

Obesity and Cancer in Minnesota



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Obesity-related Cancers

An estimated 1 of every 3 cancer deaths in the United States is linked to excess body weight, poor nutrition, and physical inactivity. These factors are all related and may all contribute to cancer risk, but body weight has the strongest evidence linking it to cancer. Excess body weight contributes to as many as 1 out of 5 of all cancer-related deaths.

During the past two decades, there has been a steady decline in overall cancer incidence in the US among men and women in most racial and ethnic groups. However, for several obesity-related cancers including pancreatic, kidney, and adenocarcinoma of the esophagus, the incidence rate has increased. This increase can be attributed, in part, to excess weight and physical inactivity. These increases adversely affect quality of life and may worsen prognosis for cancer patients.

What Is Obesity?

Obesity is a condition in which a person has an abnormally high and unhealthy proportion of body fat. To measure obesity, researchers commonly use a scale known as the body mass index (BMI). BMI is calculated by dividing a person's weight (in kilograms) by their height (in meters) squared. BMI provides a more accurate measure of overweight or obesity than weight

alone. Guidelines established by the National Institutes of Health categorize adults age 20 and older as follows based on their BMI:

BMI	BMI Categories
Below 18.5	Underweight
18.5 to 24.9	Normal
25.0 to 29.9	Overweight
30 and above	Obese

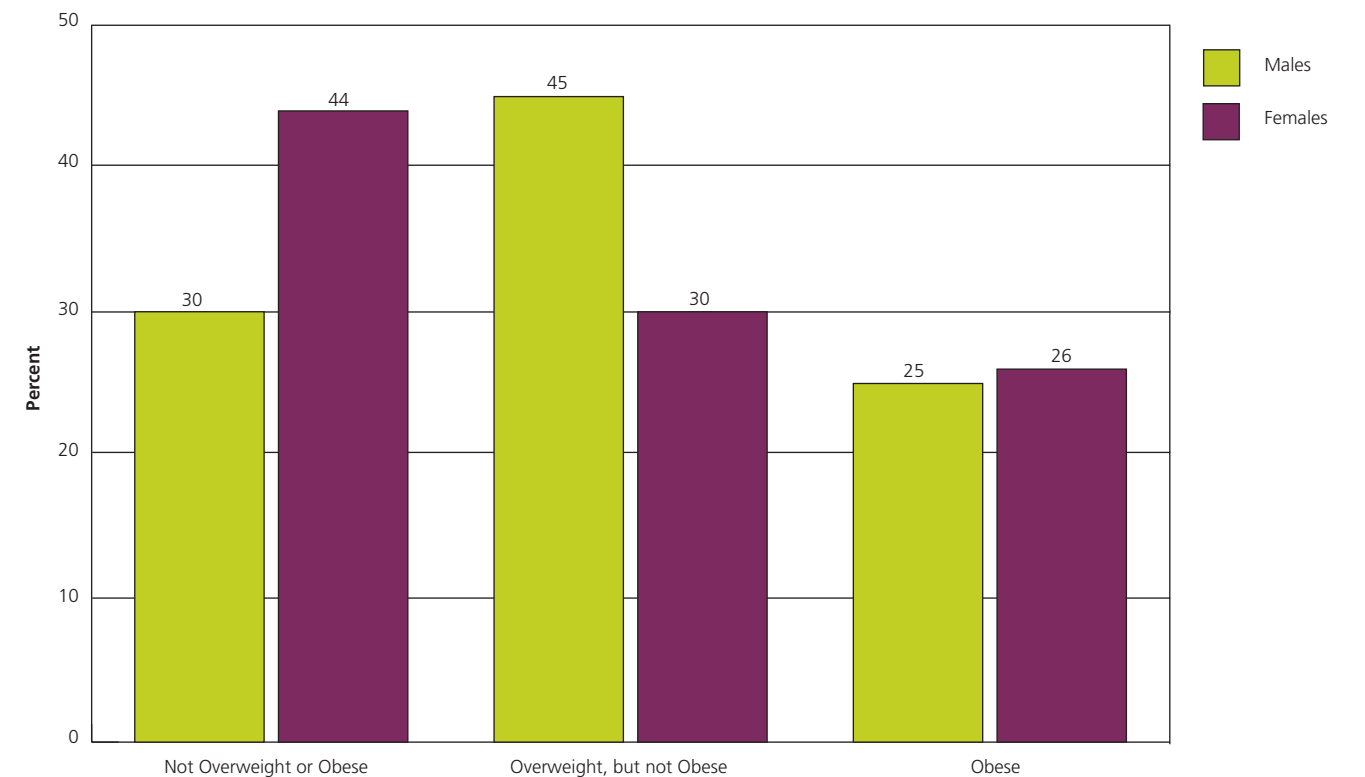
Compared with people of normal weight, those who are overweight or obese are at greater risk for many diseases, including diabetes, high blood pressure, cardiovascular diseases, stroke, and certain cancers.

Overweight and Obesity in Minnesota

The number of overweight and obese people in Minnesota has increased dramatically over the past decade:

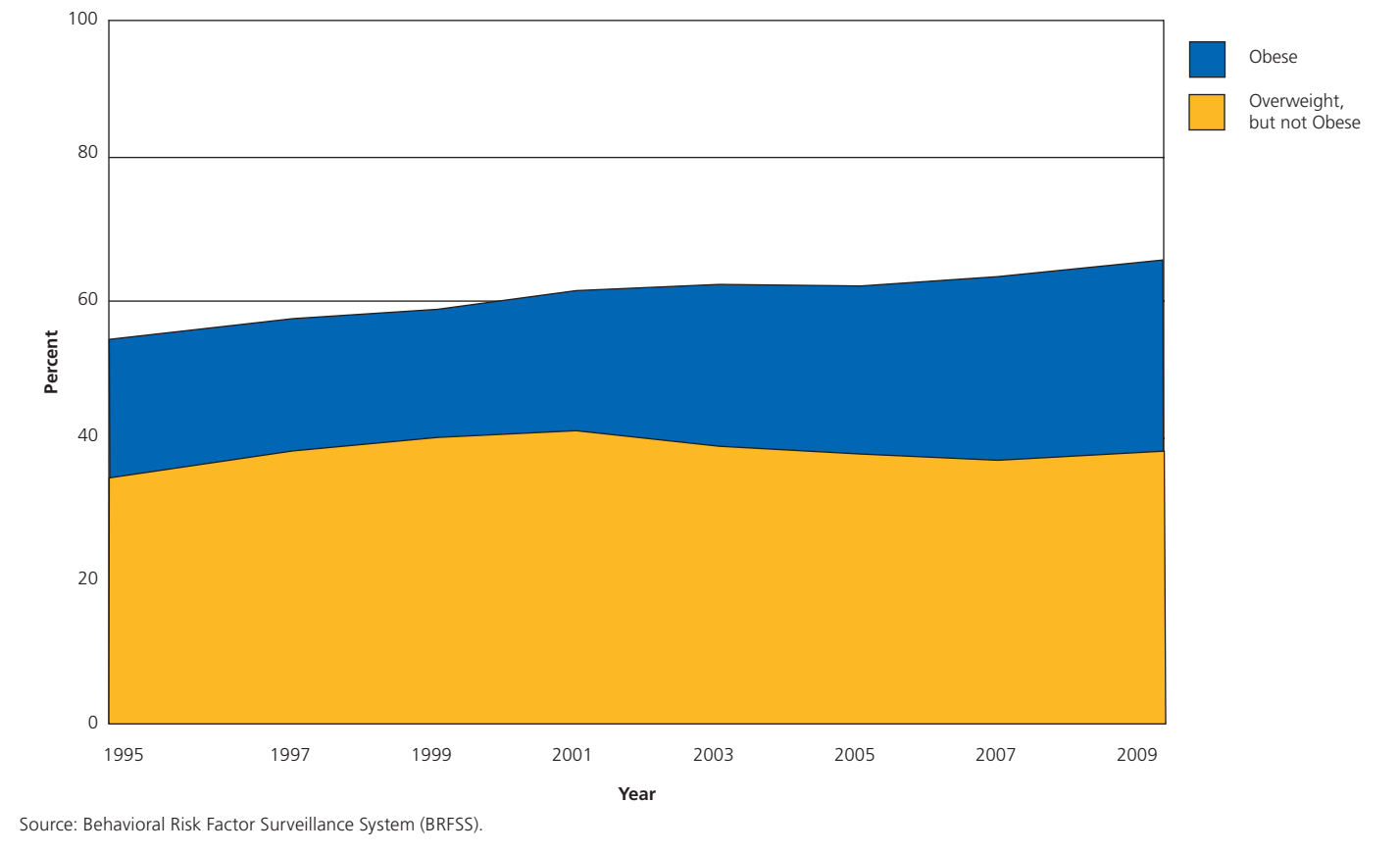
- 63% of Minnesota adults were overweight or obese.
- 21% of Minnesota high school seniors were overweight or obese.
- 29% of Minnesota children ages 2-5 who participated in the Women, Infants, and Children supplemental nutrition program were overweight or obese.

Adult Overweight and Obesity by Gender, Minnesota, 2009



Source: Minnesota Behavioral Risk Factor Surveillance System (BRFSS). Analyses were conducted by the Minnesota Cancer Surveillance System (MCSS).

Trends in Adult Overweight and Obesity, Minnesota, 1995-2009



How Does Obesity Increase Cancer Risk?

There are several ways that obesity contributes to an increased risk of cancer:

- Fat tissue produces estrogen, and high estrogen levels are associated with an increased risk of certain types of cancer.
- Fat cells produce other hormones that can affect cell growth.
- Obese people have higher levels of blood insulin, which can promote cancer development.
- Obese people have chronic low-level inflammation, which is also associated with cancer risk.

A 1% reduction in BMI of US adults could prevent 100,000 cancer cases by 2030. The National Cancer Institute estimates that if current trends persist, obesity could lead to an additional 500,000 cancer cases in the US by 2030.

What Cancers Are Likely in Overweight Populations?

Overweight and obesity are clearly associated with an increased risk for developing many cancers, including cancers of the:

- Breast (postmenopausal)
- Colon and rectum
- Endometrium (lining of the uterus)
- Esophagus
- Kidney
- Pancreas

Obesity and Postmenopausal Breast Cancer

Many studies have shown that overweight and obesity are associated with a modest increase in the risk of postmenopausal breast cancer. This higher risk is seen mainly in women who have never used menopausal hormone therapy (MHT) and for tumors that express both estrogen and progesterone receptors. By contrast, overweight and obesity have been found to be associated with a reduced risk of premenopausal breast cancer in some studies.

The relationship between obesity and breast cancer may be affected by the stage of life in which a woman gains weight and

becomes obese. Epidemiologists are actively working to address this question. Weight gain during adult life, most often from about age 18 to between the ages of 50 and 60, has been consistently associated with a risk of breast cancer after menopause.

The increased risk of postmenopausal breast cancer is thought to be due to increased levels of estrogen in obese women. After menopause, when the ovaries stop producing hormones, fat tissue becomes the most important source of estrogen. Because obese women have more fat tissue, their estrogen levels are higher, potentially leading to more rapid growth of estrogen-responsive breast tumors.

The relationship between obesity and breast cancer risk may also vary by race and ethnicity. There is limited evidence that the risk associated with overweight and obesity may be less among African American and Hispanic women than among non-Hispanic white women.

Obesity and Colon and Rectum Cancer

Among men, a higher BMI is strongly associated with an increased risk of colorectal cancer. The distribution of body fat appears to be an important factor, with abdominal obesity – which can be measured by waist circumference – showing the strongest association with colon cancer risk.

An association between BMI and waist circumference is also seen in women, but is weaker. Use of MHT may modify the association in postmenopausal women.

A number of explanations have been proposed to account for the association between obesity and an increased risk of colon cancer. One hypothesis is that high levels of insulin or insulin-related growth factors in obese people may promote colon cancer development. High BMI is also associated with rectal cancer risk, but the increase in risk is more modest.

Obesity and Endometrium Cancer

Endometrial cancer is a cancer of the lining of the uterus. In Minnesota, from 2005-2009, an average of 806 cases of endometrial cancer were diagnosed and 125 women died from the disease each year. The incidence rate for endometrial cancer in the state was higher than the nationally reported rate, with the highest rate seen among American Indian women living in Contract Health Service Delivery Area (CHSDA) counties. These women were diagnosed at a rate 17% higher than non-Hispanic white women (and 70% higher than American Indian women in non-CHSDA counties in Surveillance, Epidemiology, and End Results (SEER) 18 program areas).

A majority (70%) of endometrial cancers in Minnesota were diagnosed at a localized stage and, from 2002-2008, that percent grew to more than 95%. Similar to the disparity seen for breast cancer, the five-year survival rate for localized endometrial cancer was 96% for non-Hispanic white women and 85% for African American women.

Overweight and obesity have been consistently associated with endometrial cancer. Obese and overweight women have two to four times the risk of developing this type of cancer than women of a normal weight, regardless of menopausal status. Many studies have also found that the risk of endometrial cancer increases with increasing weight gain in adulthood, particularly among women who have never used MHT. Obesity and excess abdominal fat increase the risk of endometrial cancer, most likely by increasing the amount of estrogen in the body. Estrogen exposure is a strong risk factor for endometrial cancer.

Obesity and Esophageal Cancer

In Minnesota, from 2005-2009, an average of 285 cases of esophageal cancer were diagnosed and about 240 deaths resulted from this disease each year. Esophageal cancer incidence and mortality rates both increased significantly among males in Minnesota. It is among the top 10 most commonly diagnosed cancers for males in Minnesota, accounting for approximately 4% of all cancer deaths in the state in 2007. In Minnesota, 58% of esophageal cancers diagnosed, and 64% of deaths occurred among adults 65 years of age and older.

Overweight and obese people are about twice as likely as people of a normal weight to develop a type of esophageal cancer called esophageal adenocarcinoma. Most studies have observed no increased risk, or even a decline in risk, with obesity for the other major type of esophageal cancer, squamous cell cancer. The reasons why obesity may increase the risk of esophageal adenocarcinoma are not well understood. However, overweight and obese people are more likely than people of a normal weight to have a history of gastroesophageal reflux disease or Barrett esophagus, which are associated with an increased risk of esophageal adenocarcinoma. It is possible that obesity exacerbates the esophageal inflammation that is associated with these conditions.

Obesity and Kidney Cancer

In Minnesota, from 2005-2009, kidney cancer was the seventh most commonly diagnosed cancer among males and the 10th most commonly diagnosed cancer among females. An average of 850 cases of kidney cancer and 237 deaths occurred in Minnesota each year. About 48% of kidney cancers were diagnosed and 70% of deaths occurred among adults 65 years of age or older. Minnesota men were two times more likely to be diagnosed with kidney cancer when compared to Minnesota women. During this five-year period in Minnesota, the incidence rate of kidney cancer was two times higher among American Indians than among non-Hispanic whites. However, the risk of developing this cancer among non-Hispanic whites was two times higher than among American Indians in SEER-17 program areas.

Obesity has been consistently associated with renal cell cancer, the most common form of kidney cancer, in both men and women. High blood pressure is a known risk factor, but the relationship between obesity and kidney cancer is independent of

blood pressure status. High levels of insulin may also play a role in the development of the disease.

Obesity and Pancreatic Cancer

In Minnesota, from 2005-2009, an average of 552 cases of pancreatic cancer were diagnosed and about 572 deaths occurred each year. Pancreatic cancer is extremely rare in those under 50 years of age; about 64% of diagnoses and 73% of deaths occurred in adults 65 years of age or older. Rates were about 30% higher among males than females. In Minnesota, African American men and women had the highest pancreatic cancer incidence and mortality rates, mirroring the national trend.

Obesity has also been fairly consistently linked to increased risk of pancreatic cancer. Obese people have a 20% higher risk of developing pancreatic cancer than those who are normal weight.

American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention

The American Cancer Society guidelines for nutrition and physical activity include four recommendations for individual choices that may reduce cancer risk:

Maintain a healthy weight throughout life.

- Balance caloric intake – limit consumption of high-calorie foods and beverages – with physical activity.
- Avoid excess weight gain throughout life. If currently overweight or obese, losing even a small amount of weight has health benefits and is a good place to start.

Adopt a physically active lifestyle.

- Adults: Engage in at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity each week, or an equivalent combination, preferably spread throughout the week.
- Children and adolescents: Engage in at least 60 minutes of moderate- or vigorous-intensity physical activity each day, with vigorous-intensity activity at least three days each week.

Consume a healthy diet, with an emphasis on plant sources.

- Choose foods and beverages in amounts that help achieve and maintain a healthy weight.
- Eat five or more servings, at least 2½ cups, of vegetables and fruits each day.
- Choose whole grains instead of refined-grain products. Limit consumption of processed and red meats.

If you drink alcoholic beverages, limit consumption.

- Consume no more than one alcoholic beverage per day for women or two per day for men.