

Childhood Obesity in the US: Implication for School Education

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BACKGROUND

Childhood obesity:

- Childhood obesity has been recognized as an increasing health problem worldwide. It is a predictor of obesity during adulthood, which is linked to chronic lifestyle diseases. Obesity prevention in schoolchildren is a public health priority.

Effects on health and well-being.

Immediate health effects:

- Obese youth are more likely to have risk factors for cardiovascular disease, such as high cholesterol or high blood pressure. In a population-based sample of 5- to 17-year-olds, 70% of obese youth had at least one risk factor for cardiovascular disease. (Freedman, Zugno, Srinivasan, Berenson, & Dietz, 2007)
- Obese adolescents are more likely to have prediabetes, a condition in which blood glucose levels indicate a high risk for development of diabetes (Li, Ford, Zhao, & Mokdad; CDC, 2011)
- Children and adolescents who are obese are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem (Daniels, Arnett, Eckel, et al., 2005; Dietz, 2004)

Long-term health effects:

- Children and adolescents who are obese are likely to be obese as adults (Guo, & Chumlea, 1999; Freedman, Wang, Thornton, et al., 2009; Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001) and are therefore more at risk for adult health problems such as heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis (Office of the Surgeon General, 2010) One study showed that children who became obese as early as age 2 were more likely to be obese as adults (Freedman, Kettel, Serdula, Dietz, Srinivasan, & Berenson, 2005)
- Overweight and obesity are associated with increased risk for many types of cancer, including cancer of the breast, colon, endometrium, esophagus, kidney, pancreas, gall bladder, thyroid, ovary, cervix, and prostate, as well as multiple myeloma and Hodgkin's lymphoma.

Prevention:

- Healthy lifestyle habits, including healthy eating and physical activity, can lower the risk of becoming obese and developing related diseases.
- The dietary and physical activity behaviors of children and adolescents are influenced by many sectors of society, including families, communities, schools, child care settings, medical care providers, faith-based institutions, government agencies, the media, and the food and beverage industries and entertainment industries.
- Schools play a particularly critical role by establishing a safe and supportive environment with policies and practices that support healthy behaviors. Schools also provide opportunities for students to learn about and practice healthy eating and physical activity behaviors.

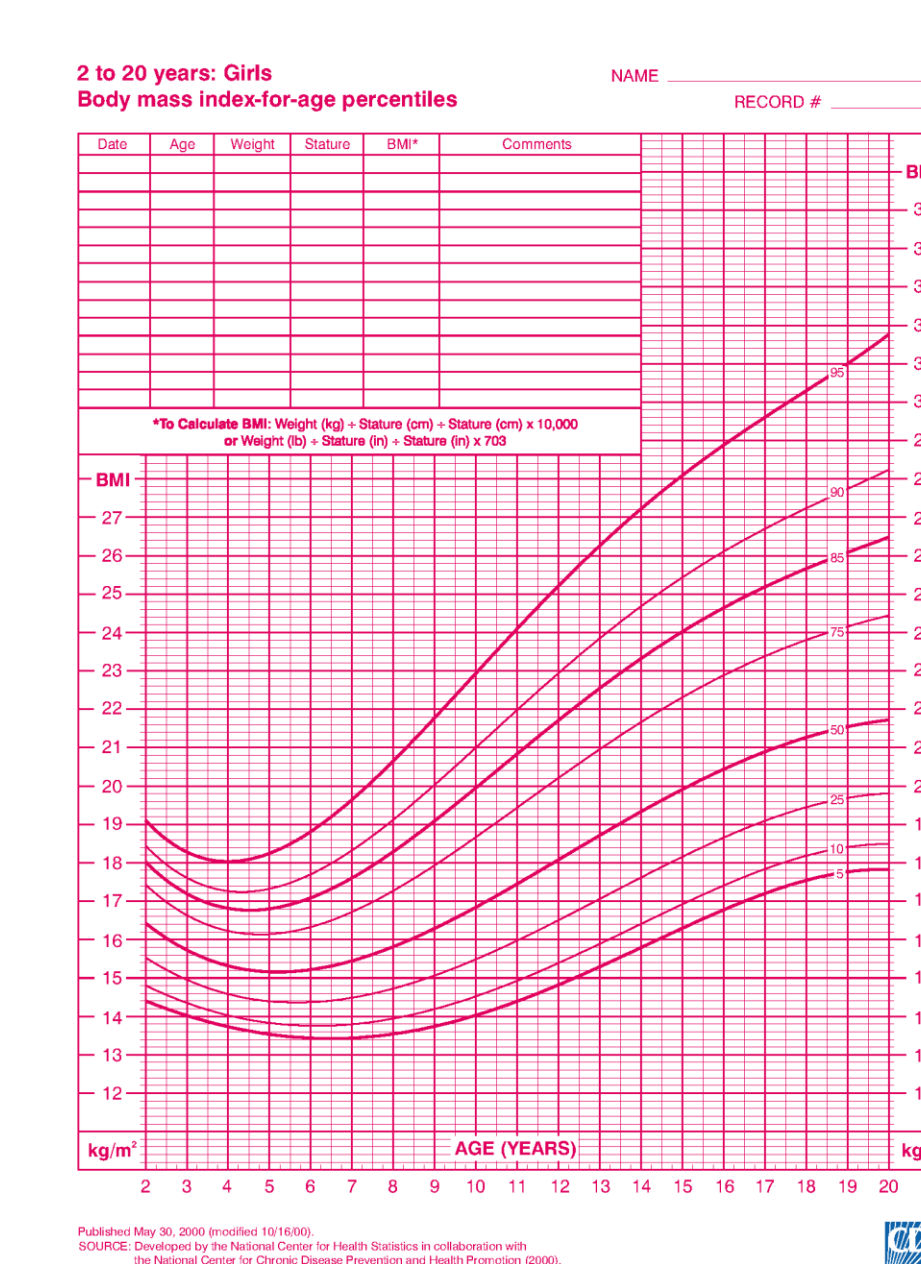
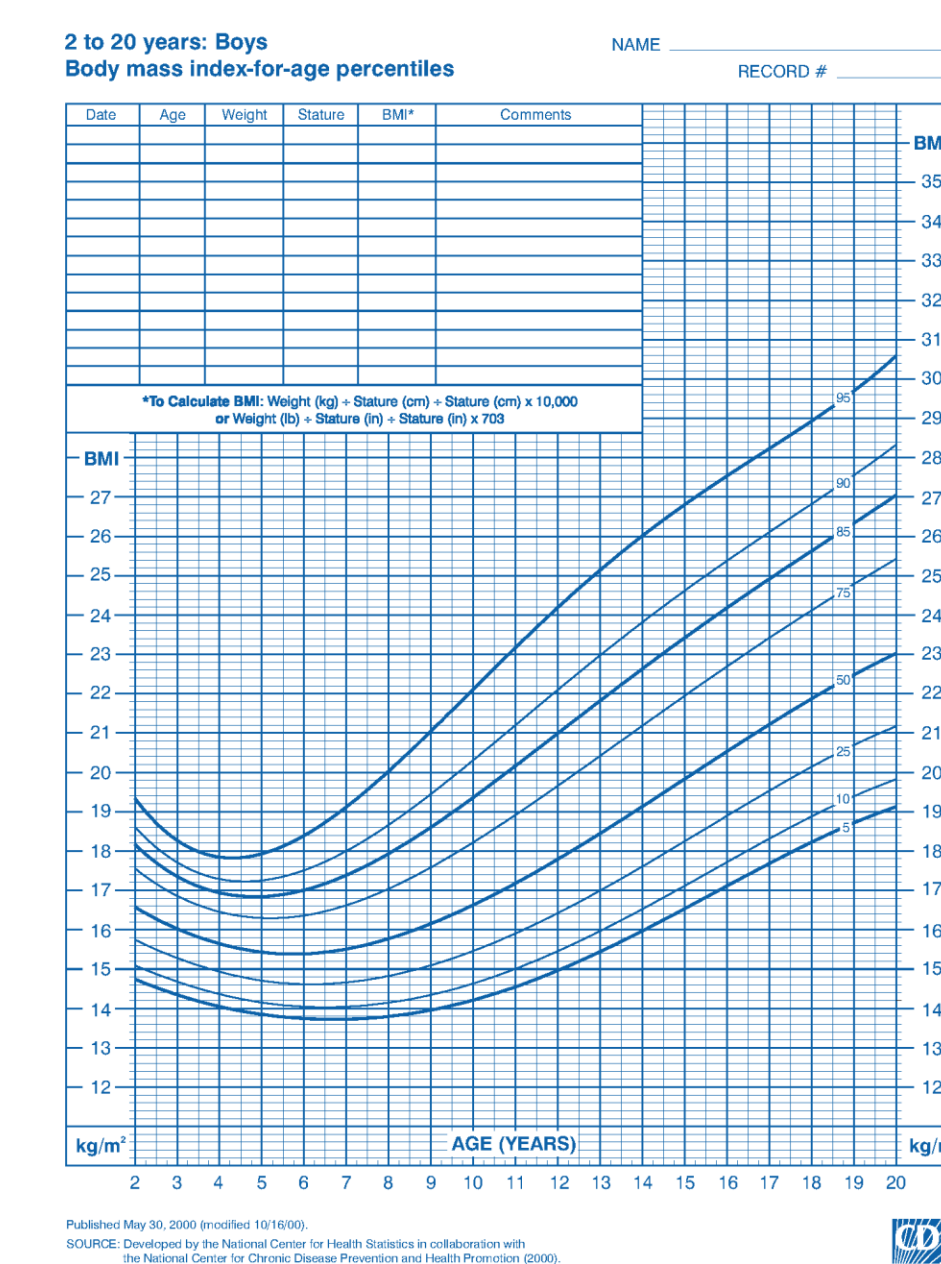
OBJECTIVES

- To examine childhood obesity prevalence in ages 5-14 by gender, race and socioeconomic status (SES) over the past 10 years and its risk factors.
- To make recommendation to school education.

METHOD

Data, Study Design, Study Participants:

- The National Health and Nutrition Examination Survey (NHANES) of 1999 - 2010 were included in this analysis.
- The NHANES was designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations.
- A total of 10,895 children ages 5 to 14 from continuous NHANES survey
- A constructing weights for combining six cycles from Analytic Guidelines, 1999–2010 (CDC) were used.
- Calculating BMI using the BMI Percentile Calculator.
- BMI-for-age percentile growth charts are the most commonly used indicator to measure the size and growth patterns of children and teens in the United States.
- BMI-for-age weight status categories and the corresponding percentiles were based on expert committee recommendations and are shown in the following table.



Weight Status Category	Percentile Range
Underweight	Less than the 5 th percentile
Normal or Healthy Weight	5 th percentile to less than the 85 th percentile
Overweight	85 th to less than the 95 th percentile
Obese	Equal to or greater than the 95 th percentile

RESULTS

Table 1: Obesity (BMI >= 95th Percentile BMI value) by age 5 to 14 with NHANES continuous survey 1999-2010 and by SNAP Family PIR Category

BMI	Age 5-6 (N= 1807)	Age 7- 8 (N= 1844)	Age 9-10 (N=1809)	Age 11-12 (N=2178)	Age 13-14 (N= 2473)	Age 5-14 (N=10111)
0-1.30						
• Not Obesity	(84.60%)	(79.23%)	(78.55%)	(74.90%)	(77.01%)	(78.91%)
• Obesity	(15.40%)	(20.77%)	(21.45%)	(25.10%)	(22.99%)	(21.09%)
1.30 - 3.5						
• Not Obesity	(85.29%)	(80.66%)	(80.22%)	(79.35%)	(83.05%)	(81.78%)
• Obesity	(14.71%)	(19.34%)	(19.78%)	(20.65%)	(16.95%)	(18.22%)
> 3.5						
• Not Obesity	(89.21%)	(87.19%)	(86.60%)	(86.13%)	(85.14%)	(86.68%)
• Obesity	(10.79%)	(12.81%)	(13.40%)	(13.87%)	(14.86%)	(13.32%)

Table 2: Obesity (BMI >= 95th Percentile BMI value) by age 5 to 14 with NHANES continuous survey 1999-2010 and by Gender & Race

Gender/Race	Age 5 - 6 (N=1950)	Age 7 - 8 (N=1995)	Age 9 - 10 (N=1941)	Age 11-12 (N=2353)	Age 13-14 (N=2656)	Age 5-14 (N=10895)
Boy						
• Not Obesity	(84.38%)	(82.49%)	(79.93%)	(79.79%)	(82.62%)	(81.84%)
• Obesity	(15.62%)	(17.51%)	(20.07%)	(20.21%)	(17.38%)	(18.16%)
Girl						
• Not Obesity	(87.53%)	(82.12%)	(82.43%)	(80.27%)	(81.66%)	(82.76%)
• Obesity	(12.47%)	(17.88%)	(17.57%)	(19.73%)	(18.34%)	(17.24%)
Mexican American						
• Not Obesity	(82.51%)	(76.92%)	(74.44%)	(70.76%)	(77.11%)	(76.37%)
• Obesity	(17.49%)	(23.08%)	(25.56%)	(29.24%)	(22.89%)	(23.63%)
Non-Hispanic White						
• Not Obesity	(87.32%)	(83.92%)	(84.09%)	(83.71%)	(84.00%)	(84.59%)
• Obesity	(12.68%)	(16.08%)	(15.91%)	(16.29%)	(16.00%)	(15.41%)
Non-Hispanic Black						
• Not Obesity	(83.55%)	(81.01%)	(75.61%)	(74.07%)	(78.47%)	(78.42%)
• Obesity	(16.45%)	(18.99%)	(24.39%)	(25.93%)	(21.53%)	(21.58%)

Note:

- Weight is recalculated based on NHANES Analytic Guidelines 1999-2010
- Percentage is weighted and number of subjects is survey sample
- Data table of BMI-for-age Charts from CDC

CONCLUSIONS/IMPLICATIONS

- The highest obesity prevalence occurs in ages 11-12.
- The obesity rate is higher among minority children and those from lower SES.
- Strategies to tackle obesity need to be incorporated into other existing school-based health promotion programs, particularly those preventing chronic diseases by promoting healthful eating and physical activity.
 - US DHHS recommends aged 6-17 years old participate in at least 60 minutes of physical activity daily → PE class in school and during recess, safe walking, biking routes to school, etc.
 - US dietary guidelines for school aged children → knowledge and skills for calories control, healthy food in school/cafeteria, nutrition message.