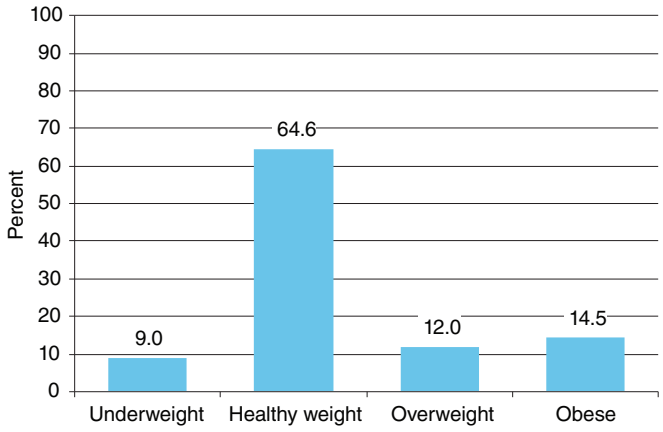
Childhood Overweight and Obesity in Colorado

Facts for Action: Chronic Diseases and Related Risk Factors in Colorado

How many children are overweight or obese in Colorado?

More than **1 in 4** children (**26.5%** or about 224,000 children) were overweight or obese in 2013.

Percent of children ages 2-14 years who were underweight, healthy weight, overweight, or obese, Colorado, 2013.



Data source: Colorado Child Health Survey.
Height and weight reported by child's primary caregiver.

Aren't national childhood obesity rates now declining?

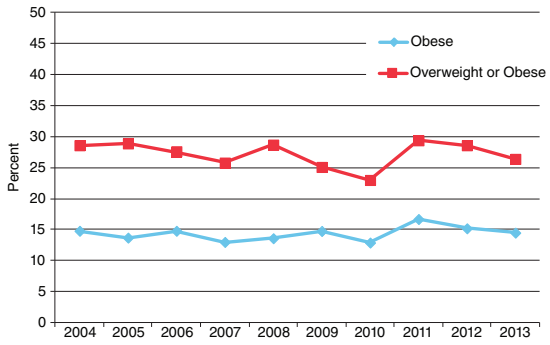
A report from the Centers for Disease Control and Prevention notes that obesity prevalence among low-income, preschool-aged children **declined** from 2008 to 2011 in 19 of the 43 states and territories studied.[1] Among those 19 states and territories, the absolute decrease in obesity prevalence ranged from 0.3 to 2.6 percentage points. Colorado was one of three states that experienced a small but statistically significant **increase** in early childhood obesity from 9.4% in 2008 to 10.0% in 2011. Note, however, that Colorado's prevalence in 2005 was 9.7%, which is not statistically different than the 2011 prevalence. For more information, see "How does Colorado compare with other states?" below.

How has the percent of children who are overweight or obese changed over time?

Nationally, the percent of children ages 2-19 years who are overweight or obese has more than **doubled** from **15.4%** in 1971-1974 to **31.8%** in 2011-2012, and the percent of children who are obese more than **tripled** from **5.2%** in 1971-1974 to **16.9%** in 2011-2012.[2] Most of the increase occurred during the 1970s, 1980s, and 1990s, with a leveling off since 1999-2000.[3]

In Colorado, data are available for children ages 2-14 years for 2004-2013. Similar to national trends, overweight and obesity among children in Colorado has been stable over this period.

Percent of children ages 2-14 years who are obese or overweight/obese, Colorado, 2004-2013.



Data source: Colorado Child Health Survey.
Note that survey methods changed in 2011 and trends should be interpreted with caution.

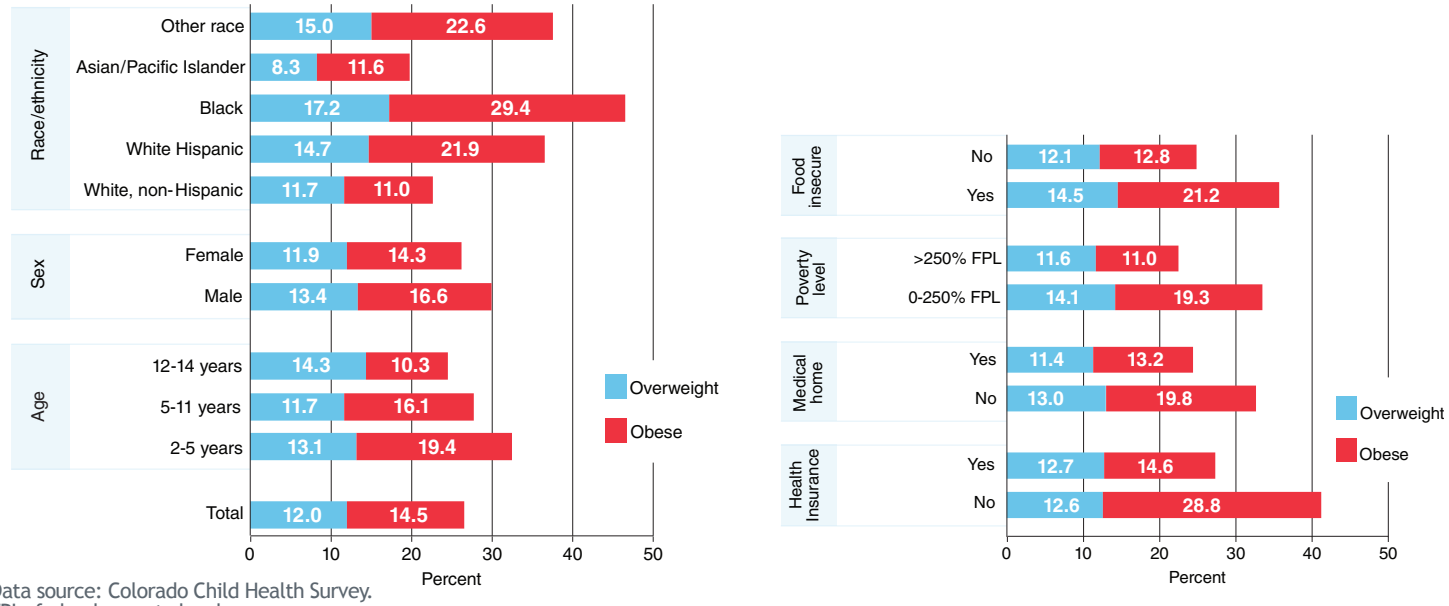
In Colorado, the percent of children who were overweight or obese did not change significantly from 2004 to 2013.

- The percent of children who were obese also did not change significantly.
- The percent of children who were overweight or obese also did not change significantly among sub-groups based on age, sex, race/ethnicity, or food insecurity. Trends by poverty status were not available to be analyzed.

Which children bear the biggest burden of overweight and obesity?

Disparities in overweight and obesity exist for Black and Hispanic children as well as for children without health insurance, without a medical home, living in poverty, or with food insecurity. By age, younger children ages 2-4 years were most likely to be obese.

Percent of children ages 2-14 years who were overweight or obese by demographic factors, Colorado, 2011-2013.



Data source: Colorado Child Health Survey.
FPL: federal poverty level.
Food insecure defined as caregiver report of sometimes or often relying on only a few kinds of low-cost food to feed the child because of running out of money to buy food.
Medical home defined as having a usual source of care, a personal doctor or nurse, family-centered care, and effective care coordination and getting needed referrals.

The prevalence of overweight or obesity was significantly higher among children who had:

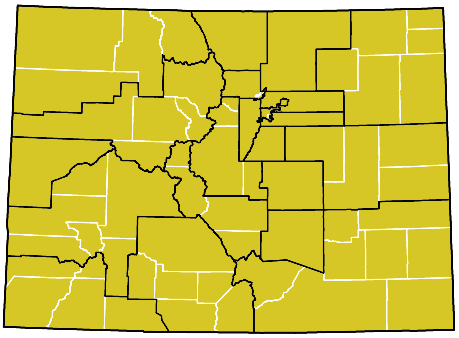
- food insecurity
- household incomes of 250% federal poverty level or less
- no medical home
- no health insurance

The prevalence of overweight or obesity was significantly higher among Black and Hispanic children compared with White non-Hispanic and Asian or Pacific Islander children.

The prevalence of overweight or obesity did not differ significantly between males and females or between children of different age groups. Looking at obesity only, the prevalence was significantly higher among children ages 2-5 and 5-11 years compared with older children.

Disparities in overweight and obesity (higher prevalence) among Black and Hispanic children in Colorado are much greater among those living in poverty compared with those with higher income levels.

Low-income and food-insecure children are more vulnerable to overweight and obesity for several reasons, including limited resources and lack of access to healthy, affordable foods; fewer opportunities for physical activity; cycles of food deprivation and over-eating; high stress levels; greater exposure to marketing of obesity-promoting products; and limited access to health care.[4]



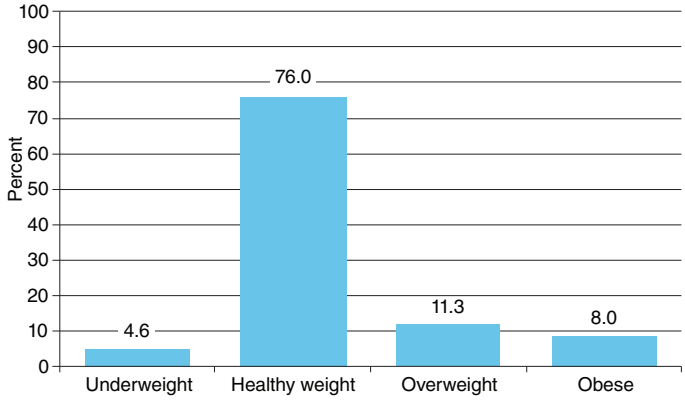
Childhood overweight and obesity is a problem that affects children across Colorado, regardless of where they live.

The 2011-2013 prevalence of childhood overweight or obesity did not vary significantly by geographic region in Colorado.

How many high school students are overweight or obese in Colorado?

Nearly **1** in **5** high school students (**19.3%** or more than 41,000 adolescents) were overweight or obese in 2013.

Percent of high school students who were underweight, healthy weight, overweight, or obese, Colorado, 2013.



Data source: Colorado Child Health Survey.
Height and weight self-reported by high school students.

27.2% of high school students described themselves as slightly or very overweight;

33.7% of females described themselves as overweight.

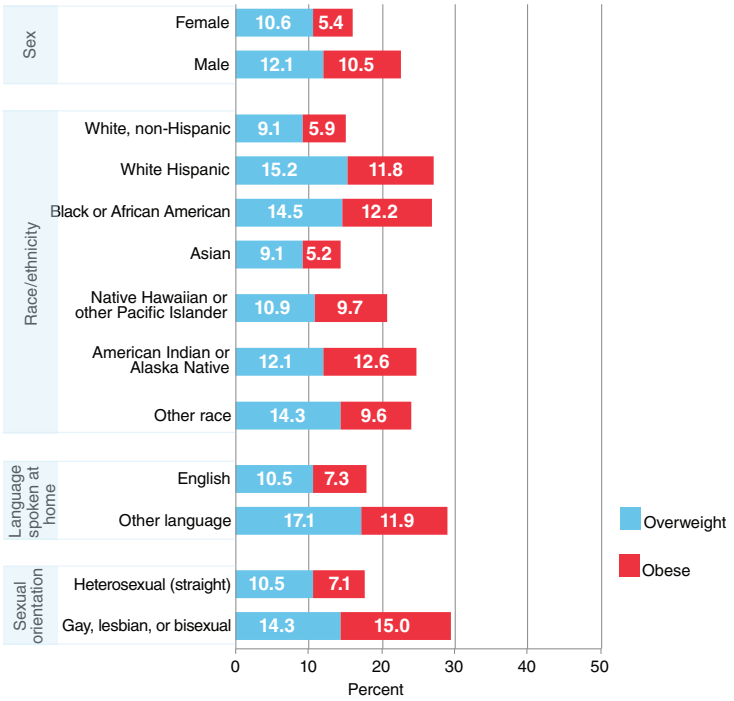
40.1% of high school students reported that they were trying to lose weight.

41.1% of high school students said that a doctor or nurse discussed how to maintain a healthy weight at their last check-up; females were more likely than males to report discussions of healthy weight, but this did not vary by age, grade, or race/ethnicity.

Which high school students bear the biggest burden of overweight and obesity?

Gay, lesbian, or bisexual high school students were among the most likely to be overweight or obese in 2013. High school students who speak a language other than English at home; those who self-identify as White Hispanic, Black or African American, or American Indian or Alaska Native; and males had significantly higher prevalence of overweight or obesity.

Percent of high school students who were overweight or obese by demographic factors, Colorado, 2013.



Data source: Healthy Kids Colorado Survey.

The prevalence of overweight or obesity among high school students did not vary by age or grade (9th-12th).

14.2% of high school students reported that they went hungry sometimes because of lack of food at home. Report of sometimes going hungry was more likely among all minority groups than White, non-Hispanics.

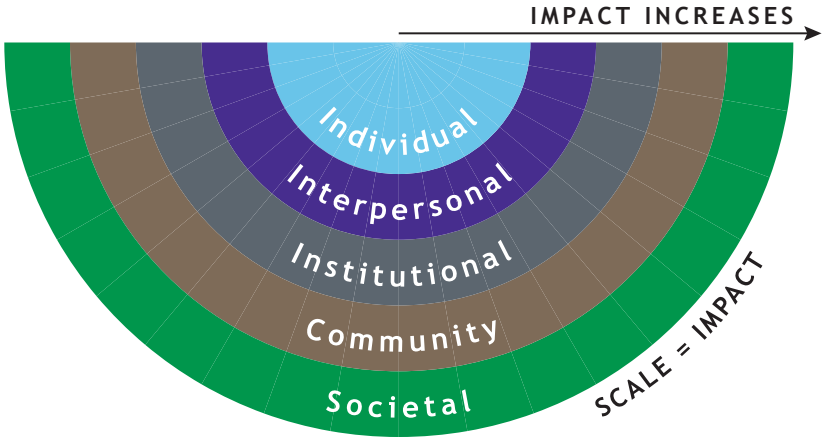
How does Colorado compare with other states?

To compare Colorado with other states, national data sources must be used. The Colorado Child Health Survey (CHS) does not allow for comparison with other states. Additionally, the National Health and Nutrition Examination Survey (NHANES), which includes direct measurement of children's height and weight, provides only national data with no state-level data available. Data from other national data sources are summarized below.

Population	Comparison and summary of the data
Population: children ages 10-17 years **Data source:** National Survey of Children's Health (NSCH) **Data collection method:** parent report of height and weight	**Although Colorado's childhood obesity prevalence is significantly lower than the overall U.S. prevalence, Colorado's prevalence is not that different than many other states.** **Summary of 2011 data:** ■ The U.S. prevalence of obesity among children ages 10–17 years was 15.7%. Among all states and District of Columbia, the prevalence ranged from 9.9% to 21.7%. ■ Colorado's obesity prevalence was 10.9% — statistically lower than the overall U.S. prevalence. ■ Colorado ranked 47th out of 51 states and D.C. A rank of 51 is the lowest or best prevalence. ■ The ranking is somewhat misleading, because Colorado's obesity prevalence was not statistically different than the states ranked 14th–51st. In other words, the difference in prevalence between states with different ranks might not be meaningful. Additionally, a change in rank over time should be interpreted with caution. ■ Colorado's obesity prevalence was not statistically different than other states within U.S. Department of Health and Human Services' Region VIII (MT, ND, SD, UT, and WY). ■ Colorado's obesity prevalence did not change significantly since 2007 when Colorado was ranked 29th (obesity prevalence of 14.2%).[5] **Link to data:** http://childhealthdata.org/browse/allstates?q=2462 **Link to related report:** http://healthyamericans.org/assets/files/TFAH-2014-ObesityReport-Fnl10.9.pdf
Population: low-income children ages 2–4 years who attend federally-funded maternal and child health nutrition programs, primarily the Special Supplemental Nutritional Program for Women, Infants, and Children (WIC) **Data source:** Pediatric Nutrition Surveillance Survey (PedNSS) **Data collection method:** direct measurement of height and weight	**Colorado's early childhood obesity prevalence among low-income children is among the lowest in the nation.** **Summary of 2011 data:** ■ The prevalence of obesity among low-income preschool children ages 2–4 years was about one in eight among the 43 states and territories with data available. The prevalence ranged from 9.2% to 17.9%. ■ Colorado's obesity prevalence was 10.0%, which was the second-lowest prevalence among 43 states and territories with data available. ■ Colorado's obesity prevalence in 2011 was a small but statistically significant increase from 2008 (9.4% to 10.0%). Only three states (CO, PA, and TN) had a significant increase. ■ Colorado's obesity prevalence was 9.7% in 2005. The trend over the past several years (2005–2011) in Colorado does not suggest a long-term increasing trend in prevalence. **Notes:** ■ The Centers for Disease Control and Prevention (CDC) discontinued PedNSS data analysis and reporting in 2011. Beginning in 2012, the Colorado Department of Public Health and Environment (CDPHE) has analyzed the data using new methodology ("point prevalence methodology"),[6] so 2012 data will be considered a new baseline to examine trends. ■ Using the new methodology, Colorado's obesity prevalence was 8.4% in 2012, 7.9% in 2013, and 7.6% in 2014. **The decrease in prevalence from 2012 to 2014 was small but statistically significant.** **Link to data:** https://www.colorado.gov/cdphe/wic-reports **Link to related report:** http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6231a4.htm?s_cid=mm6231a4_w
Population: High school students **Data source:** Youth Risk Behavior Survey (YRBS) and Healthy Kids Colorado Survey (HKCS) **Data collection method:** student self report	**Colorado's prevalence of adolescent obesity is lower than the U.S. prevalence.** **Summary of 2013 data:** ■ The prevalence of obesity among U.S. high school students was 13.7% among the 42 states with data available. The prevalence ranged from 6.4% to 18.0%. ■ National data and CDC reports for 2013 do not include Colorado, because Colorado's YRBS survey response rate did not meet the criteria for inclusion. ■ Healthy Kids Colorado Survey (HKCS), which includes components of YRBS (namely an overlapping set of core questions), had sufficient response. However, HKCS has different sampling methodology than YRBS, and comparisons of prevalence estimates between HKCS and YRBS should be interpreted with caution. ■ In 2013, Colorado's prevalence of obesity among high school students was 8.0%, which is similar to the lowest prevalence estimates among the 42 states with YRBSS data available. **Link to data:** http://www.chd.dphe.state.co.us/topics.aspx?q=Adolescent_Health_Data **Link to related reports:** http://www.cdc.gov/healthyyouth/obesity/obesity-youth.htm and http://healthyamericans.org/assets/files/TFAH-2014-ObesityReport-Fnl10.9.pdf

What causes overweight and obesity among children?

Obesity among children or adults results from an energy imbalance, where energy intake (calories) exceeds energy expenditure. Although biology and genetics play a major role in obesity, the related energy imbalance is a result of a complex interaction of social, environmental, economic, and behavioral factors.[7, 8]



- Individual behaviors, knowledge, attributions, and beliefs that affect health.
- Individuals' interactions between one another and their social networks.
- Institutions and organizations (e.g., schools, workplaces, faith-base institutions).
- Geographic, political, cultural, and other groups.
- Structures, policies, and systems that affect the built environment.

Do children in Colorado meet recommendations for preventive behaviors?

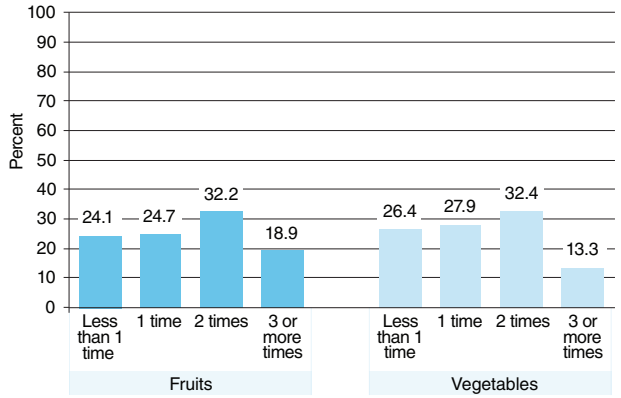
Physical activity, sufficient sleep duration, and a balanced diet (including consumption of fruits and vegetables and restricting sugary beverage consumption) are ways to help prevent obesity in individuals and populations.[9, 10, 11, 12]

More than half of children in Colorado meet recommendations for screen time, sleep, fruit consumption, and sugary beverage consumption, but there is much room for improvement. Children are not doing as well at meeting recommendations for physical activity and vegetable consumption.

Preventive behavior	How are children doing?	2013 Colorado data
Physical activity[13]	Less than half of children meet recommendations	■ 43.0% of children ages 5-14 years met recommendation of at least 60 minutes per day
Limited screen time[14]	Most children meet recommendations on weekdays but have more screen time on weekends	■ 85.2% of children ages 5-14 years had 2 hours or less screen time on weekdays ■ 53.5% of children ages 1-14 years had 2 hours or less screen time on weekend days
Sleep[15]	Half of children ages 1-14 years meet recommendations, but less than half of children ages 5-11 years meet recommendations	■ 50.0% of children ages 1-14 years met age-specific sleep recommendations ■ 59.7% of children ages 1-2 years (12+ hours) ■ 47.9% of children ages 3-4 years (11+ hours) ■ 44.4% of children ages 5-11 years (10+ hours) ■ 59.1% of children ages 12-14 years (9+ hours)
Fruit consumption[16]	About half of children meet recommendations	■ 51.2% of children ages 1-14 years ate fruit 2 or more times per day
Vegetable consumption[17]	About 1 in 8 children meet recommendations	■ 13.3% of children ages 1-14 years ate vegetables 3 or more times per day
No sugary beverage consumption[18]	Most children (about 8 in 10) meet recommendations	■ 81.1% of children ages 1-14 years did not drink any sugary beverages in a typical day

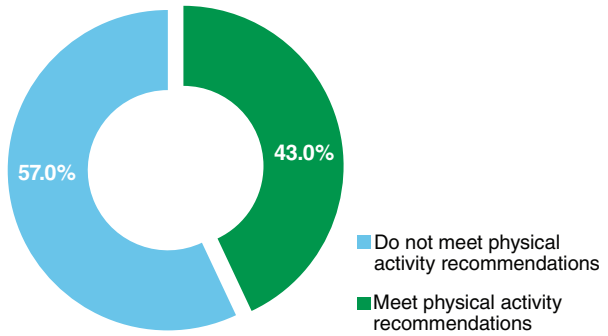
Data source: Colorado Child Health Survey.

Daily frequency of fruit and vegetable consumption (percent) among children ages 1-14 years, Colorado, 2013.



Data source: Colorado Child Health Survey.

Percent of children ages 5-14 years who met physical activity recommendations of at least 60 minutes per day, Colorado, 2013.



Data source: Colorado Child Health Survey.

Children are more likely to meet fruit and vegetable consumption recommendations if their family eats meals together at least once per day.[19]

In 2013, **52.9%** of children ages 1–14 years ate at least one meal together with their family each day in the past week.

Data source: Colorado Child Health Survey.

Do children and their parents share similar behaviors?

Children were **more likely to meet physical activity recommendations if their parent met recommendations** (49.3%) compared with children whose parent did not meet recommendations (32.8%).

- 70.1% of children who met PA recommendations had a parent who met recommendations.

Children were **more likely to eat vegetables daily if their parent ate vegetables daily** (77.1%) compared with children whose parent did not eat vegetables daily (57.0%).

- 89.4% of children who ate vegetables daily had a parent who ate vegetables daily.

Children were **more likely to eat fruit daily if their parent ate fruit daily** (89.7%) compared with children whose parent did not eat fruit daily (70.7%).

- 76.0% of children who ate fruit daily had a parent who ate fruit daily.

Children were **more likely to drink sugary beverages less than once per day if their parent drank sugary beverages less than once per day** (86.0%) compared with children whose parent drank sugary beverages more often (70.4%).

- 77.9% of children who drank sugary beverages less than once per day had a parent who drank sugary beverages less than once per day.

Data sources: Colorado Child Health Survey and Behavioral Risk Factor Surveillance System.

How do maternal factors influence childhood obesity?

Factors related to the preconception, prenatal, and infancy periods are most strongly linked to obesity risk in early childhood:[20]

Childhood obesity risk factor	2012 or 2013 Colorado data
Maternal obesity prior to pregnancy	45.2% of mothers were overweight or obese before pregnancy
Excessive weight gain during pregnancy	42.2% of mothers gained more weight during pregnancy than recommended by the Institute of Medicine guidelines based on body mass index 35.8% gained an appropriate amount
High birth weight (4000 grams or more)	5.1% of babies had high birth weight
Low birth weight (less than 2500 grams)	8.8% of babies had low birth weight
Maternal smoking during pregnancy	9.0% of mothers smoked during the last 3 months of pregnancy (of those who smoked in the past 2 years)

Data sources: 2012 Pregnancy Risk Assessment Monitoring System (PRAMS) and 2013 Vital Statistics - Colorado Department of Public Health and Environment.

What are the consequences of childhood obesity?

Childhood obesity leads to health risks in childhood and later in life.[23]

Health risks now

- High blood pressure and high cholesterol, which are risk factors for cardiovascular disease
- Impaired glucose tolerance, insulin resistance, and type 2 diabetes
- Breathing problems, such as sleep apnea, and asthma
- Joint problems and musculoskeletal discomfort
- Fatty liver disease, gallstones, and gastro-esophageal reflux (i.e., heartburn)
- Social and psychological problems, such as discrimination and poor self-esteem, which can continue into adulthood

In the Bogalusa Heart Study, **70%** of obese children had at least one cardiovascular disease risk factor, and **39%** had two or more.[24]

Health risks later

Obese children are more likely to become obese adults, and their obesity is likely to be more severe.

- Adult obesity is associated with several serious health conditions including heart disease, stroke, diabetes, and some cancers.

In Colorado:

- **33%** of obese children had **difficulties with emotions, concentration, behavior, or getting along with others** compared with 23% of non-obese children.
- Children's prevalence of asthma did not differ significantly by weight status.

Data source: Colorado Child Health Survey

Focus on breastfeeding

Breastfeeding is associated with reduced risk of childhood overweight and obesity; the risk is even lower with longer duration of breastfeeding.[21] While more research is needed, exclusive breastfeeding appears to have a stronger effect than combined breast and formula feeding, and the effect of breastfeeding on overweight and obesity appears to remain into the teenage years and adulthood.

The American Academy of Pediatrics recommends "exclusive breastfeeding for about 6 months, followed by continued breastfeeding as complementary foods are introduced, with continuation of breastfeeding for 1 year or longer as mutually desired by mother and infant."[22]

Among children born in Colorado in 2011, **55.2%** were breastfed at age 6 months, with much fewer being exclusively breastfed at this age (**25.8%**) as per American Academy of Pediatrics recommendations. A total of **29.3%** of children continued to breastfeed until 12 months of age.

Data source: National Immunization Survey

How can childhood overweight and obesity be prevented and controlled?

The CDC and the Institute of Medicine (IOM) recommend several strategies in school, preschool and childcare center, community, home, and healthcare settings to increase healthy eating and physical activity.[25, 26] Many of these recommended strategies promote environmental factors that support the healthy choice being the easy choice for children and their parents. In other words, these recommended strategies aim to reduce environments that promote increased consumption of less healthy food and physical inactivity, e.g., by reducing sugary drinks and less healthy foods on school campuses; enacting licensing regulations to ensure that child care facilities encourage more healthful eating and physical activity; promoting daily, quality physical activity in all schools; changing the built environment to improve access to safe and appealing places for physical activity; and increasing support for breastfeeding. In selecting strategies to prevent or treat obesity, it is important to examine the more proximal influences on the factors that affect energy imbalance and to use an evidence-based, multi-pronged approach.[27, 28]

On school days, children spend about half of their waking hours in school and consume a substantial portion of their daily food and beverages there.

How are overweight and obesity defined?

Body Mass Index (BMI) is used to determine overweight and obesity in children and adolescents. BMI is calculated by comparing weight and height against age- and sex-specific ranges.

Overweight children have a BMI that falls between the 85th and 94th percentile for their age and sex.

Obese children have a BMI at or above the 95th percentile for their age and sex.

BMI calculator for children: http://nccd.cdc.gov/dnpabmi/Calculator.aspx

Endnotes and References

1 Centers for Disease Control and Prevention. Vital signs: obesity among low-income, preschool-aged children — United States, 2008-2011. MMWR 2013;62(31):629-34.

2 Prevalence of Overweight and Obesity Among Children and Adolescents: United States, 1963-1965 Through 2011-2012. Hyattsville, Md: National Center for Health Statistics; 2014. Available at: http://www.cdc.gov/nchs/data/hestat/obesity_child_11_12/obesity_child_11_12.htm. Accessed March 20, 2015.

3 Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. JAMA. 2012;307(5):483-490.

4 Food Research and Action Center. http://frac.org/initiatives/hunger-and-obesity/why-are-low-income-and-food-insecure-people-vulnerable-to-obesity/ Accessed March 20, 2015.

5 Trust for America's Health. http://healthyamericans.org/assets/files/TFAH2011FasInFat10.pdf Accessed March 20, 2015.

6 For more details, see: https://www.colorado.gov/pacific/sites/default/files/PF_WIC_Overweight-Obese-Description_2014.pdf

7 Addressing Obesity Disparities: Social Ecological Model. Atlanta, Ga: Centers for Disease Control and Prevention; 2013. Available at: http://www.cdc.gov/obesity/health_equity/addressingtheissue.html

8 Huang TT, Drewnowski A, Kumanyika SK, Glass TA. A systems-oriented multilevel framework for addressing obesity in the 21st century. Prev Chronic Dis 2009;6(3):A82. http://www.cdc.gov/pcd/issues/2009/jul/09_0013.htm Accessed March 20, 2015.

9 Institute of Medicine. Early Childhood Obesity Prevention Policies. 2011. http://www.iom.edu/Reports/2011/Early-Childhood-Obesity-Prevention-Policies.aspx Accessed March 20, 2015.

10 Centers for Disease Control and Prevention. Recommended Community Strategies and Measurements to Prevent Obesity in the United States. MMWR 2009;58(No. RR-7):1-29.

11 Chen X, Beydoun MA, Wang Y. Is sleep duration associated with childhood obesity? A systematic review and meta-analysis. Obesity. 2008;16:265-274.

12 Harvard School of Public Health. http://www.hsph.harvard.edu/obesity-prevention-source/obesity-causes/sleep-and-obesity/ Accessed March 20, 2015.

13 Definition of meeting physical activity recommendation based on http://www.cdc.gov/physicalactivity/everyone/guidelines/children.html

14 Definition of meeting screen time recommendation based on http://pediatrics.aappublications.org/content/132/5/958.full

15 Definition of meeting sleep recommendation based on http://www.nhlbi.nih.gov/health/health-topics/topics/sdd/howmuch and http://sleepfoundation.org/how-sleep-works/how-much-sleep-do-we-really-need

16 Definition of meeting fruit consumption recommendation based on http://www.health.gov/dietaryguidelines/2010.asp and http://www.choosemyplate.gov/food-groups/fruits.html

17 Definition of meeting vegetable consumption recommendation based on http://www.health.gov/dietaryguidelines/2010.asp and http://www.choosemyplate.gov/food-groups/vegetables.html

18 Definition of meeting sugary beverage recommendation based on http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2013/rwjf404852 and http://www.pamf.org/ynp/5210/

19 Poniers, A. Childhood Obesity: How do the health behaviors of Colorado parents affect their children? Colorado Department of Public Health and Environment Health Watch. 2007;63:1-6. Available at: http://www.chd.dphe.state.co.us/Resources/pubs/CHS_Obesity2.pdf Accessed March 20, 2015.

20 Institute of Medicine. Early Childhood Obesity Prevention Policies. 2011. http://www.iom.edu/Reports/2011/Early-Childhood-Obesity-Prevention-Policies.aspx Accessed March 20, 2015.

21 Division of Nutrition and Physical Activity. Research to Practice Series No. 4: Does breastfeeding reduce the risk of pediatric overweight? Atlanta: Centers for Disease Control and Prevention, 2007.

22 Eidelman AI and Schandler RJ, American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the use of human milk. Pediatrics. 2012;129(3):e827-e841.

23 Centers for Disease Control and Prevention. http://www.cdc.gov/obesity/childhood/basics.html Accessed March 20, 2015.

24 Freedman DS, Mei Z, Srinivasan SR, Berenson GS, Dietz WH. Cardiovascular risk factors and excess adiposity among overweight children and adolescents: the Bogalusa Heart Study. J Pediatr. 2007;150(1):12—17.e2.

25 For more details on CDC's recommended strategies, see: http://www.cdc.gov/obesity/resources/recommendations.html and http://www.cdc.gov/physicalactivity/resources/recommendations.html

26 Institute of Medicine. Early Childhood Obesity Prevention Policies. 2011. http://www.iom.edu/Reports/2011/Early-Childhood-Obesity-Prevention-Policies.aspx Accessed March 20, 2015.

27 Dietz WH and Gortmaker SL. Preventing Obesity in Children and Adolescents. Annu Rev Public Health 2001;22:337-353.

28 Institute of Medicine (US) Committee on Prevention of Obesity in Children and Youth; Koplan JP, Liverman CT, Kraak VI, editors. Preventing Childhood Obesity: Health in the Balance. Washington (DC): National Academies Press (US); 2005. Available from: http://www.ncbi.nlm.nih.gov/books/NBK83825/