitude of state, national, and international organizations have released evidence-based guidelines concerning the prevention and treatment of obesity. These recommendations serve as valuable guidance for healthcare professionals and policymakers in tackling this significant public health concern.

- **The National Institutes of Health (NIH)** has developed guidelines for the management of overweight and obesity in adults, including recommendations for lifestyle interventions, pharmacotherapy, and bariatric surgery.⁷
- **The Centers for Disease Control and Prevention (CDC)** has developed a framework for obesity prevention and control that includes recommendations for community-based interventions and clinical management of obesity.⁸

- **The American Medical Association (AMA)** and other medical associations such as the **American Gastroenterological Association (AGA)** and the **Endocrine Society** have issued recommendations for the prevention and treatment of obesity, including the need for healthcare professionals to provide patients with evidence-based weight management strategies^{9,10} and providing insurance coverage parity for emerging obesity treatment options.¹¹
- **The American Heart Association (AHA)** has issued guidelines for the treatment of obesity in adults, including recommendations for diet, physical activity, and behavioral therapy.^{12,13}
- **The American Diabetes Association (ADA)** has issued guidelines for the prevention and treatment of obesity in the context of preventing and treating diabetes.¹⁴
- **The Obesity Society** has issued position statements on the management of obesity, including recommendations for increasing access to obesity treatment, addressing weight bias and stigma, and promoting research into the causes and treatment of obesity.^{15,16}
- **The Obesity Action Coalition** has issued policy statements to advocate for improved access to obesity treatment and address weight bias.¹⁷
- **Obesity Medicine Association: Leaders in Obesity Medicine** includes healthcare professionals committed to a comprehensive, evidence-based approach for addressing obesity.¹⁸
- **The American Society for Metabolic and Bariatric Surgery (ASMBS)** and the **International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO)** have published new guidelines for weight-loss surgery.¹⁹
- **The World Health Organization** has developed guidelines for the management of overweight and obesity in adults, including recommendations for lifestyle interventions, pharmacotherapy, and bariatric surgery.²⁰

Still, access to and utilization of obesity treatment remains limited.⁶⁸ The following recommendations to state policy makers and to employers can increase access to modernized^b and evidence-based obesity care.

State policy makers

1. **Promote insurance coverage for comprehensive obesity treatment:** State policy makers can demonstrate modern care for obesity by updating health insurance for state employees to cover evidence-based obesity treatments, including intensive behavioral counseling, nutrition support, pharmacotherapy, and bariatric surgery.
2. **Expand Medicaid coverage for obesity treatment:** State policy makers can expand Medicaid coverage to include evidence-based obesity care, including intensive behavioral counseling, nutrition support, pharmacotherapy, and bariatric surgery.
3. **Invest in community-based programs and education campaigns:** State policy makers can invest in community-based programs and infrastructure that serve as an adjunct to access to obesity treatment, ensuring individuals have access to healthy, affordable food and safe, affordable opportunities for being physically active. Education campaigns can increase awareness about the causes of and health risks associated with obesity and promote evidence-based obesity

Numerous state, national, and international organizations have released evidence-based guidelines concerning the prevention and treatment of obesity. These recommendations serve as valuable guidance for healthcare professionals and policymakers in undertaking this significant public health concern...Still, access to and utilization of obesity treatment remains limited.

^b Modern healthcare leverages science, technology, health capabilities, and cost-effective solutions to enhance quality, efficiency, and delivery of care.

treatments. Investing in community health worker (CHW) programs, for example, can be a cost-effective way to provide outreach and support to address obesity among underserved populations.^{21,22}

Employers

4. **Offer insurance coverage and wellness programs for obesity care at parity with other chronic diseases:** Employers can ensure their health insurance plans cover evidence-based obesity treatments, including intensive behavioral counseling, nutrition support, pharmacotherapy, and bariatric surgery. Employers can implement wellness programs that specifically address obesity prevention and management. These programs can include resources for healthy eating, physical activity initiatives, access to fitness facilities or classes, and weight management support.
5. **Foster a culture of support and inclusion:** Employers can create a culture of support and inclusion that recognizes and accommodates the needs of employees with obesity. This can involve implementing non-discriminatory policies, offering weight bias and stigma training, creating a supportive workplace environment that promotes healthy behaviors such as providing healthy food options, offering opportunities for physical activity, and providing reasonable workplace accommodations for individuals with obesity and related health conditions.
6. **Provide education and resources:** Employers can provide education and resources to employees to educate about the health risks associated with obesity as well as strategies for obesity care and weight management. This can include partnering with their health insurance program and other providers to encourage weight assessments as part of their annual physical, and offer health screenings, health coaching, and other support services.

State policy makers and employers play a crucial role in addressing obesity by implementing effective policies and programs that prioritize access to evidence-based treatment plans and resources. Taking a comprehensive approach to obesity prevention and treatment is key to improving population health, reducing healthcare costs linked to obesity-related conditions, improving workforce participation and productivity, and helping to reduce disparities. By working together, these stakeholders can make a significant impact in addressing the obesity epidemic and fostering a healthier future for their communities and their state's workforce.

References

1. Dall TM, Fang C, Livingston T. State Obesity Reports. Health Economics - GlobalData. Published 2023. Accessed November 3, 2023. <https://www.globaldata.com/health-economics/US/>
2. Allaire BT, Tjaden AH, Venditti EM, et al. Diet Quality, Weight Loss, and Diabetes Incidence in the Diabetes Prevention Program (DPP). *BMC Nutrition*. 2020;6(1):74. doi:10.1186/s40795-020-00400-4
3. Kungu K, Melius J, Cannonier C, Wanga V. Obesity, Chronic Job Discrimination and Social Support. *MRR*. 2019;42(5):586-604. doi:10.1108/MRR-02-2018-0060
4. Agyemang P, Powell-Wiley T. Obesity and Black Women: Special Considerations Related to Genesis and Therapeutic Approaches. *Curr Cardiovasc Risk Rep*. 2013;(7(5)):378-386. doi:10.1007/s12170-013-0328-7
5. Kumanyika SK. Advancing Health Equity Efforts to Reduce Obesity: Changing the Course. *Annu Rev Nutr*. 2022;42(1):453-480. doi:10.1146/annurev-nutr-092021-050805
6. Health Equity Coalition for Chronic Disease. *Advancing Equity: The Urgent Need to Confront Disparities in Obesity*. HECCD; 2023.
7. National Heart, Lung, and Blood Institute. Overweight and Obesity - Treatment. Published March 24, 2022. Accessed May 30, 2023. <https://www.nhlbi.nih.gov/health/overweight-and-obesity/treatment>
8. Centers for Disease Control and Prevention. State and Local Strategies | Overweight & Obesity. Published May 18, 2023. Accessed May 30, 2023. <https://www.cdc.gov/obesity/strategies/index.html>
9. Grunvald E, Shah R, Hernaez R, et al. AGA Clinical Practice Guideline on Pharmacological Interventions for Adults With Obesity. *Gastroenterology*. 2022;163(5):1198-1225. doi:10.1053/j.gastro.2022.08.045
10. Apovian CM, Aronne LJ, Bessesen DH, et al. Pharmacological Management of Obesity: An Endocrine Society Clinical Practice Guideline. *The Journal of Clinical Endocrinology & Metabolism*. 2015;100(2):342-362. doi:10.1210/jc.2014-3415
11. American Medical Association. AMA Urges Insurance Coverage Parity for Emerging Obesity Treatment Options. American Medical Association. Published November 14, 2023. Accessed November 14, 2023. <https://www.ama-assn.org/press-center/press-releases/ama-urges-insurance-coverage-parity-emerging-obesity-treatment-options>
12. Hall ME, Cohen JB, Ard JD, et al. Weight-Loss Strategies for Prevention and Treatment of Hypertension: A Scientific Statement From the American Heart Association. *Hypertension*. 2021;78(5). doi:10.1161/HYP.000000000000202
13. Marc-André Cornier M. A Review of Current Guidelines for the Treatment of Obesity. *Supplements and Featured Publications*. 2022;28. Accessed April 10, 2023. <https://www.ajmc.com/view/review-of-current-guidelines-for-the-treatment-of-obesity>
14. American Diabetes Association Professional Practice Committee. 8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: Standards of Medical Care in Diabetes—2022. *Diabetes Care*. 2021;45(Supplement_1):S113-S124. doi:10.2337/dc22-S008
15. Mechanick JL, Apovian C, Brethauer S, et al. Clinical Practice Guidelines for the Perioperative Nutrition, Metabolic, and Nonsurgical Support of Patients Undergoing Bariatric Procedures – 2019 Update: Cosponsored by American Association of Clinical Endocrinologists/American College of Endocrinology, The Obesity Society, American Society for

- Metabolic & Bariatric Surgery, Obesity Medicine Association, and American Society of Anesthesiologists. *Surgery for Obesity and Related Diseases*. 2020;16(2):175-247. doi:10.1016/j.soard.2019.10.025
16. Jastreboff AM, Kotz CM, Kahan S, Kelly AS, Heymsfield SB. Obesity as a Disease: The Obesity Society 2018 Position Statement. *Obesity*. 2019;27(1):7-9. doi:10.1002/oby.22378
 17. The Obesity Action Coalition. OAC Advocacy: What We Fight For. Published 2023. Accessed June 9, 2023. <https://www.obesityaction.org/advocacy/what-we-fight-for/>
 18. Obesity Medicine Association. Leaders in Obesity Medicine. Published 2023. Accessed November 14, 2023. <https://obesitymedicine.org/>
 19. Eisenberg D, Shikora SA, Aarts E, et al. 2022 American Society for Metabolic and Bariatric Surgery (ASMBS) and International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO): Indications for Metabolic and Bariatric Surgery. *Surgery for Obesity and Related Diseases*. 2022;18(12):1345-1356. doi:10.1016/j.soard.2022.08.013
 20. Semlitsch T, Stigler FL, Jeitler K, Horvath K, Siebenhofer A. Management of Overweight and Obesity in Primary Care—A Systematic Overview of International Evidence-based Guidelines. *Obesity Reviews*. 2019;20(9):1218-1230. doi:10.1111/obr.12889
 21. Brown LD, Vasquez D, Lopez DI, Portillo EM. Addressing Hispanic Obesity Disparities Using a Community Health Worker Model Grounded in Motivational Interviewing. *Am J Health Promot*. 2022;36(2):259-268. doi:10.1177/089011712111049679
 22. Quintiliani LM, Whiteley JA, Murillo J, et al. Community Health Worker-delivered Weight Management Intervention among Public Housing Residents: A Feasibility Study. *Preventive Medicine Reports*. 2021;22:101360. doi:10.1016/j.pmedr.2021.101360
 23. Centers for Disease Control and Prevention. Overweight & Obesity: Why it matters. Centers for Disease Control and Prevention. Published July 14, 2022. <https://www.cdc.gov/obesity/about-obesity/why-it-matters.html>
 24. Powell-Wiley TM, Poirier P, Burke LE, et al. Obesity and Cardiovascular Disease: A Scientific Statement From the American Heart Association. *Circulation*. 2021;143(21). doi:10.1161/CIR.0000000000000973
 25. Centers for Disease Control and Prevention. Consequences of Obesity. Overweight & Obesity. Published July 15, 2022. Accessed April 10, 2023. <https://www.cdc.gov/obesity/basics/consequences.html>
 26. Xu H, Cupples LA, Stokes A, Liu CT. Association of Obesity With Mortality Over 24 Years of Weight History: Findings From the Framingham Heart Study. *JAMA Network Open*. 2018;1(7):e184587-e184587. doi:10.1001/jamanetworkopen.2018.4587
 27. Lopez C, Bendix J, Sagynbekov K. *Weighing Down America: 2020 Update*. Milken Institute; 2020. Accessed April 10, 2023. <https://milkeninstitute.org/report/weighing-down-america-2020-update>
 28. Ward ZJ, Bleich SN, Long MW, Gortmaker SL. Association of Body Mass Index with Health Care Expenditures in the United States by Age and Sex. *PLOS ONE*. 2021;16(3):e0247307. doi:10.1371/journal.pone.0247307
 29. Cawley J, Biener A, Meyerhoefer C, et al. Direct Medical Costs of Obesity in the United States and the Most Populous States. *JMCP*. 2021;27(3):354-366. doi:10.18553/jmcp.2021.20410
 30. Ramasamy A, Laliberté F, Aktavoukian SA, et al. Direct and Indirect Cost of Obesity Among the Privately Insured in the United States: A Focus on the Impact by Type of Industry. *Journal of Occupational & Environmental Medicine*. 2019;61(11):877-886. doi:10.1097/JOM.0000000000001693

31. Van Den Broek-Altenburg E, Atherly A, Holladay E. Changes in Healthcare Spending Attributable to Obesity and Overweight: Payer- and Service-specific Estimates. *BMC Public Health*. 2022;22(1):962. doi:10.1186/s12889-022-13176-y
32. Woods T, Miljkovic T. Modeling the Economic Cost of Obesity Risk and Its Relation to the Health Insurance Premium in the United States: A State Level Analysis. *Risks*. 2022;10(10). doi:10.3390/risks10100197
33. Okunogbe A, Nugent R, Spencer G, Powis J, Ralston J, Wilding J. Economic Impacts of Overweight and Obesity: Current and Future Estimates for 161 Countries. *BMJ Global Health*. 2022;7(9):e009773. doi:10.1136/bmjgh-2022-009773
34. Cawley J, Biener A, Meyerhoefer C, et al. Job Absenteeism Costs of Obesity in the United States: National and State-Level Estimates. *Journal of Occupational & Environmental Medicine*. 2021; Publish Ahead of Print. doi:10.1097/JOM.0000000000002198
35. Bevan S, Cooper CL. How Health Affects Productivity. In: *The Healthy Workforce*. Emerald Publishing Limited; 2021:7-59. doi:10.1108/978-1-83867-499-120211002
36. Centers for Disease Control and Prevention. Defining Adult Overweight and Obesity. Centers for Disease Control and Prevention. Published June 3, 2022. Accessed June 7, 2023. <https://www.cdc.gov/obesity/basics/adult-defining.html>
37. USA Facts. Which states have the lowest taxes? USA Facts. Published February 23, 2023. Accessed July 18, 2023. <https://usafacts.org/data-projects/states-with-lowest-tax-burden>
38. Lee H, Ahn R, Kim TH, Han E. Impact of Obesity on Employment and Wages among Young Adults: Observational Study with Panel Data. *Int J Environ Res Public Health*. 2019;16(1):139. doi:10.3390/ijerph16010139
39. DeBeaumont R, Girtz R. The Mediation Effect of Self-Esteem on Weight and Earnings. *Atlantic Economic Journal*. 2019;47(4):415-427. doi:10.1007/s11293-019-09648-z
40. Averett S. Obesity and Labor Market Outcomes. *izawol*. Published online August 2019. doi:10.15185/izawol.32.v2
41. Bugard S, Lin K. Bad Jobs, Bad Health? How Work and Working Conditions Contribute to Health Disparities. *Am Behav Sci*. 2013;57(8). doi:10.1177/0002764213487347
42. Ward ZJ, Willett WC, Hu FB, Pacheco LS, Long MW, Gortmaker SL. Excess Mortality Associated with Elevated Body Weight in the USA by State and Demographic Subgroup: A Modelling Study. *eClinicalMedicine*. 2022;48:101429. doi:10.1016/j.eclinm.2022.101429
43. Centers for Disease Control and Prevention. CDC WONDER. Published May 18, 2023. Accessed May 23, 2023. <https://wonder.cdc.gov/>
44. National Cancer Institute. Obesity and Cancer Fact Sheet - NCI. Published April 5, 2022. Accessed May 23, 2023. <https://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet>
45. Kivimäki M, Strandberg T, Pentti J, et al. Body Mass Index and Risk of Obesity-related Complex Multimorbidity: an Observational Multicohort Study. *The Lancet Diabetes & Endocrinology*. 2022;10(4):253-263. doi:10.1016/S2213-8587(22)00033-X
46. Trading Economics. United States Personal Savings Rate - April 2023 Data - 1959-2022 Historical. Published 2023. Accessed May 23, 2023. <https://tradingeconomics.com/united-states/personal-savings>
47. Coppedge RO. Income Multipliers in Economic Impact Analysis. Published 2011. Accessed May 23, 2023. https://pubs.nmsu.edu/_z/Z108/index.html

48. U.S. Bureau of Economic Analysis. Gross Domestic Product by State, 2022. Published March 31, 2023. Accessed May 26, 2023. <https://www.bea.gov/data/gdp/gdp-state>
49. Federal Reserve Bank of St. Louis. National Totals of State and Local Government Tax Revenue, by Type of Tax. Published 2023. Accessed July 27, 2023. <https://fred.stlouisfed.org/release/tables?rid=455&eid=819802&od=2022-10-01>
50. Medicaid and CHIP Payment and Access Commission. Medicaid Spending by State, Category, and Source of Funds. MACPAC. Published December 2022. Accessed May 26, 2023. <https://www.macpac.gov/publication/medicaid-spending-by-state-category-and-source-of-funds/>
51. Singh R, Rathore SS, Khan H, et al. Association of Obesity With COVID-19 Severity and Mortality: An Updated Systemic Review, Meta-Analysis, and Meta-Regression. *Front Endocrinol.* 2022;13:780872. doi:10.3389/fendo.2022.780872
52. Cai Z, Yang Y, Zhang J. Obesity is Associated with Severe Disease and Mortality in Patients with Coronavirus Disease 2019 (COVID-19): A Meta-analysis. *BMC Public Health.* 2021;21(1):1505. doi:10.1186/s12889-021-11546-6
53. Dall TM, Storm MV, Semilla AP, Wintfeld N, O'Grady M, Narayan KMV. Value of lifestyle intervention to prevent diabetes and sequelae. *Am J Prev Med.* 2015;48(3):271-280. doi:10.1016/j.amepre.2014.10.003
54. Chen F, Su W, Becker SH, et al. Clinical and Economic Impact of a Digital, Remotely-Delivered Intensive Behavioral Counseling Program on Medicare Beneficiaries at Risk for Diabetes and Cardiovascular Disease. *PLoS One.* 2016;11(10):e0163627. doi:10.1371/journal.pone.0163627
55. Su W, Chen F, Dall TM, Iacobucci W, Perreault L. Return on Investment for Digital Behavioral Counseling in Patients With Prediabetes and Cardiovascular Disease. *Prev Chronic Dis.* 2016;13:E13. doi:10.5888/pcd13.150357
56. Su W, Chen F, Dall TM, Zvenyach T, Kyle TK, Perreault L. Where Can Obesity Management Policy Make the Largest Impact? Evaluating Sub-populations through a Microsimulation Approach. *J Med Econ.* 2018;21(9):936-943. doi:10.1080/13696998.2018.1496922
57. Chen F, Su W, Ramasamy A, et al. Ten-year Medicare Budget Impact of Increased Coverage for Anti-obesity Intervention. *J Med Econ.* 2019;22(10):1096-1104. doi:10.1080/13696998.2019.1652185
58. National Heart, Lung, and Blood Institute. *Overweight and Obesity in Adults: Systematic Evidence Review from the Obesity Expert Panel.* U.S. Department of Health and Human Services; 2013. Accessed May 29, 2023. <https://www.nhlbi.nih.gov/sites/default/files/media/docs/obesity-evidence-review.pdf>
59. Webb VL, Wadden TA. Intensive Lifestyle Intervention for Obesity: Principles, Practices, and Results. *Gastroenterology.* 2017;152(7):1752-1764. doi:10.1053/j.gastro.2017.01.045
60. Wadden TA, Tronieri JS, Butryn ML. Lifestyle Modification Approaches for the Treatment of Obesity in Adults. *The American psychologist.* 2020;75(2):235. doi:10.1037/amp0000517
61. National Institute of Diabetes and Digestive and Kidney Diseases. Prescription Medications to Treat Overweight & Obesity. National Institute of Diabetes and Digestive and Kidney Diseases. Published 2021. Accessed May 26, 2023. <https://www.niddk.nih.gov/health-information/weight-management/prescription-medications-treat-overweight-obesity>
62. Jastreboff AM, Aronne LJ, Ahmad NN, et al. Tirzepatide Once Weekly for the Treatment of Obesity. *N Engl J Med.* 2022;387(3):205-216. doi:10.1056/NEJMoa2206038
63. Slomski A. Tirzepatide Trial Demonstrates Substantial Weight Loss. *JAMA.* 2022;328(4):322-322. doi:10.1001/jama.2022.11895

64. Gurdeep Singh, Matthew Krauthamer, Meghan Bjalme-Evans. Wegovy (semaglutide): A New Weight Loss Drug for Chronic Weight Management. *J Investig Med*. 2022;70(1):5. doi:10.1136/jim-2021-001952
65. Rubino DM, Greenway FL, Khalid U, et al. Effect of Weekly Subcutaneous Semaglutide vs Daily Liraglutide on Body Weight in Adults With Overweight or Obesity Without Diabetes: The STEP 8 Randomized Clinical Trial. *JAMA*. 2022;327(2):138-150. doi:10.1001/jama.2021.23619
66. Arterburn D, Wellman R, Emiliano A, et al. Comparative Effectiveness and Safety of Bariatric Procedures for Weight Loss: A PCORnet Cohort Study. *Ann Intern Med*. 2018;169(11):741. doi:10.7326/M17-2786
67. van Rijswijk AS, van Olst N, Schats W, van der Peet DL, van de Laar AW. What Is Weight Loss After Bariatric Surgery Expressed in Percentage Total Weight Loss (%TWL)? A Systematic Review. *Obesity Surgery*. 2021;31(8):3833-3847. doi:10.1007/s11695-021-05394-x
68. Kyle TK, Stanford FC. Low Utilization of Obesity Medications: What are the Implications for Clinical Care? *Obesity*. 2016;24(9):1832-1832. doi:10.1002/oby.21566

Technical Notes

ⁱ We conducted logistic regression analyses using data from the National Health Interview Survey (NHIS) for the years 2017-2021 to estimate the relationship between employment status and obesity status. Separate regressions were performed for men and women. The dependent variable in the regression models was employment during the prior week, while the explanatory variables included body weight status categorized as healthy weight, overweight, or obesity. Age group was included as a predictor variable, with categories defined as 18-34, 35-44, 45-54, 55-64, and 65-75 years. Additionally, race/ethnicity (classified as Hispanic, non-Hispanic white, black, or other) was included as a predictor variable. Smoking status was included as a control variable to account for its potential influence. The NHIS survey year was incorporated to control for temporal variations. These regressions did not account for other potential factors that might be associated with obesity, such as education level.

ⁱⁱ We converted medical cost estimates and indirect economic cost estimates to 2022 dollars using, respectively, the medical component of the Consumer Price Index (CPI) and the overall CPI.

ⁱⁱⁱ See note ii.

^{iv} The Disease Prevention & Treatment Microsimulation Model (DPTMM) is a Markov-based microsimulation model utilized to estimate both clinical and economic outcomes for populations affected by obesity. This model predicts the annual occurrence of diseases and corresponding healthcare expenditures based on factors such as age, sex, race, Hispanic ethnicity, and biometric measurements including BMI, blood glucose level, blood pressure levels, total cholesterol level, and high-density cholesterol level. Additional risk factors modeled include smoking status and the presence of obesity-related comorbidities such as type 2 diabetes, hypertension, ischemic heart disease, congestive heart failure, history of stroke, history of myocardial infarction, and chronic kidney disease, among others.

To project the potential clinical and economic benefits of weight loss, evidence-based scenarios were simulated using the model. The first scenario, known as the usual care scenario, incorporates each individual's annual changes in BMI following the natural aging process, derived from the analysis of public survey data and published references. The counterfactual scenarios, the weight loss scenarios, incorporate actual and simulated changes in body weight and other biometric measurements during the first year, which are then maintained from the second year through the tenth year. The simulation model employs prediction equations that utilize these biometric changes as inputs to project the onset of modeled complications and the corresponding changes in direct medical costs over the next decade. By comparing the simulated health and economic outcomes between scenarios, the potential benefits of weight loss can be assessed.

^v A population sample file was created by combining state-level data from the Behavioral Risk Factor Surveillance System (BRFSS) from 2020-2021 with additional biometric and other information from matched individuals in the National Health and Nutrition Examination Survey (NHANES) from 2014-2020. The matching process was based on a 1:1 match using propensity scores derived from risk factors such as age group, gender, race/ethnicity, insurance type, and body weight category. Each merged record in the sample file includes comprehensive data on demographics, biometric parameters, smoking status, and a history of various disease conditions. This combined dataset allows for a more comprehensive analysis and understanding of the population under study.

Contact Us

If you have any more questions regarding our research, please contact us:

Life Sciences Consulting
Tim Dall
Executive Director
tim.dall@globaldata.com
+1 202 870 9211

Global Pharma
Ron Cohen
Vice President
rcohen@globaldata.com
+1 908 963 3364