

YOUR HEALTH DEPARTMENT & YOU

Guidance • Support • Prevention • Protection

# Obesity & Health

## Status Report 2006



 VERMONT  
DEPARTMENT OF HEALTH

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This publication is available in other accessible formats and at the Vermont Department of Health website: [healthvermont.gov](http://healthvermont.gov)

## Introduction

Obesity is rapidly becoming a national public health crisis. National obesity rates have more than doubled in the past 20 years, leading to a substantial increase in negative health consequences.

Nearly one-third of all direct health care costs are related to 15 diseases directly linked to obesity, including diabetes, heart disease, high blood pressure and stroke. Obesity is also linked to certain types of cancer, liver disease, osteoarthritis, gout and reproductive problems in women. The second leading cause of death in the United States is poor diet and physical inactivity.

Vermont is not immune to this problem. More than half of adult Vermonters are overweight or obese. Annual medical expenses attributable to adult obesity in Vermont total approximately \$141 million.

This report provides a detailed look at what we know about obesity in Vermont including trends and comparisons relating to gender, age, race, socioeconomic factors and chronic disease.

As you look through this report, you will see that we have a considerable challenge ahead. The problem of obesity cannot be solved at the individual level. The issue is society-wide and will require action at multiple levels—in schools, in communities, in health care, in workplaces, in government—as well as by individuals.

For more information about obesity and Vermont's plan for addressing this important issue, visit the Vermont Department of Health website, [healthvermont.gov](http://healthvermont.gov).

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# Weight and BMI

**Definition of BMI:** Body Mass Index equals 704 times weight in pounds divided by height in inches squared. ( $704 \times Wt/Ht^2 = BMI$ )

**Underweight** = BMI less than 18.5

**Healthy Weight** = BMI 18.5 to 24.9

**Overweight** = BMI 25.0 to 29.9

**Obese** = BMI 30.0 to 39.9

**Morbid Obesity** = BMI 40 or higher

	Under Weight	Healthy Weight					
BMI	<18.5	19	20	21	22	23	24
4' 10"		91	96	100	105	110	115
4' 11"		94	99	104	109	114	119
5'		97	102	107	112	118	123
5' 1"		100	106	111	116	122	127
5' 2"		104	109	115	120	126	131
5' 3"		107	113	118	124	130	135
5' 4"		110	116	122	128	134	140
5' 5"		114	120	126	132	138	144
5' 6"		118	124	130	136	142	148
5' 7"		121	127	134	140	146	153
5' 8"		125	131	138	144	151	158
5' 9"		128	135	142	149	155	162
5' 10"		132	139	146	153	160	167
5' 11"		136	143	150	157	165	172
6'		140	147	154	162	169	177
6' 1"		144	151	159	166	174	182
6' 2"		148	155	163	171	179	186
6' 3"		152	160	168	176	184	192
6' 4"		156	164	172	180	189	197

Over Weight					Obese										Morbid Obesity
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191
124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198
128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204
132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211
136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218
141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225
145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232
150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240
155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247
159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255
164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262
169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270
174	181	188	195	202	207	216	222	229	236	243	250	257	264	271	278
179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286
184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294
189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302
194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311
200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319
205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328

# Trends in Vermont

HEALTHY VERMONTERS 2010 OBJECTIVE:

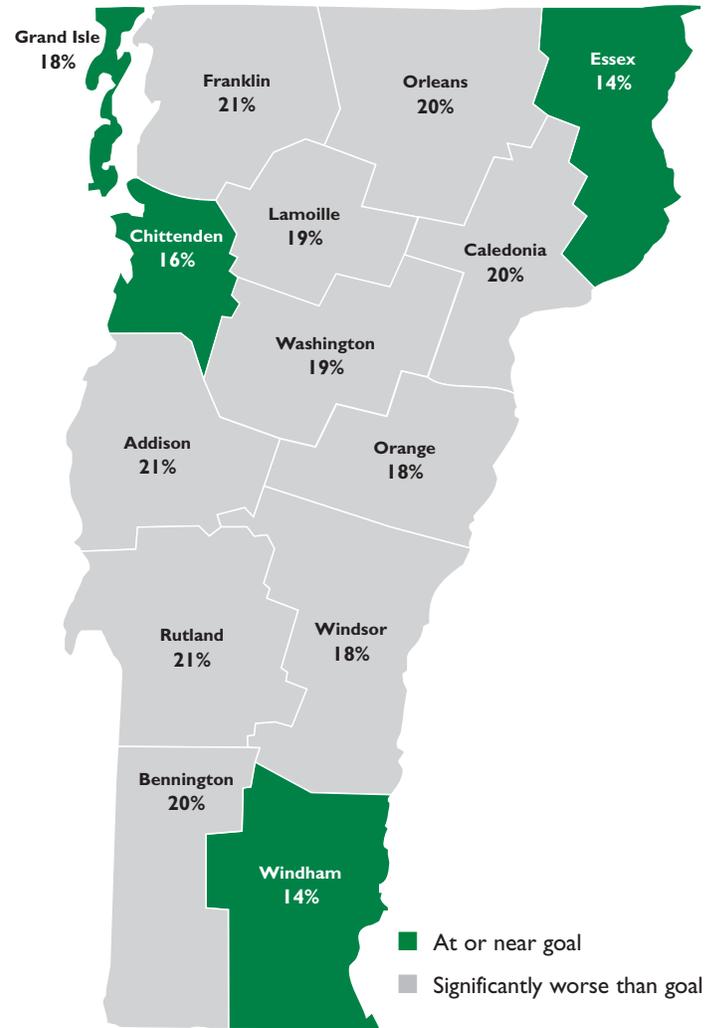
**Reduce the percentage of adults age 20+ who are obese.**

► Goal: 15% VT 2003: 19%

## Adult Obesity by County

- In Vermont, approximately 88,000 people or nearly one in five adults are obese.
- Chittenden County (16%) and Windham County (14%) have rates of obesity that are statistically better than the state as a whole (18%).
- All other counties have a rate of obesity that is statistically similar to the state as a whole.

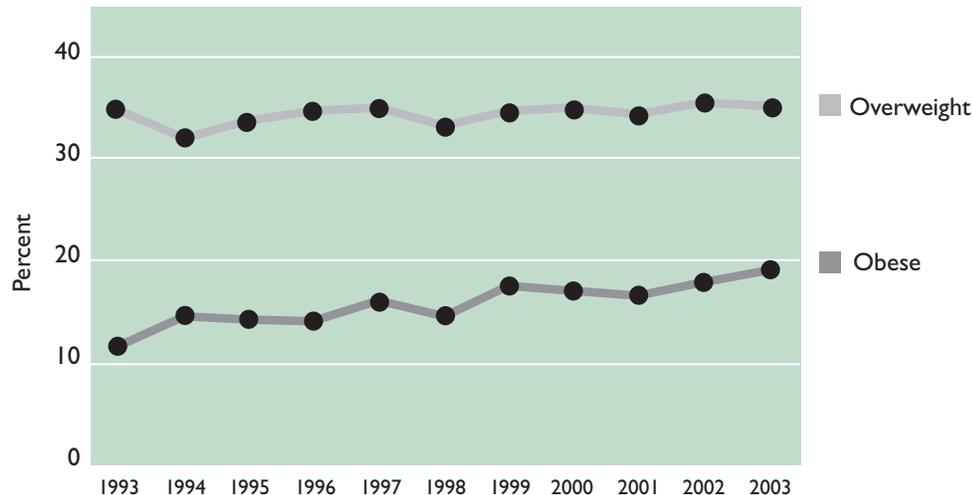
## Adult Obesity 2001-2003



### Adult Overweight and Obesity Trends

- Over half (54%) of Vermont adults are overweight or obese; that translates to about 250,000 adults above a healthy weight.
- The prevalence of obesity among Vermont adults increased by 58 percent from 1993 to 2003 (from 12% to 19%).
- At the current rate, by 2010, 61 percent of adults in Vermont will be above a healthy weight.
- Although genes can and do play a role, the increase in obesity is also attributable to other factors, including behavioral, environmental, cultural and socioeconomic influences.

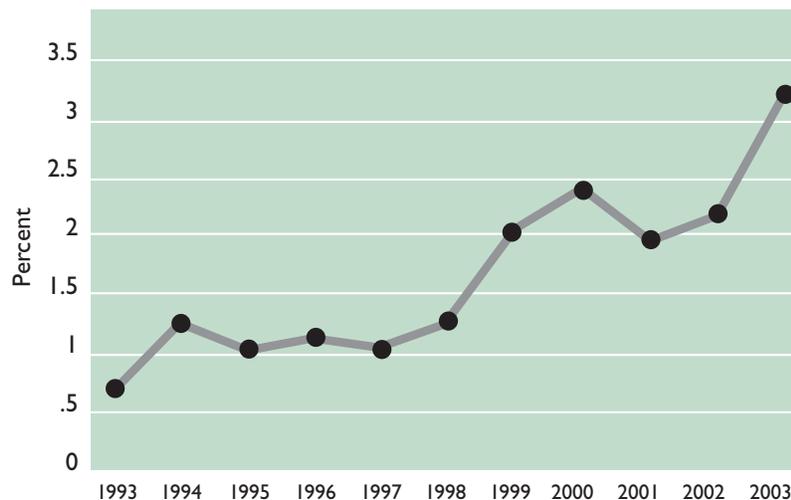
#### Adult Overweight and Obese Age 20+



### Morbid Obesity Trend

- In Vermont, Class III or morbid obesity rose a dramatic 367 percent from 1993 to 2003.
- Morbid obesity refers to adults who are more than 100 pounds above their ideal body weight.
- Although people who are extremely obese make up a relatively small percentage of the adult population, the rapid rise in prevalence is of great concern because of the many health risks associated with extreme obesity.

#### Morbid Obesity in Adults Age 20+



# Age, Gender, Race

HEALTHY VERMONTERS 2010 OBJECTIVE:

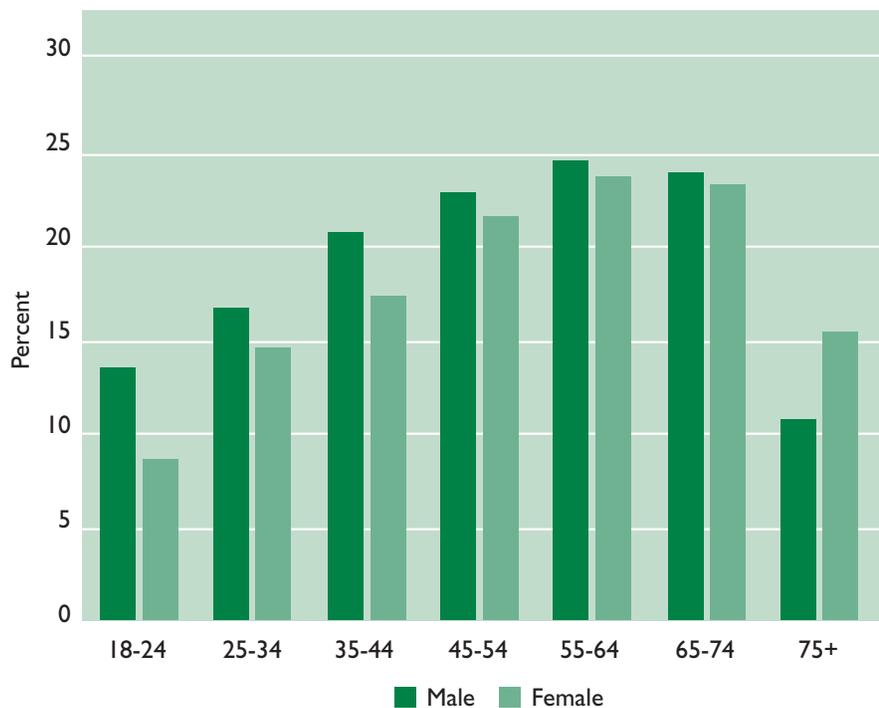
**Reduce the percentage of adults age 20+ who are obese.**

► Goal: 15% VT 2003 Men: 20 % VT 2003 Women: 19%

## Adult Obesity by Age and Gender

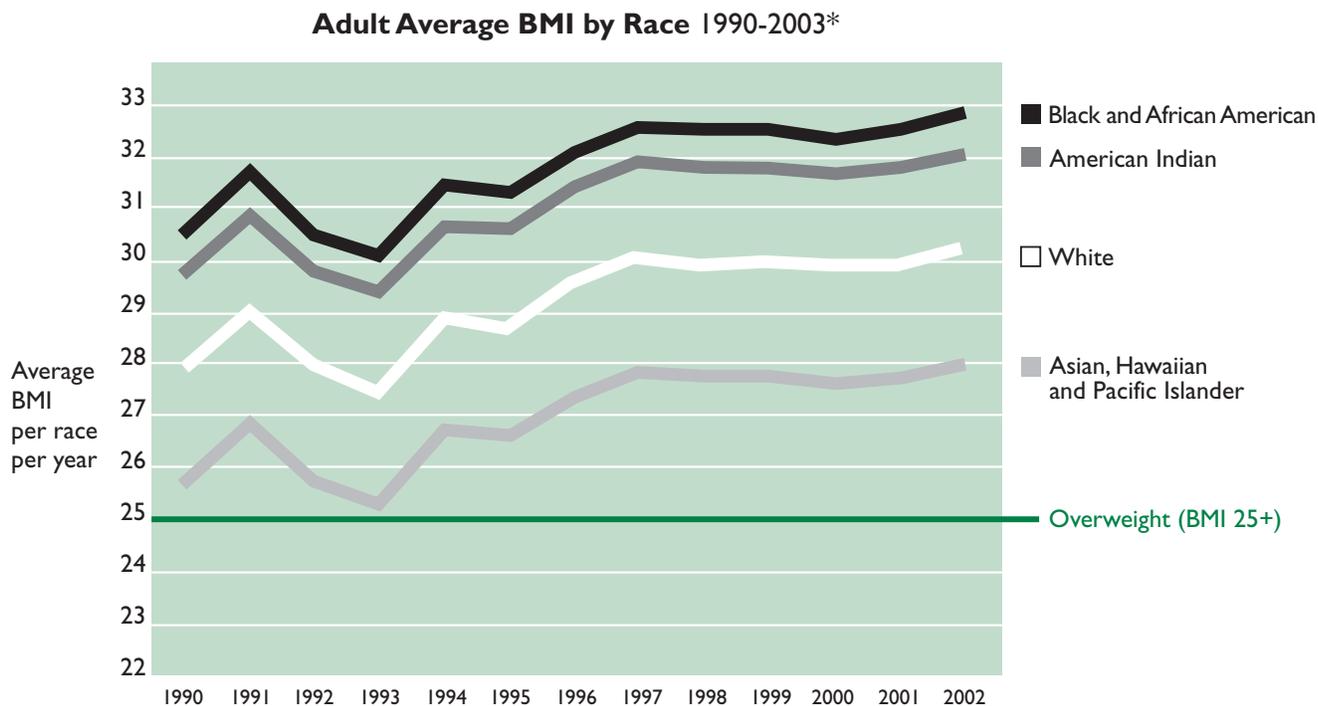
- In general, the prevalence of obesity increases with age until age 65; after that it declines. This is true for both men and women.
- Obesity is most prevalent among men and women age 55 to 64.
- The greatest increase in obesity among women occurs from age 18 to 34, while among men the greatest increase is from age 25 to 44.

**Adult Obesity by Age and Gender 1999-2003**



## BMI and Race

- Since the early 1990s, BMI has been increasing across all racial groups both nationally and in Vermont.
- Black/African Americans have the highest average BMI while Asian/Hawaiian/Pacific Islanders have the lowest.
- Nationally, for all racial groups combined, women of lower socioeconomic status (income <130 percent of the federal poverty level) are approximately 50 percent more likely to be obese than those of higher socioeconomic status.
- The increase for obesity cuts across all ages, racial and ethnic groups, and both genders.



\*This graph represents statistical modelling of the trend in Vermont, and includes age and gender adjustment.

# Children and Youth

HEALTHY VERMONTERS 2010 OBJECTIVE:

**Reduce the percentage of youth who are overweight.**

► Goal: 5% VT 2003: 11% (Grades 8-12)

## Overweight Youth by County

- In Vermont, 11 percent of youth in grades 8 through 12 are overweight and 15 percent are at risk for being overweight. This is similar to national statistics.
- Among overweight youth, 13 percent perceive themselves as being at a healthy weight.
- Overweight adolescents have a 70 percent chance of becoming overweight or obese adults.

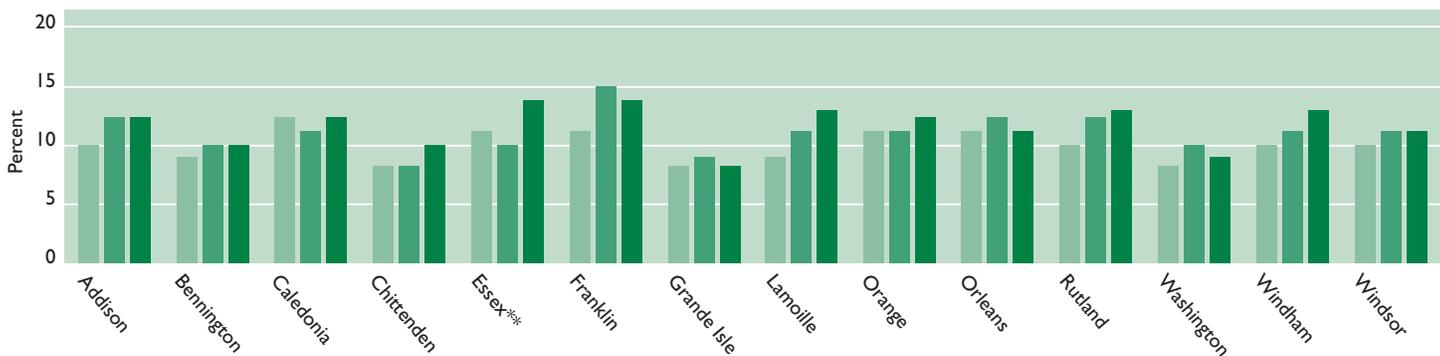
**Definitions:** Among youth, overweight is defined as being at or above the 95th percentile for BMI.

Among youth, at risk for overweight is defined as being at or above the 85th percentile and below the 95th percentile for BMI.

Overweight Youth Grades 8-12 by County 2003



Overweight Youth by County 1999, 2001, 2003 / Percent of 8-12 graders who are overweight (95th BMI Percentile)

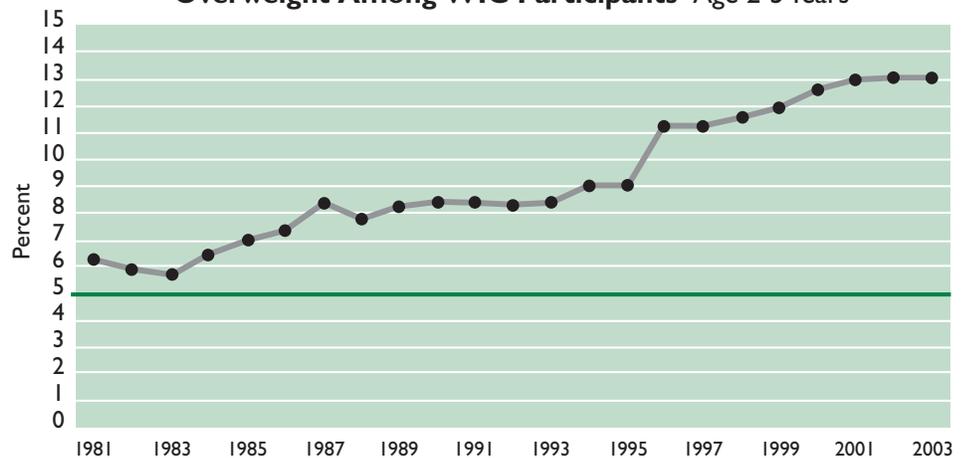


## Overweight Among Children in the WIC Program

- In Vermont, 53 percent of children age 2 to 5 years participate in the WIC program.
- In Vermont, the prevalence of overweight among children in the WIC program has more than doubled between 1981 and 2002.
- Nationally, there is an alarming increase in the incidence of type 2 diabetes among children who are overweight.
- Many children who are overweight have high cholesterol and blood pressure levels, risk factors for heart disease.

**Definition:** WIC is the supplemental nutrition program for lower income women, infants and children.

## Overweight Among WIC Participants Age 2-5 Years



■ All counties significantly worse than goal

Overweight: Children over age 2 whose Body Mass Index falls above the 95th percentile expected for age and gender. In a healthy, well nourished population, 5 percent of children are expected to be in this category.

Data Source: CDC 2003 Pediatric Nutrition Surveillance Report, Vermont Summary of Trend. The data file includes all children whose height and weight were recorded by the Vermont Department of Health WIC program during the report year.

# Income and Education

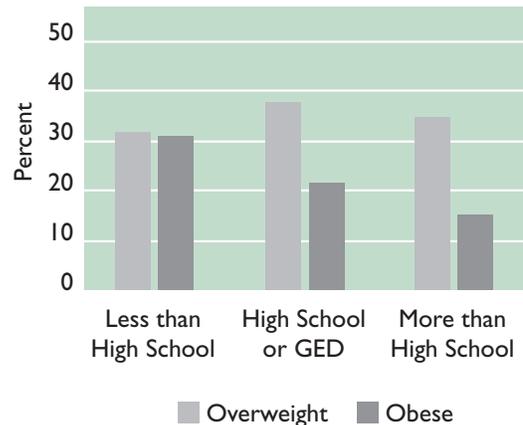
## Education

- In Vermont, adults with less education have a higher prevalence of obesity than adults with education beyond high school.
- Vermont adults with no college education are twice as likely to be obese compared to adults with some college education or higher.

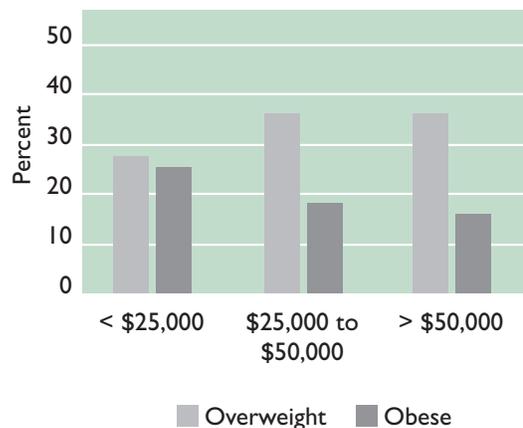
## Income

- In Vermont, adults in the lowest income category had the highest prevalence of obesity.
- A diet consisting of foods high in fat and calories is often more affordable than a diet high in lean meats, fish, fruits and vegetables.
- Individuals living in poverty are often concerned about food quantity before nutrient quality.
- Limited incomes can cause a shift in dietary choices toward foods that are energy dense, and provide the most calories for the lowest cost.
- Over the past 20 years, price increases for foods high in sugar and fats have been much lower than price increases for vegetables and fruit.
- Lack of money, lack of transportation to stores where low-cost healthy foods are available and limited knowledge of how to prepare healthy meals contribute to unhealthy eating habits.

**Adult Overweight and Obesity by Education 2001-2003**



**Adult Overweight and Obesity by Income 2001-2003**



# Hunger and Food Security

HEALTHY VERMONTERS 2010 OBJECTIVE:

**Further increase food security to reduce hunger.**

► Goal: 94% VT 2003: 90%

## Hunger and Obesity

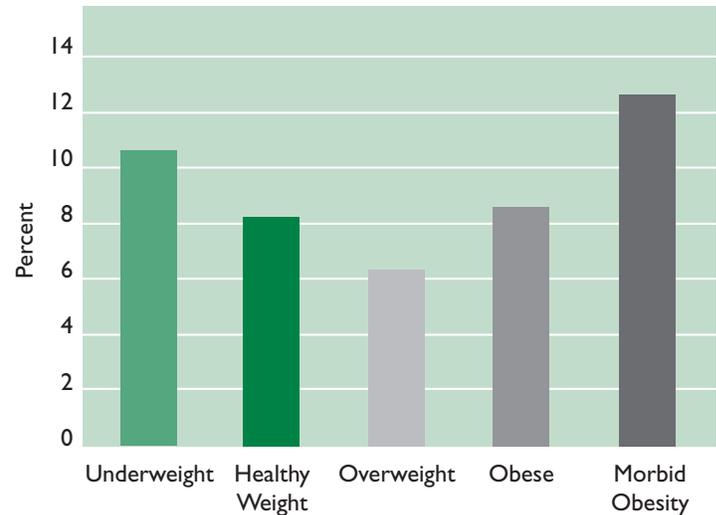
- Vermont adults who are extremely obese report the highest prevalence of experiencing hunger within the past month.
- Extreme obesity is highest among lower income Vermonters.
- Food insecure adults often have to compromise quality for quantity, eating high calorie lower cost foods.

**Definitions:** *Hunger data is calculated from the Vermont BRFSS survey question asking adults how frequently do you eat less than you feel you should because there is not enough food or money to buy food.*

*The United States Department of Agriculture defines hunger as the uneasy or painful sensation caused by lack of food.*

*Food insecurity exists whenever the availability of nutritionally adequate and safe foods, or the ability to acquire acceptable food in socially acceptable ways, is limited or uncertain.*

**Adult Hunger by BMI 1995, 1996, 1999-2004**

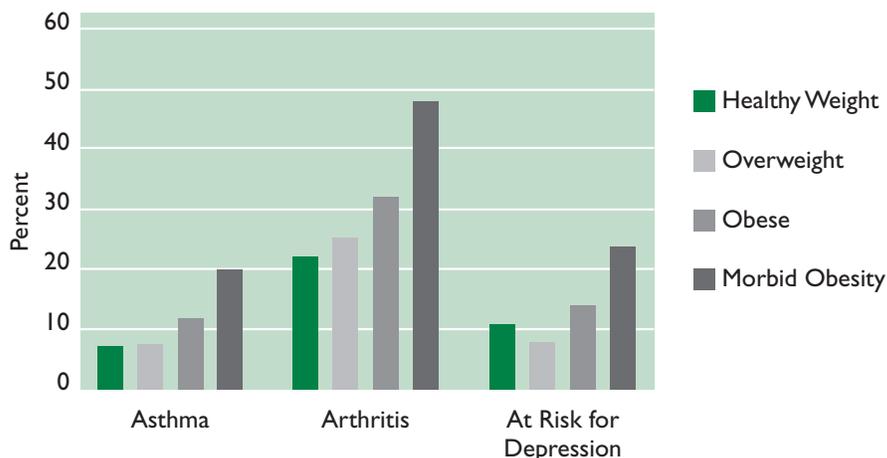


# Obesity and Chronic Disease

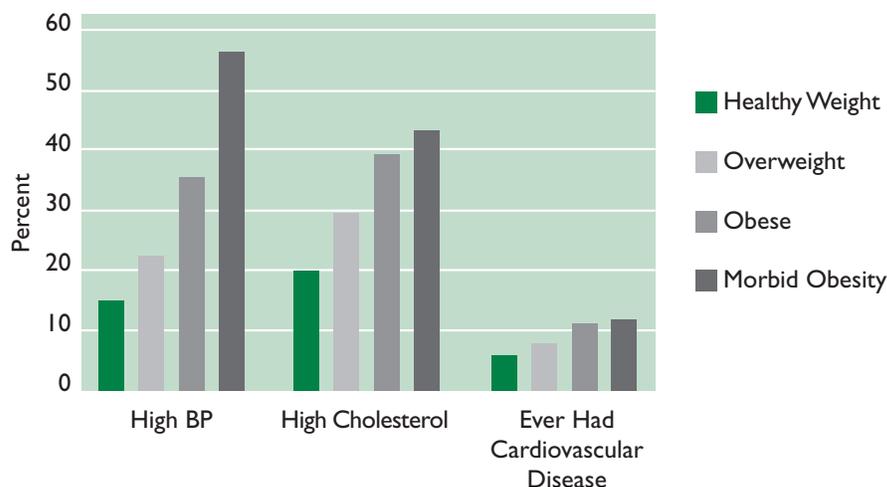
## Chronic Disease by BMI

- Being overweight substantially increases risks for many chronic diseases, including diabetes, high blood pressure, osteoarthritis, heart disease and stroke, gallbladder disease, arthritis, sleep disturbances, breathing problems, and certain cancers including breast, prostate and colorectal.
- In Vermont, the prevalence of diabetes, arthritis and asthma is higher in obese adults than in healthy weight adults.
- In Vermont, 35 percent of obese adults report high blood pressure and 56 percent of morbidly obese adults report high blood pressure.
- In 2003, estimated health care costs attributable to obesity in Vermont were \$141 million. Of that, \$40 million was spent on the Medicaid population.

Adult Chronic Disease by BMI Category 2003



Adult Chronic Disease by BMI Category 2003

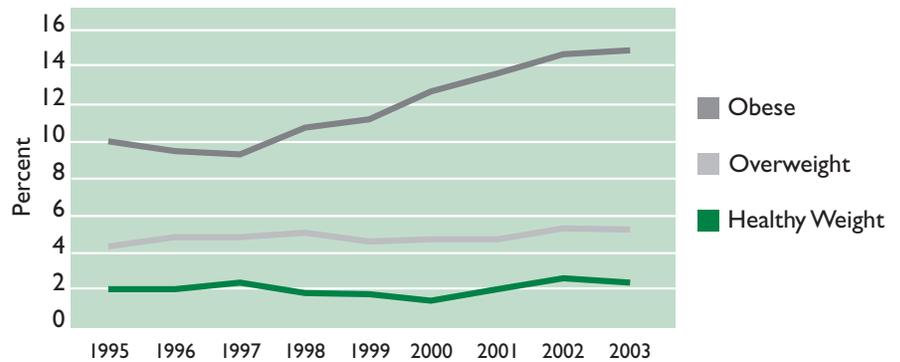


Note: Under healthy weight individuals were not included in these charts.

### Diagnosed Diabetes by BMI

- In Vermont, the prevalence of diabetes is greater among obese adults than among healthy weight adults.
- From 2000 to 2004, 49 percent of Vermonters with diabetes were obese, compared to 17 percent of Vermonters without diabetes.
- Early screening and detection can prevent or delay the onset of diabetes and related health complications.

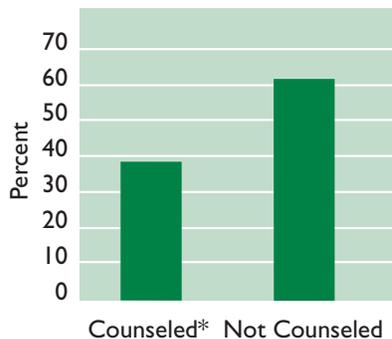
### Adult Diabetes by BMI 1995-2003



### Physician Advice

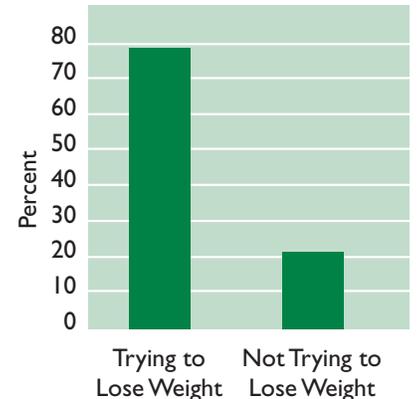
- In Vermont, 61 percent of obese adults reported that they were not advised by their physician to lose weight.
- Among obese adult Vermonters who were counseled to lose weight, 80 percent report trying to do so.
- People are more likely to attempt behavior change if advised by their health care provider to lose weight.

### Obese Adults Counseled by Doctor About Weight 2003



\*Counseled category includes 3 percent who reported they were counseled to gain or maintain weight.

### Response of Obese Adults to Doctor's Advice to Lose Weight 2003



# Nutrition and Physical Activity

## HEALTHY VERMONTERS 2010 OBJECTIVES:

### Increase the percentage of adults who engage in regular moderate physical activity.

► Goal: 50% VT 2003: 55%

### Increase the percentage of adults who eat at least two daily servings of fruit.

► Goal: 75% VT 2003: 47%

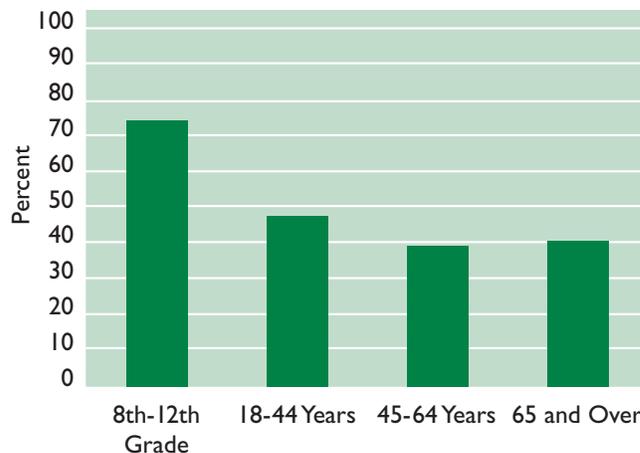
### Increase the percentage of adults who eat at least three daily servings of vegetables.

► Goal: 50% VT 2003: 44%

## Healthy Behaviors and Age

- Physical activity and healthy eating may decrease the risk of heart disease, stroke, high blood pressure, cancer, diabetes, arthritis and osteoporosis.
- Compared to other age groups, adults age 65+ are most likely to meet the recommendation to eat five fruits and vegetables daily.
- Vermont youth are more likely than adults to report being a healthy weight.
- Adults age 65+ are the least likely to meet the recommendations for physical activity.

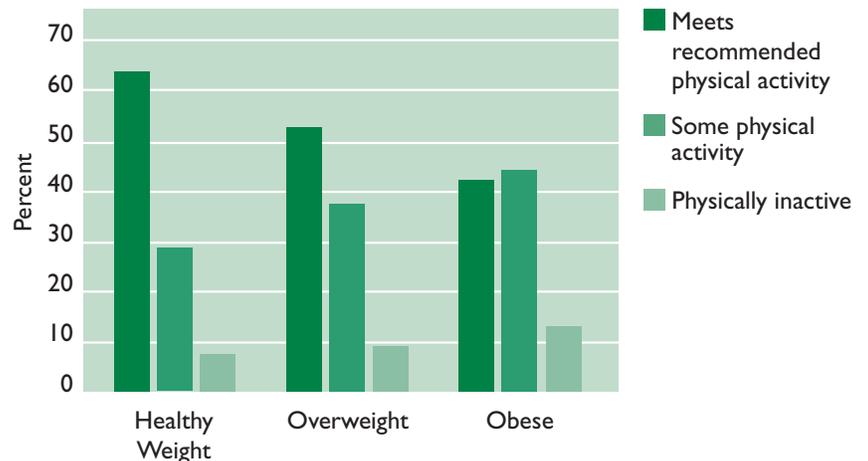
Healthy Weight by Age 2003



## Adult Physical Activity by BMI

- Adults should engage in at least 30 minutes of moderate intensity physical activity on five or more days per week, or 20 minutes of vigorous intensity physical activity on three or more days per week.
- In Vermont, healthy weight adults are more likely to report meeting the recommended physical activity level than either overweight or obese adults.
- Obese Vermonters report being physically inactive more than overweight or healthy weight individuals.

## Adult Physical Activity Level by BMI 2003



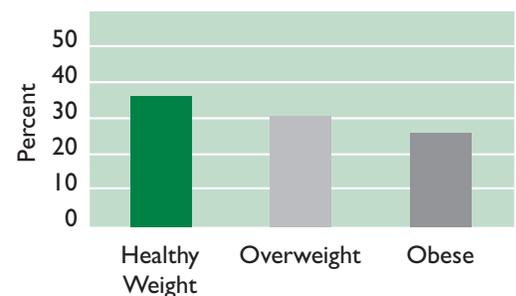
**Definitions: Moderate-intensity** is the level of effort in which a person should experience some increase in breathing or heart rate, such as while walking briskly, mowing the lawn, dancing, swimming, or bicycling on level terrain.

**Vigorous-intensity** is the level of effort in which a person should experience a large increase in breathing or heart rate, where conversation is difficult or broken, such as while jogging, mowing the lawn with a nonmotorized pushmower, participating in high-impact aerobic dancing, swimming continuous laps, or bicycling uphill.

## Fruits and Vegetables by BMI – Adults

- Eating more fruits and vegetables, along with whole grains, lean meats and low fat dairy products, as part of a low calorie diet can help people lose weight and maintain a healthy weight.
- Fruits and vegetables are naturally high in fiber and low in calories. They add volume to meals, allowing people to eat more food and feel fuller with fewer calories.
- In Vermont, obese adults report the lowest prevalence of eating five or more servings of fruits and vegetables per day, compared to other weight categories.
- Healthy weight adults report the highest prevalence of eating five or more servings of fruits and vegetables per day, compared to other weight categories.

## Adult Consumption of Fruits and Vegetables by BMI 2003



# Youth Risks and Assets

HEALTHY VERMONTERS 2010 OBJECTIVES:

## Increase the percentage of youth who engage in regular moderate physical activity

► Goal: 50% VT2003: 26% (grades 8-12)

## Increase the percentage of youth who eat at least two daily servings of fruit

► Goal: 75% VT2003: 40% (grades 8-12)

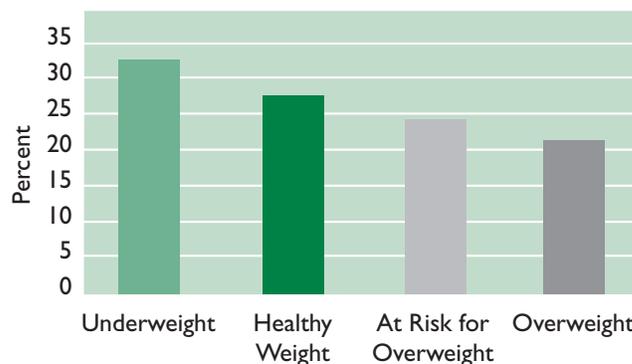
## Increase the percentage of youth who eat at least three daily servings of vegetables

► Goal: 50% VT2003: 16% (grades 8-12)

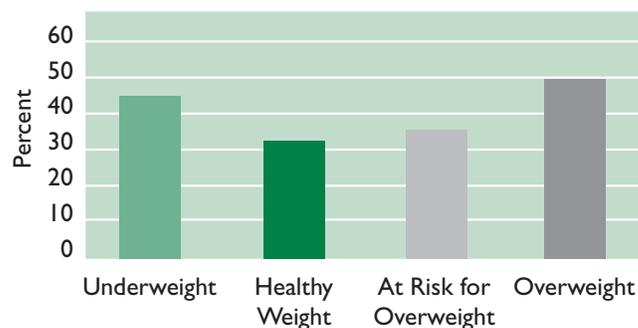
### Physical Activity by BMI

- Children and adolescents should engage in at least 60 minutes of moderate intensity physical activity on most, preferably all, days of the week.
- Almost 80 percent of overweight youth report that they are not meeting the recommendations for physical activity.
- Overall, 26 percent of students report that they exercise moderately five or more days per week.
- Fewer girls than boys participate in aerobic exercise. Among girls, 64 percent exercise aerobically three or more days per week, compared to 70 percent of boys.
- Students in higher grades participate less in physical education classes. In 2003, 87 percent of 8th graders, compared to only 27 percent of 12th graders, participated in at least one physical education class per week.
- Television is on during meals in 58 percent of children's homes, and half of all advertisements during children's television are for food.

**Youth Grades 8-12 Meeting Recommended Physical Activity by BMI 2003**



**Youth Grades 8-12 Computer /TV /Video Games 3 Hours or Greater per Day by BMI 2003**



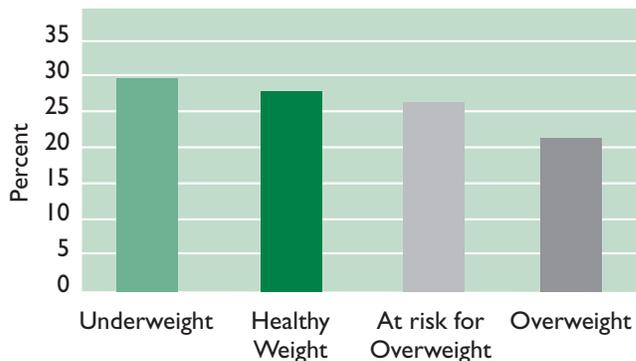
## Fruits and Vegetables

- Eating more fruits and vegetables instead of high calorie snacks can help with weight management.
- Fruits and vegetables provide fullness with fewer calories.
- Overall in Vermont, 27 percent of youth report that they eat five or more servings of fruit and vegetables daily.
- Among overweight youth, 22 percent report eating five or more servings of fruits and vegetables per day.

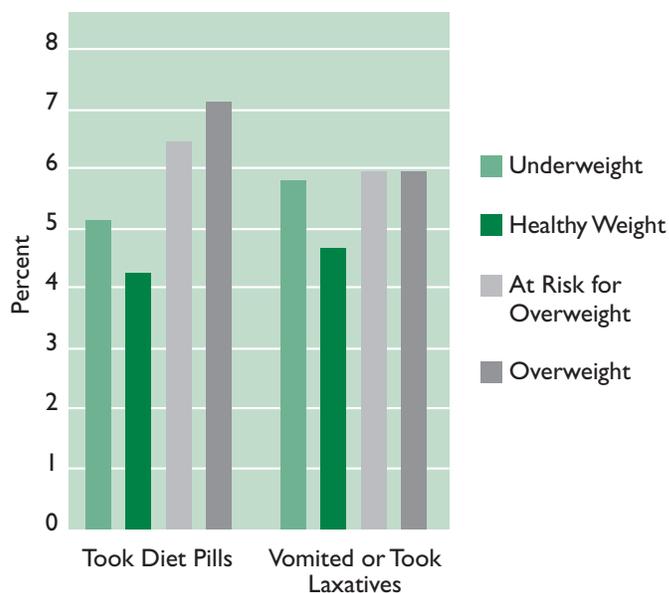
## Unhealthy Weight Control Practices

- A small percentage of youth in all weight categories use unhealthy weight control practices, including vomiting, taking laxatives or taking diet pills to lose weight.
- Using unhealthy weight control practices is more prevalent among girls than boys.
- Among healthy weight youth, 19 percent perceive themselves as being above a healthy weight.
- More girls than boys think that they are overweight and are trying to lose weight. In 2003, 37 percent of girls in grades 8-12 described themselves as overweight, compared to 26 percent of boys.

**Consumption of Fruits and Vegetables by BMI / Youth Grades 8-12 2003**



**Unhealthy Weight Control by BMI / Youth Grades 8-12 2003**



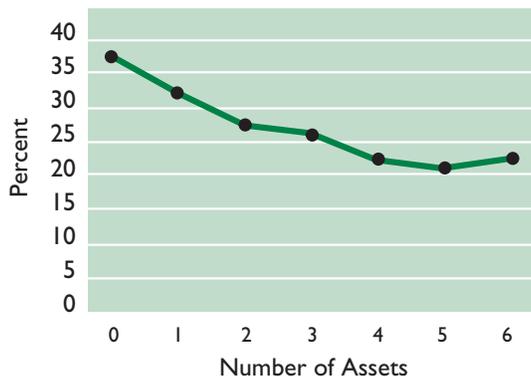
# Youth Risks and Assets (continued)

## Health Risks and Behaviors by Assets

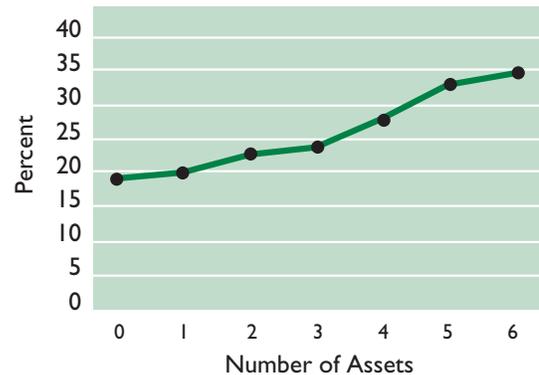
- Students with more assets tend to engage in more healthy behaviors.
- Students with fewer assets are more likely to be overweight, less active and eat fewer than five servings of fruits and vegetables daily.

**Definition of Assets:** Assets are indicators describing aspects of a positive well-being in youth. Assets measured in the Youth Risk Behavior Survey include: grades in school, talking with parents about school, involvement in clubs or organizations at school, volunteering in the community and their perceptions of students' role in deciding what happens in school and how they are valued by their community.

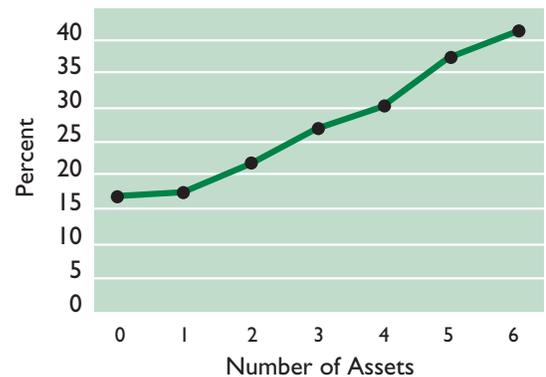
**Overweight by Number of Assets  
Youth Grades 8-12 2003**



**Moderate Exercise Five or  
More Days per Week by Number  
of Assets / Youth Grades 8-12 2003**



**Eating Five or More Servings of Fruit  
& Vegetables Per Day by Number  
of Assets / Youth Grades 8-12 2003**

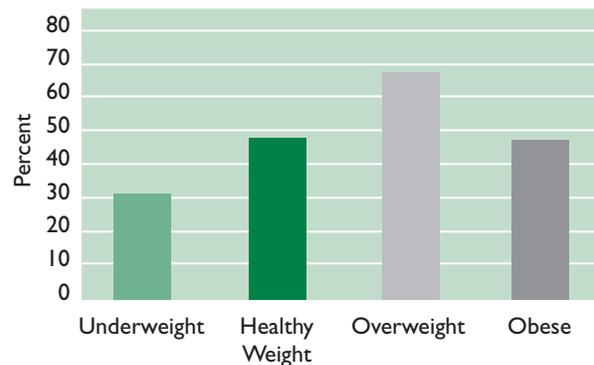


# Maternal Weight

## Excess Maternal Weight Gain

- In general, women who are overweight or obese are gaining more than the recommended amount of weight during pregnancy.
- In 2003, among women participating in WIC who were overweight, 68 percent gained more than the ideal maternal weight during pregnancy. This was up from 63 percent in 2001.
- In 2003, 47 percent of all Vermont mothers gained more than the recommended guideline for maternal weight gain.
- In 2003, 13 percent of all Vermont mothers who gave birth were overweight and 26 percent were obese.
- Obesity during pregnancy is associated with increased risk of death for both the baby and the mother, and increases the risk of maternal high blood pressure by ten times.
- Dieting during pregnancy is potentially hazardous to the mother and developing fetus.
- Women who eat well and gain the appropriate amount of weight during pregnancy are more likely to have healthy babies.

**Maternal Weight Gain Above Recommendations by BMI in WIC Participants 2003**



**Definitions:** Ideal weight gain is based on the 1990 Institute of Medicine report “Nutrition During Pregnancy”:

*Underweight pre-pregnancy*  
(ideal weight gain = 28 to 40 pounds)

*Normal weight pre-pregnancy*  
(ideal weight gain = 25 to 35 pounds)

*Overweight pre-pregnancy*  
(ideal weight gain = 15 to 25 pounds)

*Obese pre-pregnancy*  
(ideal weight gain = 15 to 25 pounds)

# Maternal Weight (continued)

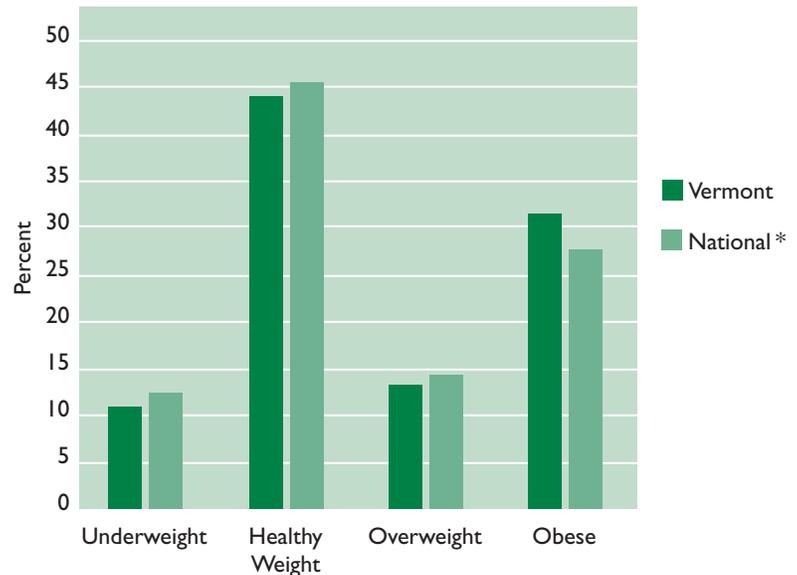
## Pre-pregnancy BMI

- In 2003, over 45 percent of women participating in WIC who gave birth were overweight or obese before becoming pregnant.
- Obese women who become pregnant are at risk for preeclampsia, gestational diabetes, cesarean delivery, and postpartum infection.
- The fetus of an obese woman is at increased risk for neural tube defects, birth trauma and late fetal death.

## Maternal Weight and Birth Weight

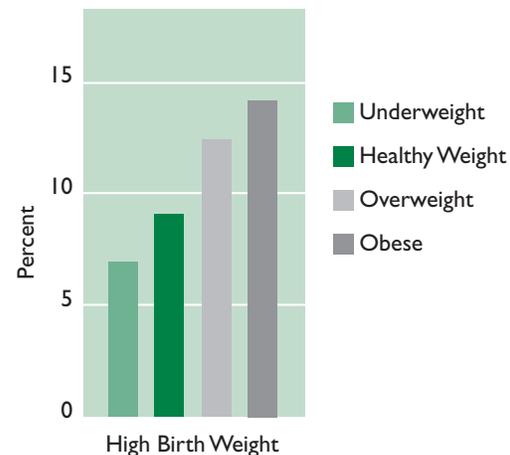
- High birth weight infants are at increased risk for neural tube defects, birth trauma and late fetal death.
- High birth weight is defined as a weight greater than 4,000 grams (8 pounds, 13 ounces) at birth.
- Women who are obese prior to becoming pregnant give birth to a higher percentage of high birth weight babies.

**BMI Prior to Pregnancy of Mothers Participating in WIC 2003**



\*National data based on 22 states and 3 tribal territories that participate in the Pregnancy Nutrition Surveillance System (PNSS)

**Infant Birth Weight by Pre-Pregnancy BMI Among Mothers Participating in WIC 2003**



## References and Data Sources

**BRFSS** (Behavioral Risk Factor Surveillance System): Since 1990, Vermont has participated with the Centers for Disease Control and Prevention in the BRFSS, a telephone survey of personal health behaviors, including weight in non-institutionalized, adult Vermonters 18 years or older. All data are self reported. Adult data in this report refer to those 18+ unless specified otherwise.

**YRBS** (Youth Risk Behavior Survey): The YRBS is part of a nationwide effort to provide accurate information about youth behaviors. The results of the 2003 Vermont Youth Risk Behavior Survey are statistically adjusted so that the sample accurately reflects all Vermont students in grades 8 through 12. Data are based on self-reported information from a representative sample of 8,081 Vermont students in middle school and high school. Students who have dropped out of school are not represented in the data.

**PNSS** (Pregnancy Nutrition Surveillance System) is a public health surveillance system that monitors risk factors associated with infant mortality and poor birth outcomes among low-income pregnant women who participate in federally funded public health programs.

**PedNSS** (Pediatric Nutrition Surveillance System) is a child-based surveillance system that monitors the nutritional status of low-income children in federally funded programs. In Vermont, the Women, Infants and Children Program (WIC) population is part of this system.

**Vermont Vital Statistics:** Information on Vermont births, deaths, fetal deaths, abortions, marriages, civil unions, divorces and dissolutions.

*Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*

[www.nhlbi.nih.gov/guidelines/obesity/ob\\_gdlns.pdf](http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf)

Medline Plus Medical Encyclopedia

[www.nlm.nih.gov/medlineplus/ency/article/003102.htm](http://www.nlm.nih.gov/medlineplus/ency/article/003102.htm)

“Vermont Behavioral Health Risks Among Race and Ethnic Groups.”  
*Report to the Vermont Department of Minority Health Program, 2003*

“The Paradox of Hunger and Obesity”

Food Research Action Center

[www.frac.org/html/hunger\\_in\\_the\\_us/hunger&obesity.htm](http://www.frac.org/html/hunger_in_the_us/hunger&obesity.htm)

“The Surgeon General’s Call to Action  
to Prevent and Decrease Overweight and Obesity”

[www.surgeongeneral.gov/topics/obesity/calltoaction/fact\\_glance.htm](http://www.surgeongeneral.gov/topics/obesity/calltoaction/fact_glance.htm)

[www.surgeongeneral.gov/topics/obesity/calltoaction/fact\\_consequences.htm](http://www.surgeongeneral.gov/topics/obesity/calltoaction/fact_consequences.htm)

“Physical Activity Recommendations for Adults and Youth”

[www.cdc.gov/nccdphp/dnpa/physical/recommendations/](http://www.cdc.gov/nccdphp/dnpa/physical/recommendations/)

“Can Eating Fruits and Vegetables Help People  
to Manage Their Weight?”

[www.cdc.gov/nccdphp/dnpa/nutrition/pdf/rtp\\_practitioner\\_10\\_07.pdf](http://www.cdc.gov/nccdphp/dnpa/nutrition/pdf/rtp_practitioner_10_07.pdf)

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“Relationships of a Brief Measure of Youth Assets  
to Health-Promoting and Risk Behaviors”

*Journal of Adolescent Health* 2004; 34: 184-191.

“Obesity During Pregnancy Threatens Health of Both Mother  
and Fetus”

[www.marchofdimes.com/aboutus/10651\\_12183.asp](http://www.marchofdimes.com/aboutus/10651_12183.asp)



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