What is Obesity?

Overweight and obesity are defined as a higher weight than what is considered healthy for a given height.[1] Overweight and obesity can develop over time due to an energy imbalance: when an individual has a higher caloric intake than output.[2] Obesity is a chronic condition that is linked to health problems such as type 2 diabetes and can be caused by various factors such as eating patterns or genetic history. Body mass index (BMI) is a measure of body fat in relation to an individual's height and is often used as a screening tool for obesity.[1] Centers for Disease Control and Prevention (CDC) growth charts are used to match the age- and sex-specific percentile to a specific BMI.[3]

Among children and teenagers, an individual is considered overweight if their BMI is at or above the 85th percentile but below the 95th percentile for all children and teenagers of the same age and sex. An individual with a BMI that is greater than or equal to the 95th percentile for all children and teenagers of the same age and sex is considered obese.[3]

Risk Factors for Childhood Obesity

Demographic Risk Factors

- *Age*
  - As individuals age, hormonal changes and less activity increases the risk for obesity.[4]
- *Race/Ethnicity*
  - Prevalence is higher among American Indian/Alaska Native, non-Hispanic Black, and Hispanic children.[6]
  - Studies have shown that Black children with higher socioeconomic status (SES) do not have a lower obesity prevalence the way that White children with higher SES do.[5]
- *Genetics or Family History*
  - Individuals with a family history of obesity may be genetically predisposed to gain weight.[4]
  - Family members tend to share similar eating and physical activity habits.[4]
- *Lower Education*
  - In 2011-2014, obesity prevalence decreased as the head of household's education level increased.[7]
- *Poverty or Low Income*
  - In 2011-2014, obesity prevalence was the highest among children (ages 2 to 19) in the lowest income group and lowest among children in the highest income group.[7]
  - Low-income and minority communities may lack affordable and healthy foods, leading them to settle for food that is nutritionally lacking and calorically dense.[8]

Social and Behavioral Risk Factors

- *Poor Nutrition or Dietary Habits*
  - Eating foods with too much saturated fats or added sugar can increase the risk for obesity.[2]
  - Children's food habits are influenced by family, caregivers, friends, schools, marketing, and the media.[9]
  - In 2017, 7.1% of high school students drank a can, bottle, or glass of soda three or more times per day in the past week.[10]
  - In 2017, 7.2% of high school students did not eat vegetables in the past week.[10]
- Screen Time and Sedentary Lifestyle
  - There is a positive association between screen time and adverse sleep; sleep deprivation is associated with weight gain among children between ages 3 and 7.[11]
  - Children with more screen media exposure consume fewer fruits and vegetables and have higher total energy intake.[11]
  - A previous study has found that children with longer usage of electronic devices were likely to spend less time on physical activities.[12]
  - In 2017, 20.7% of high school students watched television 3 or more hours per day on an average school day.[10]

Intermediate Conditions

Childhood obesity also increases the risk of other diseases and is accompanied by many complications. Some of these include:

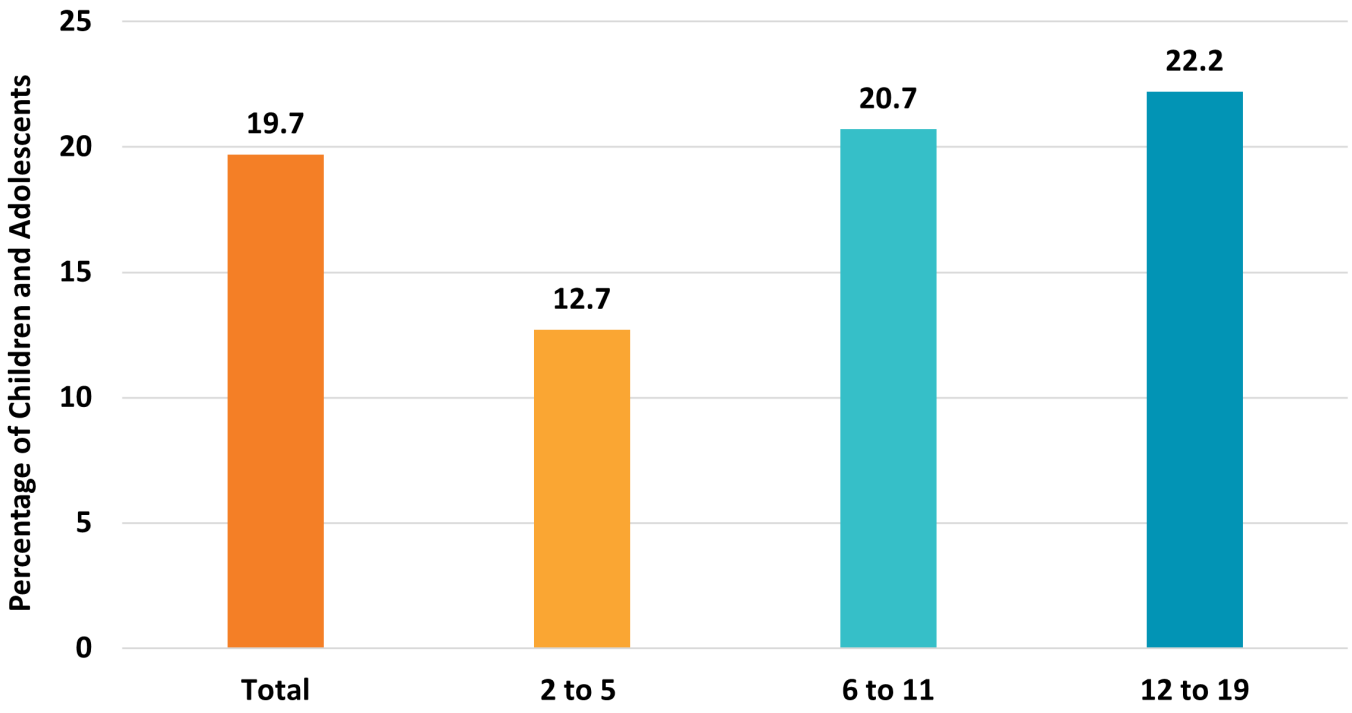
- Cardiovascular Disease (CVD)
  - Obesity-related conditions include high blood pressure and high cholesterol, which are risk factors for CVD.[7]
  - The most significant risk factor for pediatric hypertension is high BMI; 25% of children with obesity can have hypertension.[13]
- Type 2 Diabetes
  - Childhood obesity quadruples the risk of developing glucose intolerance and Type 2 diabetes.[13]
  - Over 85% of children with Type 2 diabetes are either overweight or obese at the time of diagnosis.[13]
- Cancer
  - There is a strong association between higher BMI during childhood and increased risk for cancer as an adult.[14]
- Breathing Problems
  - Overweight or obese children have a higher prevalence of asthma and are at a greater risk for sleep apnea.[13]

- Additional Consequences
  - About 15 – 30% of adults with obesity also had childhood obesity.[13]
  - Children with obesity are more likely to experience low self-esteem and depression and have fewer social interactions.[13]

National Statistics and Disparities

Statistics

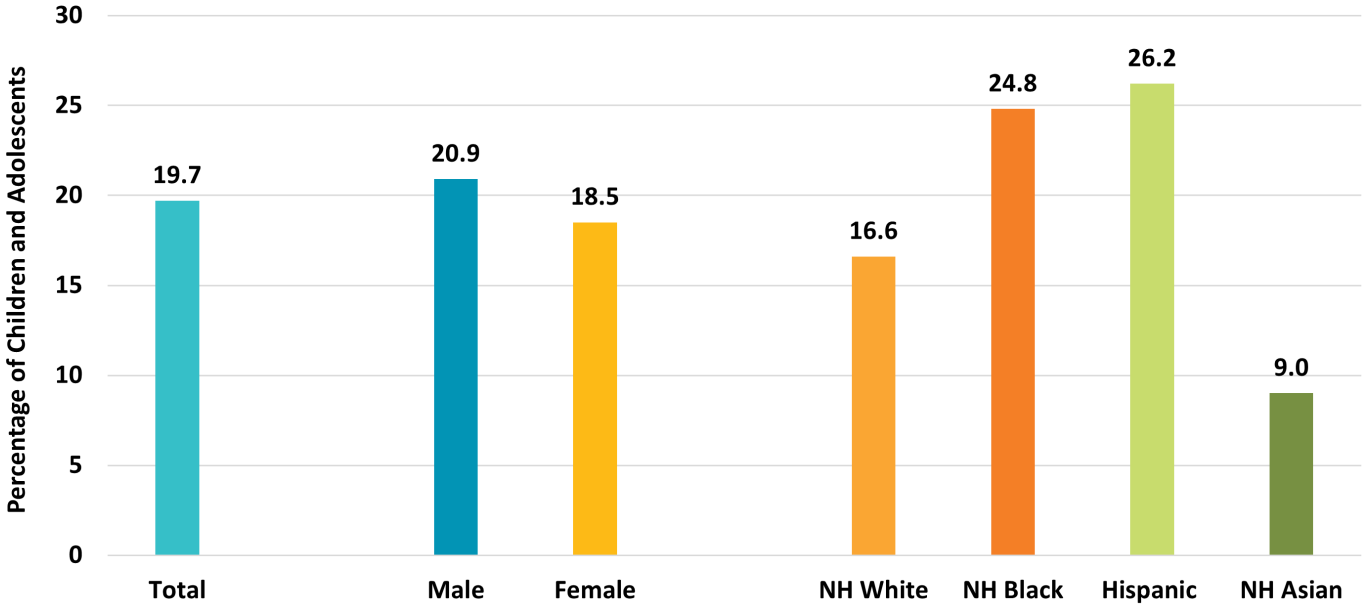
- In 2017 to March 2020, nearly 20% of children and adolescents (aged 2 – 19) in the United States had obesity.[7]
- In 2019, 15.5% of high schoolers in the United States had obesity. 15.9% of California high schoolers had obesity.[15]
- In 2019, 16.1% of high schoolers in the United States were overweight. 15.2% of California high schoolers were overweight.[15]



Source: Stierman B, Afful J, Carroll MD, Chen TC, Davy O, Fink S, et al. National Health and Nutrition Examination Survey 2017–March 2020 prepandemic data files—Development of files and prevalence estimates for selected health outcomes. National Health Statistics Reports; no 158. Hyattsville, MD: National Center for Health Statistics. 2021. DOI: https://dx.doi. org/10.15620/cdc:106273. CS324470 nhsr158-508.pdf

Prepared by County of San Diego, Health and Human Services Agency, Public Health Services, Community Health Statistics Unit. Contact 619.692.6667. https://www.sandiegocounty.gov/hhsa/programs/phs/community_health_statistics/ LiveWellSD.org. August 2022.

- From 2017 to March 2020, 19.7% of children and adolescents ages 2 to 19 had obesity.[16]
- Individuals ages 12 – 19 had the highest prevalence of obesity (22.2%).[16]



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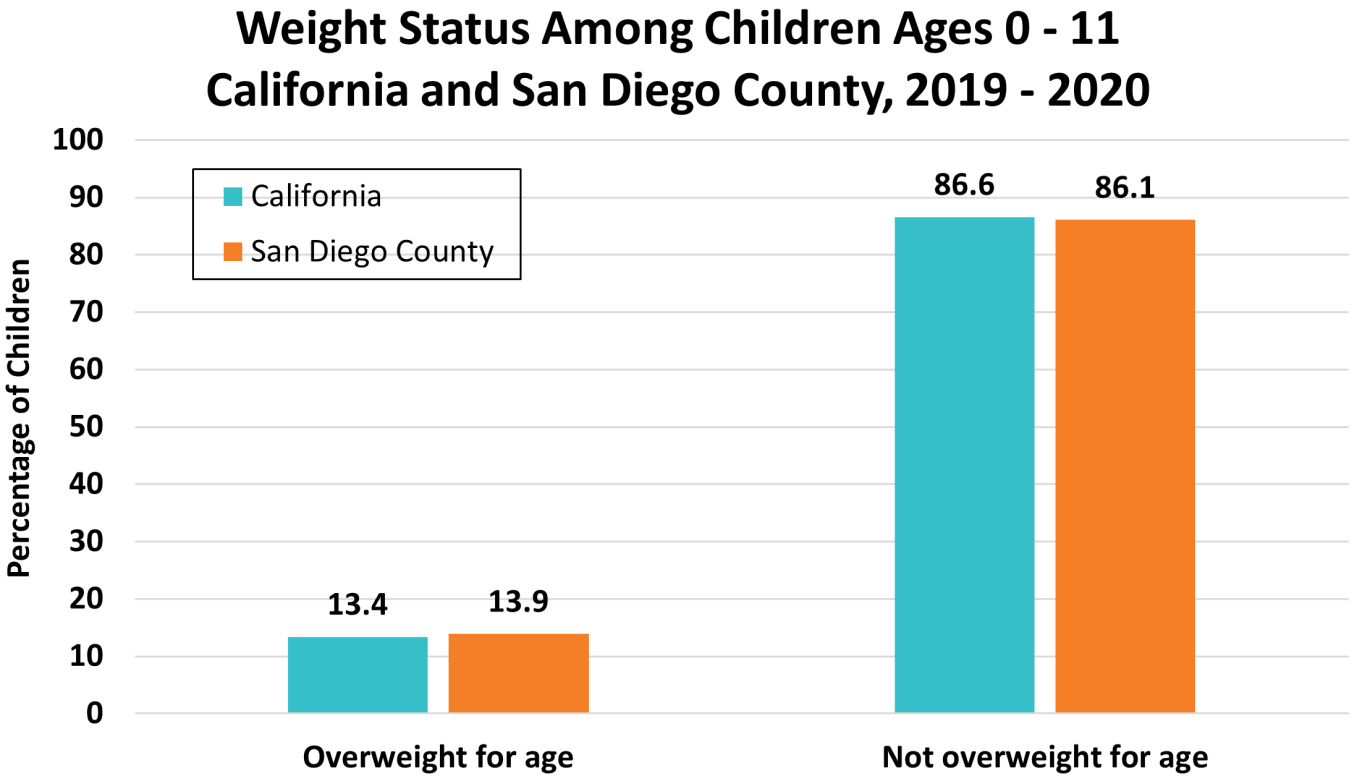
- From 2017 to March 2020, males ages 2 – 19 had a higher obesity prevalence than females ages 2 – 19.[16]
- From 2017 to March 2020, non-Hispanic (NH) Black and Hispanic children and adolescents had a higher rate of obesity than NH White children and adolescents.[16]
- From 2017 to March 2020, NH Asian children and adolescents had the lowest rate of obesity (9.0%).[16]

Disparities

- From 2017 to March 2020, obesity prevalence was lower among non-Hispanic Black boys compared to non-Hispanic Black girls.[17]
- From 2017 to March 2020, obesity prevalence was highest among Hispanic boys and the highest among non-Hispanic Black girls.[17]
- Among non-Hispanic Asian children, boys had a higher prevalence of obesity.[17]

Local and State Statistics



Source: UCLA Center for Health Policy Research, "2019, 2020 California Health Interview Survey," http://www.chis.ucla.edu.

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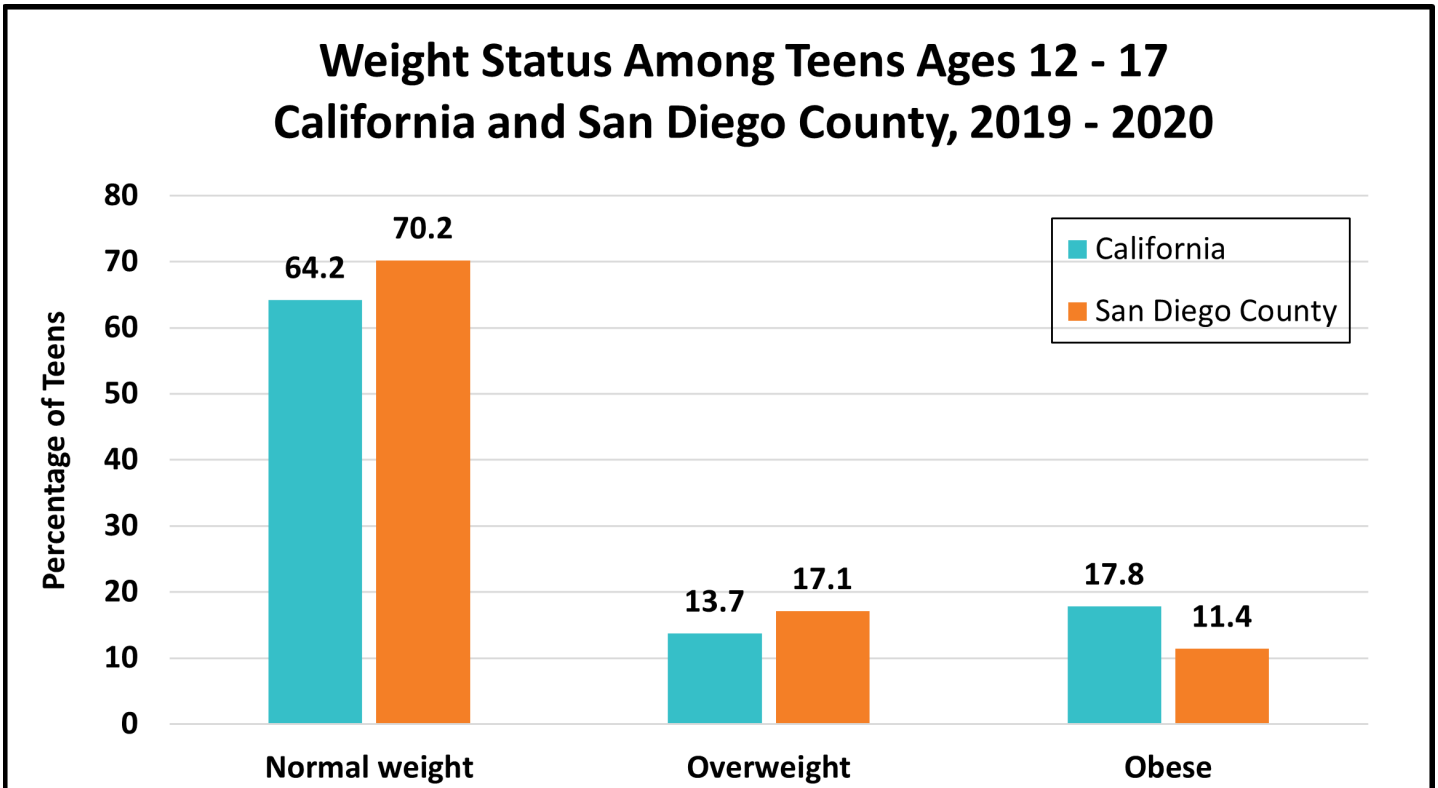
- In 2019 – 2020, nearly 14% of San Diego children were overweight for their age.[18]
- In 2019 – 2020, the percentage of children overweight for their age in San Diego was similar to the state percentage.[18]



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- In 2019 – 2020, 17.1% of San Diego teens were overweight and 11.4% were obese.[18]
- In 2019 – 2020, 13.7% of California teens were overweight and 17.8% were obese.[18]

Childhood Obesity and Its Complications: Prevention for Individuals

Parents and guardians can:

- Help children develop healthy eating habits by ensuring children eat plenty of vegetables, fruits, and whole-grain products, drink lots of water, and limit consumption of sugary drinks and saturated fats.[19]
- Ensure children get at least 60 minutes of physical activity each day. Exercise should include a mixture of aerobic, bone-strengthening, and muscle-strengthening activities.[19]
- Reduce sedentary time, including time watching television or playing video games. Turn off screens an hour before bed and remove screens from children's bedrooms.[19,20]
- Ensure children get enough sleep. Children ages 6 – 12 are recommended to get 9 - 12 hours of sleep per night. Youth ages 13 – 18 are recommended to get 8 – 10 hours per night.[20]

States and communities can:

- Promote and sponsor salad bars in schools and ensure that available food and beverage options meet dietary recommendations.[21]
- Establish supermarkets or farmers markets in underserved areas.[21]
- Increase places where people can be active, such as school facilities for public use or walking trails.[21]
- Increase the amount of time students are being active during physical education classes.[21]

Prevention Tools for Public Health Professionals: Obesity Critical Pathway

There are many opportunities for public health professionals in the community to help reduce the risk of obesity and to improve the health outcomes of individuals who already have the disease. To assist in community health efforts, an *Obesity Critical Pathway* was developed.

The *Obesity Critical Pathway* is a tool to be used in health promotion and disease prevention efforts. Its purpose is to identify populations at greater risk for obesity, and to identify prevention and early intervention opportunities. The *Obesity Critical Pathway* displays a diagram of the major risk factors and intermediate outcomes or related diseases that have an impact on, or result from, obesity. Risk factors are marked as non-modifiable (black striped bars) such as race/ethnicity or sex and modifiable (solid colored bars) such as physical activity or high blood pressure.

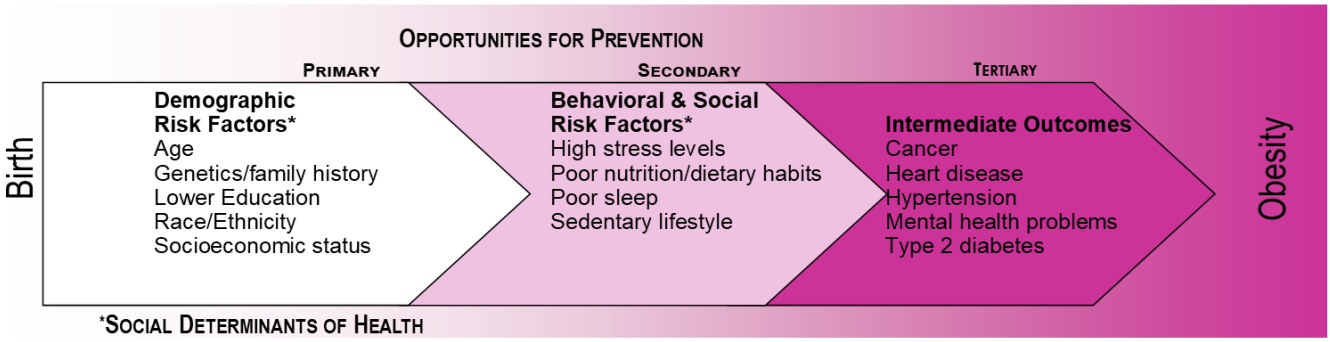
Beneath the risk factors diagram is a data grid describing the San Diego resident population in relation to selected elements of the pathway. The data grid is designed to assist in quick identification of opportunities for interventions that might have a high impact on a particular disease. The data represent all San Diegans, not only those with a particular disease. The left axis (bar) indicates the percent of the population with a known risk factor or intermediate outcome. The right axis (diamond) indicates the rate of a particular medical encounter within the population that is specified. The data are described fully described fully in the complete version of the *Critical Pathways*.[22]

In addition, the Community Health Statistics Unit website (www.SDHealthStatistics.com) provides detailed demographic, health and facility data including maps of geographically formatted health data. Also available are links to other County data sources, state and national sites of interest. For further assistance with data or interpretation, please contact the Community Health Statistics Unit.

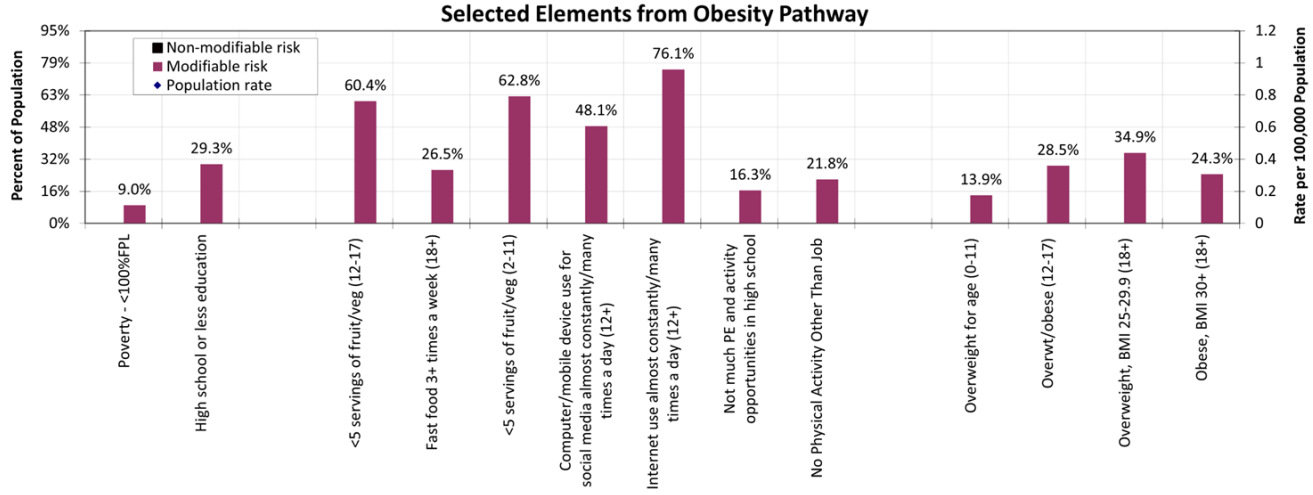
Obesity Critical Pathway to Disease

Critical Pathway

Obesity



Characteristics of Residents, San Diego County
Selected Elements from Obesity Pathway



County of San Diego ■ Health and Human Services Agency ■ Public Health Services ■ Community Health Statistics Unit ■ www.SDHeathStatistics.com ■ (619)692-6667 08/2022

Data Sources

[1] Centers for Disease Control and Prevention. (2022). *Defining Adult Overweight & Obesity*. https://www.cdc.gov/obesity/basics/adult-defining.html.

[2] National Institutes of Health. National Heart, Lung, and Blood Institute. (2022). *Overweight and Obesity. Causes and Risk Factors.* https://www.nhlbi.nih.gov/health/overweight-and-obesity/causes.

[3] Centers for Disease Control and Prevention. (2021). *Defining Childhood Overweight & Obesity*. https://www.cdc.gov/obesity/basics/childhood-defining.html.

[4] Mayo Clinic. (2021). *Obesity*. https://www.mayoclinic.org/diseases-conditions/obesity/symptoms-causes/syc-20375742.

[5] Amy S. Williams, Bin Ge, Greg Petroski, Robin L. Kruse, Jane A. McElroy, Richelle J. Koopman. The Journal of the American Board of Family Medicine Jul 2018, 31 (4) 514-521; DOI: 10.3122/jabfm.2018.04.170261

[6] Isong IA, Rao SR, Bind MA, Avendaño M, Kawachi I, Richmond TK. Racial and Ethnic Disparities in Early Childhood Obesity. Pediatrics. 2018 Jan;141(1):e20170865. doi: 10.1542/peds.2017-0865. PMID: 29269386; PMCID: PMC5744272.

[7] Centers for Disease Control and Prevention. (2022). *Childhood Obesity Facts.* https://www.cdc.gov/obesity/data/childhood.html

[8] Centers for Disease Control and Prevention. (2022). *Healthy Food Environments: Improving Access to Healthier Foods*. https://www.cdc.gov/nutrition/healthy-food-environments/improving-access-to-healthier-food.html.

[9] Roblin L. Childhood obesity: food, nutrient, and eating-habit trends and influences. Appl Physiol Nutr Metab. 2007 Aug;32(4):635-45. doi: 10.1139/H07-046. PMID: 17622277.

[10] Centers for Disease Control and Prevention. (2019). *The Obesity Epidemic and United States Students*. https://www.cdc.gov/healthyyouth/data/yrbs/factsheets/2017_US_Obesity.htm

[11] Robinson TN, Banda JA, Hale L, Lu AS, Fleming-Milici F, Calvert SL, Wartella E. Screen Media Exposure and Obesity in Children and Adolescents. Pediatrics. 2017 Nov;140(Suppl 2):S97-S101. doi: 10.1542/peds.2016-1758K. PMID: 29093041; PMCID: PMC5769928.

[12] Rocka A, Jasielska F, Madras D, Krawiec P, Pac-Kożuchowska E. The Impact of Digital Screen Time on Dietary Habits and Physical Activity in Children and Adolescents. Nutrients. 2022 Jul 21;14(14):2985. doi: 10.3390/nu14142985. PMID: 35889942; PMCID: PMC9317201.

[13] Balasundaram P, Krishna S. Obesity Effects On Child Health. [Updated 2022 Apr 14]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK570613/

[14] Weihe, P., Spielmann, J., Kielstein, H. et al. Childhood Obesity and Cancer Risk in Adulthood. Curr Obes Rep 9, 204–212 (2020). https://doi.org/10.1007/s13679-020-00387-w

[15] Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion, Division of Nutrition, Physical Activity, and Obesity.Data, Trend and Maps [online]. https://www.cdc.gov/nccdphp/dnpao/data-trends-maps/index.html. Accessed 08/2022.

[16] Stierman B, Afful J, Carroll MD, Chen TC, Davy O, Fink S, et al. National Health and Nutrition Examination Survey 2017–March 2020 prepandemic data files—Development of files and prevalence estimates for selected health outcomes. National Health Statistics Reports; no 158. Hyattsville, MD: National Center for Health Statistics. 2021. DOI: https://dx.doi. org/10.15620/cdc:106273. CS324470 nhsr158-508.pdf

[17] Bryan, S., Afful, J., Carroll, M., Te-Ching, C., Orlando, D., Fink, S., & Fryar, C. (2021). NHSR 158. National Health and Nutrition Examination Survey 2017–March 2020 pre-pandemic data files. https://doi.org/10.15620/cdc:106273

[18] UCLA Center for Health Policy Research, "2019, 2020 California Health Interview Survey," http://www.chis.ucla.edu.

[19] Centers for Disease Control and Prevention. (2021). *Tips to Help Children Maintain a Healthy Weight*. https://www.cdc.gov/healthyweight/children/index.html.

[20] Centers for Disease Control and Prevention. (2022). *Preventing Childhood Obesity: 4 Things Families Can Do*. https://www.cdc.gov/nccdphp/dnpao/features/childhood-obesity/index.html.

[21] Centers for Disease Control and Prevention. (2022). *Community Efforts*. https://www.cdc.gov/obesity/strategies/community.html.

[22] County of San Diego Health and Human Services Agency, Public Health Services. Community Health Statistics Unit. (2022). *Critical Pathways: Obesity*. August 2022.