

Obesity

Obesity is weight that endangers health because of its high body fat relative to lean body mass. It is highly prevalent in societies in the developed world and is linked to very high rates of chronic illnesses, higher than living in poverty, and much higher than smoking or drinking.²⁷⁷ Physical inactivity and poor diet are stated to be the most important contributors to obesity, although other contributing factors play an important role as well.²⁷⁸ Weight gain during teen years may worsen adult heart health²⁷⁹ while excess body weight during midlife is associated with an increased risk of death.²⁸⁰ And, in comparison to men, women suffer a disproportionate burden of disease attributable to overweight and obesity.²⁸¹ Consequently, obesity is becoming one of the newest targets of public health law,²⁸² such as regulating sugary beverages. The only positive health benefit to being obese is that obese persons survive heart attacks better than lean persons.²⁸³

Body mass index (BMI), expressed as weight/height² (kg/m²), is commonly used to classify persons as underweight, normal weight, overweight, and obese. In addition, obese is subdivided into obese and morbidly obese (about 100 lb overweight or BMI ≥ 40). The terms “at risk of overweight” and “overweight” for children have been recommended to be replaced by “overweight” and “obese” (www.amednews.com 7/9/07) and those recommendations will be followed in this report.

The prevalence of morbidly obese is increasing faster in the US than the prevalence of moderately obese (BMI ≥ 30 to < 40).²⁸⁴ BMI as it is currently employed, however, may misdiagnose Asians, many of whom experience metabolic risks such as hypertension and diabetes at a much lower threshold than is associated with other racial/ethnic groups.

Obesity has increased at an alarming rate in the United States over the past three decades.²⁸⁵ Based on National Health and Nutrition Examination Surveys (NHANES), currently, 66% of adults are overweight or obese; 34% of children are overweight and 16% are obese, and 11.5% of children 6-23 m

²⁷⁷ Sturm R, Wells KB. Does obesity contribute as much to morbidity as poverty or smoking? *Public Health Rep* 2001;115:229-295.

²⁷⁸ Keith SW et al. Putative contributors to the secular increase in obesity: exploring the roads less traveled. *Int J Obes* 2006;30:1585-1594.

²⁷⁹ Sivanandam S et al. Relation of increase in adiposity to increase in left ventricular mass from childhood to young adulthood. *Am J Cardiol* 98: 2006;411-415.

²⁸⁰ Adams KF et al. Overweight, obesity, and mortality in a large prospective cohort of persons 50 to 71 years old. *N Engl J Med* 2006;355:763-778.

²⁸¹ Muennig P et al. Gender and the burden of disease attributable to obesity. *Am J Public Health* 2006;96:1662-1668.

²⁸² Gostin LO. Law as a tool to facilitate healthier lifestyles and prevent obesity. *J Am Med Ass* 2007;297:87-90.

²⁸³ Fonarow GC et al. An obesity paradox in acute heart failure: analysis of body mass index and in-hospital mortality for 108,927 patients in the Acute Decompensated Heart Failure National Registry. *Am Heart J* 2007;153:74-81.

²⁸⁴ Sturm R. Increases in morbid obesity in the USA:2000-2005. *Public Health* 2007;121:492-496.

²⁸⁵ Wang Y, Beydoun MA. The obesity epidemic in the United States – gender, age, socioeconomic, racial/ethnic, and geographic characteristics: a systematic review and meta-regression analysis. *Epidemiol Rev* 2007;29:6-28.

old are obese (www.cdc.gov/nchs). Further, it is estimated that 21.4% of aged Medicare beneficiaries and 39.3% of disabled beneficiaries are obese.²⁸⁶

Significant differences in obesity exist by race/ethnicity and by age. Approximately 30% of non-Hispanic white adults are obese compared to 45% of non-Hispanic blacks and 36.7% of Hispanics. Non-Hispanic black and Hispanic children are much more likely to be overweight than white children. Non-Hispanic black females and Hispanic males have the highest prevalences of being overweight among children and adolescents.²⁸⁷

In addition to the NHANES estimates, the Behavioral Risk Factor Surveillance System (BRFSS) generates estimates of the prevalence of obesity. However, prevalences from that survey are believed to under estimate the actual prevalence of overweight and obesity.^{288 289} This is because women of all ages under estimate their weight while young and middle-aged men often over report their height. These behaviors then lead to faulty BMI calculations. With that acknowledgement, based on 2006 BRFSS data,²⁹⁰ Missouri's adult obesity is between 25% and 29.9%. A survey of Missouri high school students, conducted in 2003, found that 12.1% were obese and that 36.4% had insufficient or no moderate or vigorous physical activity.

For Kansas City residents the data from the 2003 BRFSS data found 64.7% of those ≥ 18 y old were overweight (30.7%) or obese (34.0%). This rate was slightly higher than the 63% for the Missouri side of the metropolitan area (35.6% overweight, 27.4% obese) and noticeably higher than the 58.7% statewide (35.3 % overweight, 23.4% obese). The BRFSS rate for obesity among Kansas Citians was >2.5 times higher than the rate found in a 2004 telephone survey commissioned by the Kansas City Health Department.²⁹¹ That survey reported an obesity rate of 12.9%.

America's 2006 obesity report card awarded Missouri a grade of B overall and for childhood obesity (www.ubalt.edu/experts/obesity). And, the Trust for America's Health in its report *F as in Fat: How Obesity Policies are Failing in America, 2006*, ranked Missouri as having the 17th highest rate of adult obesity (<http://healthyamericans.org/reports/obesity2006/>). According to the Centers for Disease Control and Prevention, in 2006, Mississippi had the highest obesity rate at 30.6%.

Being overweight or obese contributes to many health and safety issues ranging from increased risk of breast cancer, complications of pregnancy, increased risk of birth defects, impotence in males, and ability to receive certain diagnostic imaging procedures, to motor vehicle crash injury and death. It also has led to an increase in gastric bypass surgeries as a method of weight loss.

²⁸⁶ Doshi JA et al. Prevalence and trends in obesity among aged and disabled US Medicare beneficiaries, 1997-2002. *Health Affairs* 2007;26:1111-1117.

²⁸⁷ Kimbro RT et al. Racial and ethnic differentials in overweight and obesity among 3-year old children. *Am J Public Health* 2007;97:298-305.

²⁸⁸ Yun S et al. A comparison of national estimates of obesity prevalence from behavioral risk factor surveillance system and the national health and nutrition examination survey. *Int J Obes* 2006;30:164-170.

²⁸⁹ Ezzati M et al. Trends in national and state-level obesity in the USA after correction for self-report bias: analysis of health surveys. *J Royal Soc Med* 2006;99:250-257.

²⁹⁰ Blanck HM et al. State-specific prevalence of adult obesity among adults – United States, 2005. *MMWR* 2006; 55:985-988.

²⁹¹ Kansas City Health Department. 2004 Health Assessment Survey. www.kcmo.org/health.

Obesity, particularly higher levels of obesity, is associated with increased mortality relative to persons of normal weight.²⁹² And, overweight and obese women have lower mortality rates than males up until age 45, after which women's mortality rates are much higher than men's.²⁹³ While the impact of obesity on mortality may be decreasing over time, perhaps due to improvements in public health and health care, obesity remains the 2nd leading actual cause of death in the US.²⁹⁴ In addition, obesity appears to lessen life expectancy markedly, especially among younger adults.²⁹⁵ Nationally, children and adolescents who are severely obese experience a health-related quality of life as low as that reported by young cancer patients.²⁹⁶ According to the Obesity Reduction Survey conducted by the Missouri Department of Health and Senior Services, obese patients are 3.5 and 2.43 times more likely to develop type 2 diabetes mellitus and hypertension.²⁹⁷

Besides the association of obesity with chronic health conditions, weight also has a dramatic effect on people's ability to manage five basic activities of daily living: bathing, eating, dressing, walking across a room, and getting in or out of bed.²⁹⁸ While men with moderate obesity have a 50% increased probability of having limitations on these abilities; severe obesity is associated with a 300% increased probability. The effects are even larger for women. These differences underscore the need to distinguish between moderate and more severe levels of obesity.

Both chronic health conditions and limitations on the abilities to perform basic activities of daily living contribute to increased levels of disability among obese individuals.²⁹⁹ Disability rates are increasing among the non-elderly and the increases cut across all demographic and economic groups. Although mental health is one of the most important causes of disability among the non-elderly, the fastest growing causes are diabetes³⁰⁰ and musculoskeletal problems,³⁰¹ conditions that are associated with obesity. Disability is projected to increase 1% per year in 50-69 year olds if there were no further gains in weight.³⁰²

²⁹² Flegal KM et al. Excess deaths associated with underweight, overweight, and obesity. *J Am Med Ass* 2005;293:1861-1867.

²⁹³ Muennig P et al. Gender and the burden of disease attributable to obesity. *Am J Public Health* 2006;96:1662-1668.

²⁹⁴ Mokdad AH et al. Correction: Actual causes of death in the United States, 2000. *J Am Med Ass* 2005;293:293-294.

²⁹⁵ Fontaine KR et al. 2003. Years of life lost due to obesity. *J Am Med Ass* 2005;289:187-193.

²⁹⁶ Schwimmer JB et al. Health quality of life of severely obese children and adolescents. 2003. *J Am Med Ass* 2003;289:1813-1819.

²⁹⁷ Majid N. The obesity epidemic: lessons from the war on smoking. *Missouri Med* 2005;102:550-554.

²⁹⁸ McDowell MA et al. Health characteristics of US adults by body mass index category: results from NHANES 1999-2002. *Public Health Rep* 2006;121:67-73.

²⁹⁹ Lakdawalla E et al. Are the young becoming more disabled? Rates of disability appear to be on the rise among people age eighteen to fifty-nine, fueled by a growing obesity epidemic. *Health Affairs* 23: 2004;168-176.

³⁰⁰ Hannon TS et al. Childhood obesity and type 2 diabetes mellitus. *Pediatrics* 2005;116:473-480.

³⁰¹ Taylor ED et al. Orthopedic complications of overweight in children and adolescents. *Pediatrics* 2006;117:2167-2174.

³⁰² Sturm R et al. Increasing obesity rates and disability trends. *Health Affairs* 2004;23:1-7.

Obesity outranks both smoking and drinking in its deleterious effect on health care costs.³⁰³ And, obesity and smoking are primary risk factors for several chronic conditions and early death. Among the obese, 4.7% or about 9 million individuals smoke.³⁰⁴ Further, there may be an association between a woman's smoking during pregnancy and her child being overweight by 8 y of age.³⁰⁵

In 2000, the economic burden caused by obesity related health problems had been put at \$117 billion. More than half of obesity related medical costs, which totaled \$75 billion in 2003, are paid for through Medicare and Medicaid.³⁰⁶ On average, states spend 5% of their medical costs on obesity. The share of private health care spending attributable to obesity among persons 18-64 y old rose from 2% to 11.6% (from \$3.6 billion to \$36.5 billion) from 1987 to 2002.³⁰⁷ Insurance spending on these obese individuals was 56% higher than that for people of normal weight, partially due to the number of medical conditions treated among the obese. And, for morbidly obese individuals, who comprise 3% of the US adult population, health care costs are nearly double those of normal-weight adults and are >10% of all health care spending.³⁰⁸

Expenditures related to higher BMI have risen dramatically among white and older adults, but not blacks or those younger than 35 years old.³⁰⁹ The higher spending for obese patients is mainly attributable to treatment for diabetes and hypertension.³¹⁰ Hospitals are having to buy expensive new equipment such as reinforced toilets and oversized beds to treat the growing number of severely obese patients (www.novationco.com).

In addition to medical expenditures, obesity affects employers. Overweight and obese attributable costs range from \$175/y for overweight male employees to \$2,485/y for obese female employees with a BMI of 35-39.9.³¹¹ The costs of obesity at a firm with 1,000 employees are estimated to be \$285,000/y, with ~30% of the costs associated with absenteeism. Morbidly obese employees (BMI \geq 40), while representing only ~3% of the workforce, account for 21% of the obesity associated costs.

The two most amenable risk factors for obesity are lack of regular physical activity and poor diet and addressing these issues are critical components of CDC's strategies for preventing and controlling

³⁰³ Strum R. The effects of obesity, smoking and drinking on medical problems and costs: obesity outranks both smoking and drinking in its deleterious effect on health and health care costs. *Health Affairs* 2002;21:245-253.

³⁰⁴ Heaton CG et al. Smoking, obesity, and their co-occurrence in the United States: cross sectional analysis. *Br Med J* 2006;333:25-26.

³⁰⁵ Chen A et al. Maternal smoking during pregnancy in relation to child overweight: follow-up to age 8 years. *Int J Epidemiol* 2006;35:121-130.

³⁰⁶ Finkelstein EA et al. State-level estimates of annual medical expenditures attributable to obesity. *Obes Res* 2004;12:18-24.

³⁰⁷ Thorpe KE et al. The rising prevalence of treated disease: effects on private health insurance spending. *Health Affairs* 2005;W5:317-325.

³⁰⁸ Arterburn DE et al. Impact of morbid obesity on medical expenditures in adults. *Int J Obes Relat Metab Disorder* 2005;29:334-339.

³⁰⁹ Wee CC et al. Health care expenditures associated with overweight and obesity among US adults: importance of age and race. *Am J Public Health* 2005;95:159-165.

³¹⁰ Thorpe KE et al. The impact of obesity on rising medical spending. *Health Affairs* 2004;W4-480.

³¹¹ Finkelstein E et al. The costs of obesity among full-time employees. *Am J Health Promotion* 2005;20:45-51.

overweight and obesity.³¹² Regular physical activity performed on most days of the week reduces the risk of dying prematurely, dying from coronary heart disease, and developing diabetes and colon cancer. Regular activity also reduces blood pressure among people with hypertension, promotes psychological well being, and builds and maintains healthy bones, muscles, and joints so that older adults can avoid falls and maintain functional independence. Combined with poor diet, the lack of regular physical activity leads to obesity. The 2004 Health Assessment Survey commissioned by the Kansas City Health Department found that 43% of respondents usually or always exercised 3 times a week and 41% reported eating 5 servings of fruits and vegetables on most days, if not daily.

One contributing factor to reduced activity is the composition of the built environment.³¹³ For example, the ability of citizens to walk for recreation or business often comes down to whether sidewalks are available and if those walkways are considered safe to use. According to the federal Highway Administration, Americans make <6% of their daily trips on foot. Many public health experts say the way neighborhoods are built is to blame. The Urban Land Institute estimates that only 5-15% of new development follows the principles of “walkable neighborhoods.” However, there are reports that find no link between obesity and urban sprawl (www.registerguard.com).

There is a growing awareness in public health about the need to integrate community development or infrastructure to the health and well being of the citizens.³¹⁴ Kansas City with its large geographic area, low population density, and excellent interstate system, has an infrastructure that is associated with less walking and bicycling and with more automobile travel than more densely populated communities. As land use spreads further apart, existing transportation systems offer few attractive and safe alternatives to driving.

According to the 2003 BRFSS data, 26.2% of Kansas City residents were physically inactive despite the number of private physical fitness centers and the presence of 6 public recreation facilities. The Kansas City Parks and Recreation Department maintains 213 parks scattered throughout the community. Exercise alone, however, is not enough to offset obesity health risks.³¹⁵ It is not surprising that portion sizes and energy intake for specific food types have increased markedly with greatest increases for food consumed at fast food establishments and in the home.³¹⁶

³¹² Kartz D et al. Public health strategies for preventing and controlling overweight and obesity in school and worksite settings. A report on recommendations of the Task Force on Community Preventive Services. *MMWR* 2005;54(RR-10):1-12.

³¹³ Committee on Physical Activity, Health, Transportation, and Land Use. *Does the built environment influence physical activity? Examining the evidence – special report 282*. National Academies Press, Washington DC, 2005.

³¹⁴ Lopez R. Urban sprawl and risk for being overweight or obese. *Am J Public Health* 2004;94:1574-1579.

³¹⁵ Hu FB et al. Adiposity as compared with physical activity in predicting mortality in women. *N Engl J Med* 2004;351:2694-2703.

³¹⁶ Nielsen SJ, Popkin BM. Patterns and trends in food portion sizes, 1977-1998. *J Am Med Ass* 2003;289:450-453.