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Prevalence of overweight and obesity among adults in Minnesota and its relationships with demographic variables

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The prevalence of overweight and obesity has increased sharply since the mid-1970s for both adults and children in the United States. Data from National Health and Nutrition Examination Surveys (NHANES) show that among adults aged 20-74 years the prevalence of obesity increased from 15.0% in the 1976-1980 survey to 32.9% in the 2003-2004 survey. Between 1980 and 2002, overweight prevalence tripled in children and adolescents aged 6 to 19 years.[1] Being overweight or obese increases the risk of many diseases and health conditions, including hypertension, type 2 diabetes, coronary heart disease, stroke and some cancers.[2] Thus the increasing prevalence of overweight and obesity raises concern for Americans' health. One of the national health objectives for 2010 is to reduce the prevalence of obesity among adults to less than 15 percent.

This report examines the prevalence of overweight and obesity among Minnesota adults. Data came from the Minnesota Survey on Adult Substance Use (MNSASU), a statewide telephone survey conducted between October 2004 and July 2005. A total of 16,891 adults, selected using a stratified random sample design, participated in the survey with an overall response rate of 55%.[3] All the data analyses were conducted using SPSS Complex Samples procedures. Adults under the age of 20[4] (418 cases) or pregnant women (184 cases) are excluded from the analyses.

Body mass index (BMI), expressed as weight/height^2 (kg/m^2), is a reliable indicator of body fatness for people. For adults 20 years old and older, BMI is interpreted using standard weight status categories that are the same for all ages and for both men and women: underweight (below 18.5), healthy weight (18.5-24.9), overweight (25.0-29.9) and obesity (30.0 and above).[5,6]

About 38% of Minnesota adults are overweight, with an additional 22% being obese.

In Minnesota, over one-third (38%) of adults are overweight with an additional 22% being obese. Compared to the estimates for U.S. adults based on NHANES, Minnesota adults are more likely to have a healthy weight and less likely to be obese. However, these differences are probably due to the difference in methodology: Minnesota data are based on self-report whereas in NHANES, height and weight were measured by field workers. Another national survey that is based on self-report (Behavioral Risk Factor Surveillance System) showed that national prevalence of overweight and obesity was similar to Minnesota estimates.

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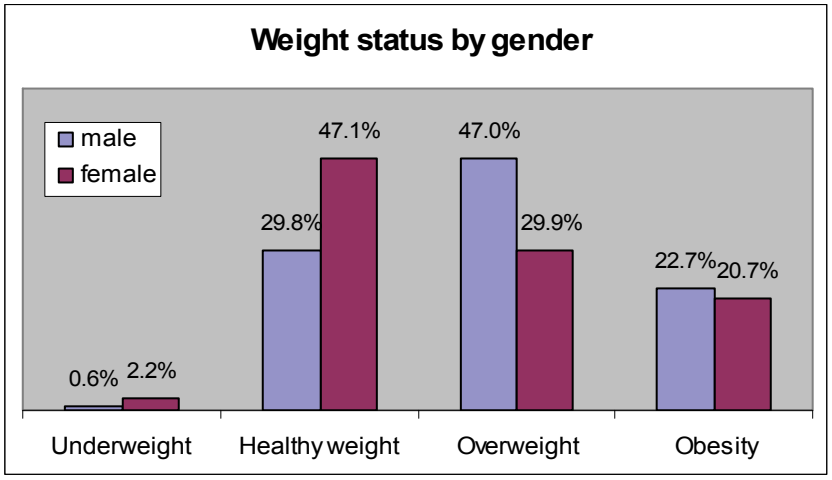
[1] Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. *Prevalence of overweight and obesity in the United States, 1999-2004. JAMA* 2006;295:1549-1555.
[2] CDC document available at http://www.cdc.gov/nccdphp/dnpa/obesity
[3] For detailed information about the survey, go to DHS web page: http://www.dhs.state.mn.us/main/groups/healthcare/documents/pub/dhs_id_010105.hcsp#P165_4772
[4] According to U.S. Department of Health and Human Services, those who are 12 to 19 year olds are considered as adolescents in terms of body weight status.
[5] CDC document available at http://www.cdc.gov/nccdphp/dnpa/obesity
[6] U.S. Department of Health and Human Services. *Statistics related to overweight and obesity.* October 2006

Weight Status among Minnesota Adults vs. U.S. Adults

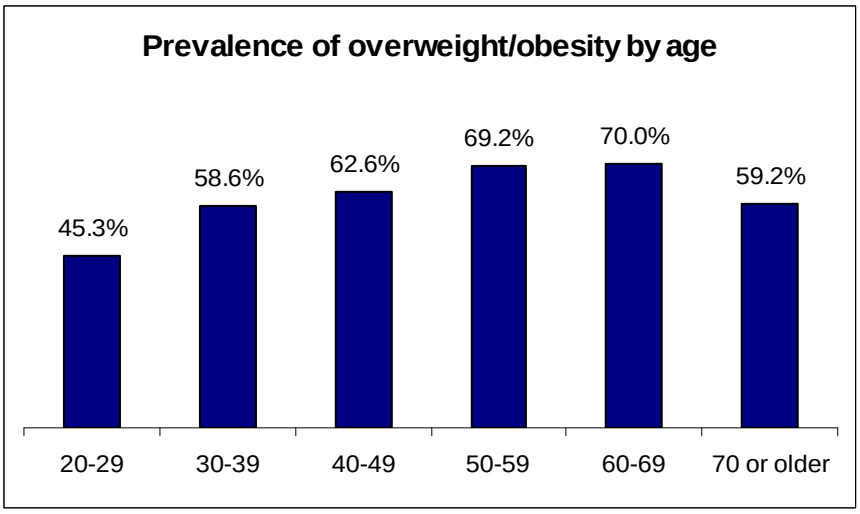
	U.S. Data from 2003/2004 NHANES	U.S. Data from 2004 BRFSS	Minnesota
Underweight	0.8%	39.6%*	1.4%
Healthy weight	32.9%		38.6%
Overweight	34.1%	36.9%	38.3%
Obesity	32.2%	23.2%	21.7%

* BRFSS data provided an estimate for a combined category for "neither overweight, nor obese."

Males are more likely to be overweight or obese than females. In general, the prevalence of overweight/obesity increases as people get older although it declines among the oldest group. A significant increase in the prevalence of overweight/obesity occurs in the 30s among men and in the 50s among females.



About 47% of Minnesota females have a healthy weight whereas only three in 10 males have a healthy weight. The exact mirror image of that is seen in the prevalence of overweight across genders: 47% of males, compared to three in 10 females, are overweight. The relative risk of being overweight or obese is 1.4 for Minnesota male adults. That is, a male adult in Minnesota is 1.4 times as likely to be overweight or obese as a female adult. The obesity rate is also higher among males than females, but the difference is not as large as in the overweight rates. On the other hand, females are more likely to be underweight than their male counterparts (2.2% vs. .6%).

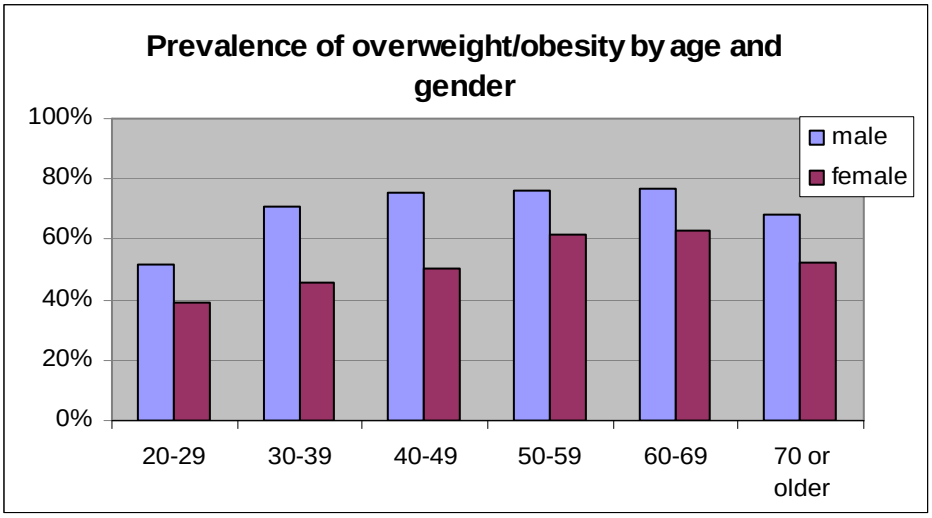


In general, older Minnesota adults are more likely to be overweight or obese than younger adults. About 45% of 20-29 year old adults are overweight or obese and the proportion significantly increases to 59% among those in their 30s. Another significant increase in the proportion of overweight/obesity occurs among adults in their 50s: 63% of the 40-49 year olds, compared to 69% of the 50-59 year olds, are overweight or obese. The prevalence of overweight/obesity significantly decreases among Minnesota adults who are 70 years old or older. This could be at least partially explained by the increased risk of death among obese people.[7]

Examination of the proportion of obesity across age shows a similar pattern: A significant increase in the proportion occurs among the 30-39 year old adults (from 16% among adults in their 20s to 21% among adults in their 30s), and among the 50-59 year olds (from 23% of the 40-49 year olds to 28% of the 50-59 year olds being obese). In addition, a similar decline in the proportion is seen among the oldest age group (70 or older) with 19% being obese, a significant drop from 24% among the 60-69 year old adults.

Male adults in Minnesota show significantly higher proportions of overweight/obesity compared to their female counterparts across all age groups. For male adults, the prevalence of overweight/obesity significantly increases from 52% of the 20-29 year olds to 71% of the 30-39 year olds. The proportion of overweight and obese males stays above 75% throughout the rest of the age categories until it declines to 68% among the oldest group. For female adults, the prevalence of overweight and obesity gradually increases across age groups, followed by a significant increase among the 50-59 year olds: 50% of the 40-49 year old females, compared to 62% of the 50-59 year old females, are reported to be either overweight or obese. A significant decrease in the proportion of overweight and obese females also occurs among the oldest female adults (from 63% among the 60-69 year old females to 52% of those in their 60s).

[7] Calle EE, Thun MJ, Petrelli JM, Rodriguez C, Heath CW. Body mass index and mortality in a prospective cohort of U.S. adults. N Engl J Med 1999 Oct 7;341(15):1097-105.



Examination of overweight rates separately from obesity rates shows another interesting gender difference. The significant percentage increase observed among males in their 30s was mostly due to the increase in the overweight prevalence: The percentage increase of overweight males from 36% of the 20-29 year olds to 49% of the 30-39 year olds was statistically significant whereas the percentage increase of obese males across the same age groups (16% to 22%) was not. On the other hand, the comparable proportion hikes observed among females in their 50s from the previous age group was significant in the obesity rates (21% to 28%), but not in the overweight rates (29% to 33%).

Asian/Pacific Islanders show the highest proportion having a healthy weight, and American Indians the lowest. Among females, American Indians, blacks and Hispanics have significantly higher rates of obesity than white adults. Among males, however, there is no significant difference across race/ethnicity sub-groups.

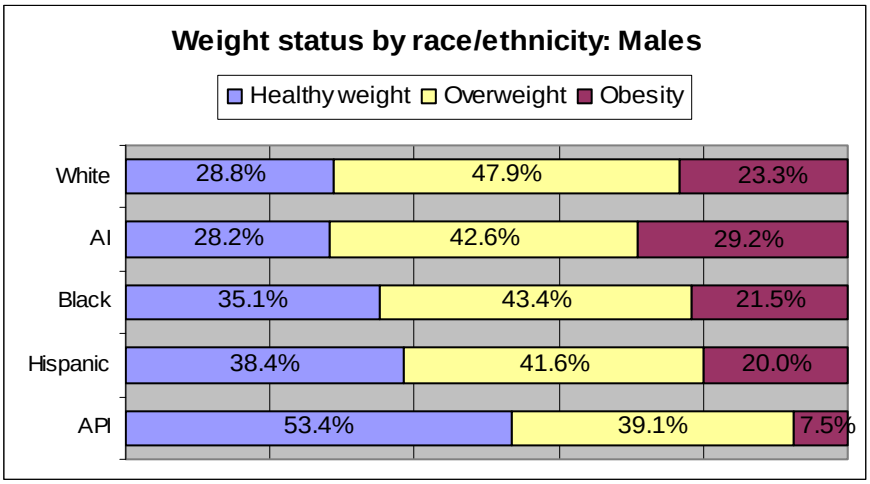
More than 60% of Asian/Pacific Islanders (API) in Minnesota have a healthy weight whereas only 26% of American Indians (AI) have a healthy weight. Among white adults in Minnesota, about 39% have a healthy weight, another 39% are overweight and 22% are obese. Compared to white adults, American Indians (40%) blacks (31%) and Hispanics (25%) have significantly higher rates of obesity and Asian/Pacific Islanders (6%) have significantly lower rates of obesity.[8]

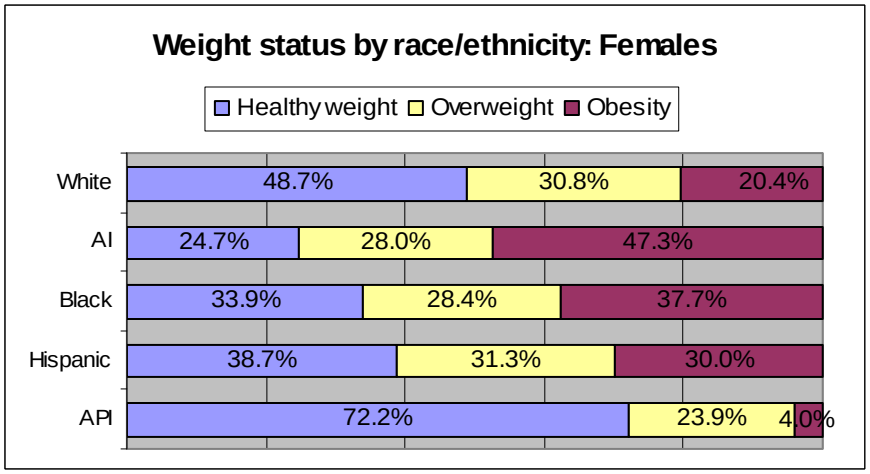
[8] A logistic regression controlling for age, gender, education, income, immigration and metro residency showed, compared to whites, significantly higher rates of obesity for Hispanics (odds ratio=1.83; 95% CI= 1.24-2.70), blacks (odds ratio=1.92; 95% CI= 1.39-2.64), American Indians (odds ratio=2.23; 95% CI= 1.25-3.98), and a significantly lower rate for API (odds ratio=0.47; 95% CI= 0.23-0.99).

Weight Status by Race/Ethnicity

	Healthy weight	Overweight	Obesity
White	38.8%	39.3%	21.9%
American Indian (AI)	26.1%	33.6%	40.3%
Black	34.4%	35.1%	30.5%
Hispanic	38.5%	36.3%	25.2%
Asian/Pacific Islander (API)	62.2%	31.9%	5.8%

Note. Underweight category is excluded from race/ethnicity comparisons.



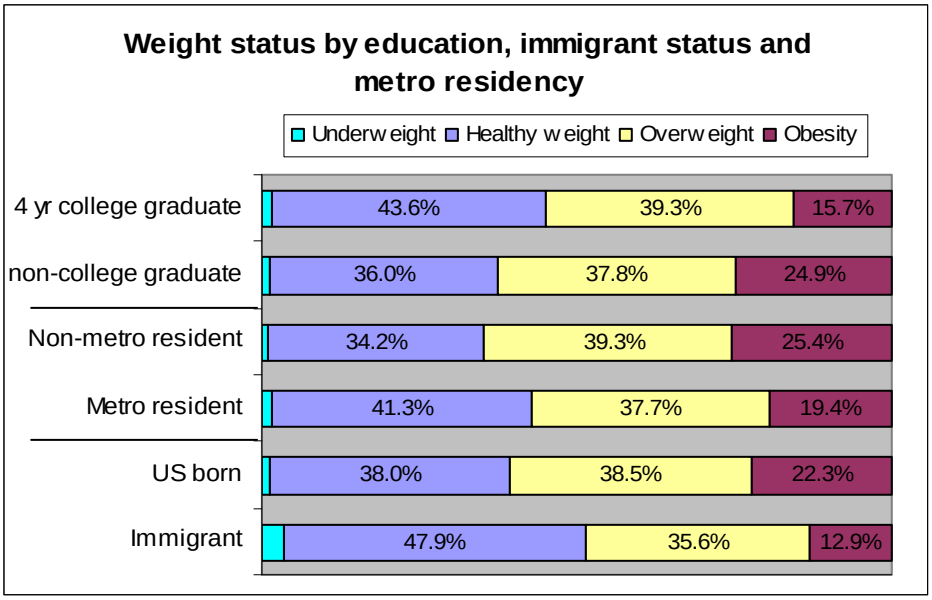


Gender specific comparisons show that the differences across race/ethnicity subgroups largely disappear among male adults. In fact, among male adults, there is no significant relationship between race/ethnicity and weight categories if the Asian/Pacific Islanders were excluded. Multiple logistic regression analysis also confirms this finding (see

appendix). On the other hand, about 20% of white females are obese compared to 47% of American Indian females, 38% of black females and 30% of Hispanic females. Only 4% of API females are obese. Odds ratios from multiple logistic regression analyses are reported in the appendix.

For white adults, both overweight and obesity rates are significantly higher among males than females. Among American Indians, blacks and Hispanics, however, more females than males are obese while more males than females are overweight. This was not statistically significant but the pattern was consistent across all minority groups except APIs.

Minnesota adults with a 4-year college degree are more likely to have a healthy weight than those without it. U.S.-born adults (compared to immigrants) and adults in rural areas (compared to those in the metro area) are more likely to be obese.



Minnesota adults who graduated from a 4-year college are significantly less likely to be obese than those who did not graduate from a 4-year college. About 16% of those with a college degree, compared to a quarter of those with lesser education, are obese. This is true when household income level was controlled (see appendix for the multivariate logistic regression results). Compared to Minnesota adults who were born in the U.S., immigrants are significantly more likely to have healthy weight and less likely to be obese. Almost half of the immigrants have a healthy weight and only 13% are obese. Similarly,

Minnesota adults in the metro area[9] are more likely to have a healthy weight and less likely to be obese than those living in rural areas. Similar patterns were found when the analyses were conducted separately for each gender.

In sum, adults in Minnesota are slightly more likely to have a healthy weight than adults nationwide; however, fully three in five Minnesota adults are still either overweight or obese. The problem is greater among males than females. Both males and females gain weight as they age (until their seventies), but males increase in overweight from their twenties into their thirties whereas females increase in obesity from their forties into their fifties. There are some differences among other demographic groups, with obesity more likely to occur among rural compared to metro residents, U.S.-born persons compared to immigrants, and non-college graduates compared to college graduates. Also, among females (but not among males), Hispanics, Blacks and American Indians are more likely to be obese than Whites or Asian/Pacific Islanders.

[9] Those who live in the 7 metro counties (Hennepin, Ramsey, Anoka, Carver, Scott, Dakota, Washington) as well as Stearns and St. Louis counties are considered as metro residents.

– Appendix –

Multivariate logistic regression results

	Males (n=6002)		Females (n=8635)	
Factors (reference category)	Odds Ratio	95% CI	Odds Ratio	95% CI
Age (20-29)	p=.000		p=.000	
30-39	1.71	1.25-2.35	1.55	1.17-2.05
40-49	1.98	1.46-2.67	1.64	1.24-2.16
50-59	2.21	1.62-3.00	2.49	1.89-3.27
60-69	1.91	1.37-2.66	1.65	1.22-2.23
70 or older	1.23	.85-1.77	.99	.73-1.34
Race/ethnicity (white)	p=.508		p=.000	
Black	1.14	.70-1.87	2.60	1.73-3.90
American Indian	1.25	.64-2.43	3.05	1.44-6.44
Hispanic	1.39	.77-2.52	2.17	1.31-3.61
Asian/Pacific Islander	.56	.21-1.52	.31	.12-.79
Immigrant (U.S. born)	p=.019		p=.006	
Immigrant	.55	.33-.91	.56	.37-.84
Residency (non metro)	p=.002		p=.017	
Metro	.76	.64-.91	.83	.72-.97
Education (4 year college degree or above)	p=.000		p=.000	
High school graduate or less	1.50	1.20-1.87	1.74	1.42-2.13
Some college	1.61	1.31-1.99	1.61	1.33-1.95
Income (more than $60,000)	p=.233		p=.000	
$30,000 or less	1.23	.97-1.55	1.68	1.36-2.08
$30,001-60,000	1.11	.91-1.34	1.36	1.13-1.64

Dependent variable: Obesity (1=yes; 0=no)