

Nearly One in Five Maryland Adults is Obese

The prevalence of obesity among Maryland's adults age 18 and older rose by 57 percent during the 1990s, from 11.6 percent in 1991 to 18.2 percent in 1999. The state's rate of increase mirrors the national increase over this time period. These data, from the Behavioral Risk Factor Surveillance Survey (BRFSS), are probably conservative estimates.¹

Obesity is currently defined as a body mass index (BMI) of 30 or greater, and overweight is a BMI between 25 and 30. BMI is the ratio of an individual's weight (in kilograms) to height (in meters squared). Obesity and overweight have become increasingly prevalent among adults since the 1980s.² In 1999, more than half of adults in Maryland and nationwide were either overweight or obese.³ Data from the BRFSS indicate that while BMI has increased across both sexes and all sociodemographic groups, the greatest increases have occurred among the young and highly educated populations.¹ Experts believe that the rise in BMI is the result of an overall high-calorie diet and low levels of physical activity. This problem is mainly due to advances in technology, which have resulted in higher standards of living but work that is more sedentary.^{2,4}

Increases in the prevalence of obesity have a dramatic effect on public health because, in addition to causing deaths directly, obesity is associated with the development of serious chronic conditions, such as cardiovascular disease, Type II diabetes mellitus, hypertension, stroke, dyslipidemia, osteoarthritis, and some cancers.⁵ In a population of 1 million persons aged 35 to 84 years, one study estimated that obesity would account for approximately 132,900 cases of hypertension (45.0 percent of all cases), 58,500 cases of Type II diabetes (85.0 percent), 51,500 cases of hypercholesterolemia (18.0 percent), and 16,500 cases of coronary heart disease (35.0 percent). The study estimated healthcare costs attributable to obesity for this population to total \$345.9 million, or about \$346 for each person aged 35 to 84, obese or not.⁶ A recent report estimated the total cost to the United States

Obesity & Overweight Prevalence in Adults: 1991-1999⁸

	MD		US		% Change	
	1991	1999	1991	1999	MD	US
Obese	11.6	18.2	12.6	19.7	+57	+56
Overweight	32.0	37.2	33.6	36.8	+16	+10
Combined	43.6	55.4	46.2	56.5	+27	+22

Obesity* & Overweight Prevalence in Adults by Sex: 1999⁹

	Male		Female	
	Obese	Overweight	Obese	Overweight
MD	16.4	45.8	19.9	29.0

*Note: Obesity does not significantly differ between males and females. In both tables, obesity is defined as BMI ≥ 30 . Overweight is defined as BMI between 25.0 and 29.9. All values are percentages. U.S. values are the median of all states that reported data.

health system of treating persons with obesity in 1999 to be \$238 billion, of which \$102 billion is the cost of treating obesity itself.⁷

Simply being overweight but not obese can have a detrimental effect on an individual's health status. More than one-third of U.S. adults are overweight (but not obese).³ BRFSS data indicate that 37.2 percent of Maryland adults age 18 and older were overweight in 1999. Unlike obesity, prevalence of overweight was higher in Maryland than the median for all states in 1999.⁸

Prevalence rates for obesity or overweight vary by gender and race/ethnicity. Although prevalence of obesity is statistically similar in men and women, men are more likely to be overweight. This disparity has occurred throughout the 1990s, both in Maryland and nationwide. Across all states in 1999, prevalence of overweight or obesity is highest among blacks, followed by Hispanics, then whites, with other racial groups ranking last. In Maryland, blacks are significantly more overweight/obese than all other racial groups.⁹

Overweight and Obesity Across Maryland's Jurisdictions

The 1997-1999 3-year average for prevalence of overweight and obesity combined across Maryland's jurisdictions ranged from a low of 41.8 percent in Montgomery County to a high of 59.5 percent in Baltimore City. In all but six counties (Montgomery, Howard, St. Mary's, Queen Anne's, Somerset, and Cecil), more than half of the population was overweight or obese.¹⁰

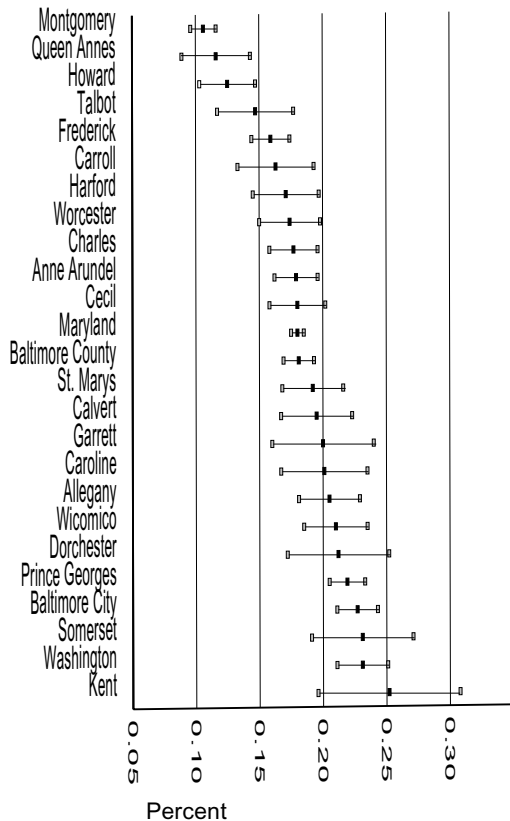
Four of the six counties in the Baltimore Metro Area and five of the nine counties in the Eastern Shore Region ranked among the counties with the lowest overweight/obese prevalence in the state. The areas of greater prevalence were Western Maryland (3 of the 4 counties) and Southern Maryland (2 of the 3 counties).¹⁰

We identified counties with an upward or downward trend during this period by comparing 1997-1998 prevalence rates to those for 1998-1999. Two counties had statistically significant increases: Baltimore (3 percent) and Prince George's counties (5 percent). Two counties had statistically significant decreases: Cecil (13 percent) and St. Mary's counties (6 percent).¹⁰

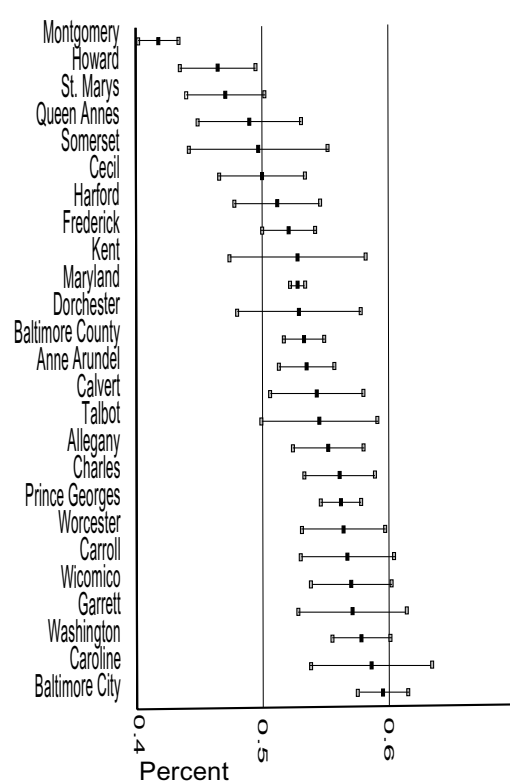
The 3-year prevalence of obesity across Maryland jurisdictions ranged from a low of 10.6 percent in Montgomery County to a high of 25.2 percent in Kent County. The county rankings for prevalence of obesity did not always reflect the pattern for the combination of overweight/obese. One-third of the counties in the lower half of jurisdictions for prevalence of overweight/obese were in the top half of obese prevalence rates, indicating that obese individuals comprise a higher share of overweight/obese residents in these counties relative to other counties.¹⁰

As with the prevalence of overweight/obese, the Baltimore Metro Area counties had a lower prevalence of obesity, Southern Maryland and Western Maryland counties had higher prevalence rates, and the Eastern Shore counties were split between the lower and upper halves.¹⁰ The only county exhibiting an upward trend in obesity over this period was Prince George's County with a 3 percent increase.¹⁰

Proportion Obese by Maryland County 1997-1999: Midpoint Within 95% Confidence Interval¹⁰



Proportion Obese & Overweight by Maryland County 1997-1999: Midpoint Within 95% Confidence Interval¹⁰

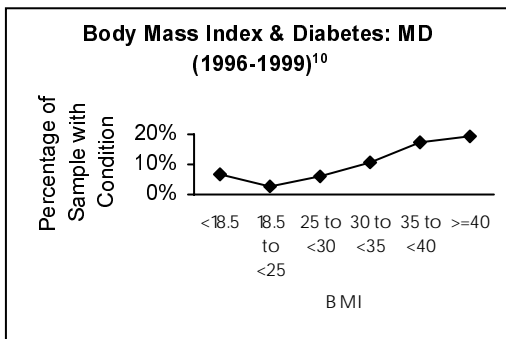


The Relationship Between BMI and Chronic Diseases in Maryland Adults

BRFSS data permit a Maryland-specific examination of the relationships between BMI and 2 of the chronic conditions cited earlier (i.e., diabetes and hypertension), along with cholesterol and other health status measures.

Diabetes

Obesity results in an insulin resistant state¹¹, which is associated with Type II diabetes. However, a study using NHANES III data found significantly increased prevalence for Type II diabetes (and hypertension) even in those who were overweight, but not obese.¹² As with the NHANES population, BMI and diabetes are positively correlated in Maryland adults. Between 1992 and 1999, the percentage of Maryland residents over the age of 18 who reported having diabetes rose by 21 percent from 5.6 percent of the population in the former year to 6.8 percent in the latter year. The corresponding growth in the percentage of adults reported to be either overweight or obese was 16 percent.¹⁰



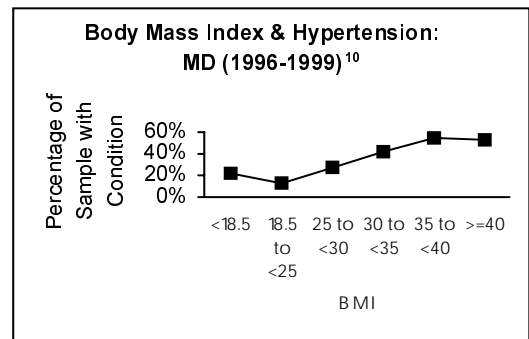
The graph above is based on a sample of Maryland adults from 4 years and depicts how the likelihood of developing diabetes increases with BMI. Within this sample, the risk is lowest for individuals with a BMI of 18.5 to just under 25 (2.9 percent). Diabetes is more likely for those who are leaner (6.4 percent) or overweight but not obese (6.0 percent). As expected, risk is greater for the obese and grows, as BMI increases, to 19.4 percent of individuals with a BMI of 40 or greater reporting a diagnosis of diabetes.¹⁰

When BMI is considered simultaneously with other risk factors (i.e., sex, race, ethnicity, age, education, marital status, income, physical activity, and past attempts to lose weight), the odds of a diabetes diagnosis increase by 3.4 for each unit increase in BMI above the average (i.e., 26.1). So an obese adult with a BMI of 36 is 34

times more likely to have the disease than a mildly overweight person with a BMI of 26, all other things being equal. These results differed slightly from the estimates generated for a U.S. sample of data in which the odds of developing diabetes leveled off after a certain body mass had been attained.¹⁰

Hypertension

Although scientific studies have indicated a strong relationship between obesity and hypertension, the risk of developing hypertension is not as greatly influenced by BMI relative to diabetes. Specifically, studies have estimated that a BMI higher than 32 increases the risk of diabetes 40 times but increases the risk of hypertension only 6 times.¹¹ Even so, significant long-term reductions in blood pressure can result from modest weight loss.¹³



As indicated by the graph above, which is based on a sample of Maryland adults from 1996 to 1999, the likelihood of being diagnosed with hypertension is positively correlated with BMI. Thirteen percent of individuals with a BMI of 18.5 to less than 25 reported being hypertensive compared to 27.5 percent for overweight individuals and nearly 51.9 percent of individuals with a BMI of 40 or greater. When other risk factors besides body weight are considered (i.e., sex, race, ethnicity, age, education, marital status, and income), hypertension increases with BMI in a curvilinear fashion, but the effect levels off. In our sample, hypertension leveled off at a BMI value between 47 and 48. Results were similar in the U.S. sample.¹⁰

High Cholesterol & Other Measures

Obesity is associated with insulin resistance and abnormalities in serum lipids, including triglycerides¹¹. The association between high cholesterol and BMI begins below the cut-off for obesity. Between the period 1992 and 1999, the probability of being overweight/obese and the probability of having high cholesterol both increased in Maryland adults, becoming more similar to one another. The dramatic increase in the proportion of individuals reporting a high cholesterol level was probably affected by more widespread screening efforts during the 1990s. The percentage of this population with high cholesterol increased by 78 percent, from a 17.2 prevalence rate in 1992 to 30.6 in 1999.¹⁰

When considered with other risk factors (i.e., sex, race, ethnicity, age, education, marital status, and income), our analysis found that the odds of having high cholesterol increases with BMI in a curvilinear fashion, but levels off after a certain body mass (i.e., 31) has been attained. Similar results were obtained for the U.S. sample.¹⁰

Controlling for other risk factors, we found that the odds of having a heart attack and the number of days of poor physical health, self-reported by Maryland respondents, tend to increase with BMI. We also found that the number of days of poor physical health, self-reported by U.S. respondents, tends to increase with BMI, as does the risk of angina.¹⁰

Public Health Efforts

According to most experts, obesity is a complex issue that cannot be handled by physicians alone, but requires changes in policy and education (of both the public and healthcare providers) as well as a team approach to patient care involving dietitians and health educators.¹⁴ The state of Maryland has made some efforts to combat obesity through a variety of programs (e.g., Move it Maryland Physical Activity & Nutrition Coalition, a conference on addressing childhood obesity through schools, community nutrition education, state membership in the National Partnership for Healthy Weight Management, and the Maryland State Advisory Council on Physical Fitness)¹⁵, but the federal government has only recently initiated a comprehensive effort. In January, 2001, Surgeon General Dr. David Satcher announced a year-long plan, integrating schools, workplaces, and clinics, to deal with the obesity epidemic. The US Department of

Health and Human Services has already held meetings of public health experts and researchers to initiate the development of a national action plan. Meetings are also scheduled for 2001 between federal agencies to develop an integrated government strategy.

Notes

¹ Mokdad AH et al. "The Spread of the Obesity Epidemic in the United States, 1991-1998." *Journal of the American Medical Association*, 282(16):1519-1522. October 27, 1999.

² Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. "Preventing Obesity Among Children." *Chronic Disease Notes & Reports*, 13(1)1-4. Winter, 2000.

³ Centers for Disease Control and Prevention, National Center for Health Statistics. "Prevalence of Overweight and Obesity Among Adults: United States, 1999." Dec. 11, 2000. www.cdc.gov/nchs/products/pubs/pubd/hestats/obese/obse99.htm.

⁴ Philipson TJ & Posner RA. "The Long-Run Growth in Obesity as a Function of Technological Change." Working Paper, University of Chicago. May 17, 1999.

⁵ Allison DR et al. "Annual Deaths Attributable to Obesity in the United States." *Journal of the American Medical Association*, 282(16):1530-1538. October 27, 1999.

⁶ Oster G et al. "The Clinical and Economic Burden of Obesity in the Managed Care Setting." *American Journal of Managed Care*, 6(6):681-689. June, 2000.

⁷ Rubin RJ et al. *Cost of Obesity*. Lewin Group, American Obesity Association. Sept. 15, 1999.

⁸ Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. *BRFSS Summary Prevalence Reports*. June 23, 2000.

⁹ Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. Behavioral Risk Factor Surveillance Survey Prevalence and Trends Data.

<http://apps.nccd.cdc.gov/brfss>

¹⁰ MHCC analyses of Behavioral Risk Factor Surveillance Survey data.

¹¹ Pi-Sunyer FX. "Pathogenesis of Obesity." *Drug Benefit Trends*, 12(supp A):28-33. 2000.

¹² Must A et al. "The Disease Burden Associated with Overweight and Obesity." *Journal of the American Medical Association*, 282(16):1523-1529. October 27, 1999.

¹³ Stevens TJ et al. "Long-Term Weight Loss and Changes in Blood Pressure: Results of the Trials of Hypertension Prevention, Phase II." *Annals of Internal Medicine*, 134:1-11. January 2, 2000.

¹⁴ Pickering TG. "Obesity and Hypertension: What Should We Do?" *Annals of Internal Medicine*, 134:72-73. Jan. 2, 2001.

¹⁵ U.S. Department of Health and Human Services. "Surgeon General Launches Effort to Develop Action Plan to Combat Overweight, Obesity." *HHS News*, United States Surgeon General Press Release. Jan. 18, 2001.

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We gratefully acknowledge the assistance of Alyse Weinstein and Helio Lopez from the Office of Public Health Assessment, Maryland DHMH.