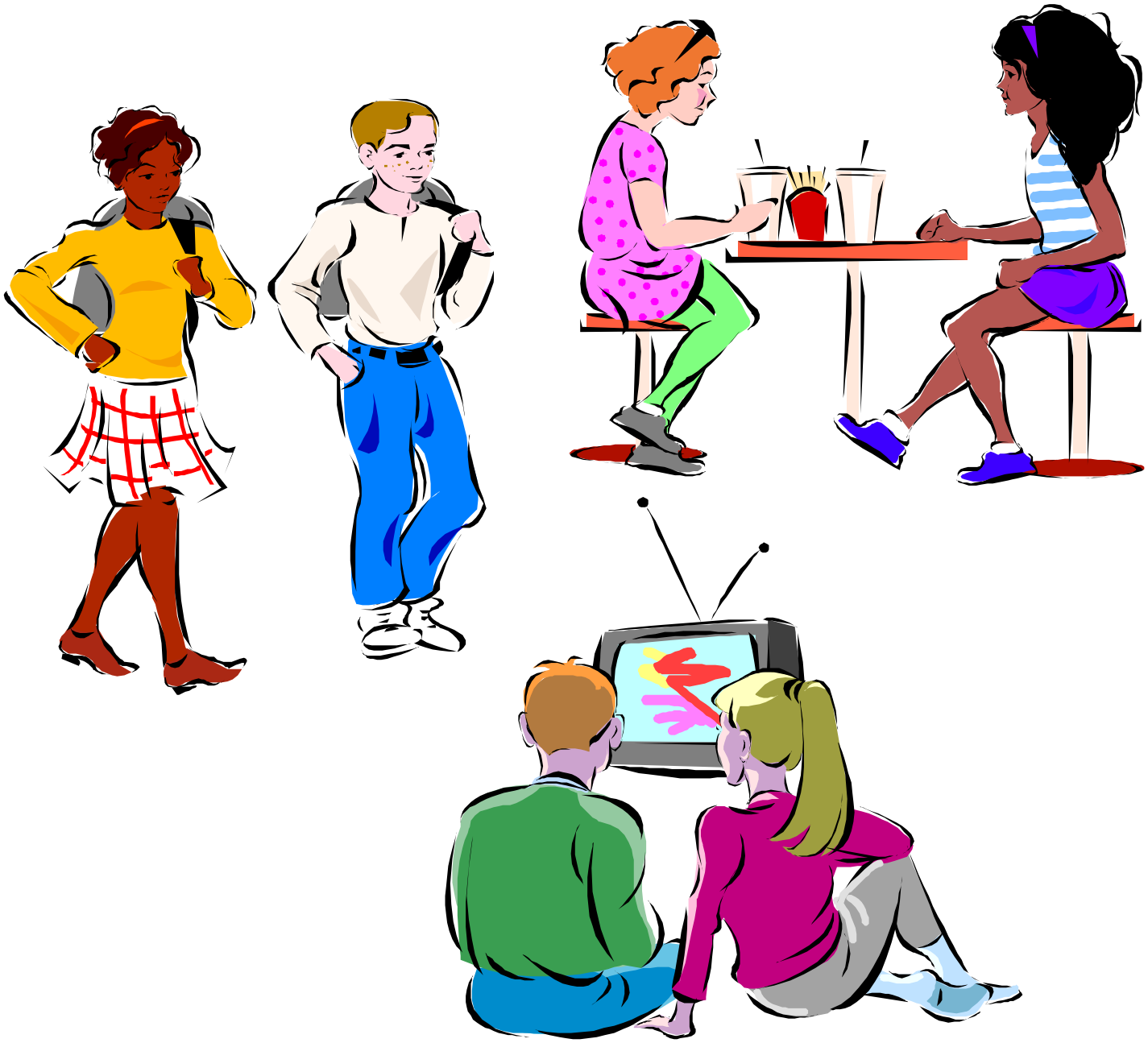
OVERWEIGHT among

Middle and High School Students

IN GEORGIA, 2001



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Summary

- Overweight among children and adolescents is increasing in the United States
- Childhood overweight is related to serious health problems such as hypertension, asthma, sleep apnea, and Type 2 diabetes, as well as poor psychosocial functioning and decreased well-being (low self-esteem)
- Three in ten (29.7%) middle school students aged 11 to 14 years in Georgia are *at risk for overweight* and *overweight*
- One in four (26.7%) high school students aged 14 to 18 years in Georgia is *at risk for overweight* and *overweight*
- The prevalence of *at risk for overweight* and *overweight* for White females is about half that for all other race-, sex-groups
- Prevention and management of overweight among adolescents will require participation from many groups; among the most important are family, schools, and health professionals

Introduction

Overweight among children and adolescents is increasing in the United States (1-3), as it is increasing among adults (4-6). Recent national data suggest that 30% of youth ages 12-19 are at risk for overweight or overweight (Body mass index for age ≥ 85th percentile)(1). Overweight children are at increased risk for becoming obese adults, and obese adults are, in turn, at risk for raising obese children (7). Childhood overweight is also related to serious health problems such hypertension, asthma, sleep apnea, and Type 2 diabetes, as well as poor psychosocial functioning and decreased well being (low self-esteem)(8,9).

Overweight and obesity are caused by an imbalance between physical activity and nutritional intake. National data suggest that among high school students in the U.S., 31% did not participate in either vigorous or moderate physical activity, 48% were not enrolled in a physical education class, and 68% did not attend a physical education class daily. In addition, 79% of high school students ate less than 5 servings of fruits and vegetables per day and 84% drank less than 3 glasses of milk per day (10).

Defining obesity or overweight among children and adolescents is difficult. Body mass index (BMI)[*], a value derived from height and weight, is commonly used to classify adult weight status because these measures can be obtained with relative ease and have a reasonably high correlation with measures of adiposity (2). For adults, overweight is defined as a BMI of 25.0-29.9 and obesity is defined as a BMI of 30.0 or higher. Extreme obesity is a BMI of 40.0 or higher (11). However, in children BMI is age dependent since the components of the measure are changing throughout development.

A well-known approach to characterizing children and adolescents is the use of growth charts. Growth charts show the distribution of weight-for-height across a range of ages for a reference population. Percentile cut-offs are chosen to classify children as underweight (BMI-for-age <5th percentile), at risk for overweight (BMI-for-age ≥85th percentile but <95th percentile), or overweight (BMI-for-age ≥ 95th percentile). In contrast with current definition for adults in which obesity is defined by BMI, the term obesity when applied to children traditionally has been limited to actual measures of fatness or adiposity such as skin caliper measurements or underwater weighing. Therefore, a weight-based measurement can classify children as overweight but not necessarily as obese (2). Centers for Disease Control and Prevention (CDC) growth charts (12), based on National Health and Nutrition Examination Surveys (NHANES I, II, and III) are the basis for defining overweight and at risk for overweight in this report (See Appendix III).

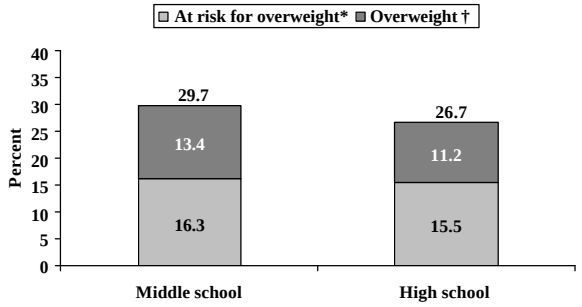
Data on the prevalence of overweight among adolescents have not previously been available in Georgia. In 2001, height and weight questions were added to the Georgia Youth Tobacco Survey, which was conducted in a representative sample of public middle and high schools in Georgia. The following report provides descriptive information on the current prevalence of *at risk for overweight* (BMI-for-age ≥85th percentile but <95th percentile) and *overweight* (BMI-for-age ≥ 95th percentile) for Georgia middle and high school students.

[*] BMI= weight-for-height index defined as weight in kilograms/ height in meters^2

Overweight among Middle and High School Students in Georgia

The prevalence of *at risk for overweight* (BMI-for-age ≥85th percentile but <95th percentile) and *overweight* (BMI-for-age ≥ 95th percentile) among middle and high school students in Georgia is high. Three in ten middle school students (29.7%) and more than one in four high school students (26.7%) were *at risk for overweight* or *overweight* **(Figure 1)**. Among high school students, Georgia rates for students who were *at risk for overweight* (15.5%) and for students who were *overweight* (11.2%) are slightly higher than the corresponding national rates, 13.6% and 10.5%, respectively, but not statistically different.

Figure 1. Prevalence of *at risk for overweight* and *overweight* among Georgia student by school type, 2001

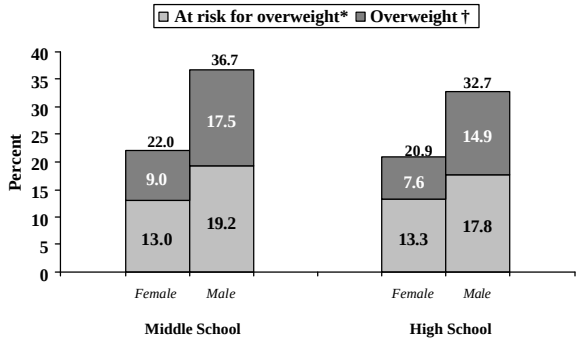


* Body mass index for age ≥85th percentile but <95th percentile

† Body mass index for age ≥95th percentile

In both middle school and high school, males were significantly more likely to be *at risk for overweight* or *overweight* than females (**Figure 2)**. Middle school males had the highest percent of both being *at risk for overweight* (19.2%) and *overweight* (17.5%).

Figure 2. Prevalence of *at risk for overweight* and *overweight* among Georgia students by school type and sex, 2001

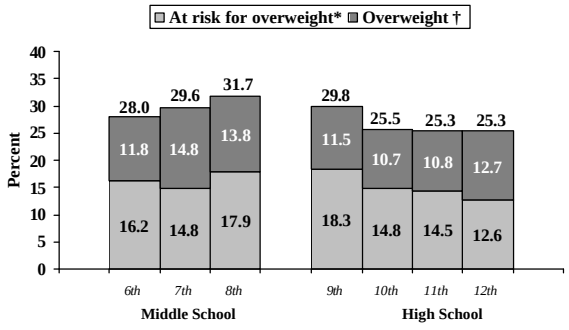


* Body mass index for age ≥85th percentile but <95th percentile

† Body mass index for age ≥95th percentile

In middle school, as grade increases there is a small increase in the combined prevalence of *at risk for overweight* and *overweight*, whereas in high school, as grade increases there is a small decrease in the combined prevalence of *at risk for overweight* and *overweight* (**Figure 3)**. However, there is no statistical difference in both *at risk for overweight* or *overweight* between the grades.

Figure 3. Prevalence of *at risk for overweight* and *overweight* among Georgia students by school type and grade, 2001

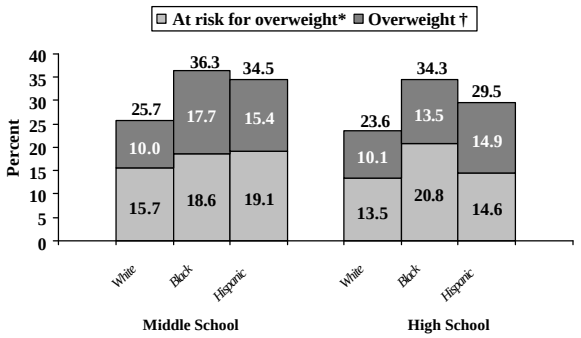


* Body mass index for age ≥85th percentile but <95th percentile

† Body mass index for age ≥95th percentile

Black and Hispanic students in both middle and high schools were more likely to be *at risk for overweight* or *overweight* than White students **(Figure 4)**. Moreover, when examining the prevalence of *at risk for overweight* and *overweight* in the different race/ethnicity and sex groups, White females had the lowest prevalence of *at risk for overweight* or *overweight* in both middle and high schools **(Figure 5)**. The prevalence of *at risk for overweight* and *overweight* for White females is about half that for all other race-, sex-groups.

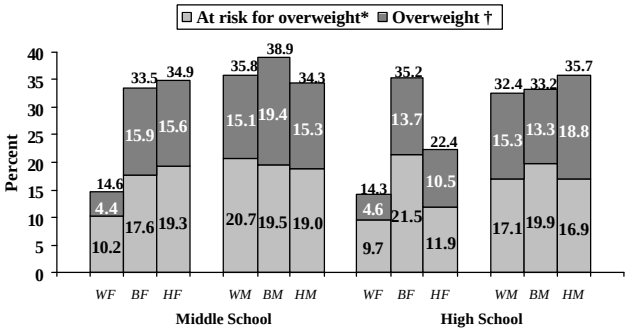
Figure 4. Prevalence of *at risk for overweight* and *overweight* among Georgia students by school type and race, 2001



* Body mass index for age ≥85th percentile but <95th percentile

† Body mass index for age ≥95th percentile

Figure 5. Prevalence of *at risk for overweight* and *overweight* among Georgia students by school type, race and sex, 2001



* Body mass index for age ≥85th percentile but <95th percentile

† Body mass index for age ≥95th percentile

Conclusion

This report summarizes the most recent data available on the prevalence of overweight among middle and high school students aged 11 to 18 years in Georgia. Overweight is prevalent among Georgia middle and high school students. About one in three middle school students and one in four high school students are *at risk for overweight* or *overweight*. The prevalence of *at risk for overweight* and *overweight* for White females is about half that for all other race-, sex-groups.

Healthy People 2010 objective (number 19-3b) addresses overweight among adolescents aged 12-19 years. The target of this objective is to reduce the proportion of adolescents who are overweight or obese (BMI-for age ≥ 95th percentile) to 5% in the year 2010. In Georgia, the prevalence of overweight (BMI-for age ≥ 95th percentile) among adolescents is two times higher (11.2%) than the national goal.

Recommendations for prevention of overweight in children and adolescents

Overweight among children is a multi-faceted and complex problem that will require participation from many sectors. Prevention and management programs will need to be implemented in a coordinated fashion in multiple settings. Intervention programs to prevent and manage overweight in children and adolescents should include all contributing factors: behavioral, policy, and environmental factors. Such interventions should take place in all levels (13), including

- Individual level (knowledge, attitude, behaviors)
- Interpersonal level (family, friends, social network)
- Organizational level (organizations and social institutions)
- Community level (county, municipality, neighborhood)
- Society level (state).

Three key settings for interventions are: in the family, at school, and in the health care settings.

Family: The family is one of the strongest influences on a child's risk of overweight. Parental knowledge, attitudes, purchase patterns and presentation of food, modeling of eating and exercise habits, and support for active leisure lifestyle can all affect children's eating and exercise patterns. The following actions can be taken in the family to prevent and control overweight among children:

Nutrition:

- Serve as a role model for children by eating a healthy, balanced meal high in fruits and vegetables, and whole grains
- Provide children with healthy food choices for meals and snacks
- Involve children in selecting and preparing food

Physical Activity:

- Serve as a role model for children by being physically active
- Make physical activity a fun, family event
- Encourage children to be physically active
- Play and be physically active with children

Schools. Throughout their growth and development years, children spend a significant amount of time attending school and a great deal of their eating and physical activity is carried out in this setting. Schools can also assist in identifying children who may be at risk for overweight. The following actions can be taken in schools to prevent and manage overweight among children:

Nutrition:

- Offer healthy, appealing foods such as fruits, vegetables, and low-fat grain products that meet USDA nutrition standards and the Dietary Guidelines

- Limit the availability of foods high in fat, sodium, and added sugars such as soda, candy, and french fries at school, on class trips, and during fund-raising activities

- Provide healthy snacks for school parties and special events

- Use curricula that follow CDC's Guidelines for School Health Programs to promote lifelong healthy eating habits

- Stock vending machines with 100% fruit juice, water, and other healthy snacks

Physical Activity:

- Provide health education and daily physical education for students in all grades

- Ensure that physical education and extracurricular programs offer lifelong activities, such as walking and dancing

- Provide time during the day, such as recess, for unstructured physical activity, such as walking or jumping rope

- Ensure that school facilities are clean, safe, and open to students during non-school hours and vacations

- Make schools available for the public to use after school hours

- Use curricula that follow CDC's Guidelines for School and Community Programs to Promote Lifelong Physical Activity Among Young People and the national standards for physical education and health education

Health Care Settings: Health care professionals such as registered dieticians, school nurses, pediatricians, and family physicians have an important role in the prevention, detection, and management of childhood overweight. School nurses and pediatricians can regularly assess and provide education and counseling on potential lifestyle risk factors for overweight such as unhealthy eating and physical inactivity. The following actions can be taken by health care professionals to prevent and control overweight among children:

- Measure height and weight accurately and use the CDC growth charts to screen children

- Refer overweight children for intervention, as appropriate

- Provide preventive guidance and counseling to parents and children regarding healthy eating and physical activity habits

Parents have also a significant role in the health care setting. They should seek advice from their children's health care professional on the prevention and treatment of overweight.

Public health has an important role in the prevention and monitoring of overweight in children. The main risk factors of overweight - poor nutrition and physical inactivity - are monitored periodically and guide the development and evaluation of population-based prevention programs. Public health also collaborates with other organizations and agencies such as local and state school systems and the American Academy of Pediatrics to develop and implement programs to improve nutrition and physical activity practices.

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Appendix I

Methods

The Georgia Youth Tobacco Survey (GYTS) is a paper-and-pencil questionnaire administered to Georgia public middle and high school students in the fall of 2001 (14). The GYTS included a core set of 64 tobacco-related questions developed by CDC, along with state-added questions including questions on height and weight. A separate middle and high school sample was selected. The sampling frame consisted of all public schools with students enrolled in grades 6-8 for the middle school frame and 9-12 for the high school frame. For both the middle school and high school data, a weighting variable was calculated for each student record to reflect the likelihood of sampling each student and to reduce bias by compensating for differing patterns of non-response. Overall response rate was 91% (n=2,848) for the middle school sample and 84% for the high school sample (n=2,975).

Weight status classifications were calculated using a SAS program developed by the CDC, Division of Nutrition and Physical Activity to generate anthropometric indices for children from 2 to 20 years of age based on national data (12). The program uses the GYTS variables for height, weight, sex and age to calculate a body mass index (BMI) value and percentile of BMI-for-age. Students who were at or above the 95th percentile for BMI-for-age were classified as overweight. Students who were at or above the 85th percentile, but less than the 95th percentile for BMI-for-age were classified as at risk for overweight. Further analysis by race, grade and sex was done using SUDAAN software to account for the sampling. Grade serves as a proxy measure for age, since grade was a part of the sampling frame and the data are weighted accordingly.

The findings in this report are subject to several limitations. First, the data apply only to youth who attend public middle and high schools in Georgia. Private school, home-schooled and out of school adolescents are not included in this survey. Second, BMI is calculated based on self-reported height and weight and, therefore, tends to underestimate the prevalence of overweight and at risk for overweight. A recent study (15) that assessed the reliability and validity of self-reported height and weight among high school students found that on average students over-reported their height by 2.7 inches and under-reported their weight by 3.5 pounds. The resulting BMI values were an average of 2.6 kg/m^2 lower when based on self-reported versus measured values.

TABLE. Prevalence of *at risk for overweight* and *overweight* by sex, school type, grade, and race/ethnicity – Georgia, 2001*

Category	At risk for becoming overweight†						Overweight§					
	Female	95%CI	Male	95% CI	Total	95%CI	Female	95% CI	Male	95% CI	Total	95%CI
Middle School Grade												
6th	11.9	(8.3-15.6)	20.1	(14.3-25.8)	16.2	(13.1-19.3)	6.0	(3.1-8.8)	17.1	(13.5-20.8)	11.8	(9.5-14.2)
7th	13.5	(10.9-16.2)	16.0	(12.6-19.4)	14.8	(12.5-17.1)	10.9	(7.8-13.9)	18.5	(14.7-22.2)	14.8	(12.3-17.4)
8th	13.6	(10.2-16.9)	21.8	(17.4-26.2)	17.9	(15.3-20.4)	10.3	(6.6-13.9)	17.0	(12.9-21.1)	13.8	(10.8-16.8)
Race/Ethnicity												
White	10.2	(7.7-12.7)	20.7	(16.7-24.7)	15.7	(13.1-18.3)	4.4	(1.9-6.9)	15.1	(11.6-18.7)	10.0	(7.4-12.7)
Black	17.6	(13.4-21.9)	19.5	(15.2-23.9)	18.6	(16.0-21.3)	15.9	(11.5-20.2)	19.4	(15.8-23.1)	17.7	(15.3-20.1)
Hispanic	19.3	(7.3-31.2)	19.0	(11.1-26.8)	19.1	(11.5-26.7)	15.6	(7.0-24.1)	15.3	(8.1-22.6)	15.4	(9.4-21.4)
Other	5.3	(0.8-9.9)	8.5	(2.1-14.9)	7.2	(2.7-11.7)	5.4	(4.2-6.7)	25.3	(15.9-34.7)	16.9	(10.9-22.9)
Total	**13.0**	**(11.1-14.9)**	**19.2**	**(16.9-21.5)**	**16.3**	**(15.0-17.5)**	**9.0**	**(6.8-11.2)**	**17.5**	**(15.2-19.8)**	**13.4**	**(11.7-15.1)**
High School Grade												
9th	18.1	(12.3-23.9)	18.5	(14.6-22.4)	18.3	(15.3-21.4)	7.2	(4.7-9.7)	15.3	(11.0-19.5)	11.5	(8.6-14.3)
10th	10.5	(6.5-14.5)	19.0	(12.6-25.4)	14.8	(10.4-19.1)	9.0	(4.5-13.5)	12.4	(8.1-16.6)	10.7	(7.6-13.8)
11th	13.4	(8.2-18.6)	15.7	(10.7-20.8)	14.5	(11.3-17.8)	6.9	(3.0-10.7)	14.9	(10.9-18.9)	10.8	(8.2-13.4)
12th	8.4	(5.9-10.9)	17.3	(11.9-22.7)	12.6	(9.6-15.6)	7.7	(3.1-12.3)	18.4	(12.2-24.6)	12.7	(8.7-16.7)
Race/Ethnicity												
White	9.7	(7.5-12.0)	17.1	(13.3-20.8)	13.5	(11.7-15.4)	4.6	(2.5-6.7)	15.3	(12.2-18.4)	10.1	(8.3-11.8)
Black	21.5	(14.8-28.2)	19.9	(13.8-26.0)	20.8	(15.7-25.8)	13.7	(10.0-17.4)	13.3	(9.1-17.4)	13.5	(10.3-16.7)
Hispanic	11.9	(0.0-26.2)	16.9	(8.9-24.9)	14.6	(5.0-24.2)	10.5	(4.4-16.6)	18.8	(8.8-28.7)	14.9	(8.9-20.9)
Other	4.8	(0.0-9.8)	16.3	(6.3-26.3)	11.3	(4.8-17.8)	1.3	(0.0-3.7)	10.7	(0.3-21.1)	6.6	(0.8-12.4)
Total	**13.3**	**(9.8-16.7)**	**17.8**	**(14.5-21.0)**	**15.5**	**(13.3-17.7)**	**7.6**	**(5.4-9.8)**	**14.9**	**(12.2-17.6)**	**11.2**	**(9.5-13.0)**

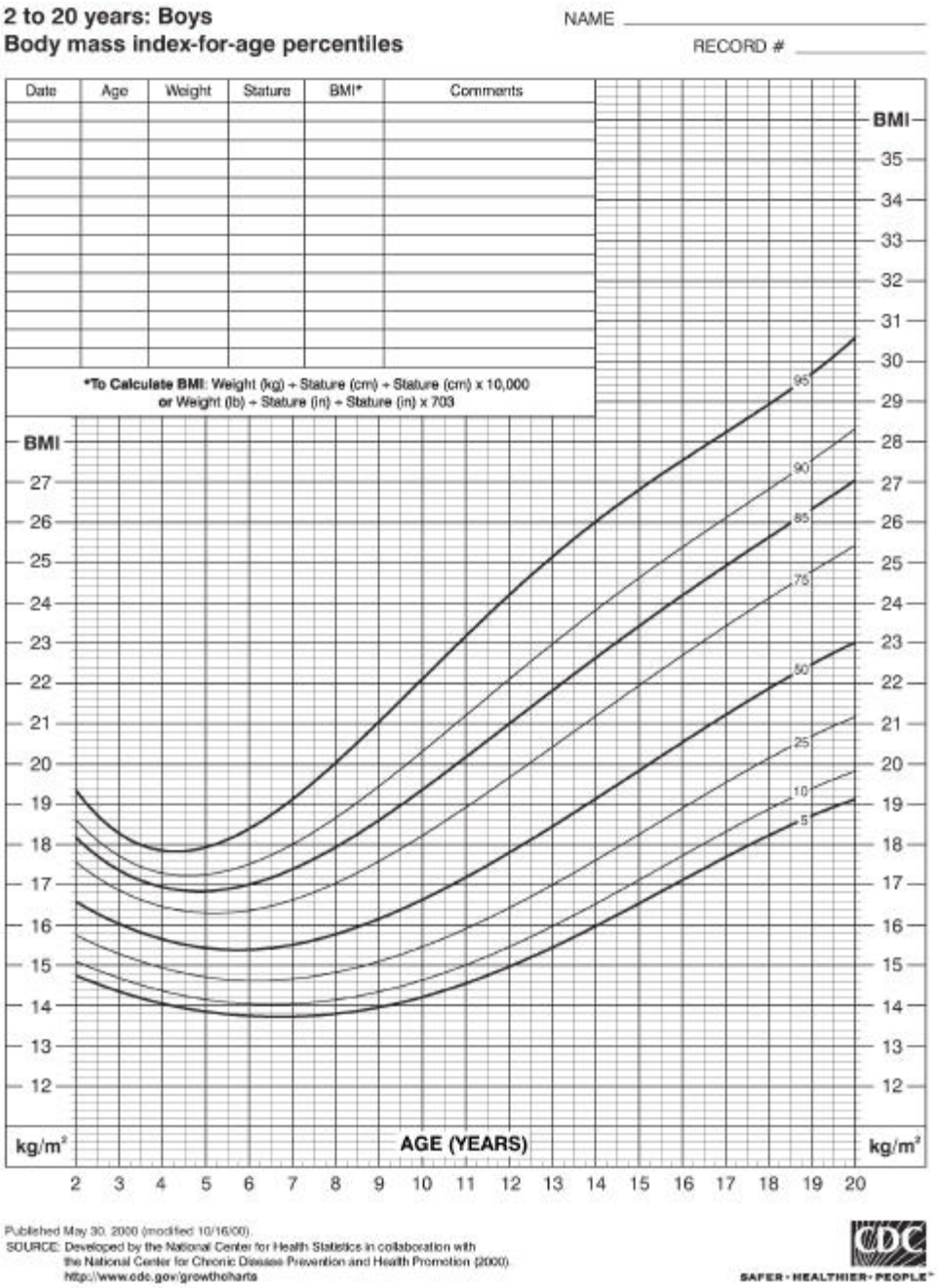
*Data was collected in the 2001 Georgia Youth Tobacco Survey

†Students who were ≥85th percentile but <95th percentile for body mass index for age based on reference data from the National Health and Nutrition Examination Survey I.

§ Students who were ≥95th percentile for body mass index for age based on reference data from the National Health and Nutition Examination Survey I.

Appendix III

CDC Growth Charts: United States



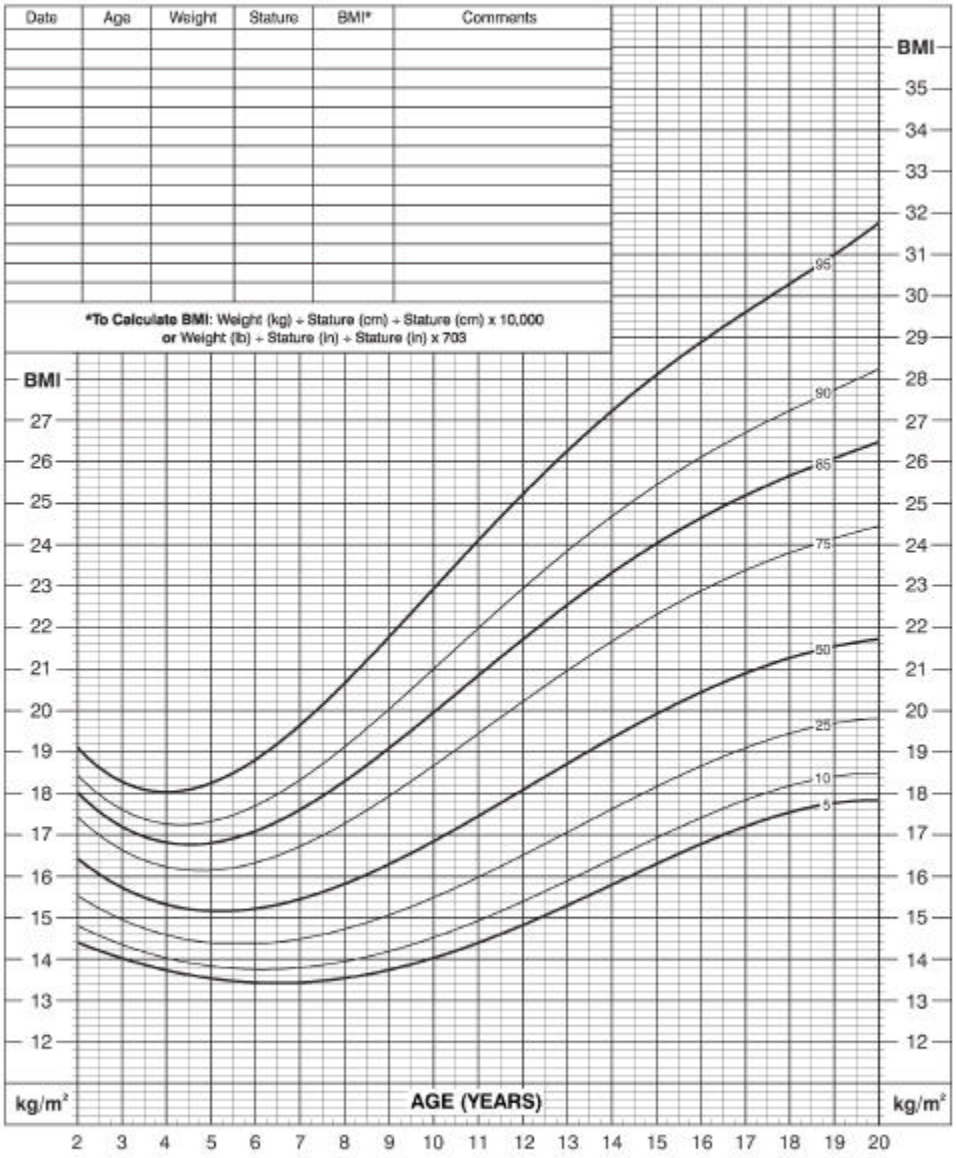
2 to 20 years: Girls
Body mass index-for-age percentiles

NAME _____

RECORD # _____

Date	Age	Weight	Stature	BMI*	Comments

***To Calculate BMI:** Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703



Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

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