



# Statistics Related to Overweight and Obesity

 **NIDDK** *Weight-control Information Network*

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To understand the significance of statistics related to overweight and obesity, it is important to know how overweight and obesity are defined and measured. This fact sheet discusses these terms and their measures, and explains why statistics may differ when obtained from diverse sources. It then presents statistics related to overweight and obesity in the United States.

*Overweight and obesity are known risk factors for:*

- |                       |                         |
|-----------------------|-------------------------|
| • diabetes            | • osteoarthritis        |
| • heart disease       | (degeneration of        |
| • stroke              | cartilage and bone of   |
| • hypertension        | joints)                 |
| • gallbladder disease | • sleep apnea and other |
|                       | breathing problems      |
|                       | • some forms of cancer  |
|                       | (uterine, breast,       |
|                       | colorectal kidney, and  |
|                       | gallbladder).           |

*Obesity is associated with:*

- |              |                       |
|--------------|-----------------------|
| • high blood | • stress incontinence |
| cholesterol  | (urine leakage caused |

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• complications of pregnancy</li> <li>• menstrual irregularities</li> <li>• hirsutism (presence of excess body and facial hair)</li> </ul> | <ul style="list-style-type: none"> <li>• by weak pelvic-floor muscles)</li> <li>• psychological disorders such as depression</li> <li>• increased surgical risk.</li> </ul> |
|---|---|

## What Are Overweight and Obesity?

Overweight refers to an excess of body weight compared to set standards. The excess weight may come from muscle, bone, fat, and/or body water. Obesity refers specifically to having an abnormally high proportion of body fat.<sup>1</sup> One can be overweight without being obese, as in the example of a bodybuilder or other athlete who has a lot of muscle. However, many people who are overweight are also obese.

## How Are Overweight and Obesity Measured?

A number of methods are used to determine if an individual is overweight or obese. Some of them are based on mathematical calculations of the relation between height and weight--others are based on measurements of body fat. These methods are described below.

### ***Body Mass Index***

Body Mass Index (BMI) can be used to measure both overweight and obesity in adults. It is the measurement of choice for many obesity researchers and other health professionals. BMI is a direct calculation based on height and weight, and it is not gender-specific. Most health organizations and published information on overweight and its associated risk factors use BMI to measure and define overweight and obesity. BMI does not directly measure percent of body fat, but it provides a more accurate measure of overweight and obesity than relying on weight alone.

BMI is found by dividing a person's weight in kilograms by height in meters squared. The mathematical formula is:

$$\text{weight (kg)/height squared (m}^2\text{)}.$$

To determine BMI using pounds and inches, multiply your

weight in pounds by 704.5,\* then divide the result by your height in inches, and divide that result by your height in inches a second time. (Or you can use the BMI calculator at <http://www.nhlbisupport.com/bmi/> or check the chart shown below that has calculated BMI for you.)

\* The multiplier 704.5 is used by the National Institutes of Health. Other organizations may use a slightly different multiplier; for example, the American Dietetic Association suggests multiplying by 700. The variation in outcome (a few tenths) is insignificant.

BODY MASS INDEX CHART																	
Height (inches)	Body Weight (pounds)																
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287

Source: *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*, National Institutes of Health, National Heart, Lung, and Blood Institute, June 1998.

The National Institutes of Health (NIH) identify overweight as a BMI of 25-29.9 kg/m<sup>2</sup>, and obesity as a BMI of 30 kg/m<sup>2</sup> or greater. However, overweight and obesity are not mutually exclusive, since obese persons are also overweight.<sup>1</sup> Defining overweight as a BMI of 25 or greater is consistent with the recommendations of the World Health Organization <sup>2</sup> and most other countries.

Calculating BMI is simple, quick, and inexpensive--but it does have limitations. One problem with using BMI as a measurement tool is that very muscular people may fall into the "overweight" category when they are actually healthy and fit. Another problem with using BMI is that people who have lost muscle mass, such as the elderly, may be in the "healthy weight" category--according to their BMI--when they actually have reduced nutritional reserves. BMI, therefore, is useful as a general guideline to monitor trends in the population, but by itself is not diagnostic of an individual patient's health status. Further evaluation of a patient should be performed to determine his or her weight status and associated health risks.

### ***Weight-for-height Chart***

Weight-for-height charts are another measure used to determine if a person is overweight (although they do not measure body fat). These charts, which have been used by doctors and other health care workers for decades, usually give a range of acceptable weights for a person of a given height. Many versions of weight-for-height charts exist, some showing different acceptable weight ranges for men and women. Health care workers often disagree over which is the best chart to use. The 2000 *Dietary Guidelines for Americans*, published jointly by the U.S. Departments of Agriculture and Health and Human Services, provide the most up-to-date [weight-for-height chart](#). The healthy weight range in this chart corresponds to a BMI between 18.5 and 25.

### ***Measurements of Body Fat***

There are a number of ways to measure body fat. Historically, the standard method is to weigh a person underwater; this procedure is limited to laboratories with specialized equipment.

Other simpler methods for measuring body fat include *skinfold thickness* measurements and *bioelectrical impedance analysis* (BIA). Skinfold thicknesses are measures of the subcutaneous (lying just beneath the skin) fat at specific sites of a person's body, such as the triceps (the back of the upper arm). Accurate measurements of skinfold thickness depend on the skill of the examiner and may vary widely when measured by different examiners.

To measure body fat using BIA, a harmless amount of an electrical current is sent through the body. The body's ability to conduct an electrical current reflects the total amount of water in the body. Generally, a higher percent body water indicates a larger amount of muscle and lean tissue. Mathematical equations are used to translate the percent body water measure into an indirect estimate of body fat and lean body mass. A standard method should be used to measure bioelectrical impedance because dehydration, recent exercise, skin and room temperature, and placement of electrodes all can affect test results. To obtain the most precise reading, the person being tested should fast for at least 4 hours and lie down for at least several minutes prior to testing. BIA may not be accurate in severely obese individuals, and it is not useful for tracking short-term changes in body fat brought about by diet or exercise.

In addition to body weight and height measurements, health professionals may also rely on a person's waist measurement to determine the location of excess body fat and the corresponding health risks. Analogous to BMI, health risks increase as waist circumference increases. A woman whose waist measures more than 35 inches and a man whose waist measures more than 40 inches may be at particular risk for developing health problems. Studies indicate that increased abdominal or upper body fat is related to the risk of developing heart disease, diabetes, high blood pressure, gallbladder disease, stroke, and certain cancers, and is associated with overall mortality (likelihood of death). Body fat concentrated in the lower body (around the hips, for example) may be less harmful in terms of mortality and morbidity (likelihood of disease), with the exception of varicose veins and orthopedic problems.<sup>3, 4</sup>

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### **Why Do Statistics About Overweight and Obesity Differ?**

The definitions or measurement characteristics for overweight and obesity have varied over time, from study to study, and from one part of the world to another. The varied definitions affect the prevalence statistics of studies and make it difficult to compare data from different studies and from different countries. *Prevalence* refers to the total number of existing cases of a disease or condition in a given population at a designated time. Some overweight- and obesity-related prevalences are presented in *total* (or *crude*) numbers, while others are *age-adjusted* numbers. For age-

adjusted rates, statistical procedures are used to remove the effect of age differences in populations that are being compared over different time periods. Total numbers and age-adjusted numbers will yield slightly different values.

Older studies in the United States have used the 1959 or the 1983 Metropolitan Life Insurance tables of desirable weight-for-height as the reference for overweight.<sup>5</sup> More recently, many Government agencies and scientific health organizations have estimated overweight using data from a series of cross-sectional surveys called the National Health Examination Surveys (NHES) and the National Health and Nutrition Examination Surveys (NHANES). These surveys were conducted by the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention (CDC). Each of these surveys had three cycles: NHES I, II, and III spanned the period from 1960 to 1970, and NHANES I, II, and III were conducted in the 1970's, 1980's, and early 1990's.

Many reports in the literature use a statistically derived definition of overweight from NHANES II (1976-1980). This definition (based on the gender-specific 85th percentile values of BMI for 20-29 year olds) is a BMI greater than or equal to ( $\geq$ ) 27.3 for women and  $\geq$  27.8 for men. Some studies round these numbers to a whole number, which affects the statistical prevalence. Rounding down will always increase the prevalence, and rounding up will decrease the prevalence. For example, 36.4 percent of women are overweight based on a BMI  $\geq$  27.3. When the BMI is rounded up to 28, only 33 percent of women are overweight (a decrease of 3.4 percent).<sup>6</sup>

In 1995, the World Health Organization recommended a classification for three "grades" of overweight using BMI cutoff points of 25, 30, and 40<sup>7</sup>. The International Obesity Task Force suggested an additional cutoff point of 35 and slightly different terminology.<sup>8</sup>

Two organizations within NIH--the National Heart, Lung, and Blood Institute (NHLBI) and the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)--convened an expert panel whose report, released in June 1998, provided definitions for overweight and obesity in agreement with those used by the World Health

Organization. The panel identifies overweight as a BMI  $\geq 25$  to less than ( $<$ ) 30, and obesity as a BMI  $\geq 30$ . (As explained previously, overweight and obesity are not mutually exclusive, since obese persons are also overweight.) These definitions are based on evidence that health risks increase more steeply in individuals with a BMI  $\geq 25$ .

As stated earlier, BMI cutoff points are a *guide* for definitions of overweight and obesity and are useful for comparative purposes across populations and over time; however, the health risks associated with overweight and obesity do not conform to rigid cutoff points. (For example, an overweight individual with a BMI of 29 does not instantly acquire all of the health consequences of obesity after crossing the threshold of BMI 30). Health risks increase gradually as BMI increases.

Regardless of the definitions used for overweight and obesity, studies have shown that the number of overweight individuals in the United States continues to rise for all age groups.

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## Prevalence Statistics Related to Overweight and Obesity \*

Overweight and obesity are found worldwide, and the prevalence of these conditions in the United States ranks high along with other developed nations. Approximately 280,000 adult deaths in the United States each year are attributable to obesity.<sup>9</sup>

Below are some frequently asked questions and answers about overweight and obesity statistics. Unless otherwise specified, the figures given represent total (not age-adjusted) numbers. (Age-adjusted numbers based on the 2000 population census will be posted at [http://www.health.gov/healthypeople/.](http://www.health.gov/healthypeople/))

\* The statistics presented here are based on the following definitions unless otherwise specified: overweight = BMI  $\geq 25$  to  $< 30$ ; obesity = BMI  $\geq 30$ .

### **Q: How many adults are overweight?**

**A:** More than half of U.S. adults are overweight (BMI  $\geq 25$ , which includes those who are obese).<sup>5</sup>

All adults (20+ years old): 97.1 million (54.9 percent)  
Women (20+ years old): 46.9 million (50.7 percent)  
Men (20+ years old): 50.2 million (59.4 percent)

**Q: How many adults are obese?**

**A:** Nearly one-quarter of U.S. adults are obese (BMI  $\geq$  30).<sup>5</sup>

All adults (20+ years old): 39.8 million (22.3 percent)  
Women (20+ years old): 23 million (25 percent)  
Men (20+ years old): 16.8 million (19.5 percent)

**Q: How many adults are a healthy weight?**

**A:** Less than half of U.S. adults are a healthy weight (BMI  $\geq$  19 to  $<$  25).<sup>5</sup>

All adults (20+ years old): 73.2 million (41.4 percent)  
Women (20+ years old): 40.3 million (43.6 percent)  
Men (20+ years old): 32.9 million (39.0 percent)

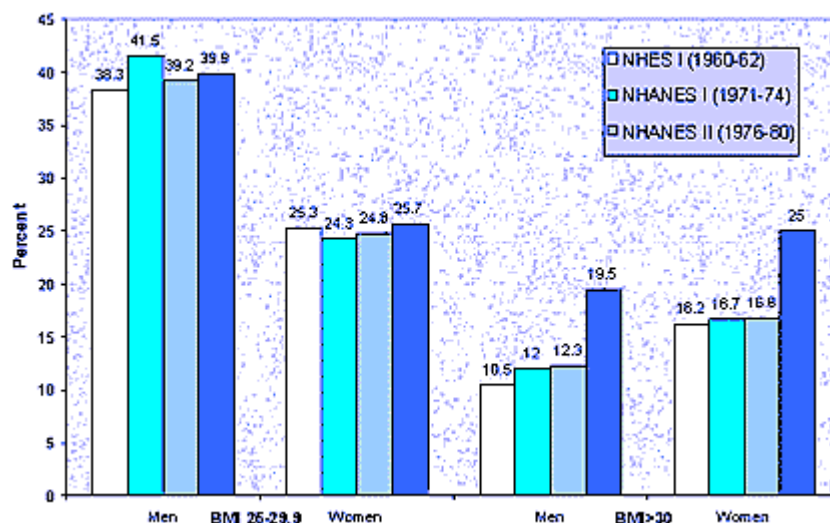
**Q: How has the prevalence of overweight and obesity in adults changed over the years?**

**A:** The prevalence has steadily increased over the years among nearly all\* racial/ethnic groups,<sup>5</sup> as shown in the chart below. For example, from 1960 to 1994, the prevalence of overweight (BMI  $\geq$  25 to  $<$  30) increased from 31.6 to 32.6 percent in U.S. adults. The prevalence of obesity (BMI  $\geq$  30) during this same time period increased from 13.4 to 22.3 percent--a relative increase of more than 50 percent--with most of this rise occurring in the past decade. The prevalence of overweight and obesity increases with advancing age until a person reaches his or her sixties, when it starts to decline.<sup>5</sup> From 1991 to 1998, obesity increased in every state of the United States, in both genders, and across all races/ethnicities, age groups, educational levels, and smoking statuses.<sup>10</sup>

\* An exception is the prevalence of overweight in white men in their

twenties to forties, which decreased from the early 1970s to late 1970s.

Figure 1. Prevalence of Overweight (BMI 25-29.9) and Obesity (BMI  $\geq$  30)



Source: CDC/NCHS, United States, 1960-1994

Note: Although the definitions of overweight and obesity based on BMI were slightly different in the 1960s than today's definitions, the data presented here are comparable. The older data were recomputed to reflect current definitions.

### Q: What is the prevalence of overweight and obesity in minorities?

**A:** The age-adjusted prevalence of combined overweight and obesity (BMI  $\geq$  25) in racial/ethnic minorities--especially minority women--is generally higher than in whites in the United States.<sup>5</sup>

Black women (20+ years old): 65.8 percent  
 Mexican American women (20+ years old): 65.9 percent  
 White women (20+ years old): 49.2 percent  
 Black men (20+ years old): 56.5 percent  
 Mexican American men (20+ years old): 63.9 percent  
 White men (20+ years old): 61.0 percent

Studies using this definition of overweight and obesity (BMI  $\geq$  25) provide ethnicity-specific data only for these three racial-ethnic groups. Studies using other definitions of overweight and obesity, as described earlier, find a high

prevalence of overweight and obesity among Hispanics and Native Americans. The prevalence of overweight and obesity in Asian Americans is lower than in the general population.<sup>1</sup>

**Q: What is the prevalence of overweight and obesity in children and adolescents?**

**A:** While there is no generally accepted definition for *obesity* as distinct from *overweight* in children and adolescents, the prevalence of overweight is increasing for children and adolescents in the United States. Approximately 11 percent of children (ages 6-11) and 11 percent of adolescents (ages 12-17) were overweight\* in 1988 to 1994--up from approximately 5 percent in the 1960s and 1970s.<sup>11</sup>

\* Overweight is defined by the sex- and age-specific 95th percentile cutoff points of the revised NCHS/CDC growth charts (preliminary data). The revised growth charts incorporate smoothed BMI percentiles and are based on data from NHES II (1963-1965) and III (1966-1970), and NHANES I (1971-1974), II (1976-1980), and III (1988-1994).

**Q: What is the prevalence of overweight and obesity in people with diabetes?**

**A:** Among persons who have been diagnosed with type 2 (noninsulin-dependent) diabetes, 67 percent have a BMI  $\geq$  27 and 46 percent have a BMI  $\geq$  30.<sup>12</sup> An estimated 15.6 million adults in the U.S. (8 percent of men and women age 20 or older) have diabetes, with type 2 diabetes accounting for about 90-95 percent of these cases. The relative risk of diabetes increases by approximately 25 percent for each additional unit of BMI over 22.<sup>13</sup>

**Q: What is the prevalence of overweight and obesity in people with hypertension (high blood pressure)?**

**A:** The age-adjusted prevalence of hypertension in overweight U.S. adults (BMI  $\geq$  25 and  $<$  30) is 23.9 percent for men and 23.0 percent for women, compared with 18.2 percent for men and 16.5 percent for women who are not overweight (BMI  $<$  25). The prevalence for obese adults (BMI  $\geq$  30) is 38.4 percent for men and 32.2 percent for women.<sup>14</sup> (Hypertension is defined as mean systolic blood pressure  $\geq$  140 mm Hg, mean diastolic  $\geq$  90 mm Hg, or currently taking antihypertensive medication.)

**Q: What is the prevalence of overweight and obesity in people with high blood cholesterol?**

**A:** The age-adjusted prevalence of high blood cholesterol ( $\geq 240$  mg/dL) in overweight U.S. adults (BMI  $\geq 25$  and  $< 30$ ) is 19.0 percent for men and 28.0 percent for women, compared with 14.7 percent for men and 15.7 percent for women who are not overweight (BMI  $< 25$ ). The prevalence for obese adults (BMI  $\geq 30$ ) is 20.2 percent for men and 24.7 percent for women.<sup>14</sup>

**Q: What is the prevalence of overweight and obesity in people with cancer?**

**A:** While direct prevalence information is not available, studies have found that heavier individuals are at increased risk for some types of cancers including endometrial (cancer of the lining of the uterus), colorectal, gallbladder, and renal cell (kidney) cancer.<sup>15</sup> Almost half of the post-menopausal women diagnosed with breast cancer have a BMI  $\geq 29$ .<sup>16</sup> In one study (the Nurses' Health Study), women gaining more than 20 pounds from age 18 to midlife doubled their risk of breast cancer, compared to women whose weight remained stable.<sup>17</sup>

**Q: What is the mortality rate associated with obesity?**

**A:** Most studies show an increase in mortality rate associated with obesity (BMI  $\geq 30$ ). Obese individuals have a 50-100 percent increased risk of death from all causes, compared with normal-weight individuals (BMI 20-25). Most of the increased risk is due to cardiovascular causes.<sup>18</sup>

**Economic Costs Related to Overweight and Obesity**

As the prevalence of overweight and obesity has increased in the United States, so have related health care costs--both direct and indirect. Direct health care costs refer to preventive, diagnostic, and treatment services (for example, physician visits, medications, and hospital and nursing home care). Indirect costs are the value of wages lost by people unable to work because of illness or disability, as well as the value of future earnings lost by premature death.

The statistics presented in question-and-answer form below

represent the economic cost of overweight and obesity in the United States in 1995. Unless otherwise specified, the statistics given are from Wolf and Colditz,<sup>19</sup> who based their data on existing epidemiological studies that defined overweight and obesity as a BMI  $\geq$  29.

**Q: What is the cost of overweight and obesity?**

**A: Total cost:** \$99.2 billion

**Direct cost:** \$51.6 billion (5.7 percent of the U.S. health expenditure)

**Indirect cost:** \$47.6 billion (comparable to the economic costs of cigarette smoking)

**What is the cost of heart disease related to overweight and obesity?**

**A: Direct cost related to overweight and obesity:** \$6.99 billion (17 percent of the \$40.4 billion total direct cost of heart disease, independent of stroke)

**Q: What is the cost of type 2 diabetes related to overweight and obesity?**

**A: Total cost related to overweight and obesity:** \$63.14 billion (more than 60 percent of the total cost of type 2 diabetes)

**Direct cost:** \$32.4 billion

**Indirect cost:** \$30.74 billion

**Q: What is the cost of osteoarthritis related to overweight and obesity?**

**A: Total cost related to overweight and obesity:** \$17.2 billion

**Direct cost:** \$4.3 billion

**Indirect cost:** \$12.9 billion

**Q: What is the cost of hypertension (high blood pressure) related to overweight and obesity?**

**A: Direct cost related to overweight and obesity:** \$3.23 billion (17 percent of the total cost of hypertension)

**Q: What is the cost of cancer related to overweight and obesity?**

**A: *Post-menopausal breast cancer***

**Total cost related to overweight and obesity:**

\$2.32 billion

**Direct cost:** \$840 million

**Indirect cost:** \$1.48 billion

***Endometrial cancer***

**Total cost related to overweight and obesity:**

\$790 million

**Direct cost:** \$286 million

**Indirect cost:** \$504 million

***Colon cancer***

**Total cost related to overweight and obesity:**

\$2.78 billion

**Direct cost:** \$1 billion

**Indirect cost:** \$1.78 billion

**Q: What is the cost of lost productivity related to obesity?**

**A:** The cost of lost productivity related to obesity (BMI  $\geq$  30) among Americans ages 17-64 is \$3.93 billion. This value considers the following annual numbers (for 1994):

**Workdays lost related to obesity:** 39.3 million

**Physician office visits related to obesity:** 62.7 million

**Restricted activity days related to obesity:** 239.0 million

**Bed-days related to obesity:** 89.5 million

**Other  
Statistics  
Related to  
Overweight  
and Obesity**

**Q: How much do we spend on weight-loss products and services?**

**A:** Americans spend \$33 billion annually on weight-loss products and services.<sup>20</sup> (This figure represents consumer dollars spent in the early 1990s on all efforts at weight loss or weight maintenance including low-calorie foods,

artificially sweetened products such as diet sodas, and memberships to commercial weight-loss centers.)

**Q: How physically active is the U.S. population?**

**A:** Only 22 percent of U.S. adults get the recommended regular physical activity (5 times a week for at least 30 minutes) of any intensity during leisure time. About 15 percent get the recommended amount of vigorous activity (3 times a week for at least 20 minutes). About 25 percent of adults claim they do no physical activity at all in their leisure time.<sup>21</sup>

About 25 percent of young people (ages 12-21 years) participate in light to moderate activity (e.g., walking, bicycling) nearly every day. About 50 percent regularly engage in vigorous physical activity. Approximately 25 percent report no vigorous physical activity, and 14 percent report no recent vigorous or light to moderate physical activity.<sup>21</sup>

Lack of physical activity contributes to the high prevalence of overweight and obesity in the United States. In addition to helping to control weight, physical activity decreases the risk of dying from coronary heart disease and reduces the risk of developing diabetes, hypertension, and colon cancer.<sup>21</sup>

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**Research on Obesity**

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) is the part of the National Institutes of Health primarily responsible for obesity- and nutrition-related research. NIDDK supports the study of obesity in its own laboratories and clinics and at universities, hospitals, and research centers across the United States. NIDDK-funded research has helped scientists learn more about the role of genes and metabolism in obesity. Other NIDDK-supported studies have examined the relationship between obesity and other medical conditions such as breast cancer. Ongoing NIDDK research efforts include better ways to define and manage obesity and to understand how the body stores and uses fat.

NIDDK also transfers research knowledge about overweight and obesity to health professionals, patients, and the

general public through the Weight-control Information Network.

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