

How BIG are We?

A Report on Obesity in Snohomish County
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A 2001 report from the U.S. Surgeon General stated that "overweight and obesity...have reached epidemic proportions in the United States."*

*Surgeon General's Call to Action

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www.snohd.org/snoHealthStats



Mission Statement:

To improve the health of individuals, families, and communities through disease prevention, health promotion, and protection from environmental threats.



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Executive Summary



Executive Summary

Obesity is nationally recognized as a growing health concern. It is estimated to cause between 100,000 and 300,000 deaths annually in the United States, including those caused by diseases that are associated with obesity.

Increasing rates of obesity were responsible for nearly 30 percent of the overall increase in U.S. health care spending between 1987 and 2002. Total medical expenditures attributable to obesity were approximately \$75 billion dollars in 2003.

Adults

Obesity has also been increasing in Snohomish County. According to the Behavioral Risk Factor Surveillance Survey (BRFSS), the proportion of obese adults in the county nearly doubled from 13% to 24% between 1993 and 2004.

These estimates are based on self-reported height and weight, and therefore, probably underestimate the prevalence of obesity. The National Health and Nutrition Examination Survey (NHANES) found an overall adult obesity prevalence of 32% in the U.S. during 2003 - 2004, about one-third greater than the prevalence found by the 2004 BRFSS survey.

There was no difference in the county prevalence of obesity between men and women, but the prevalence of obesity generally increased with age. Adults in the North Health Planning Area (Stanwood, Marysville, Arlington, and Darrington) had a significantly higher prevalence of obesity than adults in the other Health Planning Areas.

Adults suffering from obesity tended to rate their health as worse than those not obese, and they were more likely to report symptoms of depression.

Between 1994 and 2004 the self-reported prevalence of adult diabetes increased from 3% to 6%. Obese adults were three times more likely to be diagnosed with diabetes than those not obese, and approximately twice as likely to be diagnosed with asthma, high blood pressure, or high cholesterol.

Obese adults were significantly more likely to experience joint pain and to be diagnosed with arthritis. One-third of obese adults indicated a health condition limited their activity.

Nearly three-quarters of obese adults reported trying to lose weight. Among these, most were either trying to eat fewer total calories, less fat, or both. Three-quarters were exercising to control their weight.

The majority of adults (85%) engaged in some form of exercise outside of the workplace. Many Snohomish County adults (40%) engaged in 30 minutes of moderate physical activity such as walking or gardening on five or more days of the week. About 30% of adults participated in vigorous physical activity on three or more days a week for 20 minutes or more. Less than half of obese adults engaged in either the recommended amount of moderate or vigorous physical activity.

Only about one-third of Snohomish County adults ate two or more servings of fruit per day, and less than one-quarter of adults consumed the recommended three or more daily servings of vegetables. Only one in eight adults met both recommendations. Only 22% of the adult population of the county reported consuming five or more servings of vegetables and fruit daily.

Among obese adults, one-third reported that a medical professional told them to lose weight. Those advised to lose weight by a doctor were significantly more likely to try losing weight than those not so advised.

Youth

In 2004, based on self-reported height and weight, 9% of Snohomish County youth in grades 8, 10, and 12 were obese and another 13% were at risk of becoming obese.

Almost one-third of students perceived themselves to be obese or at risk of obesity compared with only 22% of students whose Body Mass Index (BMI) categorized them as obese or at risk of becoming obese. Females were more likely to perceive themselves as obese than males, although males were more likely to be measured as obese using BMI. Most of the students who were determined to be obese by their BMI (82%) also thought of themselves as obese.

Students who were obese reported lower grades than those who were not obese and generally had lower expectations of how far they would advance in school.

Three-quarters of obese students were trying to lose weight. Nearly all students (84%) who thought of themselves as obese said they were trying to lose weight. The most common strategies for losing weight were exercising more and eating less.

Only about one-third of Snohomish County students engaged in 30 minutes or more of moderate physical activity on five or more days of the week, but nearly three-quarters engaged in 20 minutes or more of vigorous activity three or more times per week. One-quarter of students did not engage in the recommended amount of either moderate or vigorous physical activity.

Less than half of all students spent 20 minutes or more being active in a physical education (P.E.) class on three or more days of the week.

Less than one-quarter of students reported consuming five or more servings of fruits and vegetables each day.

Obese students watched significantly more TV than others. Obese students also reported spending more time playing video games or using a personal computer for fun than not obese students.

Self-reported obesity was highly correlated with poor mental health measures. Students who described themselves as “somewhat” or “very” obese were almost twice as likely to report depression, suicidal ideation, and suicide attempts as students who did not think of themselves as obese. Students who were measurably obese (BMI) did not show these differences.

Students who were measurably obese were no more likely than others to drink alcohol, smoke cigarettes, use drugs, or be involved in violence at school. However, students who thought of themselves as obese were more likely to smoke cigarettes, drink alcohol, and use drugs other than marijuana.

Obesity as measured by BMI was associated with chronic conditions such as asthma, physical or emotional disabilities, and being limited in activities due to a disability. Students who were obese reported that they were perceived by other people as having a disability more often than students who were not obese.

Executive Summary Cont.

Public Policy

Although obesity has been recognized as a growing problem since at least 1988, “the country does not have a strategic policy to address obesity, despite the serious impact it has on the nation’s health and economy.”*

Public health agencies can promote healthier lifestyles through education and by providing infrastructure to help people balance their energy input. It is recommended that obesity prevention and control strategies focus on youth, because “instilling in them the importance of healthy behaviors can help reduce the risk for obesity and related health issues throughout their lifetime.”*

The Washington State Department of Health, with funding from the Centers for Disease Control and Prevention, has developed the ***Washington State Nutrition and Physical Activity Plan***, which has goals of increasing the proportions of the state’s residents whose diets reflect the Dietary Guidelines for Americans and who get at least 30 minutes of moderate activity on five or more days of the week. The state currently has several interventions or programs under way.

The *Healthy Communities* project mobilizes cities and towns to develop and implement nutrition and physical activity policy action plans, while the *Revenue Replacement* project supports school districts in implementing new nutrition guidelines and developing alternative revenue strategies.

The Snohomish Health District’s *Strategic Plan* includes a strategic direction, with goals and measures, to improve wellness by increasing physical activity and improving nutrition for Health District employees and residents of the county.

*Levi J, Segal LM, Juliano C. F as in Fat: How Obesity Policies are Failing in America. *TrU.S.t for America’s Health – Issue Report*, 2006.

Introduction



Introduction

In a 2001 report the U.S. Surgeon General stated that “overweight and obesity . . . have reached epidemic proportions in the United States (1).” Obesity has also been increasing in Snohomish County and is a growing health concern. This report summarizes the extent of the problem in Snohomish County. It provides data on how many people are considered overweight or obese in the county and discusses the costs associated with being overweight in terms of health and quality of life. Public health responses to this problem are also addressed.

Data on obesity in adults and youth are presented separately in this report because of differing definitions of obesity for youth and adults and because the data are drawn from different surveys. Due to differences in methodology, results from the adult and youth surveys are not directly comparable. Details on the data presented in this report (i.e., number of subjects, 95% confidence intervals, *p* values, etc.) are presented in the Appendix.

Survey Descriptions

The data for adults are from the Behavioral Risk Factor Surveillance Survey (BRFSS) done in 2003 and 2004 (2). The BRFSS is a telephone survey sample of civilian, non-institutionalized persons 18 years of age and older. Residential telephone numbers in Snohomish County are randomly selected and called. One adult living at each residence contacted is interviewed. The methods for conducting the BRFSS are standardized by the Behavioral Surveillance Branch of the Centers for Disease Control & Prevention (CDC). Administration of the BRFSS in Washington State is coordinated by the Washington State Department of Health. Data are collected continuously throughout the year to mitigate the effects of seasonal variation in health-related behaviors (e.g., smoking rates tend to increase during the winter months).

Data for youth are from 2004 Washington Healthy Youth Survey, which uses a sample of students from all schools in the public school system that have students in grades 6, 8, 10 or 12 (3). Within the participating schools, all students in the surveyed grades are asked to participate. A minimum of 15 students in each grade is required for inclusion in the survey. Schools statewide were randomly chosen to participate in the survey. Additional schools in Snohomish County were randomly selected to take part in the survey to allow more detailed county-level analyses to be conducted. Because questions about obesity are not asked of 6th graders, the data in this report reflect only the responses of 8th, 10th and 12th grade students.

Definitions

‘Overweight’ and ‘obesity’ are labels for ranges of weight that are greater than considered healthy for a given height. The terms also identify ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems (4). Both ‘overweight’ and ‘obesity’ refer to an excess of body weight compared to set standards. Weight is determined by a combination of muscle, bone, fat, and/or body water. Clinical obesity refers specifically to having an abnormally high proportion of body fat (1). An individual can be misclassified as overweight without being having an excess of body fat. For example, a very muscular bodybuilder or other athlete can be overweight as measured by standards despite having little body fat. However, most people who are defined as overweight have excessive body fat (5).

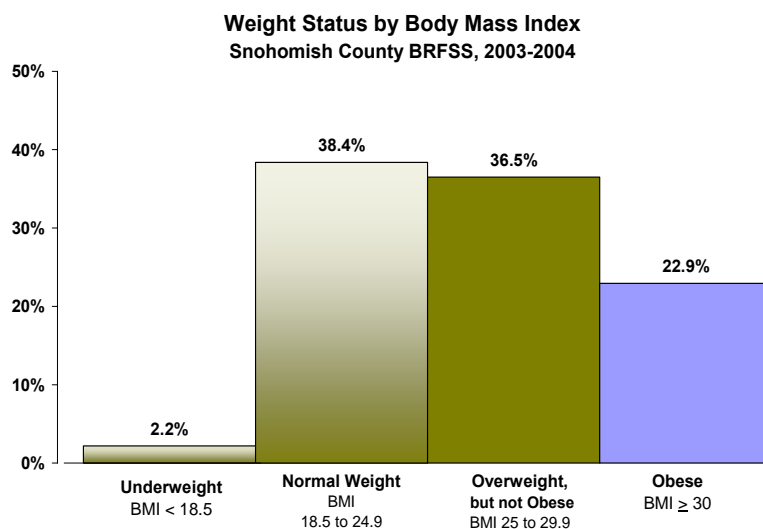
The most direct and accurate way to determine if a person is overweight or obese is to measure the proportion of their weight that is comprised of fat.

Introduction Cont.

There are many ways of measuring body fat, including hydro densitometry (comparing what people weigh in and out of a tank of water), caliper measurement of specific body parts, or the measuring of body circumferences (6).

Although directly measuring body fat is the best way to determine overweight or obesity for a person, these methods are too cumbersome and expensive to determine the obesity status of a population. Instead, a measure called the Body Mass Index (BMI) is used. The BMI is a calculation based upon a person's height and weight, which are much more readily available measures than percent body fat. While use of the BMI has limitations (see below), it is generally agreed that "BMI is significantly correlated with total body fat content for the majority of individuals" (1). The formula for the BMI is (kilograms of weight) / (meters of height)²

Adults



A person's BMI places them in one of four categories (7):

- *Underweight* is a BMI of less than 18.5. Being underweight is associated with health risks such as osteoporosis, infertility and poor immune system response. Many people are underweight due to (usually undiagnosed) type 1 diabetes (4). Very few people in Snohomish County were considered underweight during 2003 and 2004 (2.2%).

- *Normal* is a BMI of 18.5 to 24.9. People with a BMI in this range are considered to be at a healthy weight. Just over one-third of adults (38.4%) fell into this category.
- *Overweight* is a BMI of 25.0 to 29.9. The research is unclear as to whether being overweight is a health risk. This is partly due to the fact that it is possible to have a BMI in the overweight category, but still have low body fat. Muscular people often fall into this category, since muscle is much denser than fat. However, these people are the exceptions not the rule. Most people who are overweight have an excess of body fat. In Snohomish County during 2003 and 2004 a little more than one-third of adults were in this category.
- *Obese* is a BMI of 30.0 or greater. This condition has been consistently associated with increased risk of adverse health and psychological conditions. Approximately one-quarter of Snohomish County adults (22.9%) were considered obese in 2003 and 2004.

Because obesity is clearly defined and highly correlated with health problems it will be the main focus of this report. Thus, in this report obese people will be compared to those who are not obese (i.e., BMI < 30.0).

Introduction Cont.

The following table allows the reader to cross-index their height and weight to determine their Body Mass Index. The color of the cell indicates the weight category corresponding to that BMI. For example, a 5' 10" tall person who weighs 200 pounds has a BMI of 29, which places them in the 'overweight' category.

Height	Weight in Pounds													
	120	130	140	150	160	170	180	190	200	210	220	230	240	250
4' 6	29	31	34	36	39	41	43	46	48	51	53	56	58	60
4' 8	27	29	31	34	36	38	40	43	45	47	49	52	54	56
4' 10	25	27	29	31	34	36	38	40	42	44	46	48	50	52
5' 0	23	25	27	29	31	33	35	37	39	41	43	45	47	49
5' 2	22	24	26	27	29	31	33	35	37	38	40	42	44	46
5' 4	21	22	24	26	28	29	31	33	34	36	38	40	41	43
5' 6	19	21	23	24	26	27	29	31	32	34	36	37	39	40
5' 8	18	20	21	23	24	26	27	29	30	32	34	35	37	38
5' 10	17	19	20	22	23	24	26	27	29	30	32	33	35	36
6' 0	16	18	19	20	22	23	24	26	27	28	30	31	33	34
6' 2	15	17	18	19	21	22	23	24	26	27	28	30	31	32
6' 4	15	16	17	18	20	21	22	23	24	26	27	28	29	30
6' 6	14	15	16	17	19	20	21	22	23	24	25	27	28	29
6' 8	13	14	15	17	18	19	20	21	22	23	24	25	26	28

Underweight
 Healthy Weight
 Overweight
 Obese

Source: Surgeon General's Call to Action to Prevent & Decrease Overweight and Obesity, 2001
www.surgeongeneral.gov/topics/obesity/calltoaction/fact_advice.htm

Youth

In youth, overweight status is determined by comparing the child's BMI to the appropriate CDC Growth Chart for Girls and Boys (8,9). These charts show the distribution of heights and weights for youth at each year of age up to 17. There are separate growth charts for boys and girls. The most recent charts were created in 2000 based on data from the National Health and Nutrition Examination Survey (NHANES). 'Overweight' is defined as having a BMI in the 95th percentile of the distribution for a child's age and sex, that is, having a BMI greater than 95% of youth of the same age and sex. Youth whose BMI falls between the 85th and 95th percentiles are considered to be 'at risk' of becoming overweight.

This report will compare those youth who fall in the 95th percentile for their age and sex with all other youth of the same age and sex. We will use the term 'obese' to describe youth in the 95th percentile, although this term is defined differently for obesity in adults. This report will also examine the effects of "perceived" obesity, that is, whether students believe themselves to be obese. This is determined by their response to the question "How would you describe your weight?" Students who described or perceived themselves as 'slightly' or 'very' overweight were combined into a group called 'obese' and compared to all other students.

Introduction Cont.

Limitations of the Body Mass Index

The BMI is the only available standard from which comparisons can be made. However, it has several limitations. Problems associated with using the BMI include the potential unreliability of people's self-reported weight and height, and the somewhat arbitrary cut-off points for the various BMI categories. The two primary data sources used for this report (the Behavioral Risk Factor Surveillance Survey and the Healthy Youth Survey) both rely on self-reported weight and height. According to a recent article "Study participants, especially in telephone surveys, tend to under-report their weight, over-report their height, or both, leading to underestimation of obesity prevalence. According to the National Health and Nutrition Examination Survey (NHANES), which measures weight and height for an adult sample aged ≥ 20 years, the prevalence of obesity among U.S. adults overall was 32.2% during 2003 - 2004, about one-third greater than the 23.9% prevalence reported in the 2005 BRFSS survey."

Use of the BMI may lead to an even greater underestimation of the prevalence of obesity in youth. Using the top 5% of a distribution as the standard for obesity does not reflect an objective standard of obesity, but a relative one. The current standardized charts were created in 2000, but they do not account for the fact that youth's average BMIs were increasing before then. For example, the average BMI of a 14-year old boy as measured by the National Health and Nutrition Examination Survey (NHANES) between 1976 and 1980 was 20.2, but increased to 22.3 by 1999 - 2002 (9). The current growth charts do not reflect the increase in average BMI that occurred before 2000. If average BMIs among youth continue to increase and the Standardized Growth Charts are simply up-dated to reflect new data, the threshold for defining obesity will increase with it. That is, if the country continues to become more overweight, the highest 5% of children will become more overweight, thus shifting the curve (12). This makes comparisons over time less meaningful as the definition of obese will always be changing for children and youth.

Causes

Body weight is determined by a combination of genetic, behavioral, environmental, cultural, and socioeconomic factors in ways that are not yet well understood. For the vast majority of people, obesity is caused by an imbalance of energy input and output (1). More calories of energy (in the form of food) are taken in than are expended. People eat too much and exercise too little. Sedentary lifestyles and a high abundance of calorie-dense foods, prevalent in Western societies, are a major contributing factor to obesity (13).

"Socio-economic status is an important determinant of obesity, especially among women. Longitudinal studies have shown that growing up poor is a major risk factor for obesity because poverty is associated with large caloric intake and low energy expenditure." (13) The lowest-cost food is often the most fattening, and the poor cannot afford to buy healthier, but more expensive foods (13). The neighborhoods in which the poor live tend to limit physical activity choices, because recreational facilities often do not exist, or because of safety issues.

Genetics play a part in obesity by determining the body's ability to regulate weight. It is estimated that genetic influences account for 33% of the variation in body weight. In rare cases obesity is determined by genetics, but these influences are more important in determining how fat is distributed in the body rather than total body fat (13, 14).

Introduction Cont.

Environmental factors can indirectly contribute to obesity. In some cases a person's physical activity level can be limited by their environment. For example, people may choose to drive instead of walk in areas where there are no sidewalks or where the crime rate is high (12, 15).

Other less common factors that contribute to obesity include drug side-effects (steroid hormones and common anti-depressants such as Prozac), diseases (e.g., Cushing's Disease), brain damage, pregnancy and psychological factors (13). Recent research suggests that there may be a link with a form of adenovirus (Ad-36) implicated in obesity in animals (16). The ability of bacteria and Archaea that live in the human intestine to turn food into energy may also be related to obesity (17).

Health & Financial Impact

"Obesity is clearly associated with increased morbidity and mortality" (5). It is estimated to cause between 100,000 and 300,000 deaths annually in the United States. While estimates of how many deaths are attributable to obesity are the subject of heated debate (18, 19, 20), studies have shown that "the risk of death rises with increasing weight" (1). These deaths are not all directly attributable to obesity, but are caused by diseases that are associated with obesity, including heart disease, hypertension, type 2 diabetes, and certain cancers (colon, endometrial and others) (1, 5). Breathing problems, including asthma and sleep apnea, are common among obese individuals, as are certain musculoskeletal disorders such as osteoarthritis. Overweight and obese individuals may also suffer from psychological consequences like social stigmatization, discrimination, and poor body image, all of which can contribute to depression (21). Recent studies suggest females suffer more from the effects of obesity than males. Obese women suffer significantly more years of life lost (YLLs) than obese men. This difference was more pronounced when years of life lost were adjusted for quality of life (22).

Overweight and obesity have a significant impact on the U.S. economy, and on the health care system in particular (23). Costs associated with obesity involve both direct and indirect costs. Direct medical costs include preventive, diagnostic and treatment services related to obesity. Indirect costs relate to morbidity and mortality. Morbidity costs are the value of income lost due to decreased productivity, restricted activity, absenteeism, and bed days. Mortality costs are the values of future income lost due to premature death (24).

The increasing prevalence of obesity contributes directly to rising in health-care costs in three ways. First, the increase in obesity has led to a concomitant increase in the prevalence of diseases associated with obesity, so the amount spent on treating these diseases has increased. Second, changes in clinical standards have caused an increase in the proportion of diseases that receive treatment, in particular the growing emphasis on early detection and treatment of chronic conditions such as diabetes and heart disease. As treatment for these illnesses become more complex and costly, there is an increase in the average cost of treatment per patient (24, 25). A study by Thorpe, Florence and Howard found that increasing rates of obesity were responsible for nearly 30 percent of the overall increase in U.S. health care spending between 1987 and 2002 (26).

Introduction Cont.

A recent estimate placed the total cost of medical expenditures attributable to obesity at approximately \$75 billion dollars nationwide in 2003, representing approximately five percent of total U.S. medical expenditures (27). About half of these costs were paid for by the Medicare and Medicaid programs (28). Private spending on obesity-related medical problems was estimated to have increased from \$3.6 billion in 1987 to \$36.5 billion in 2002. This latter figure represents 11.6% of all private spending on health care. In addition to medical costs, the Federal Trade Commission estimates that \$35 billion were spent annually on weight-loss products and services in 2001 (29). More recent estimates place the size of this industry at \$46 billion (30).

In Washington State, an estimated \$1.3 billion was spent on obesity-related health care during 2003 (31). Of these expenditures, 17.7% were paid by Medicare (\$236 million), while an additional 27.4% were paid by the Medicaid program (\$365 million). A study commissioned by the Washington State Department of Health and the Washington Coalition for Promoting Physical Activity found that physical inactivity cost the state more than \$5 billion in 2002 for medical care, workers' compensation claims, and lost productivity (32).

Patients weighing 400 lbs or more require wider, stronger beds, chairs, operating tables, and/or wheelchairs. Larger gowns, blood pressure cuffs, and other routine supplies are also needed. These costs can strain resources and are often passed to the consumer.

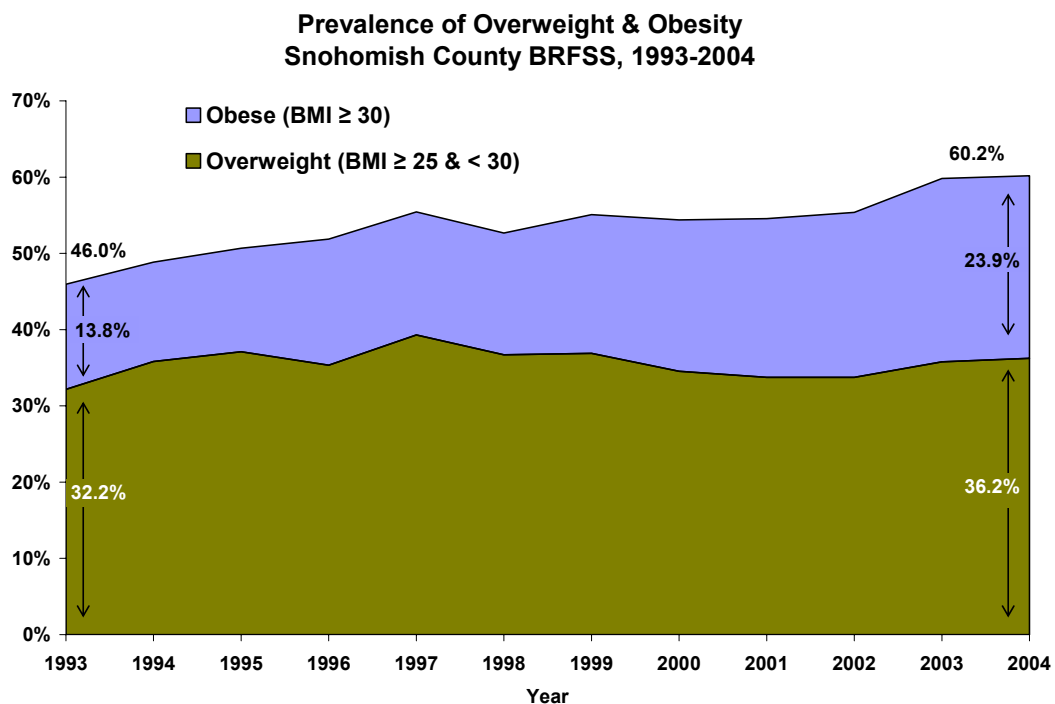
Obesity in Adults



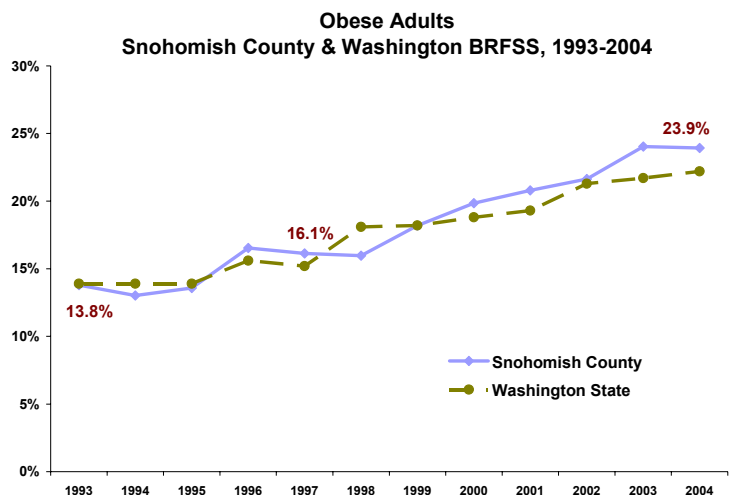
Obesity in Adults

Prevalence/Trends

The proportion of adults who were considered overweight or obese grew by 30% between 1993 and 2004, from 46.0% in 1993 to 60.2% in 2004. During this period, the proportion of adults who were overweight, but not obese remained fairly constant at approximately 35%. The overall increase was driven by growth in the percentage of adults who were obese, which increased 74.0% during this period.



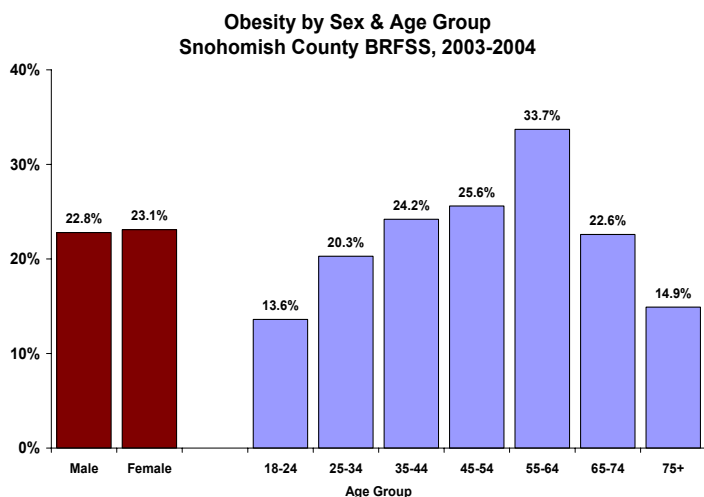
Between 1993 and 2004 the prevalence of obesity among adults in Snohomish County and Washington State showed large, statistically significant increases. In Snohomish County, the proportion of obese adults nearly doubled between 1993 and 2004 from 13.8% to 23.9%. Obesity increased in Washington State in a manner similar to Snohomish County, increasing from 13.9% to 22.2%. Both the county and the state were very similar to the U.S. median prevalence of 22.8% in 2003 (the last year reported). Neither has met the Healthy People 2010 goal for a 15% prevalence of obesity among adults (33).



Obesity in Adults

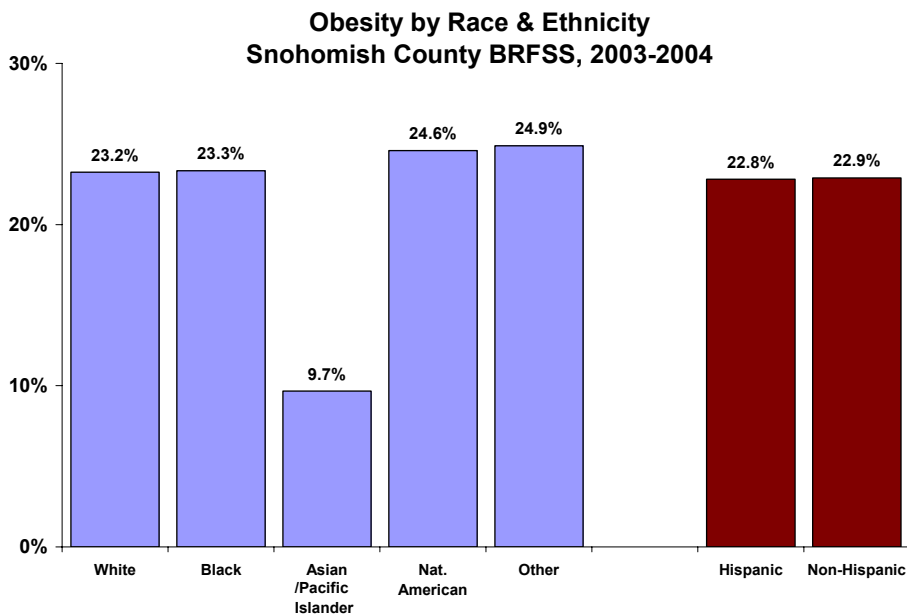
Demographics

In targeting public health's response to the obesity problem it is useful to know who is at risk for becoming obese. This allows for targeted interventions within defined populations.



The data from 2003-2004 showed no difference in the prevalence of obesity between men and women. The prevalence of obesity generally increased with age. Less than 14% of adults between the ages of 18 and 24 were obese compared with more than one-third of those between the ages of 55 and 64. After the age of 65, the prevalence of obesity decreased markedly. This may be due to excess mortality among obese members of this age group.

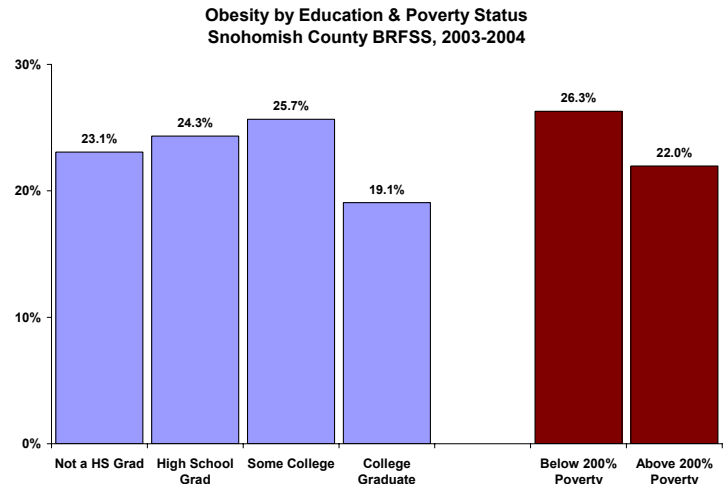
The prevalence of obesity did not vary significantly by race, with the exception of Asians and Pacific Islanders, who had significantly lower rates of obesity than other races ($p = 0.009$). The prevalence of obesity among Hispanics was similar to that of non-Hispanics. Other studies (such as the National Health Interview Survey) suggest that differences between sexes vary by race and ethnicity. Due to the small number of minorities in the sample, it was not possible to determine if this relationship exists in the Snohomish County data.



Obesity in Adults

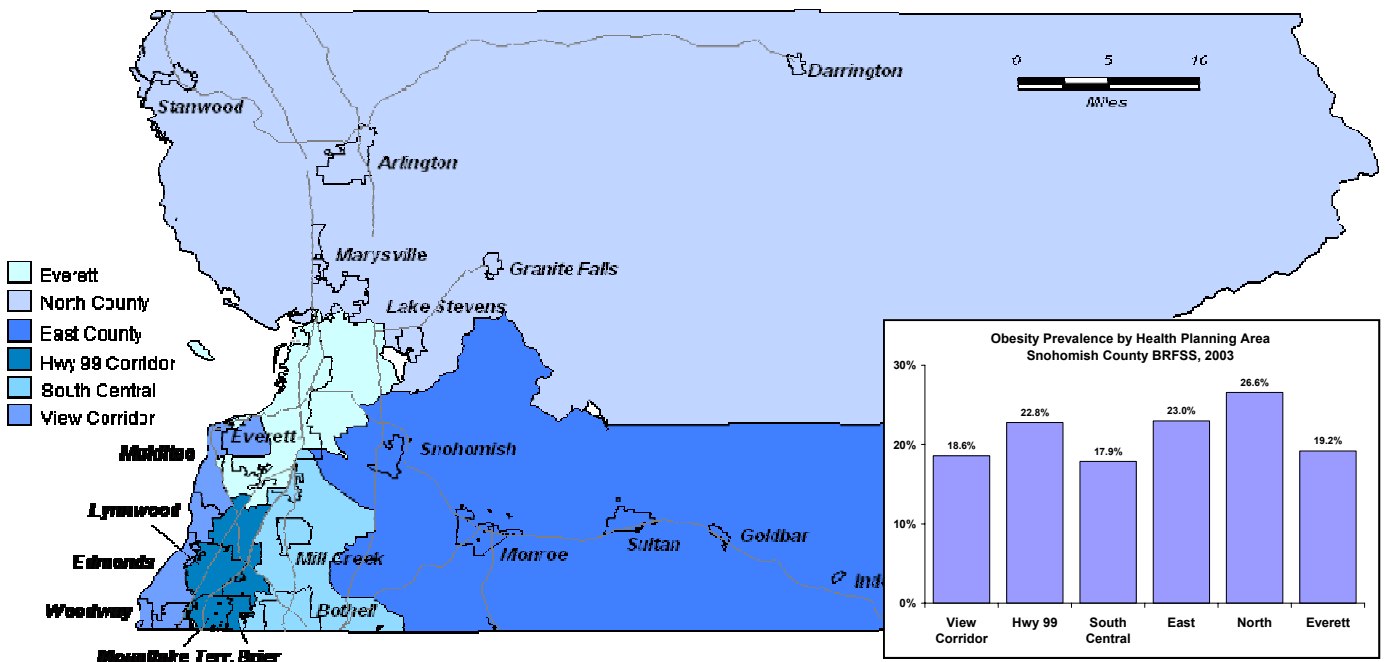
Obesity did not vary by educational attainment, except that adults who attended college were significantly less likely to be obese than others ($p = 0.01$).

However, even college graduates did not meet the Healthy People 2010 goal for a 15% prevalence of obesity among adults. Those living below 200% of the Federal Poverty guidelines were more likely to be obese than others ($p = 0.05$). The greater prevalence of obesity among the poor is significant for public health agencies because many adults living in poverty have health insurance provided by public sources. Thus, the increases seen in health care spending due to obesity fall disproportionately on government funding sources.

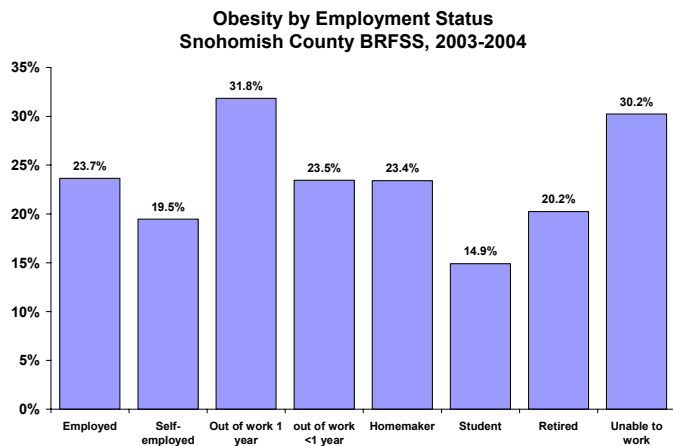


The Snohomish Health District divides the county into six Health Planning Areas (HPAs) (see below) for planning purposes. The North Health Planning Area (Stanwood, Marysville, Arlington, and Darrington) had a significantly higher prevalence of obesity than the other HPAs in 2003 ($p = 0.0038$). While there was variation in the rates of obesity in other parts of the county, none of the other Health Planning Areas were significantly different than the others.

Obesity by Health Planning Area Snohomish County, 2003



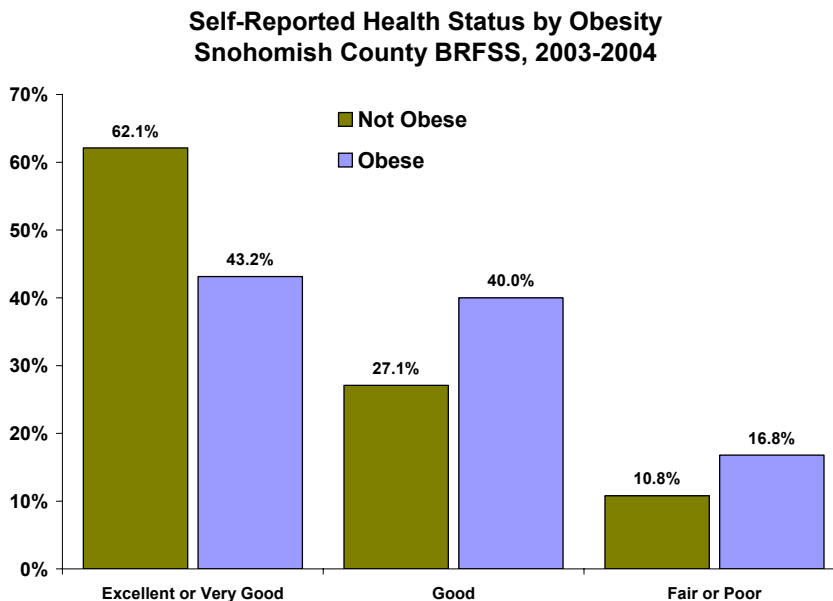
Obesity in Adults



Adults who had been out of work for a year or more and those who were unable to work were more likely to be obese than others ($p = 0.009$). Students were less likely to be obese, but this is probably due to their being younger, as younger adults are less likely to be obese (see previous section).

Health Conditions of Obese Adults

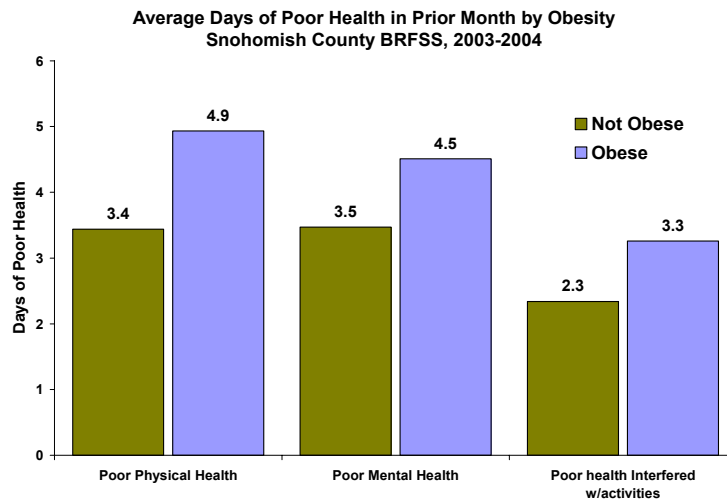
As noted previously, obesity is correlated with the development of chronic conditions such as diabetes and arthritis. Obese individuals also suffer from poorer mental health than others. This section details these associations in the Snohomish County population.



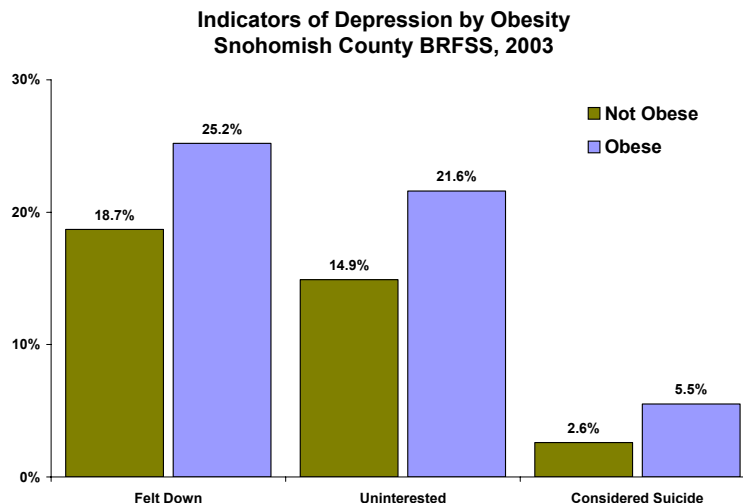
Persons suffering from obesity tended to rate their health lower than not obese adults ($p = 0.0001$). Nearly two-thirds of not obese adults rated their health as “excellent” or “very good,” while less than half of obese adults felt their health merited such a description. Obese adults were much more likely than those not obese to rate their health as “fair” or “poor”.

Obesity in Adults

Obese adults averaged more days of self-reported poor mental or physical health in the previous month than those not obese. Nearly half (48.3%) of obese adults said they experienced at least one day of poor physical health in the prior month compared with only 39.5% of those not obese ($p = 0.0001$, not shown). Obese adults averaged 4.9 days of poor physical health per month compared with 3.4 days for those not obese ($p = 0.0001$). Obese adults were no more likely to experience at least one day of poor mental health than those not obese. However, those who did experience poor mental health averaged more days of poor mental health ($p = 0.006$) than those not obese. Poor health (physical or mental) was more likely to interfere with the daily functioning of obese adults. They experienced significantly more days of impairment than adults who were not obese ($p = 0.007$).



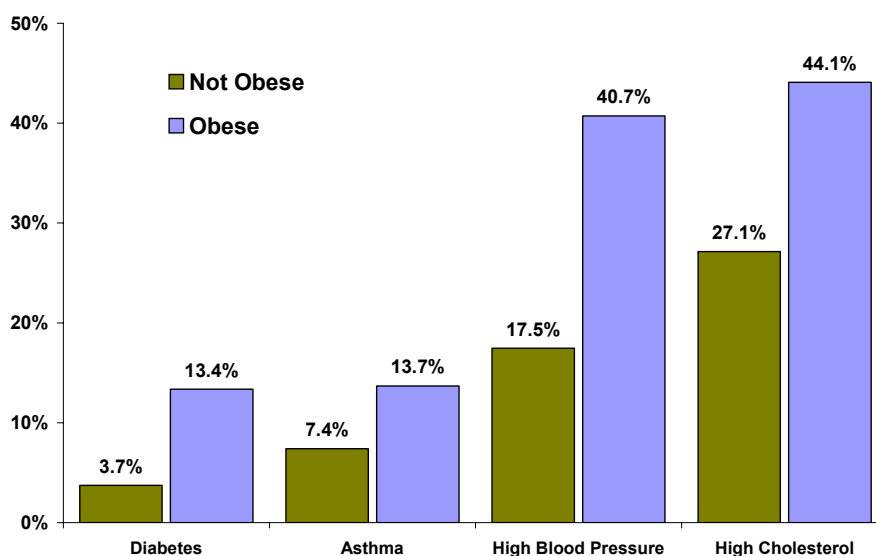
Obese adults were more likely than others to report symptoms of depression. They were significantly more likely to say that they had “been bothered by feeling down, depressed or hopeless” than others ($p = 0.02$). They were also more likely to be “bothered by little interest or pleasure in doing things” ($p = 0.009$). Obese adults were more likely to report seriously considering suicide, but this difference was not statistically significant ($p = 0.09$).



Obesity in Adults

Obesity was associated with higher self-reported prevalence rates of diabetes, asthma, high blood pressure, and high cholesterol. Obese adults were more than three times as likely to be diagnosed with diabetes as others ($p = 0.0001$). Between 1994 and 2004, the self-reported prevalence of diabetes increased from 3.4% to 5.8%. Obese adults were approximately twice as likely to be diagnosed with asthma, high blood pressure, or high cholesterol. Approximately one-quarter of obese adults (23.8%) had both high blood pressure and high cholesterol compared with only 10.4% of those not obese. There were no differences in the proportions of obese and not obese adults who had been told that they had suffered a heart attack or stroke. It is unknown if this result reflects the proportion of adults who had suffered these traumas or the proportion who survived them.

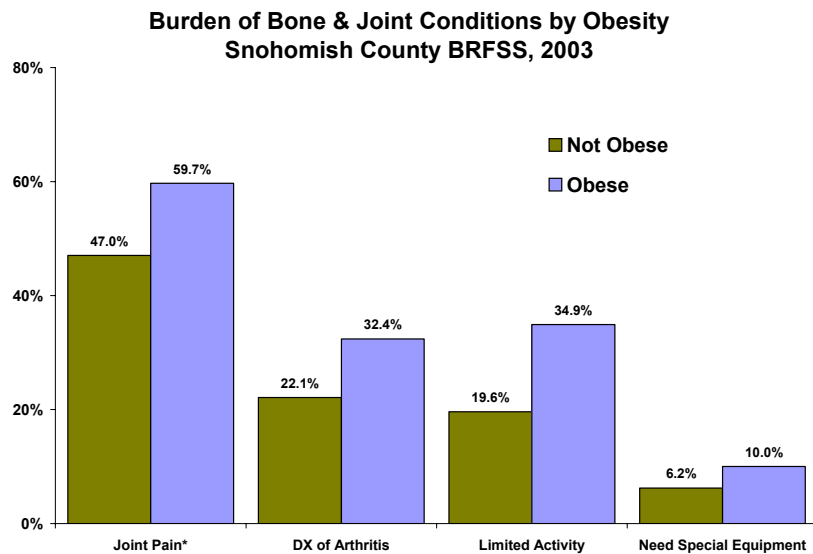
**Prevalence of Related Health Conditions by Obesity
Snohomish County BRFSS, 2003-2004**



Obese adults were approximately two to three times as likely to be diagnosed with diabetes, asthma, high blood pressure, or high cholesterol.

Obesity in Adults

Adults who were obese were disproportionately affected by arthritis. This is probably due to the extra stress on joints that support the excess weight. Obese adults were significantly more likely to experience joint pain and to be diagnosed with arthritis by a doctor. Among those who had arthritis, adults who were obese were more likely than those who were not obese to report their condition resulted in some form of activity limitation, and that arthritis affected their choice of profession (not shown). When asked whether any health condition limited their activity, about one-third of obese adults indicated a limitation compared with only one in five of those not obese ($p = 0.001$). In addition, obese adults were more likely to report that they had a health condition that required them to use special equipment such as a cane, wheelchair, special bed, etc. ($p = 0.008$).

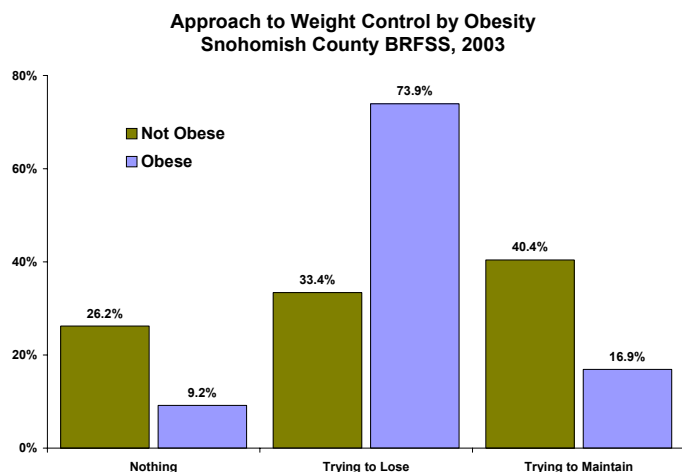


Obesity in Adults

Prevention

Weight Control

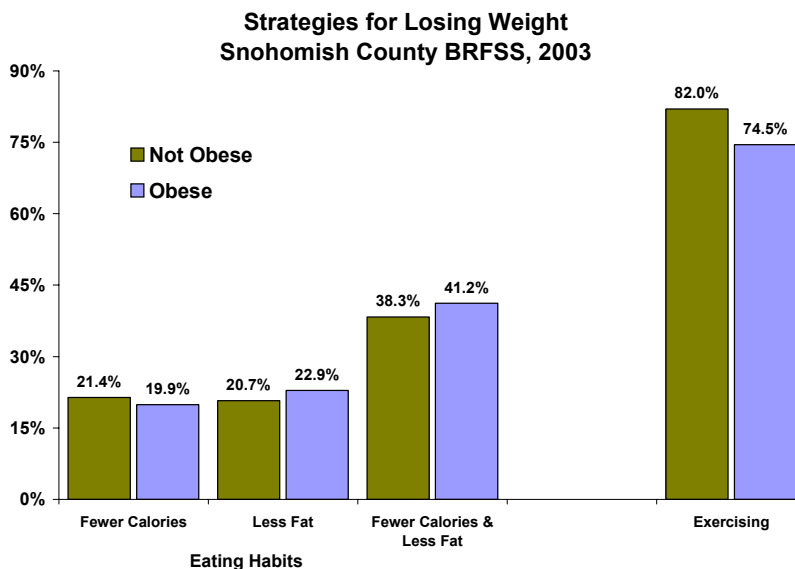
One way to decrease the prevalence of obesity is to increase the number of obese adults who are losing weight. In fact, the majority of obese adults are trying to lose weight, but the prevalence of the condition has not decreased.



Among adults who were obese, nearly three-quarters (73.9%) reported they were trying to lose weight. They were twice as likely to be trying to lose weight as adults who were not obese.

Another 16.9% of obese adults were trying to maintain their weight and less than one in ten (9.2%) said they were doing nothing about their weight.

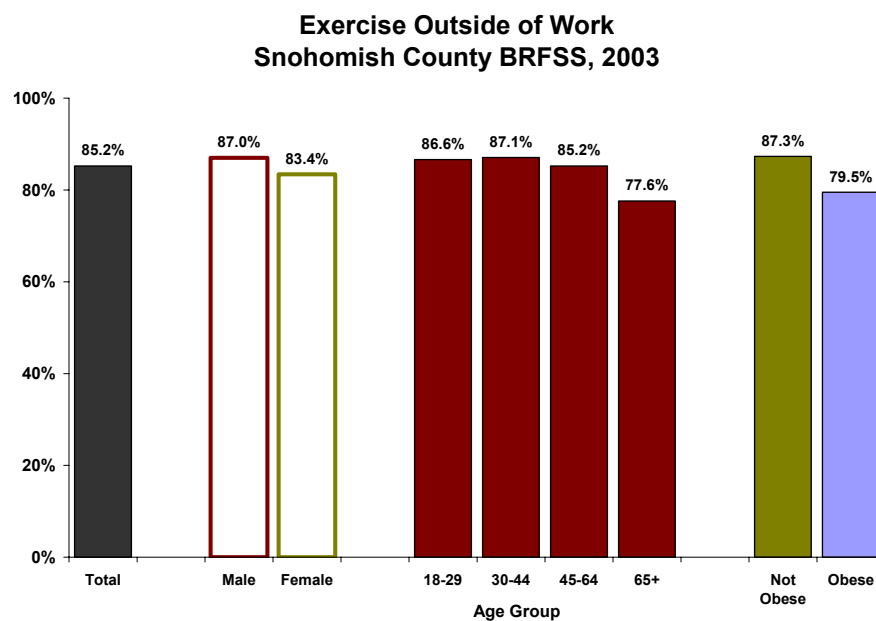
Among those obese adults who were trying to lose weight, most (84.0%) were either trying to eat fewer total calories (19.9%), less fat (22.9%), or both (41.2%). In addition, three-quarters of obese adults (74.5%) were exercising to control their weight. Most (61.5%) said they were both modifying their eating habits and exercising to lose weight (not shown). How adults modified their eating habits to lose weight did not vary between obese and not obese adults. However, adults who were not obese were more likely than obese adults to exercise as part of their weight loss strategy ($p = 0.002$).



Obesity in Adults

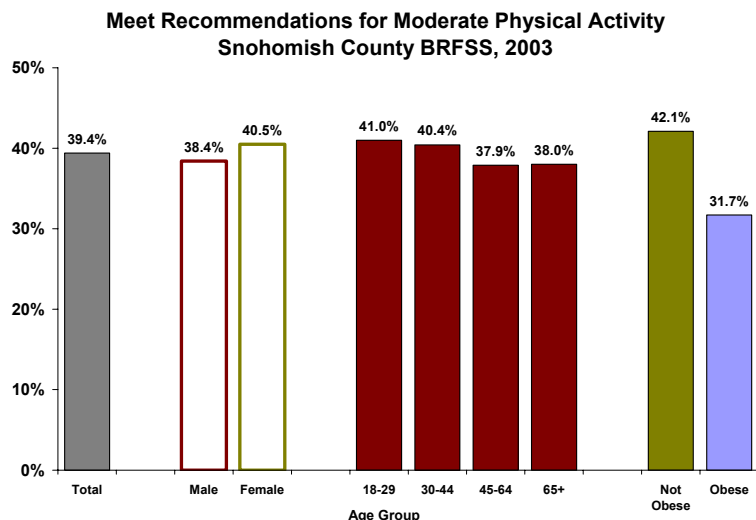
Physical Activity

Exercise is an important component of effective weight control. Research continues to find that exercise provides numerous other health benefits as well. Because regular exercise is an important factor in overall health, it is important to know how much of the population is engaging in regular physical activity.



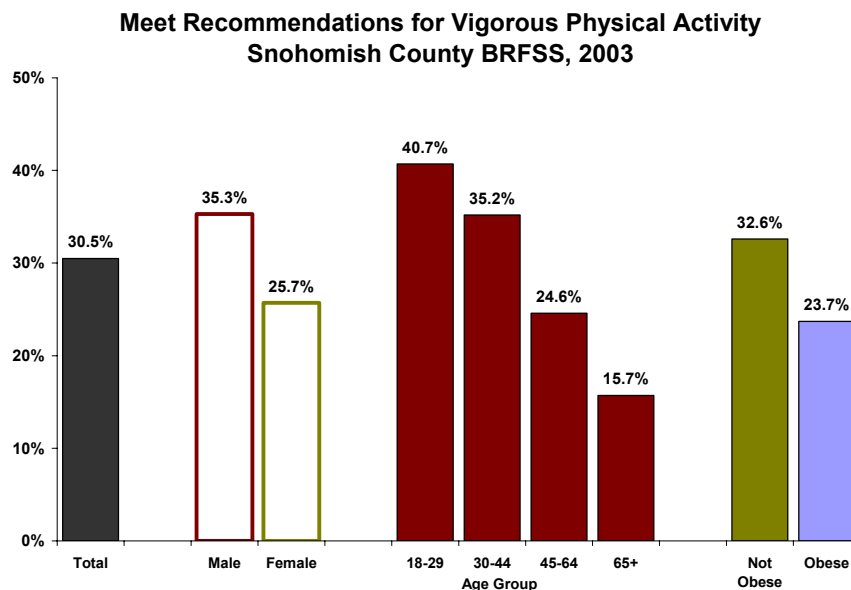
The majority of Snohomish County adults (85.2%) said they engaged in some form of exercise outside of the workplace. Snohomish County exceeded the Healthy People 2010 goal (22-1) that 80% of adults engaging in leisure-time physical activity. Males were more likely to report exercising outside of work than females. The proportion of adults engaging in activity outside the workplace was constant across ages, except that adults 65 and older were less likely to be active. Obese adults were significantly less likely to exercise outside of work ($p = 0.001$) than those who were not obese.

Obesity in Adults



Healthy People 2010 sets a goal that 30% of adults engage in at least 30 minutes of moderate physical activity such as walking or gardening on five or more days of the week (objective 22-2). In 2003 almost 40% (39.4%) of Snohomish County adults met this guideline. There were no significant differences in the proportion of adults who met this guideline by sex or age. However, obese adults were less likely to engage in this level of activity than others ($p = 0.0002$).

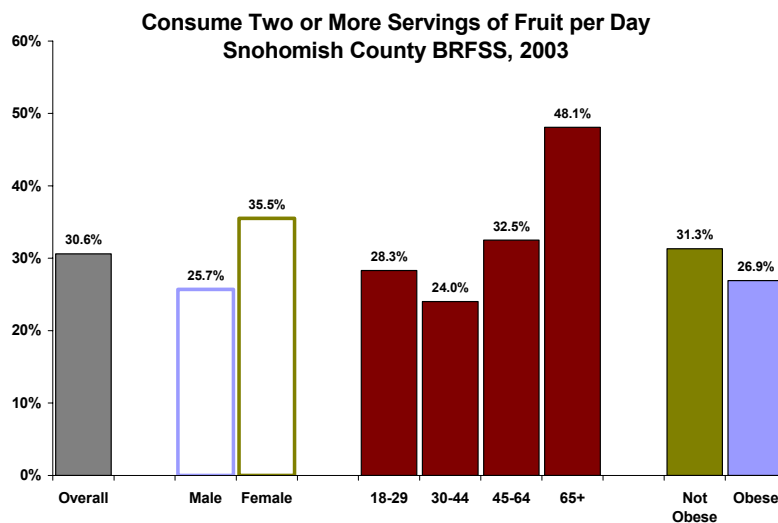
Another Healthy People 2010 goal (22-3) is for 30% of adults to participate in vigorous physical activity (that causes one to break a sweat) on three or more days a week for 20 minutes or more. Snohomish County is meeting this goal. Men were more likely to engage in vigorous physical activity three times per week than women ($p = 0.0001$). The proportion of adults engaging in the suggested amount of vigorous activity decreased dramatically with age ($p = 0.0001$). Obese adults were significantly less likely to engage in vigorous activity than others ($p = 0.0001$). Less than half of obese adults (43.9%) engaged in either the recommended amount of moderate or vigorous physical activity (not shown).



Obesity in Adults

Nutrition

Nutrition is a vital component of the obesity problem. Americans eat a lot of pre-processed food because of its convenience and low cost. Such food tends to be high in calories and fat. Unfortunately, the only reliable nutrition data collected by the BRFSS is on the consumption of fruits and vegetables. However, these data are a good indicator of how healthy a person's diet is in general, and recent research indicates that higher consumption of fruits and fiber is correlated with a healthy weight in adults (34).

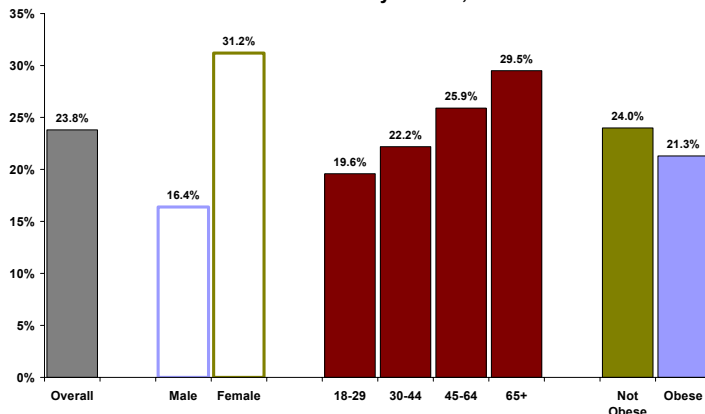


Healthy People 2010 recommends that adults should eat at least two servings of fruit per day (goal 19-5). The previous edition of Healthy People, which set goals for the year 2000, used a standard of five or more servings of any combination of fruits and/or vegetables per day. More adults are familiar with this recommendation than those set forth in Healthy People 2010, which recommends separate goals for fruits and vegetables.

The goal is to have 75% of adults consume the recommended amount of fruit. Snohomish County has a long way to go toward meeting this goal, with only 30.6% of adults eating two or more servings of fruit daily. Females were more likely to consume two or more servings of fruit per day than males ($p = 0.001$). Adults older than 65 were more likely to eat two or more servings of fruit than younger adults ($p = 0.001$). Obese adults were less likely to consume the recommended amount of fruit than those not obese, but the difference was not statistically significant.

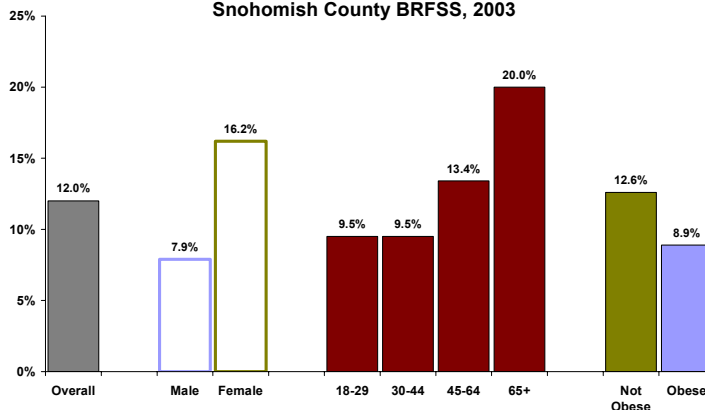
Obesity in Adults

Consume Three or More Servings of Vegetables per Day
Snohomish County BRFSS, 2003



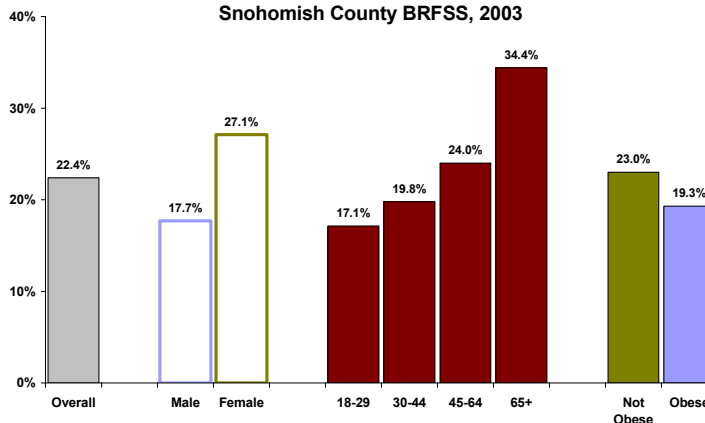
Less than one-quarter of adults (23.8%) consumed the recommended three or more servings of vegetables per day compared with the Healthy People 2010 goal that 50% of adults should be eating that amount of vegetables (goal 19-6). Females were twice as likely as males to consume the recommended amount of vegetables ($p = 0.001$). The proportion of adults who ate three or more servings of vegetables per day increased from 20% among 18 to 29 year olds to 30% among adults 65 and older ($p = 0.018$). Obese adults were less likely to consume the recommended amount of vegetables than those not obese, but the difference was not statistically significant.

Consume Three or More Servings of Vegetables and Two or more Servings of Fruit per Day
Snohomish County BRFSS, 2003



Only 12% of adults met the combined Healthy People 2010 recommendations for fruit and vegetable consumption. Females were twice as likely as males to meet both recommendations ($p = 0.001$). Adults who were 65 and older were significantly more likely to meet both these recommendations than younger adults ($p = 0.001$). Adults who were not obese were more likely to consume two or more fruits and three or more vegetables per day than obese adults ($p = 0.03$).

Consume Five or More Servings of Fruits or Vegetables per Day
Snohomish County BRFSS, 2003

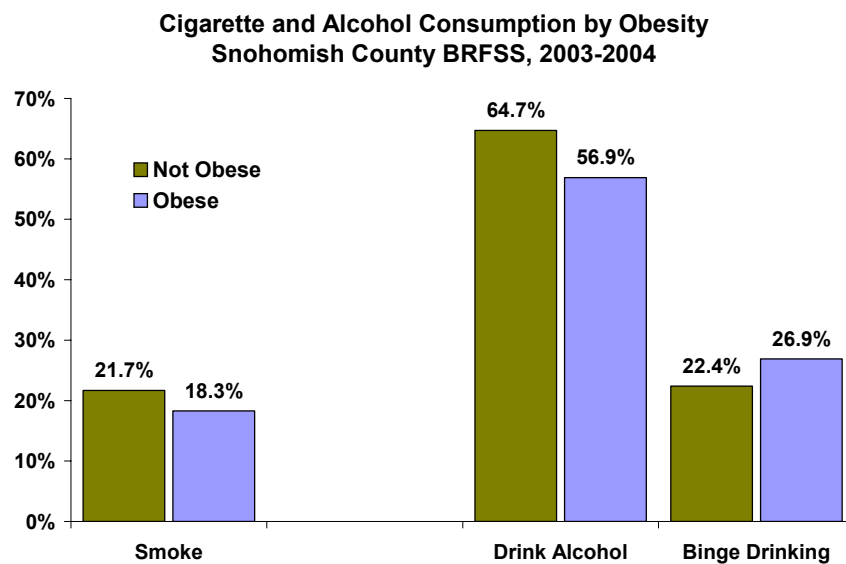


Only 22.4% of the adult population of the county reported consuming this amount of vegetables and fruit (not shown). There was no statistically significant difference in the prevalence of obese and not obese adults who ate five or more servings per day. Adults consumed a daily average of 3.7 servings of fruits and vegetables.

Obesity in Adults

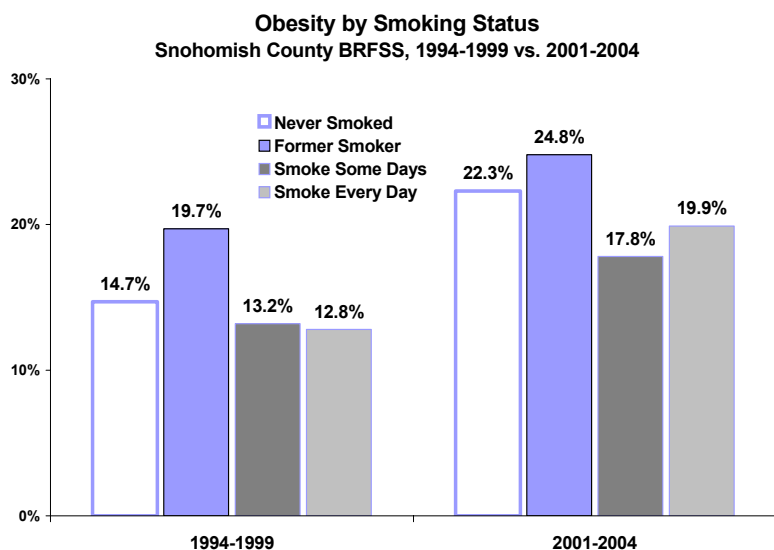
Cigarette & Alcohol Consumption

Research has demonstrated that smoking cigarettes is associated with reduced weight and are considered by some to be a diet aid (35). The relationship between alcohol consumption and obesity is less clear. The literature reports that adults who regularly consume small amounts of alcohol are less likely to be obese than those who do not drink at all, but heavy drinkers are more likely than non-drinkers to be obese (36).



Although Snohomish County data suggest that obese adults were less likely to smoke than those who were not obese, this difference was not statistically significant ($p = 0.094$). However, obese adults were less likely to drink alcohol than those not obese ($p = 0.005$). There was no difference between obese and not obese adults in the average amount of alcohol consumed on days when they did drink (not shown). Obese adults were no more likely to engage in binge drinking (i.e., having five for more drinks on a single occasion) than those not obese ($p = 0.11$).

Obesity in Adults

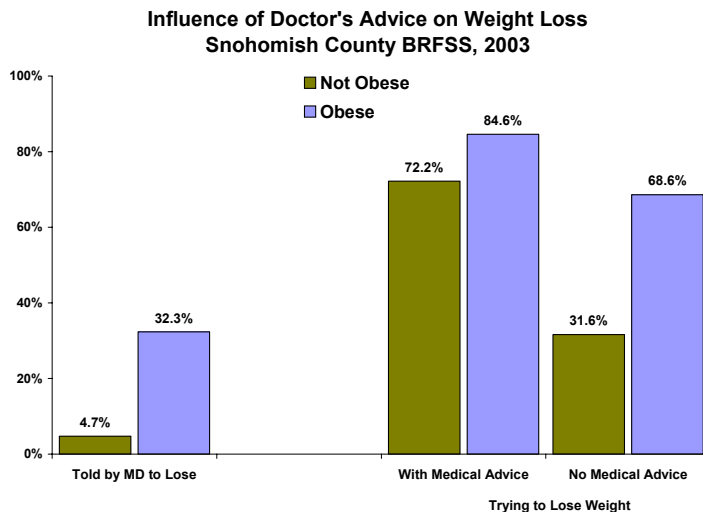


The graph shows the proportion of obese adults by their smoking status for the periods 1994-1999 and 2001-2004. During the 1990s, adults who smoked were the least likely to be obese and former smokers were the most likely to be obese ($p = 0.0001$). However, these differences were no longer great enough to be statistically significant during the period 2001-2004 ($p = 0.1$). During this later period, obesity increased among smokers, non-smokers, and former smokers alike. The greatest increases in obesity occurred among those who never smoked and those who smoked every day.

Physicians' Recommendations

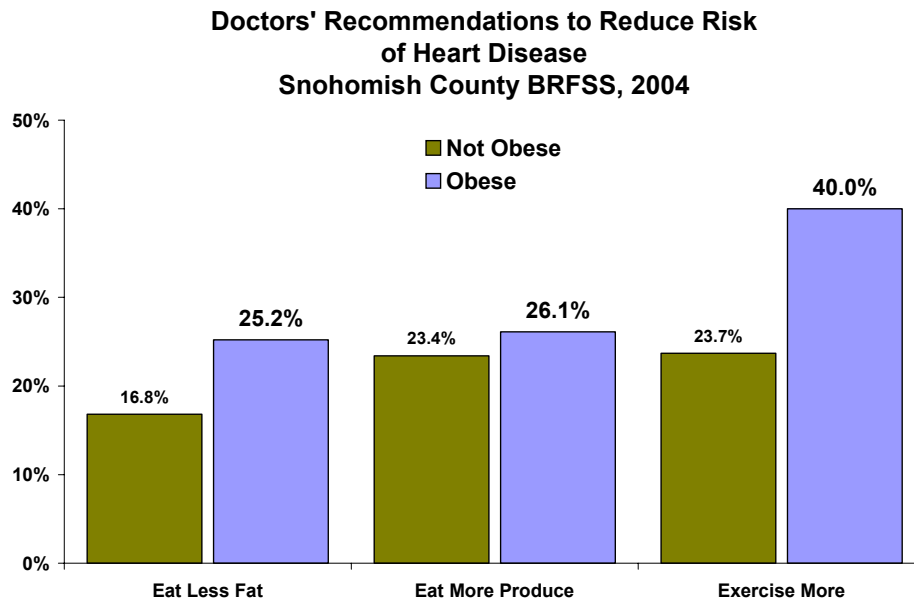
Recommendations made by family doctors have been a very effective component of community health education. Doctors have traditionally been uncomfortable discussing weight issues with their patients, and patients have been equally unwilling to broach the subject with their doctors (37, 38). In recent years, efforts have been made to encourage doctors to make weight management a topic that is regularly discussed with patients.

Among those adults considered obese, one-third (32.3%) reported they had been told by a medical professional to lose weight, while only 4.7% of not obese adults had been told to lose weight ($p = 0.0001$). Adults who were advised to lose weight by a doctor were significantly more likely to try to lose weight than those not so advised (81.8% vs. 38.3%, $p = 0.0001$) regardless of whether they were obese or not (not shown).



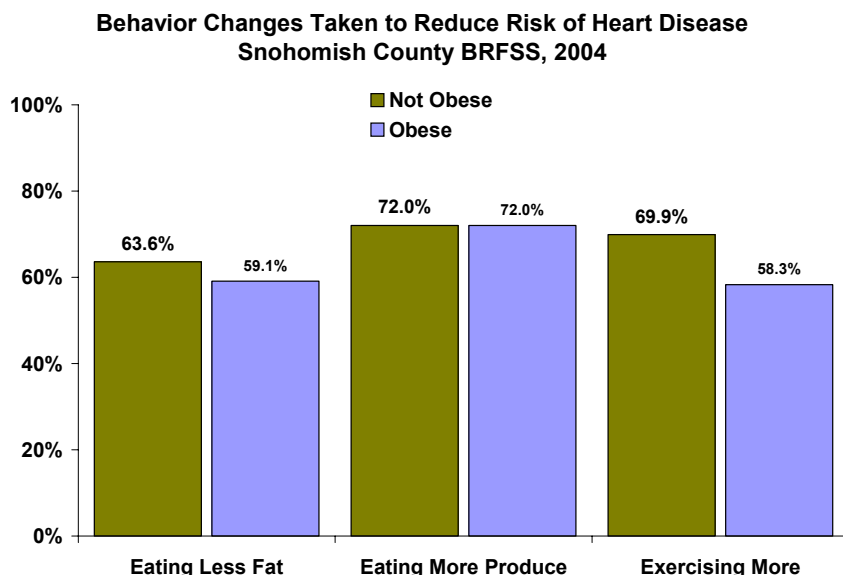
Obesity in Adults

Because obesity is associated with heart disease, understanding health behaviors related to heart disease is important for understanding obesity. The 2004 BRFSS survey asked adults whether their doctor had recommended changes to their dietary or exercise habits to prevent heart disease, and whether they changed their behaviors. Respondents reported that doctors infrequently suggested dietary or activity changes to avoid heart disease. Only 25.2% of obese adults indicated that doctors had recommended eating less fat. Only 26.1% of obese adults said that increasing fruit and vegetable consumption was recommended, while 40% indicated that exercising was suggested. Obese adults reported receiving recommendations to eat less fat and exercise significantly more often than those not obese. There was no difference in the proportion of adults who reported recommendations to eat more fruits and vegetables.

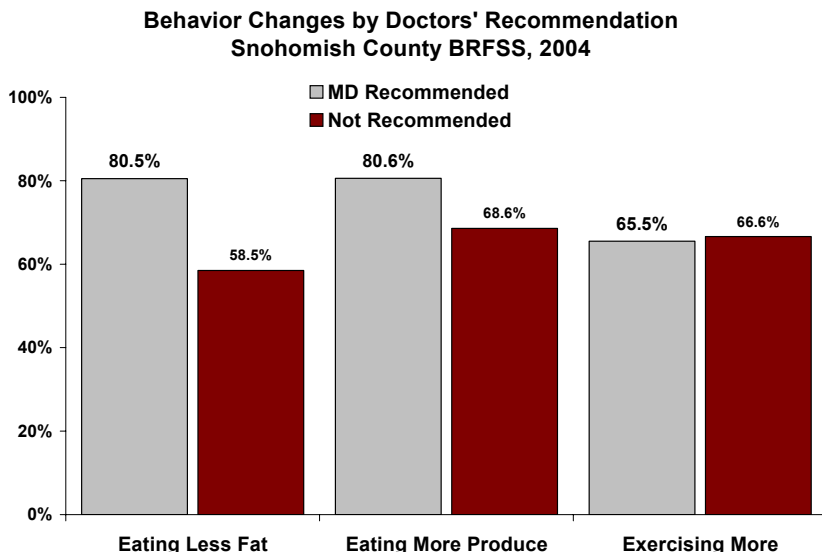


Obesity in Adults

Despite the small number of patients who reported receiving behavioral change recommendations from their doctors to reduce their risk of heart disease, most adults said they were eating less fat, more fruits and vegetables, or exercising more. There were no differences in the proportions of obese and not obese adults who had changed their dietary habits, but obese adults were significantly less likely to have increased their physical activity than those not obese.



Adults who reported receiving advice from their doctors to eat less fat or eat more fruits and vegetables to reduce their risk of heart disease were more likely to report changing those behaviors than those who reported no such advice from their doctors. However, there were no differences in the proportion of adults who were engaging in greater physical activity. Thus it seems that doctors' recommendations influenced dietary changes, but not physical activity.



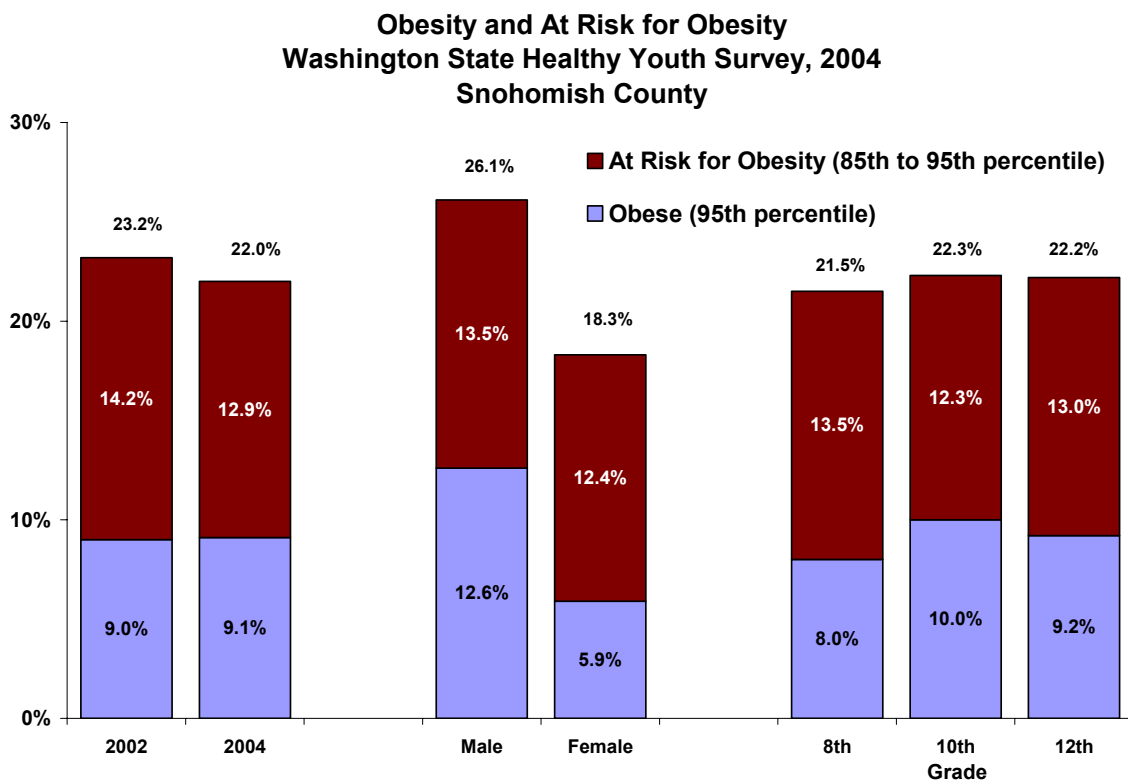
Obesity in Youth



Obesity in Youth

The definition of obesity in youth (or being at-risk for obesity) was previously described in the Background-Definitions section (see page 7). For this report, 'obese' will be used to describe those youth whose BMI places them in the 95th percentile for their age and sex. All other youth (underweight, normal and at-risk of becoming obese) will be described as 'not obese'.

Although 13% of youth in Snohomish County are at risk for becoming obese, this report will largely focus on those youth who are already obese.



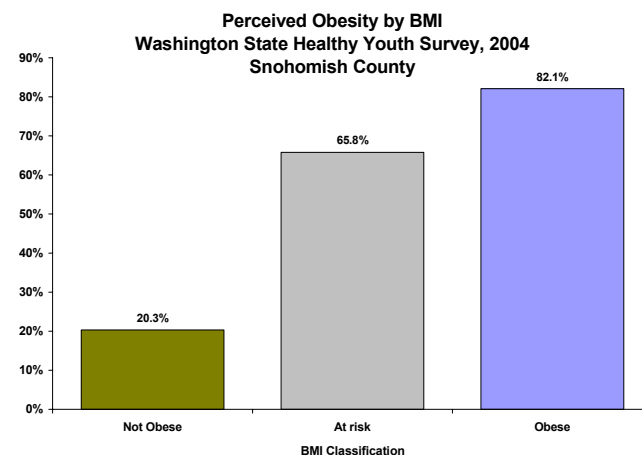
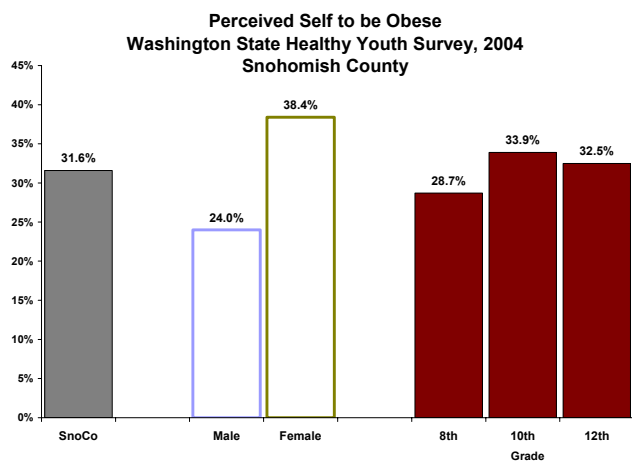
Prevalence & Demographics

In 2004, 9.1% of Snohomish County youth in grades 8, 10, and 12 were obese. Another 12.9% were at risk of becoming overweight. This means that more than one in five (22%) youth were either obese or at risk. This has not changed since 2002. Snohomish County students were less likely to be obese or at risk than the statewide averages of 10% obese and 13.7% at risk (not shown). Males were twice as likely to be obese as females ($p = 0.001$), but there was no difference by grade. Snohomish County has almost twice the percentage of obese youth as the Healthy People 2010 goal of 5% (goal 19-3).

Obesity in Youth

Another measure of obesity is youths' perception of their own weight. Self-perception may be a more accurate measure of obesity than BMI, at least for males, as some obesity defined by BMI is a reflection of muscle mass in athletes rather than fat. It may also be more accurate because the standardized growth charts that determine obesity using BMI have not been updated since 2000 (see page 8). However, a significant drawback to measures of self-perceptions is that they are highly influenced by cultural norms.

For example, girls who are at a healthy weight may perceive themselves as overweight due to societal pressures to be thin. Some cultures perceive obesity as a reflection of health and wealth. Nevertheless, because perception is an important alternative measure of obesity, it is included in the analyses which follow. It appears to be more strongly associated with poor health and health-related behaviors than the objective measure of obesity based on BMI. Students who described their own weight as 'slightly overweight' or 'very overweight' were considered to see themselves as 'obese' for the purposes of this analysis.



Almost one-third of students (31.6%) thought of themselves as obese or at risk of obesity compared with 22.0% of students whose BMI categorized them as obese or at risk. Females were more likely than males to perceive themselves as obese ($p = 0.0001$), although males were more likely to be obese using BMI. Females in high school were more likely to think of themselves as obese than were those in middle-school (not shown). However, high school males were no more likely than middle-school males to think of themselves as overweight. High school students were more likely to perceive themselves as obese than middle school students ($p = 0.002$).

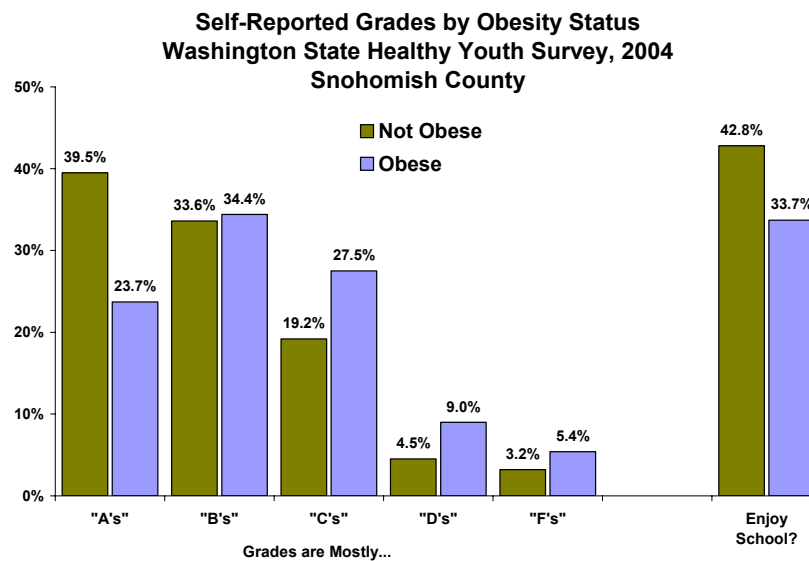
The proportion of students who thought of themselves as obese was highly correlated with BMI-determined obesity. More than 80% of students (82.1%) whose BMI classified them as obese thought they were obese. Only 20.3% of the students whose BMI classified them as normal weight thought of themselves as obese. Females whose BMI classified them as 'normal' weight were much more likely to think of themselves as obese than were males (29.5% vs. 9.2%, $p = 0.001$, not shown).

Obesity in Youth

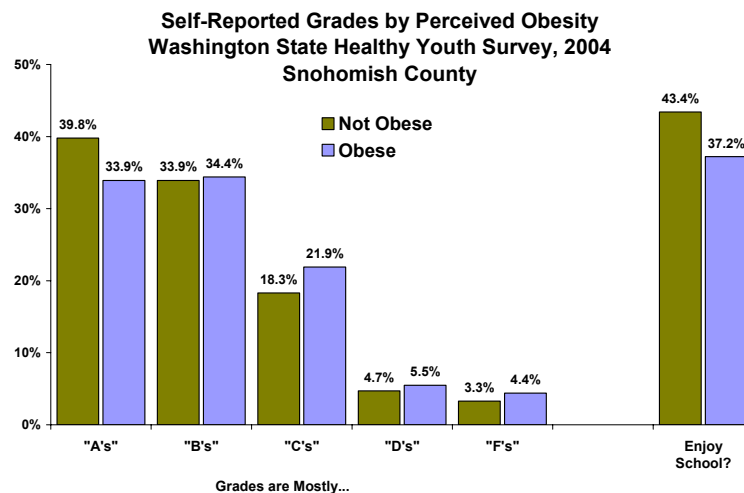
Academic Achievement

Poor nutrition and lack of physical activity in youth are associated with poor academic achievement (39, 40, 41). These factors are also associated with obesity.

Students whose BMI classified them as obese reported generally lower grades than those who were not obese. More students who were not obese reported their average grades were "A's," while obese students were more likely to report grades of "C," "D," or "F." In addition, students who were not obese were significantly more likely than obese students to say they enjoyed school. (42.8% vs. 33.7%, $p = 0.001$).

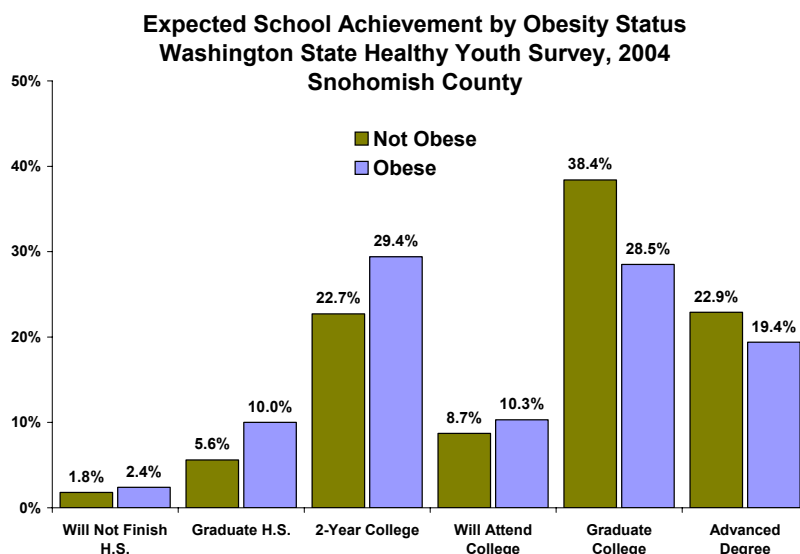


Similar results were obtained when their enjoyment in school was analyzed by students' perceived obesity ($p = 0.002$).

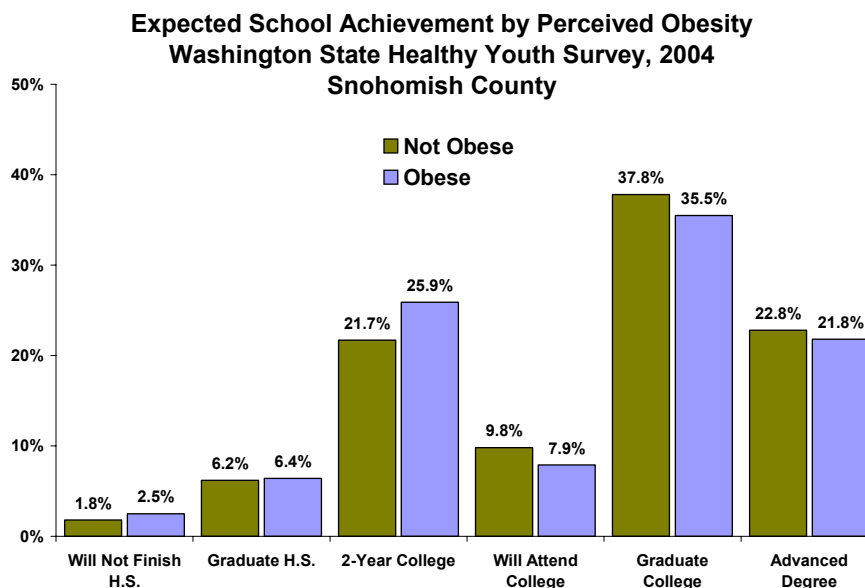


Obesity in Youth

Students who were obese as determined by BMI had generally lower expectations of how far they would advance in school compared with not obese students ($p = 0.001$). One in eight (12.4%) obese students did not expect to go beyond high school compared with only 7.4% of not obese students. In contrast, 61.3% of not obese students said they would graduate from college or get an advanced degree compared with only 47.9% of obese students (see below).



Students who perceived themselves as obese also tended to have lower expectations of how far they would go in school (see below, $p = 0.013$).

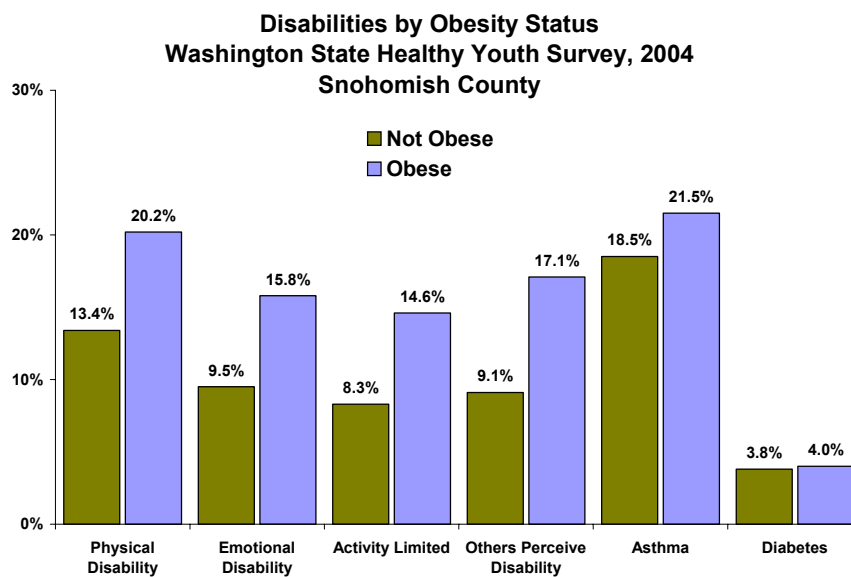


Obesity in Youth

Health Conditions

Disabilities

Obesity is associated with other health conditions (42). Some conditions develop after many years of obesity, while others may develop much earlier during childhood.



Being obese (as measured by BMI) was associated with chronic conditions such as asthma, physical or emotional disabilities, or being limited in activities due to a disability. Obese students were significantly more likely to suffer from all of these conditions than students who were not obese. Students who were obese also reported that they were perceived by others as having a disability more often than students who were not obese. A similar pattern was evident between students who thought they were obese and those who did not.

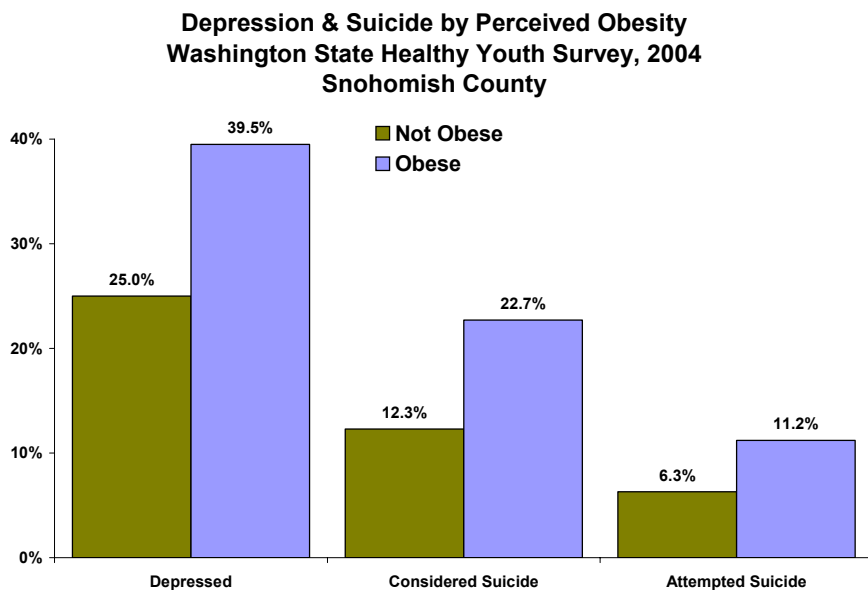
There was no difference in the reported prevalence of diabetes between obese students and those who were not obese. Most of these cases were probably type 1 diabetes, for which obesity is only one of many known risk factors. However, recent studies suggest that the incidence of type 2 diabetes has been increasing in youth (43).

Obesity is the main risk factor for type 2 diabetes, so it may be that some of the diabetic youth in this sample (particularly the obese ones) may have this type. Unfortunately, it is not possible to determine which type of diabetes each child has from these data.

Obesity in Youth

Mental Health

Studies have shown a correlation between obesity and depression in youth (44, 45). It is unclear whether depression causes obesity or obesity causes depression, or if some third factor is responsible for both.



Students who were measurably obese did not show any differences in the incidence of depression, suicidal behavior, and drug and alcohol use compared with those who were not measurably obese (not shown). However, the self-reported perception of being obese was highly correlated with poor mental health measures. Students who described themselves as “somewhat” or “very” obese were almost twice as likely to report depression, suicidal ideation, and suicide attempts as students who did not think of themselves as obese.

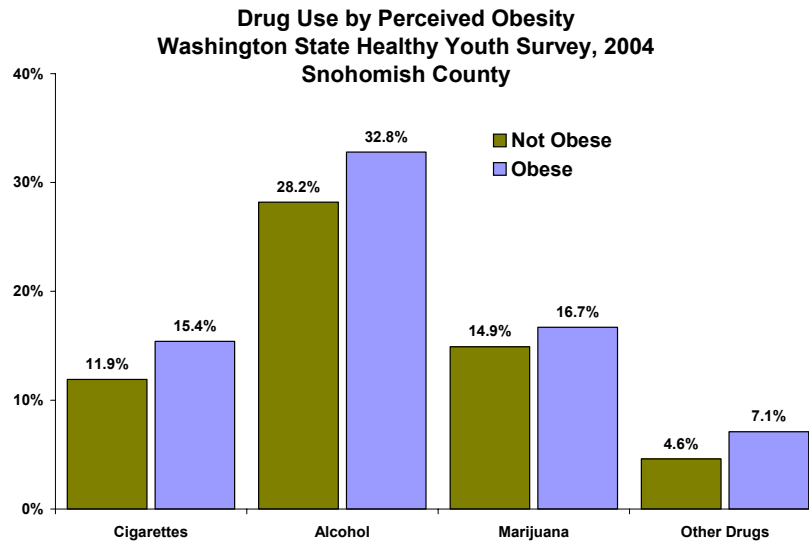
The self-reported perception of being obese was highly correlated with poor mental health measures.

Obesity in Youth

Risk Factors

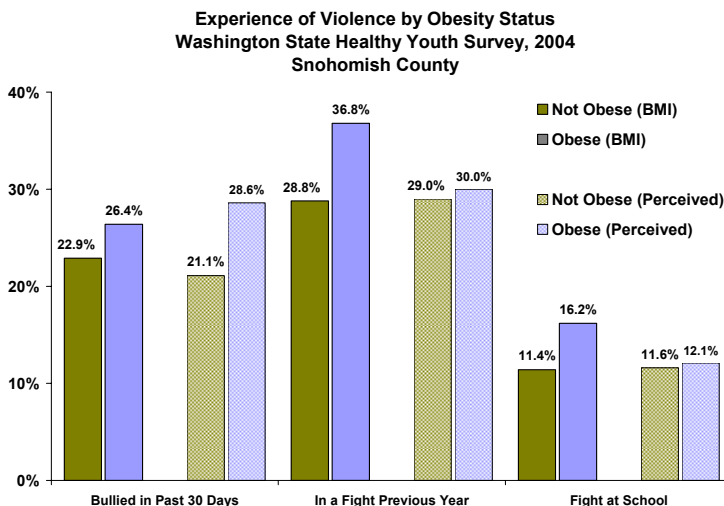
Substance Abuse

Students who were measurably obese were no more likely than others to drink alcohol, smoke cigarettes, or use drugs. However, students who thought of themselves as obese were more likely to smoke cigarettes, drink alcohol, and use drugs other than marijuana. There was no significant difference in marijuana use between students who thought of themselves as obese and those who did not.



Violence

The relationship between obesity and the experience of violence is not well addressed in the literature. However, data from Snohomish County suggests that for youth such a relationship exists.

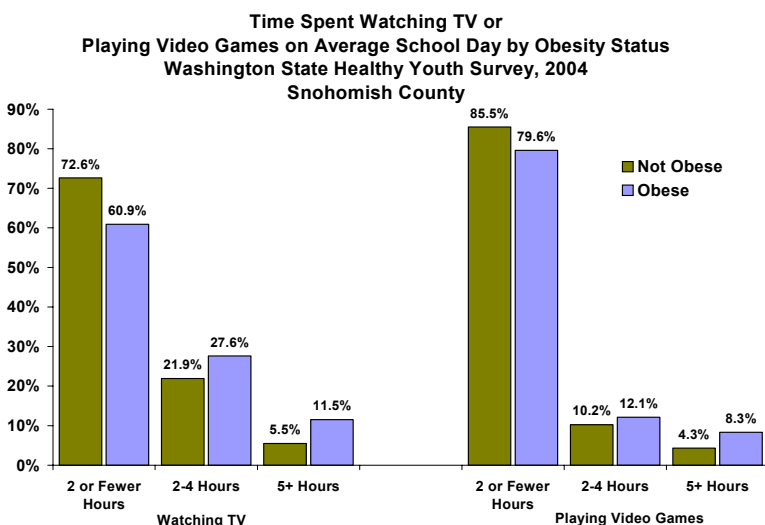


Obese students were generally more likely to experience violence than students who were not obese. Students who were measurably obese were significantly more likely to have been in a fight during the 12 months before the survey than those who were not obese ($p = 0.002$), but they were not significantly more likely to have been bullied ($p = 0.13$). Conversely, students who perceived themselves as obese were no more likely than other students to have been involved in a fight ($p = 0.5$), but were significantly more likely to have been bullied ($p = 0.001$).

Obesity in Youth

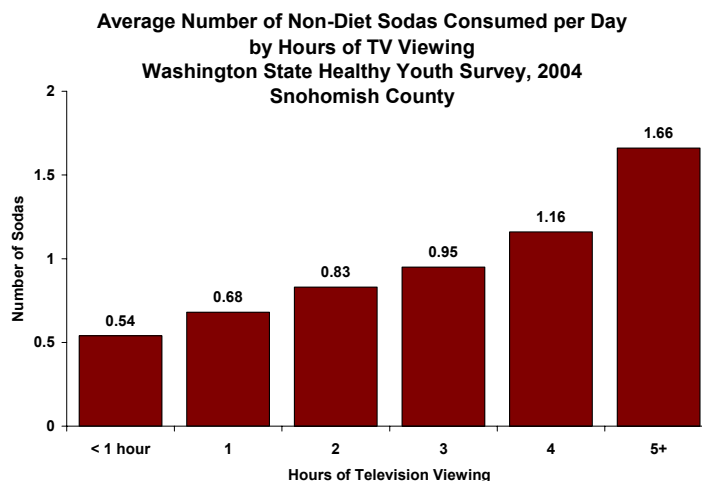
Electronic Media

A recent report from the Henry J. Kaiser Family Foundation concluded that “youth who spend more time with media are significantly more likely to be obese than other youth” (46). While it seems obvious that this relationship might be due to media displacing physical activity, current research suggests otherwise. Instead, greater media exposure may lead to obesity because of increased exposure to food advertising. Food advertising has been shown to influence youths’ food preferences. Most food advertising aimed at youth is for products that are high in calories. While most such advertising exposure comes from television viewing, marketing to youth is increasing on the Internet and through product placement in movies.



The majority of students (71.5%) watched two or fewer hours of television on school days. This was less than the Healthy People 2010 goal of having 75% of youth watch no more than two hours of TV (goal 22-11). Obese students watched significantly more TV than others ($p = 0.001$). More than one in ten obese students said they watched five or more hours of TV on an average school day, almost twice the proportion of not obese students. Obese students also reported spending more time playing video games or using a personal computer for fun than not obese students ($p = 0.009$).

A significant positive relationship was found between daily television viewing and the consumption of soda consumption ($p = 0.001$). Although these data cannot be taken as proof that watching TV leads to soda consumption, there is a positive correlation between these two behaviors in this sample. More information on soda consumption can be found in the Nutrition section (page 45).

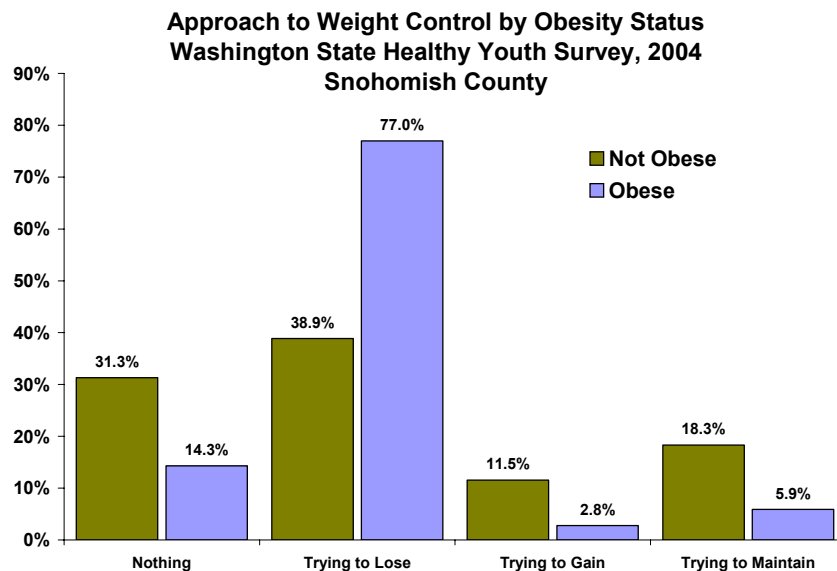


Obesity in Youth

Prevention

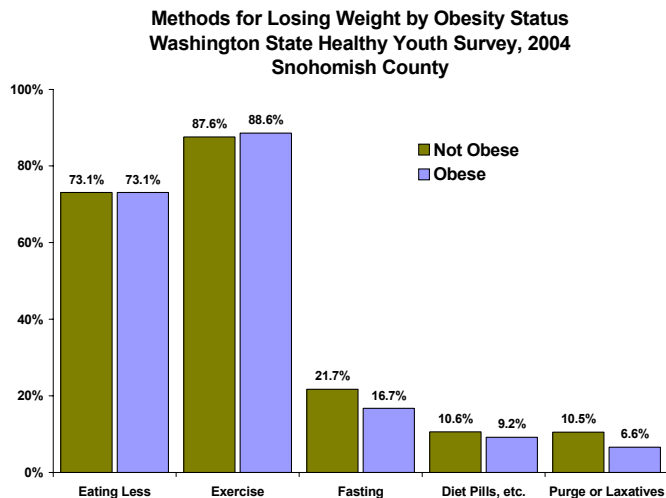
Weight Control

Obese youth are at increased risk of becoming obese adults (1). They can reduce this risk by losing their extra weight while they are still young. However, some young people turn to risky or unproven methods to control their weight.



Like obese adults, the vast majority of students who were obese (77%) said they were trying to lose weight. This was twice the proportion of not obese students who said they were trying to lose weight. An even higher proportion of students who perceived of themselves as obese said they were trying to lose weight (83.9%). Only 22.4% of those students who did not describe themselves as obese said they were trying to lose weight.

Obesity in Youth

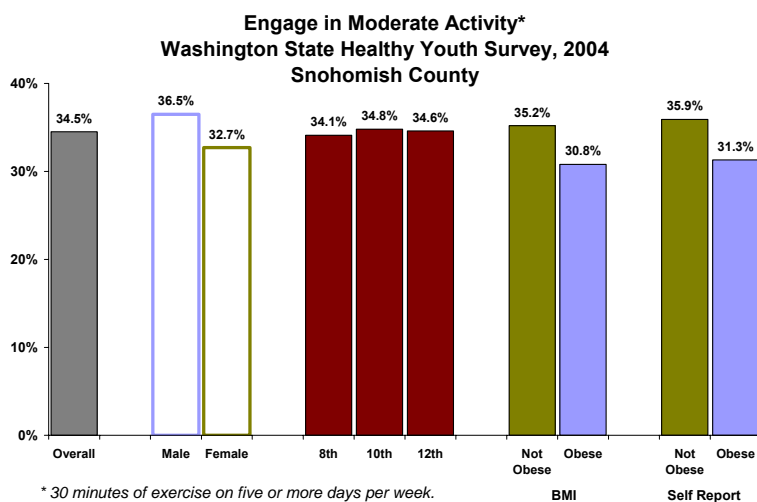


Among those youth who were trying to lose weight, the most common strategies for losing weight were exercising more and eating less. The same proportion of students used these strategies regardless of whether they were obese or not. About one in five students who were trying to lose weight said they had tried fasting to lose weight. Students who were not obese were more likely to have tried this method than those who were obese. About 10% of students who were trying to lose weight had used diet pills that were not recommended by a doctor.

Another 10% of students who were trying to lose weight had tried purging or used laxatives. Students who were not obese were more likely to have tried this method than those who were obese. Girls were much more likely than boys to resort to fasting, diet pills, and/or purging to lose weight, regardless of whether they were actually obese or not.

Physical Activity

An inadequate amount of physical activity is a major contributor to obesity. This section provides some measures of whether youth in Snohomish County are getting adequate amounts of physical activity.

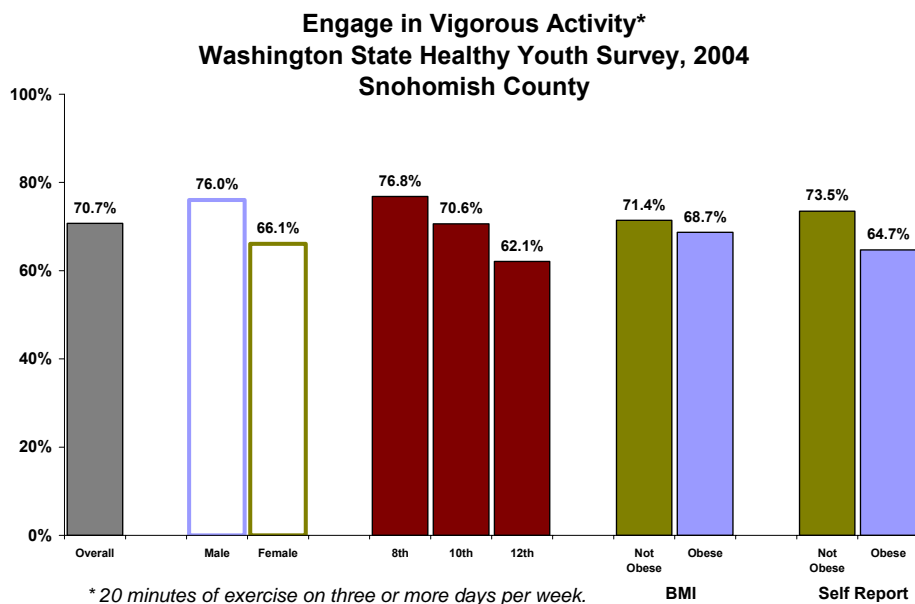


About one-third of Snohomish County students (34.5%) engaged in 30 minutes or more of moderate physical activity on five or more days of the week. This was very close to the Healthy People 2010 goal of 35% of youth engaging in the recommended amount of moderate activity (Goal 22-6). Males were more likely to engage in moderate activity than females ($p = 0.008$). The proportion of students who engaged in moderate activity did not vary by grade or by obesity status as determined by BMI ($p = 0.1$). However, students who perceived themselves as obese were less likely than others to meet the moderate physical activity goal ($p = 0.003$).

Obesity in Youth

Less than three-quarters of students (70.7%) engaged in 20 minutes or more of vigorous activity three or more times per week. This was short of the Healthy People 2010 goal of having 85% of youth engage in vigorous activity (goal 22-7). Males were more likely to engage in the recommended amount of vigorous exercise than females ($p = 0.001$). The proportion of students who engaged in vigorous activity declined with age, from 76.8% of 8th graders to only 62.1% of 12th graders ($p = 0.001$).

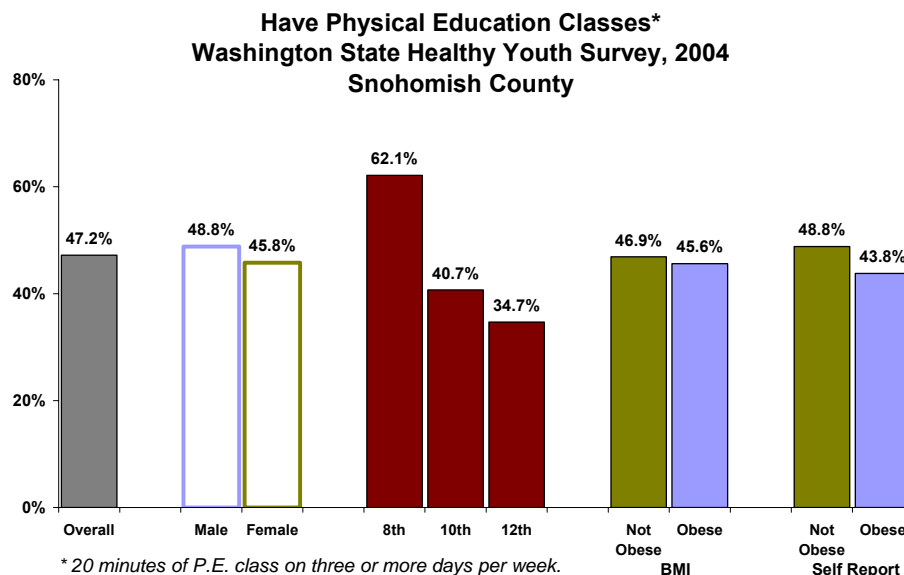
Students who were measurably obese were slightly less likely to engage in the recommended amount of vigorous activity goal than others. However, students who perceived themselves to be obese were significantly less likely to exercise vigorously than others ($p = 0.001$). Approximately one-quarter of students did not engage in either the recommended amount of moderate or vigorous physical activity.



Obesity in Youth

Less than half of all students (47.2%) spent 20 minutes or more being active in a physical education (P.E.) class on three or more days of the week. This was close to the Healthy People goal of 50% (goal 22-10). Males were more likely to meet the recommended amount of P.E. than females ($p = 0.05$). The proportion of students who received regular P.E. declined from nearly two-thirds of 8th graders to only one-third of 12th graders ($p = 0.001$).

Students whose BMI define them as obese were no less likely to have regular P.E. class participation than others. Those students who thought of themselves as obese were less likely than others to have regular P.E. classes ($p = 0.002$).

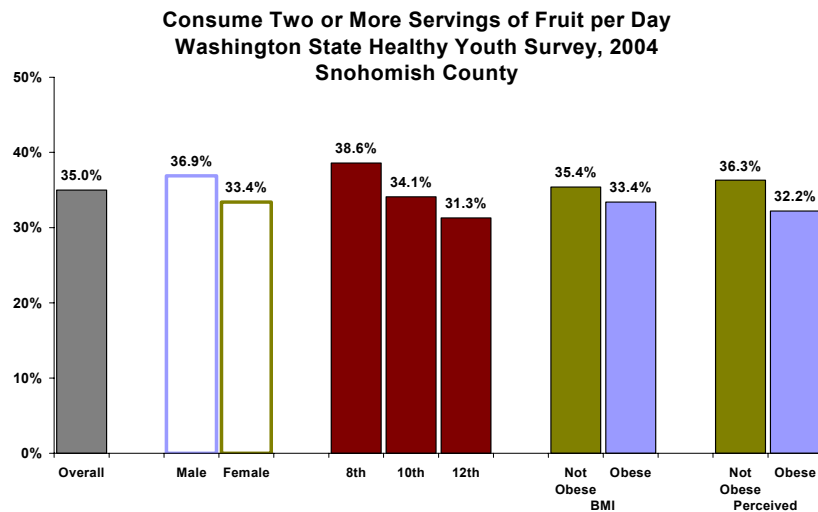


Students who perceived themselves to be obese were significantly less likely to exercise vigorously than others.

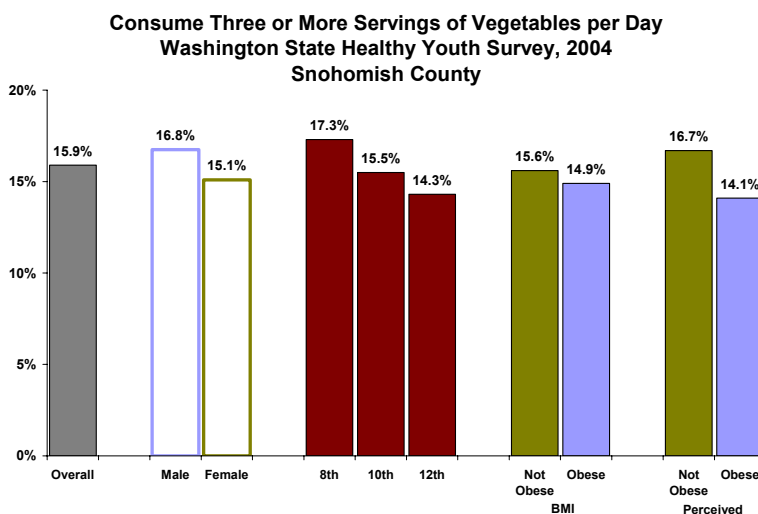
Obesity in Youth

Nutrition

One of the causes of obesity is poor food choices. While there are not enough data to determine the health of youth's diets, data do exist for consumption of fruits and vegetables (a healthy food choice) and non-diet soda (an unhealthy food choice). These data provide some indications of what kinds of food youth are consuming.

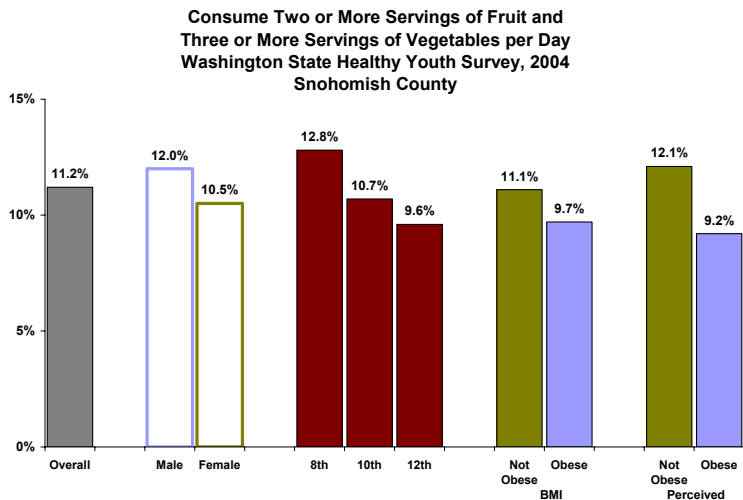


Only about one-third of Snohomish County students (35%) met the Healthy People 2010 recommendation to consume two or more servings of fruit per day. Males were more likely to meet this recommendation than females ($p = 0.02$). The proportion of students who consumed two or more fruits per day declined with age, from 39% among 8th graders to 31% of 12th graders ($p = 0.001$). There was no significant difference between obese students and those who were not obese, however, students who perceived themselves as obese were significantly less likely to eat two servings of fruit per day than those who did not see themselves as obese ($p = 0.008$).



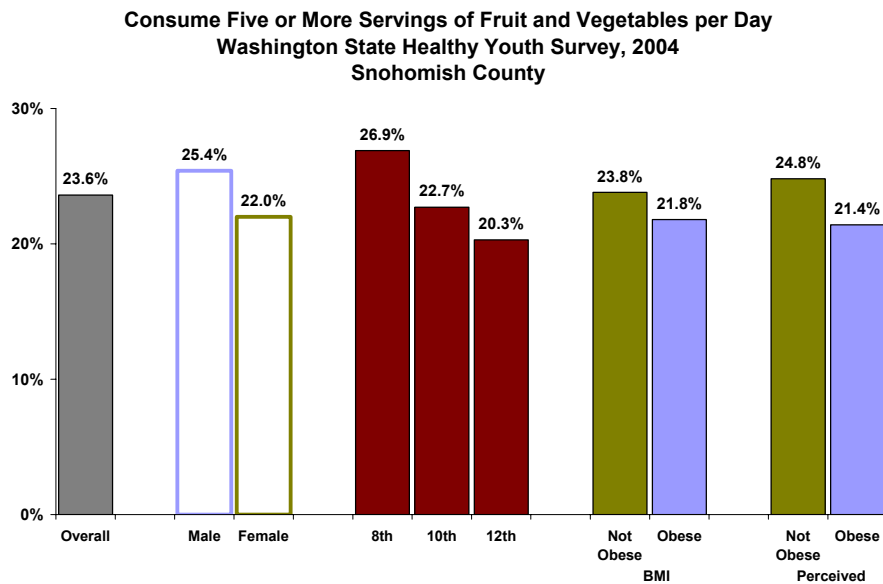
Only 16% of students consumed three or more servings of vegetables per day. Consumption of the recommended amount of vegetables did not vary significantly by sex, grade or obesity. Students who perceived themselves as obese were less likely to consume three or more servings of vegetables per day than those who did not perceive themselves as obese ($p = 0.03$).

Obesity in Youth



Fewer than one in eight students (11.2%) met the combined Healthy People 2010 recommendations for fruit and vegetable consumption. The proportion of students consuming the recommended amounts of fruits and vegetables decreased with age ($p = 0.02$). There were no significant differences by sex or obesity, although students who perceived themselves as obese were less likely to consume the recommended amounts of fruits and vegetables than other students ($p = 0.005$).

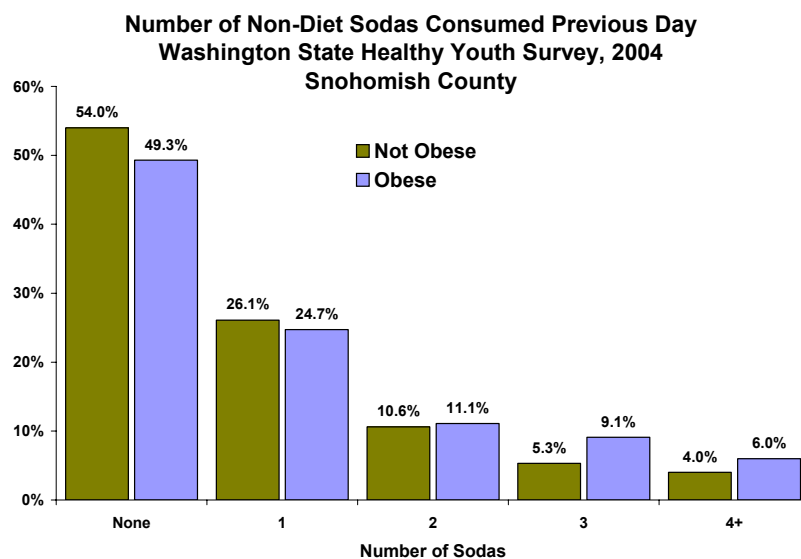
Although Healthy People 2010 includes separate recommendations for fruit and vegetable consumption, people are more familiar with the recommendation from Healthy People 2000 that they should consume a total of five servings of fruits and/or vegetables daily.



Only about one-quarter of Snohomish County students met the Healthy People 2000 recommendation that they should consume five or more servings of fruits and vegetables (in any combination) per day. Males were more likely to consume five or more servings per day than were females ($p = 0.008$). The number of students who ate five or more servings of fruits and vegetables decreased with grade ($p = 0.001$). There were no significant differences between obese and not obese students with regards to fruit and vegetable consumption. However, students who perceived themselves as obese were less likely to consume five or more servings of produce per day ($p = 0.02$). The average daily consumption of fruits and vegetables was only 3.7 servings.

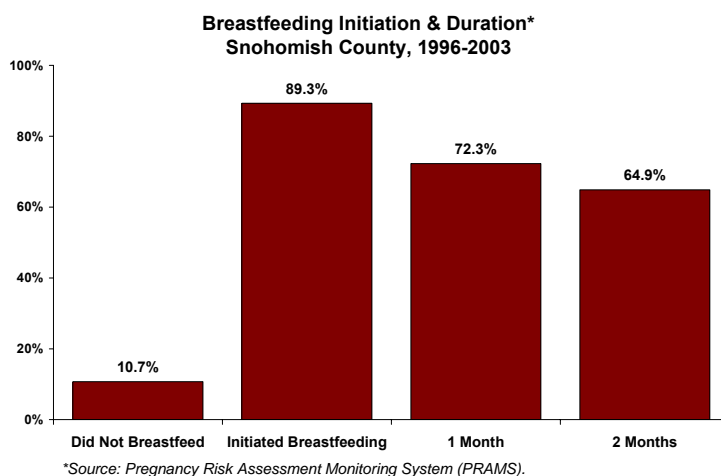
Obesity in Youth

Obese students reported greater consumption of non-dietary sodas on the day before the survey than others ($p = 0.012$). Students who were obese consumed an average of 0.98 sodas per day compared with only 0.79 sodas for not obese students. This difference was also significant if only students who consumed sodas are considered. Among those who drank soda, obese students averaged 1.9 sodas compared with 1.7 for those who were not obese ($p = 0.0072$). There was no difference in the amount of soda consumed by those students who saw themselves as obese and those who did not.



Breastfeeding

Breastfeeding is considered a protective factor against many health problems later in life, including obesity. Studies show that the longer an infant is breast-fed, the lower the probability of obesity in childhood (47).



In Snohomish County, 89.3% of women initiated breastfeeding after the birth of their baby. At one month, 72.3% of women were breastfeeding, and at two months this percentage decreased to 64.9%. Healthy People 2010 sets a goal (goal 16-19) that at least 75% of women breastfeed their infants in the early postpartum period, 50% at 6 months, and 25% at one year. If the early postpartum period is defined as one or two months, it is clear that Snohomish County has not reached the goal of 75% breastfeeding during this period. Six month and one year breastfeeding data are not available.



Prevention Programs/Activities



Prevention Programs/Activities

Public Policy

Although obesity has been recognized as a growing problem since at least 1988, “the country does not have a strategic policy to address obesity, despite the serious impact it has on the nation’s health and economy” (48). In the past, obesity was generally viewed as a cosmetic and health problem for individuals, rather than as a national public health crisis. An exclusive focus on individual behavior, however, ignores the range of other factors that contribute to the obesity problem which must be addressed. Societal trends encourage physical inactivity and an over-reliance on high-calorie food. Often, communities do not provide accessible public recreational space or safe routes for non-motorized transportation. Residential building policies encourage sprawl and reliance on automobiles for transportation. In schools, physical education is sometimes viewed as peripheral to the educational mission and as taking time away from the core academic curriculum.

While public health cannot be responsible for the behaviors of individual citizens, public health can promote healthier lifestyles through education and by providing the infrastructure to help people balance their energy input (food and drink) and output (exercise). Public health can work with city and county planning departments to develop neighborhoods that are conducive to physical activity. Public health can also provide education about healthy food choices and encourage the consumption of those foods. Obesity prevention and control strategies should focus on youth, because “instilling in them the importance of healthy behaviors can help reduce the risk for obesity and related health issues throughout their lifetime” (46).

Statewide Programs

Public health is playing a significant role in addressing the obesity epidemic in the U.S. and in Washington State. Below are descriptions of some of the programs currently in place in Washington State and Snohomish County. This is not intended to be a comprehensive list, but only a sampling of the different types of programs that are in place.

The Washington Department of Health, with funding from the CDC, has developed the **Washington State Nutrition and Physical Activity Plan** (49). This document “provides a framework in which policy makers can work to build and support environments that make it easier for Washington residents to choose healthy foods and be physically active.” The plan’s goals are to increase the proportion of the state’s residents whose diets reflect the Dietary Guidelines for Americans and who get at least 30 minutes of moderate activity on five or more days of the week. It defines three goals related to nutrition and three related to physical activity. For each goal, further ‘priority recommendations’ have been specified.

Prevention Programs/Activities

Nutrition Goals

1. Increase access to health-promoting foods. The recommendations are to increase consumption of fruits and vegetables, to ensure that worksites provide healthful foods, and to ensure that K-12 schools provide healthful foods and beverages.
2. Reduce hunger and food insecurity. This goal is addressed by providing adequate support for nutrition and food programs and improving access to nutrition programs.
3. Increase the proportion of mothers who breastfeed their infants and toddlers. Healthcare, childcare and worksites should be breast-feeding friendly.

Physical Activity Goals

1. Increase the physical activity opportunities available to youth. This includes adopting school-based curricula and policies that provide quality daily physical education for all students, providing opportunities for students to participate in physical activity outside of formal physical education, and providing active alternatives to sedentary behaviors like watching television.
2. Increase the number of people who have access to free or low-cost recreational activities. This involves providing adequate funding for state and local recreation facilities, developing model policies to increase access to public facilities for physical activity, and increasing the number of worksites that have policies to enhance activity opportunities.
3. Increase the number of community environments that are conducive to physical activity. Urban planning (i.e., zoning and land-use policies) should be used to promote physical activity, transportation policies and infrastructure changes should be used to promote the use of non-motorized transit, and community safety should be enhanced to improve residents' ability to walk or ride a bicycle.

The state currently has several interventions or programs under way:

- A capacity for surveillance and health promotion has been established through the Washington Coalition of Promotion of Physical Activity. This organization has 125 active members and a strong history of successful conferences and public awareness campaigns (www.BeActive.org).
- The Department of Health is an active partner in the Northwest Obesity Prevention Project. The goal of this program is to build capacity to address the issue of obesity in the region. It is a part of the Center for Public Health Nutrition at the University of Washington (www.Cphn.org).
- The Access to Healthy Foods Coalition is a collaborative effort that brings together food processors and growers, restaurants, vending machine operators, physicians, the military, and non-profit organizations to increase the availability of health-promoting foods.
- The Active Community Environments Grassroots project increases active living for older adults by ensuring that community infrastructures support active lifestyles. Nine regional task forces provide guidance on ways that policy and fund allocation can promote increased activity in older adults.

Prevention Programs/Activities

- The Safe and Active Routes to School Project has three goals. The first is to increase the proportion of youth who meet physical activity recommendations for health. The second is to increase the proportion of youth who walk or bike to schools or in their neighborhood. The third goal is to improve the areas around schools to make them friendlier to pedestrians and bicyclists.
- An intervention to Reduce Sedentary Behaviors by Training Child Care Providers focuses on the environment in child care centers and in out-of-school programs. Training is provided to child care staff so that they can ensure that youth engage in healthy levels of physical activity.
- The Breastfeeding Assessment Project applies lessons learned in the Moses Lake Breastfeeding Project to aid in the development of a statewide standard for a “Breastfeeding Friendly Environment” and a guide to creating such an environment in a community.
- The Diabetes Prevention Program Pilot in Tribes is intended to prevent and control obesity and other chronic conditions by increasing the proportion of Native American adults and youth whose diets reflect the Dietary Guidelines for Americans.
- There are two “tool kits” available. The Active Community Environment Kit provides the basic elements to make community policy and environment changes that increase opportunities for physical activity. The Television Reduction Kit helps child care providers reduce the amount of time that youth spend watching television and increase the amount of time they spend being physically active.

In addition to these organizations and programs, the Washington State Department of Health sponsors two local *Healthy Communities* pilot projects, one in Moses Lake and the other in Mount Vernon. Both communities are working to implement policy and environmental changes that promote physical activity and healthy eating.

Snohomish County Programs

There are a number of nutrition and physical exercise programs in Snohomish County sponsored by community agencies and employers. While this is not a comprehensive list of programs in the county, it describes the breadth and variety of the programs available. Programs listed here are those that responded to a survey by the Health District’s Wellness Program.

Snohomish Health District Activities

The Health District’s Strategic Plan includes a strategic direction, including goals and measures, to improve wellness by increasing physical activity and improving nutrition for employees and residents of the county.

The Health District administers the county’s Women, Infants and Children’s (WIC) program, the USDA’s special supplemental nutrition program. Nearly 40% of babies born in Snohomish County benefit from the WIC program, which provides nutritious food, nutrition counseling, and access to health services to over 18,000 clients each year. WIC participation reduces by half the need for expensive intensive care for low birth weight babies (which averages \$75,000) for an average cost of \$400 per pregnant woman.

Prevention Programs/Activities

In addition, the Health District's Wellness and Community Mobilization Program has three projects that focus on physical activity and nutrition.

- The Worksite Wellness project support employees of the Health District to be healthier through on-site educational sessions, physical activity challenges, and a fresh fruit market.
- The *Healthy Communities* project mobilizes cities and towns to develop and implement nutrition and physical activity policy action plans. The City of Marysville has been selected as the pilot site for this project. Implementation is planned for 2007.
- The Revenue Replacement project supports school districts in implementing new nutrition guidelines and developing alternative revenue strategies. The Health District was active in the 2003-2004 school year with the Everett School District's Nutrition Standards Committee. Also, the Health District has been working with the Marysville School District throughout the 2006-2007 academic year to create a fundraising plan and to monitor implementation of the new guidelines.

The Health District's Partners in Childcare program offers continuing education classes that address healthy eating, weight management, and physical activity. Subjects include menu planning, eating with youth for safety and role modeling, division of responsibility during mealtimes, outdoor and indoor games, and adding activities for stress relief, brain development, and improved learning. Consulting is available for managing asthma, allergies and diabetes in child care settings.

Community Activities in Snohomish County

- The Snohomish County Coalition's Get Movin' program encourages youth between 5 and 17 to be physically active for 30 minutes a day, five days a week throughout the summer. Incentives include free passes to local physical activity venues like public pools and ice skating rinks.
- Senior Services of Snohomish County offer a 12 week series of classes titled "Eat Better, Move More," which teaches seniors about nutrition, encourages behavior changes, and promotes walking by tracking steps using pedometers. The program aims to increase seniors' intake of fruits, vegetables, calcium rich foods, and whole grains, and to increase physical activity, primarily through walking.
- Medical providers at the Community Health Center (CHC) of Snohomish County offer education about obesity prevention, nutrition, and physical activity constantly in the course of individual patient visits. A full-time nutritionist offers individual counseling for CHC patients on nutrition and obesity prevention. The CHC also offers a series of nutrition classes for diabetic patients. CHC patients are primarily low-income residents of Snohomish County.
- The Everett Clinic has a Wellness Program for its employees with the goal of minimizing absenteeism and keeping down health insurance costs. Employees earn points for practicing healthy behaviors and achieving good results. Points are rewarded at the end of each quarter with a cash incentive. The Everett Clinic also offers diabetes education for patients with diabetes or pre-diabetes. The Clinic also participates in the Get Movin' program (see above).

Prevention Programs/Activities

- The nutrition department of the Everett Community College organizes a Pedometer Challenge for faculty, staff, and administrators. Participants are organized into teams, and prizes are awarded based on the total number of steps team members take during the challenge or for showing improvement. The challenge ran for five weeks during the fall quarter.
- The Everett School District has implemented new nutrition policies and guidelines. Water, 100% fruit juices, and low-fat milk are now the only beverages sold to students. Soda vending machines have been removed from schools, and deep-fat fryers have been removed from school cafeterias. In addition, the school's staff has been instructed to avoid using food as a reward.
- The Everett Parks Department offers programs for kids and adults in cooking, weight loss, and stress reduction. Their programs aim to promote healthy and active individuals and families, and provide recreational opportunities for as many people as possible. Examples include 80 day camps in sports such as baseball, basketball, golf, cheerleading, football soccer, tennis, volleyball, and gymnastics. Other programs include Young Chefs, parent/child canoeing, rowing, swimming lessons, aquatic exercise classes, hiking and walking trips, Tai Chi, yoga, meditation, and dance.
- The City of Lynnwood offers Summer Day Camps and non-school day programs during the school year. The staff is required to include time for nutrition and physical activity through games and art. Activities include rock climbing, roller skating, swimming, and sports like soccer and basketball. Healthy food habits and nutritional education are incorporated in the day camp environment.
- The City of Lynnwood Parks and Recreation Department offers a large variety of dance classes serving people of all ages, ethnicities and economic backgrounds. The goal of the dance programs is to educate and enrich peoples lives through the physical activity of dancing. Those who cannot afford to pay for the programs can apply to Lynnwood's Recreation Benefit Fund. If they fit the criteria, the fund pays for their program.
- Students in the Marysville School District average 100 minutes of physical activity each week in primary and middle schools. About half of this time is spent with a physical education specialist and the remainder with the classroom teacher. Students have a variety of options for physical education, from aquatics and aerobics to leisure walking and weight training. Students in middle school also have a quarter of health classes. High school students are required to have 4.5 semesters of physical education and half a semester of health. Nutritional policy in the district is aimed at eliminating items that are high in sugar and do not meet minimum nutrition requirements. In addition, interscholastic sports at the middle and high school levels teach nutrition in terms of optimizing performance through good dietary choices.
- The Marysville Everett Clinic, in conjunction with the YMCA and Youths' Hospital and Medical Center, offers a structured 12-week program to combat child obesity. The program consists of two 90-minute exercise sessions per week, with three monthly follow-ups. The program focuses on lifestyle changes for child and family.

Prevention Programs/Activities

- The City of Mill Creek has a wellness program for city employees, focusing on increasing physical exercise and stress management. Participation in monthly activities and events earn points that can be redeemed for a free day off work. Employees are also encouraged to get a health check to evaluate their health.
- The Mountlake Terrace Parks and Recreation Department offers on-going fitness related classes with many pool-based physical activities, yoga and strength training for people of all ages.
- Providence Everett Medical Center offers *Healthy Heart* exams to the general population. These exams assess a person's risk factors for developing heart disease, such as cholesterol levels, blood pressure, weight, physical activity levels, glucose, and family history. Advice is offered on risk factor goals, and educational materials are provided. The Center's Diabetes Program provides out-patient classes in diabetes and weight management.
- The Washington State Dairy Council targets leaders in education, health care, government, media and the community to reach consumers of all ages with targeted messages about nutrition. Nutrition education services provide the public with educational programs and activities to use in a variety of settings. Through these efforts, consumers gain knowledge that leads to healthful dietary behavior changes.

A recent study implied that Americans are burning nearly 1 billion more gallons of gasoline each year than they did in 1960 because of their expanding waistlines. Simply put, more weight in the car means lower gas mileage.

- The Engineering Economist, Oct. 2006

Summary

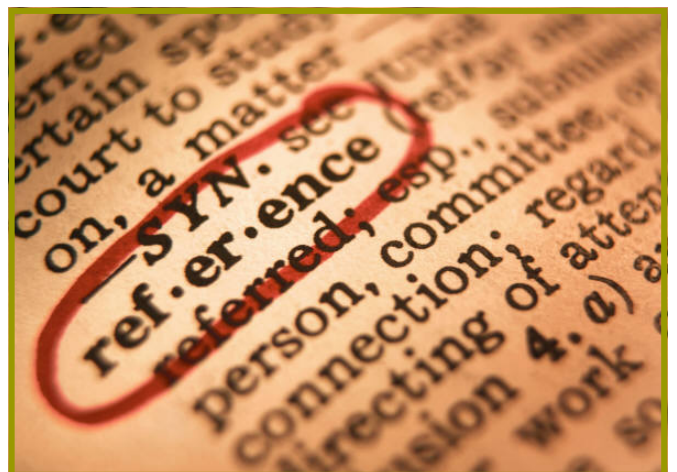
This report quantifies the extent of the growing problem of obesity in Snohomish County's adults and youth. It presents data about factors that contribute to obesity and some of the consequences. Also described are some of the public health initiatives underway in Washington State and Snohomish County.

Unfortunately, for many of the factors related to obesity the data are inadequate, and for others no data exist at all. For example, while improving peoples' diets is a large part of solving the obesity problem, only partial data (their consumption of fruit and vegetables) are available to measure such improvement. In order to measure the effectiveness of community programs to improve diets and increase physical activity, more specific data are required.

Despite the limitations of local data, the problem of obesity is clear. Snohomish County residents, young and old, are increasingly overweight and facing the serious medical problems associated with being overweight. Such a complex problem demands multiple approaches. Fortunately, the community is responding.



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Data Tables



Data Tables - Adult

Prevalence/Trends

Year	Not Overweight		Overweight		Obese		Cases
	Percent	95% C.I.	Percent	95% C.I.	Percent	95% C.I.	
1993	54.0	(50.1, 57.9)	32.2	(28.7, 35.9)	13.8	(11.3, 16.7)	799
1994	51.2	(47.4, 54.9)	35.8	(32.3, 39.5)	13.0	(10.8, 15.7)	825
1995	49.3	(45.5, 53.2)	37.1	(33.5, 40.9)	13.6	(11.2, 16.4)	797
1996	48.1	(44.9, 51.3)	35.3	(32.3, 38.5)	16.5	(14.3, 19.1)	1,158
1997	44.6	(40.3, 48.9)	39.3	(35.1, 43.6)	16.1	(13.1, 19.7)	779
1998	47.3	(44.2, 50.5)	36.7	(33.7, 39.8)	16.0	(13.8, 18.4)	1,164
1999	44.9	(41, 48.9)	36.9	(33.1, 40.9)	18.2	(15.4, 21.4)	760
2000	45.6	(39.6, 51.8)	34.5	(29, 40.6)	19.9	(15.1, 25.6)	346
2001	45.5	(41.9, 49.1)	33.8	(30.4, 37.3)	20.8	(18.1, 23.8)	915
2002	44.6	(39, 50.4)	33.8	(28.7, 39.2)	21.6	(17.6, 26.3)	453
2003	40.2	(38, 42.5)	35.8	(33.6, 38)	24.0	(22.2, 26)	2,292
2004	39.8	(36.9, 42.9)	36.2	(33.3, 39.3)	23.9	(21.4, 26.7)	1,343

Year	Snohomish County			Washington		
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases
1993	13.8	(11.3, 16.7)	799	13.9	(12.5, 15.3)	2,586
1994	13.0	(10.8, 15.7)	825	13.9	(12.5, 15.3)	3,351
1995	13.6	(11.2, 16.4)	797	13.9	(12.5, 15.3)	3,225
1996	16.5	(14.3, 19.1)	1158	15.6	(14.2, 17)	3,373
1997	16.1	(13.1, 19.7)	779	15.2	(13.8, 16.7)	3,406
1998	16.0	(13.8, 18.4)	1164	18.1	(16.6, 19.8)	3,421
1999	18.2	(15.4, 21.4)	760	18.2	(16.8, 19.8)	3,452
2000	19.9	(15.1, 25.6)	346	18.8	(17.4, 20.3)	3,410
2001	20.8	(18.1, 23.8)	915	19.3	(18, 20.7)	4,026
2002	21.6	(17.6, 26.3)	453	21.3	(19.8, 22.8)]	4,674
2003	24.0	(22.2, 26)	2292	21.7	(20, 22.5)	17,702
2004	23.9	(21.4, 26.7)	1343	22.2	(21.4, 23)	17,567

Demographics, 2003-2004

Sex	Percent	95% C.I.	Cases	p value
Male	22.8	(20.4, 25.3)	1,518	0.8311
Female	23.1	(21.1, 25.2)	2,117	
Age Group				
18-24	13.6	(9.5, 19.1)	253	0.0001
25-34	20.3	(16.7, 24.5)	604	
35-44	24.2	(21, 27.7)	868	
45-54	25.6	(22.3, 29.3)	785	
55-64	33.7	(29.1, 38.5)	512	
65-74	22.6	(18.1, 28)	349	
75+	14.9	(10.7, 20.3)	264	
Race				
White	23.2	(21.6, 25)	3,728	0.0966
Black	23.3	(11.5, 41.6)	47	
Asian	9.7	(4.5, 19.5)	115	
Native American	24.6	(11.2, 45.7)	33	
Other	24.9	(16.9, 35.1)	122	
Ethnicity				
Hispanic	22.8	(15.4, 32.5)	136	0.9845
Non-Hispanic	22.9	(21.3, 24.6)	3,490	

Education	Percent	95% C.I.	Cases
Not a high school graduate	23.1	(17.4, 30)	238
High school graduate	24.3	(21, 28)	881
Some college	25.7	(22.9, 28.6)	1,258
College graduate	19.1	(16.8, 21.6)	1,254

Poverty	Percent	95% C.I.	Cases
Below 200% poverty	26.3	(22.5, 30.5)	695
Not in poverty	22.0	(20.2, 23.9)	2,551

Health Planning Area	Percent	95% C.I.	Cases
Everett	19.2	(15.4, 23.6)	412
North County	26.6	(22.7, 30.9)	568
East County	23.0	(18.2, 28.5)	322
South Central	17.9	(14, 22.6)	334
Hwy 99 Corridor	22.8	(18.4, 27.9)	371
View Corridor	18.6	(14.1, 24.1)	285

Employment Status	Percent	95% C.I.	Cases
Employed	23.7	(21.5, 26)	1,894
Self-employed	19.5	(15.1, 24.7)	341
Out of work 1 year	31.8	(21.8, 44)	103
Out of work <1 year	23.5	(16.3, 32.5)	161
Homemaker	23.4	(18.4, 29.3)	290
Student	14.9	(8, 26)	86
Retired	20.2	(16.9, 24.1)	599
Unable to work	30.2	(22.7, 39)	156

	Males			Females			Total			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Underweight	1.2	(0.6, 2.4)	16	3.2	(2.4, 4.4)	63	2.2	(1.7, 2.9)	79	0.0001
Normal	30.8	(28.2, 33.6)	456	46.3	(43.9, 48.8)	942	38.4	(36.5, 40.3)	1,398	
Overweight	45.2	(42.3, 48.1)	704	27.3	(25.2, 29.6)	604	36.5	(34.7, 38.4)	1,308	
Obese	22.8	(20.4, 25.3)	342	23.1	(21.1, 25.2)	508	22.9	(21.4, 24.6)	850	

Data Tables - Adult

General Health, 2003 - 2004

	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Excellent or very good	62.1	(60, 64.2)	1,725	43.2	(39.3, 47.1)	358	0.0001
Good	27.1	(25.2, 29.1)	737	40.1	(36.2, 44.1)	324	
Fair/Poor	10.8	(9.5, 12.2)	315	16.8	(14.2, 19.8)	168	

	Not Obese			Obese			p value
	Average # of days	95% C.I.	Cases	Average # of days	95% C.I.	Cases	
Days of poor physical health	3.4	[3.1, 3.8]	2,743	4.9	[4.3, 5.6]	833	0.0001
Days of poor mental health	3.4	[3.1, 3.8]	2,726	4.5	[3.8, 5.2]	837	0.0061
Days poor health interfered with activities	2.3	[2, 2.6]	2,351	3.3	[2.7, 3.8]	723	0.0065

	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Often felt down, depressed or hopeless	18.7	(16.3, 21.3)	1171	25.2	(20.3, 30.8)	348	0.0198
Often had little interest or pleasure	14.9	(12.8, 17.3)	1171	21.6	(17.1, 26.9)	348	0.0088
Considered suicide	2.6	(1.5, 4.5)	729	5.5	(2.7, 10.7)	222	0.0891

	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Diabetes	3.7	(3.1, 4.5)	2,779	13.4	(10.9, 16.3)	847	0.0001
Asthma	7.4	(6.4, 8.6)	2,776	13.7	(11.2, 16.6)	849	0.0001
High blood pressure	17.5	(15.6, 19.5)	1,767	40.7	(36.1, 45.5)	520	0.0001
High cholesterol	27.1	(24.7, 29.7)	1,387	44.1	(39, 49.4)	438	0.0314

	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Experience joint pain	47.0	(44.4, 49.6)	1,763	59.7	(54.9, 64.4)	522	0.0001
Diagnosed with arthritis	22.1	(20.1, 24.3)	1,765	32.4	(28.2, 36.9)	522	0.0001
Impairment limits activity	19.6	(17.7, 21.7)	1,755	34.9	(30.5, 39.6)	523	0.0001
Requires special equipment	6.2	(5.1, 7.5)	1,768	10.0	(7.5, 13.2)	523	0.0075

Weight Control, 2003

	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Nothing	26.2	(23.9, 28.6)	432	9.2	(6.7, 12.5)	46	0.0001
Trying to lose	33.4	(31.1, 35.9)	621	73.9	(69.5, 77.9)	380	
Trying to maintain	40.4	(37.8, 43)	712	16.9	(13.7, 20.7)	96	

How Trying to Lose	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Nothing	19.6	(16.4, 23.3)	115	16.0	(12.2, 20.7)	60	0.4999
Fewer calories	21.4	(17.9, 25.3)	127	19.9	(15.8, 24.7)	75	
Less fat	20.7	(17.4, 24.5)	130	22.9	(18.4, 28.2)	82	
Fewer calories & less fat	38.3	(34.2, 42.6)	241	41.2	(35.8, 46.9)	160	
Exercising	82.0	(78.5, 85.1)	619	74.5	(69.3, 79)	377	0.0098

Data Tables - Adult

Physical Activity, 2003

Exercise	Percent	95% C.I.	Cases	p value
Total	85.2	(83.5, 86.7)	2,371	
Male	87.0	(84.6, 89.1)	973	0.0297
Female	83.4	(81, 85.5)	1,398	
18-29	86.6	(81.7, 90.3)	352	0.0058
30-44	87.1	(84.4, 89.4)	784	
45-64	85.2	(82.5, 87.6)	830	
65+	77.6	(72.7, 81.8)	405	
Not obese	87.3	(85.5, 89)	1,766	0.0001
Obese	79.5	(75.5, 82.9)	520	

Moderate	Percent	95% C.I.	Cases	p value
Total	39.4	(37.2, 41.7)	2,247	
Male	38.4	(35, 41.9)	928	0.3769
Female	40.5	(37.5, 43.5)	1,319	
18-29	41.0	(35.3, 46.9)	344	0.6968
30-44	40.4	(36.7, 44.2)	751	
45-64	37.9	(34.2, 41.7)	799	
65+	38.0	(32.6, 43.8)	353	
Not obese	42.1	(39.5, 44.8)	1,673	0.0002
Obese	31.7	(27.3, 36.5)	504	

Vigorous	Percent	95% C.I.	Cases	p value
Total	30.5	(28.4, 32.7)	2,306	
Male	35.3	(32, 38.7)	944	0.0001
Female	25.7	(23.2, 28.4)	1,362	
18-29	40.7	(35.1, 46.6)	348	0.0001
30-44	35.2	(31.6, 38.9)	769	
45-64	24.6	(21.5, 28)	808	
65+	15.7	(12.1, 20.1)	381	
Not obese	32.6	(30.1, 35.1)	1,712	0.0007
Obese	23.7	(19.8, 28.1)	513	

Nutrition, 2003

Fruit Consumption				
	Percent	95% C.I.	Cases	p value
Total	30.6	(28.6, 32.7)	2,321	
Male	25.7	(22.8, 28.8)	954	0.0001
Female	35.5	(32.7, 38.4)	1,367	
18-29	28.3	(23.4, 33.8)	350	0.0001
30-44	24.0	(20.9, 27.4)	771	
45-64	32.5	(29.1, 36.1)	817	
65+	48.1	(42.6, 53.6)	383	
Not obese	31.3	(28.9, 33.7)	1,734	0.0877
Obese	26.9	(22.9, 31.3)	513	

Vegetable Consumption				
	Percent	95% C.I.	Cases	p value
Total	23.8	(22, 25.7)	2,292	
Male	16.4	(14, 19)	946	
Female	31.2	(28.5, 34)	1,346	0.0001
18-29	19.6	(15.3, 24.8)	332	0.0183
30-44	22.2	(19.2, 25.4)	765	
45-64	25.9	(22.8, 29.2)	820	
65+	29.5	(24.6, 34.9)	375	
Not obese	24.0	(21.9, 26.3)	1,708	0.2501
Obese	21.3	(17.8, 25.4)	505	

Fruit & Vegetables				
	Percent	95% C.I.	Cases	p value
Total	12.0	(10.7, 13.5)	2,250	
Male	7.9	(6.3, 9.9)	930	0.0001
Female	16.2	(14.1, 18.5)	1,320	
18-29	9.5	(6.7, 13.2)	330	0.0001
30-44	9.5	(7.5, 12)	754	
45-64	13.4	(11.1, 16.1)	806	
65+	20.0	(15.8, 25)	360	
Not obese	12.6	(11.1, 14.4)	1,682	0.0296
Obese	8.9	(6.6, 11.9)	496	

Five or more				
	Percent	95% C.I.	Cases	p value
Total	22.4	(20.6, 24.3)	2,250	
Male	17.7	(15.2, 20.5)	930	0.0001
Female	27.1	(24.5, 29.8)	1,320	
18-29	17.1	(13.1, 22)	330	0.0001
30-44	19.8	(16.9, 23.1)	754	
45-64	24.0	(20.9, 27.3)	806	
65+	34.4	(29.2, 40)	360	
Not obese	23.0	(20.9, 25.3)	1,682	0.0988
Obese	19.3	(15.9, 23.2)	496	

Data Tables - Adult

Cigarette & Alcohol Use, 1994 - 2004

	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Smoke cigarettes	21.7	(19.9, 23.7)	2,775	18.3	(15.3, 21.9)	848	0.094
Drink alcohol	64.7	(62.6, 66.7)	2,774	56.9	(52.9, 60.7)	3,622	0.0005
Binge drinking past month	22.4	(20, 24.9)	1,764	26.9	(22, 32.4)	465	0.11

	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
1994-1999							
Never smoked	85.3	(83.6, 86.9)	2,101	14.7	(13.2, 16.4)	364	0.0001
Former smoker	80.3	(77.9, 82.5)	1,266	19.7	(17.5, 22.1)	301	
Smoke some days	86.8	(80.2, 91.4)	176	13.2	(8.6, 19.8)	26	
Smoke every day	87.2	(85, 89.2)	1,074	12.8	(10.8, 15)	165	

	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
2001-2004							
Never smoked	77.7	(75.7, 79.7)	1,823	22.3	(20.3, 24.3)	541	0.101
Former smoker	75.2	(72.2, 77.9)	872	24.8	(22.1, 27.8)	314	
Smoke some days	82.2	(74.8, 87.8)	180	17.8	(12.2, 25.2)	38	
Smoke every day	80.1	(76.5, 83.3)	611	19.9	(16.7, 23.5)	152	

Physician Involvement, 2003 - 2004

	Not Obese			Obese			
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	p value
Told by MD to lose weight	4.7	(3.8, 5.9)	1,763	32.3	(28, 37)	521	0.0001
<i>Trying to Lose Weight</i>							
With MD advice	72.2	(60.2, 81.7)	85	84.6	(78.2, 89.4)	175	0.032
Without MD advice	31.6	(29.2, 34.1)	1,675	68.6	(62.8, 73.8)	344	0.0001

	Not Obese			Obese			
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	p value
Eat less fat	16.8	(13.2, 21)	406	25.2	(17.8, 34.2)	144	0.0511
Eat more fruits/vegetables	23.4	(19.2, 28.3)	405	26.1	(18.6, 35.2)	143	0.5757
Exercise more	23.7	(19.5, 28.4)	406	40.0	(31.3, 49.4)	145	0.0009

	Not Obese			Obese			
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	p value
Eating less fat	63.6	(57.9, 68.9)	400	59.1	(49.5, 68.1)	143	0.4224
Eating more fruits/vegetables	72.0	(66.7, 76.8)	405	72.0	(62.4, 79.9)	144	0.9957
Exercising more	69.9	(64.7, 74.7)	400	58.3	(48.7, 67.4)	144	0.0291

	Doctor Recommended			No Doctor's Recommendation			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Eating less fat	80.5	(71.1, 87.3)	117	58.5	(53.1, 63.7)	452	0.0001
Eating more fruits/vegetables	80.6	(71.7, 87.2)	127	68.6	(63.2, 73.5)	428	0.0206
Exercising more	65.5	(57.3, 73)	185	66.6	(61.2, 71.7)	392	0.8181

Data Tables - Youth

Prevalence/Trends

Year	Not Obese			At Risk for Obesity			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
2002	76.9	(75.3, 78.2)	2,456	14.2	(13, 15.4)	454	9.0	(8.1, 10.1)	289	
2004	78.0	(76.7, 79.3)	3,086	12.9	(11.9, 14)	511	9.1	(8.2, 10.0)	360	
Sex										
Male	73.9	(71.9, 75.9)	1,403	13.5	(12.0, 15.1)	256	12.6	(11.1, 14.2)	239	0.0001
Female	81.7	(80.0, 83.4)	1,683	12.4	(11.0, 13.9)	255	5.9	(4.9, 7.0)	121	
Grade										
8th	78.6	(76.3, 80.8)	1,057	13.5	(11.7, 15.4)	181	8.0	(6.6, 9.5)	107	0.362
10th	77.6	(75.4, 79.7)	1,170	12.3	(10.7, 14.1)	186	10.1	(8.6, 11.7)	152	
12th	77.8	(75.2, 80.2)	859	13.0	(11.1, 15.2)	144	9.1	(7.5, 11.0)	101	

Perceive Self as Obese				
	Percent	95% C.I.	Cases	p value
Snohomish Total	31.6	(30.2, 3.3)	4,415	
Sex				0.001
Male	24.0	(22.1, 25.8)	2,075	
Female	38.4	(36.4, 40.4)	2,336	
Grade				0.005
8th	28.7	(26.5, 3.1)	1,641	
10th	33.9	(31.6, 36.3)	1,617	
12th	32.5	(29.8, 35.3)	1,157	
BMI Class				0.001
Not obese	20.3	(18.9, 21.7)	3,072	
At risk	65.8	(61.5, 69.9)	509	
Obese	82.1	(77.7, 85.9)	357	

Academic Achievement, 2004

By BMI	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Grades							
A's	39.5	(37.8, 41.2)	1297	23.7	(19.4, 28.5)	79	0.0001
B's	33.6	(32, 35.2)	1104	34.4	(29.5, 39.7)	115	
C's	19.2	(17.9, 20.6)	632	27.5	(23, 32.6)	92	
D's	4.5	(3.9, 5.3)	149	9.0	(6.4, 12.6)	30	
F's	3.2	(2.6, 3.8)	104	5.4	(3.4, 8.4)	18	
	Total Cases =		3286	Total Cases =		334	
Enjoy school	42.8	(41.1, 44.5)	3280	33.7	(28.9, 39)	335	0.001

Perceived	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Grades							
A's	39.8	(38, 41.6)	1090	33.9	(31.4, 36.5)	441	0.014
B's	33.9	(32.1, 35.7)	929	34.4	(31.9, 37)	448	
C's	18.3	(16.9, 19.8)	502	21.9	(19.7, 24.2)	285	
D's	4.7	(4, 5.6)	130	5.5	(4.3, 6.8)	71	
F's	3.3	(2.7, 4)	90	4.4	(3.4, 5.6)	57	
	Total Cases =		2741	Total Cases =		1302	
Enjoy school	43.4	(41.5, 45.2)	2730	37.2	(34.7, 39.9)	1308	0.002

By BMI	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Not finish H.S.	1.8	[.0136,.0226]	58	2.4	[.0122,.0477]	8	0.0001
Graduate H.S.	5.6	[.0483,.064]	184	10.0	[.072,.1374]	33	
2-year college	22.7	[.2133,.2418]	751	29.4	[.2473,.3454]	97	
Attend college	8.7	[.078,.0973]	288	10.3	[.0745,.1408]	34	
Graduate college	38.4	[.3672,.4004]	1268	28.5	[.2387,.336]	94	
Advanced degree	22.9	[.2147,.2434]	756	19.4	[.1548,.2402]	64	

Perceived	Not Obese			Obese			p value
	Percent	95% C.I.	Cases	Percent	95% C.I.	Cases	
Not finish H.S.	1.8	[.0135,.0235]	49	2.5	[.018,.0354]	82	0.0128
Graduate H.S.	6.2	[.0534,.0715]	170	6.4	[.0516,.0783]	253	
2-year college	21.7	[.2015,.2323]	595	25.9	[.2361,.2837]	933	
Attend college	9.8	[.087,.1092]	268	7.9	[.0655,.0949]	371	
Graduate college	37.8	[.3601,.3964]	1,039	35.5	[.3295,.3815]	1,502	
Advanced degree	22.8	[.2129,.2442]	627	21.8	[.1962,.241]	911	

95% C.I. = 95% Confidence Interval

Data Tables - Youth

Disabilities & Mental Health, 2004

<i>By BMI</i>	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
Physical disability	13.4	(12.2, 14.6)	2,966	20.2	(16, 25.2)	292	0.001
Emotional disability	9.5	(8.5, 10.5)	3,091	15.8	(12.1, 20.3)	304	0.0001
Activity limited by disability	8.3	(7.4, 9.4)	3,214	14.6	(11.1, 18.9)	316	0.0001
Others perceive disability	9.1	(8.1, 10.2)	2,998	17.1	(13.2, 21.9)	292	0.0001
Diagnosed with asthma	18.5	(17.2, 19.9)	3,267	21.5	(17.3, 26.4)	316	0.192
Diagnosed with diabetes	3.8	(3.1, 4.6)	2,443	4.0	(2.2, 7.2)	252	0.873

<i>By BMI</i>	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
Depressed in Past Year	29.2	(27.8, 30.7)	3,585	32.3	(27.7, 37.3)	359	0.8764
Considered Suicide	15.2	(14.1, 16.5)	3,582	17.8	(14.2, 22.1)	360	0.7269
Attempted Suicide	7.9	(7.1, 8.8)	3,583	8.3	(5.9, 11.7)	360	0.7711

<i>Perceived</i>	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
Depressed in Past Year	25.0	(23.4, 26.5)	3,009	39.5	(37, 42.1)	1,393	0.0001
Considered Suicide	12.3	(11.2, 13.5)	3,006	22.7	(20.5, 24.9)	1,390	0.0001
Attempted Suicide	6.3	(5.5, 7.2)	3,005	11.2	(9.6, 12.9)	1,388	0.0001

Risk Factors, 2004

Substance Abuse & Violence

<i>By BMI</i>	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
Smoke cigarettes	13.3	(12.2, 14.5)	3,594	15.0	(11.7, 19.1)	359	0.3566
Drink alcohol	30.6	(29.1, 32.1)	3,586	33.6	(18.9, 38.7)	357	0.2386
Smoke marijuana	16.0	(14.8, 17.2)	3,584	19.1	(15.3, 23.5)	357	0.1315
Use other drugs	5.2	(4.6, 6)	3,585	7.0	(4.8, 10.2)	356	0.1571

<i>Perceived</i>	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
Smoke cigarettes	11.9	(10.8, 13.1)	3,016	15.4	(13.6, 17.4)	1,393	0.0013
Drink alcohol	28.2	(26.6, 29.9)	3,013	32.8	(30.4, 35.4)	1,389	0.0018
Smoke marijuana	14.9	(13.7, 16.2)	3,012	16.7	(14.8, 18.8)	1,388	0.1235
Use other drugs	4.6	(3.9, 5.4)	3,012	7.1	(5.9, 8.6)	1,387	0.0004

<i>By BMI</i>	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
Bullied in past 30 days	22.9	(21.5, 24.3)	3,594	26.4	(22.1, 31.2)	359	0.1315
In a fight past 12 mo	28.8	(27.3, 30.3)	3,589	36.8	(31.9, 41.9)	359	0.0016
In fight at school past 12 mo	11.4	(10.4, 12.5)	3,588	16.2	(12.7, 20.4)	358	0.007

<i>Perceived</i>	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
Bullied in past 30 days	21.1	(19.6, 22.6)	3,016	28.6	(26.2, 31)	1393	0.0001
In a fight past 12 mo	29.0	(27.5, 30.7)	3,013	30.0	(27.6, 32.4)	1391	0.5253
In fight at school past 12 mo	11.6	(10.5, 12.8)	3,008	12.1	(10.5, 14)	1393	0.6349

Data Tables - Youth

Risk Factors Cont.

Electronic Media

	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
<i>Hours of television per day</i>							
2 or fewer	72.6	(71.1, 74)	2,536	60.9	(55.7, 65.9)	212	0.0001
2-4 hours	22.0	(20.6, 23.4)	767	27.6	(23.1, 32.5)	96	
5 or more	5.5	(4.8, 6.3)	191	11.5	(8.5, 15.3)	40	
<i>Hours of video games</i>							
2 or fewer	85.5	(84.3, 86.6)	2,973	79.6	(75, 83.5)	277	0.0088
2-4 hours	10.2	(9.3, 11.3)	356	12.1	(9, 15.9)	42	
5 or more	4.3	(3.6, 5)	148	8.3	(5.9, 11.7)	29	

	<i>Average # of sodas consumed</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>p value</i>
0 Hours	0.55	(0.46, 0.64)	454	0.0001
< 1 Hour	0.54	(0.48, 0.60)	851	
1 Hour	0.68	(0.61, 0.75)	782	
2 Hours	0.83	(0.77, 0.90)	976	
3 Hours	0.95	(0.86, 1.04)	690	
4 hours	1.16	(1.01, 1.32)	273	
5+ Hours	1.66	(1.48, 1.84)	273	

Physical Activity, 2004

Moderate Activity				
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>p value</i>
Snohomish Total	34.5	(33.1, 35.9)	4,343	
Sex				
Male	36.5	(34.4, 38.6)	2,031	0.0081
Female	32.7	(30.8, 34.6)	2,312	
Grade				
8th	34.1	(31.9, 36.5)	1,632	0.9249
10th	34.8	(32.5, 37.2)	1,590	
12th	34.6	(31.9, 37.4)	1,128	
BMI Class				
Not obese	35.2	(33.6, 36.8)	3,072	0.0961
Obese	30.8	(26.2, 35.8)	357	
Self Perception				
Not obese	35.9	(34.2, 37.7)	2,942	0.0027
Obese	31.3	(28.8, 33.8)	1,360	

Vigorous Activity				
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>p value</i>
Snohomish Total	70.7	(69.3, 72)	4,363	
Sex				
Male	76.0	(74.1, 77.8)	2,039	0.0001
Female	66.1	(64.1, 68)	2,324	
Grade				
8th	76.8	(74.7, 78.8)	1,638	0.0001
10th	70.6	(68.3, 72.8)	1,596	
12th	62.1	(59.2, 64.8)	1,136	
BMI Class				
Not obese	71.4	(69.9, 72.9)	3,516	0.2824
Obese	68.7	(63.6, 73.3)	351	
Self Perception				
Not obese	73.5	(71.8, 75)	2,951	0.0001
Obese	64.7	(62.2, 67.2)	1,369	

Physical Education Classes				
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>p value</i>
Snohomish Total	47.2	(45.7, 48.7)	4,274	
Sex				
Male	48.8	(46.6, 51)	1,990	0.0503
Female	45.8	(43.8, 47.9)	2,284	
Grade				
8th	62.1	(59.7, 44.5)	1,607	0.0001
10th	40.7	(38.3, 43.2)	1,559	
12th	34.7	(32, 37.6)	1,115	
BMI Class				
Not obese	46.9	(45.2, 48.5)	3,447	0.6445
Obese	45.6	(40.4, 50.8)	349	
Self Perception				
Not obese	48.8	(47, 50.6)	2,881	0.0024
Obese	43.8	(41.2, 46.5)	1,354	

Data Tables - Youth

Nutrition, 2004

Fruit Consumption				
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>p value</i>
Snohomish Total	35.0	(33.6, 36.5)	4,394	
Sex				
Male	36.9	(34.8, 39)	2,051	0.0171
Female	33.4	(31.5, 35.4)	2,343	
Grade				
8th	38.6	(36.3, 41)	1,637	0.0002
10th	34.1	(31.8, 36.5)	1,613	
12th	31.3	(28.7, 34)	1,148	
BMI Class				
Not obese	35.4	(33.9, 37)	3,545	0.4508
Obese	33.4	(28.7, 38.5)	356	
Self Perception				
Not obese	36.3	(34.6, 38.1)	2,972	0.0081
Obese	32.2	(29.8, 34.7)	1,384	

Vegetable Consumption				
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>p value</i>
Snohomish Total	15.9	(14.8, 17)	4,336	
Sex				
Male	16.8	(15.2, 18.4)	2,018	0.1381
Female	15.1	(13.7, 16.6)	2,318	
Grade				
8th	17.3	(15.5, 19.2)	1,621	0.0959
10th	15.5	(13.8, 17.4)	1,591	
12th	14.3	(12.4, 16.4)	1,128	
BMI Class				
Not obese	15.6	(14.4, 16.8)	3,504	0.7371
Obese	14.9	(11.5, 19)	349	
Self Perception				
Not obese	16.7	(15.4, 18.1)	2,934	0.0259
Obese	14.1	(12.3, 16)	1,365	

Fruit & Vegetables				
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>p value</i>
Snohomish Total	11.2	(10.3, 12.2)	4,321	
Sex				
Male	12.0	(10.7, 13.5)	2,009	0.1226
Female	10.5	(9.3, 11.8)	2,312	
Grade				
8th	12.8	(11.3, 14.6)	1,612	0.0202
10th	10.7	(9.2, 12.3)	1,586	
12th	9.6	(8, 11.5)	1,127	
BMI Class				
Not obese	11.1	(10.1, 12.2)	3,491	0.4438
Obese	9.7	(7, 13.3)	349	
Self Perception				
Not obese	12.1	(11, 13.4)	2,920	0.0053
Obese	9.2	(7.8, 10.9)	1,364	

Five or More				
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>p value</i>
Snohomish Total	23.6	(22.4, 24.9)	4,316	
Sex				
Male	25.4	(23.6, 27.4)	2,006	0.0081
Female	22.0	(20.4, 23.7)	2,310	
Grade				
8th	26.9	(24.8, 29.1)	1,611	0.0002
10th	22.7	(20.7, 24.8)	1,584	
12th	20.3	(18, 22.7)	1,125	
BMI Class				
Not obese	23.8	(22.4, 25.2)	3,487	0.4245
Obese	21.8	(17.8, 26.5)	348	
Self Perception				
Not obese	24.8	(23.2, 26.4)	2,916	0.0168
Obese	21.4	(19.3, 23.7)	1,363	

Soda Consumption	Not Obese			Obese			<i>p value</i>
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>	
None	54.0	(52.4, 55.7)	1,894	49.3	(44.1, 54.5)	174	0.0118
1	26.1	(24.7, 27.6)	916	24.7	(20.4, 29.4)	87	
2	10.6	(9.7, 11.7)	373	11.1	(8.2, 14.8)	39	
3	5.3	(4.6, 6.1)	185	9.1	(6.5, 12.5)	32	
4 or more	4.0	(3.4, 4.7)	139	6.0	(3.9, 9)	21	

Breastfeeding 1996-2003			
	<i>Percent</i>	<i>95% C.I.</i>	<i>Cases</i>
Did not breastfeed	10.7	(8.4, 13.6)	133
Initiated breastfeeding	89.3	(86.4, 91.7)	207
One month	72.3	(68.4, 75.8)	98
Two months	64.9	(60.9, 68.8)	845

