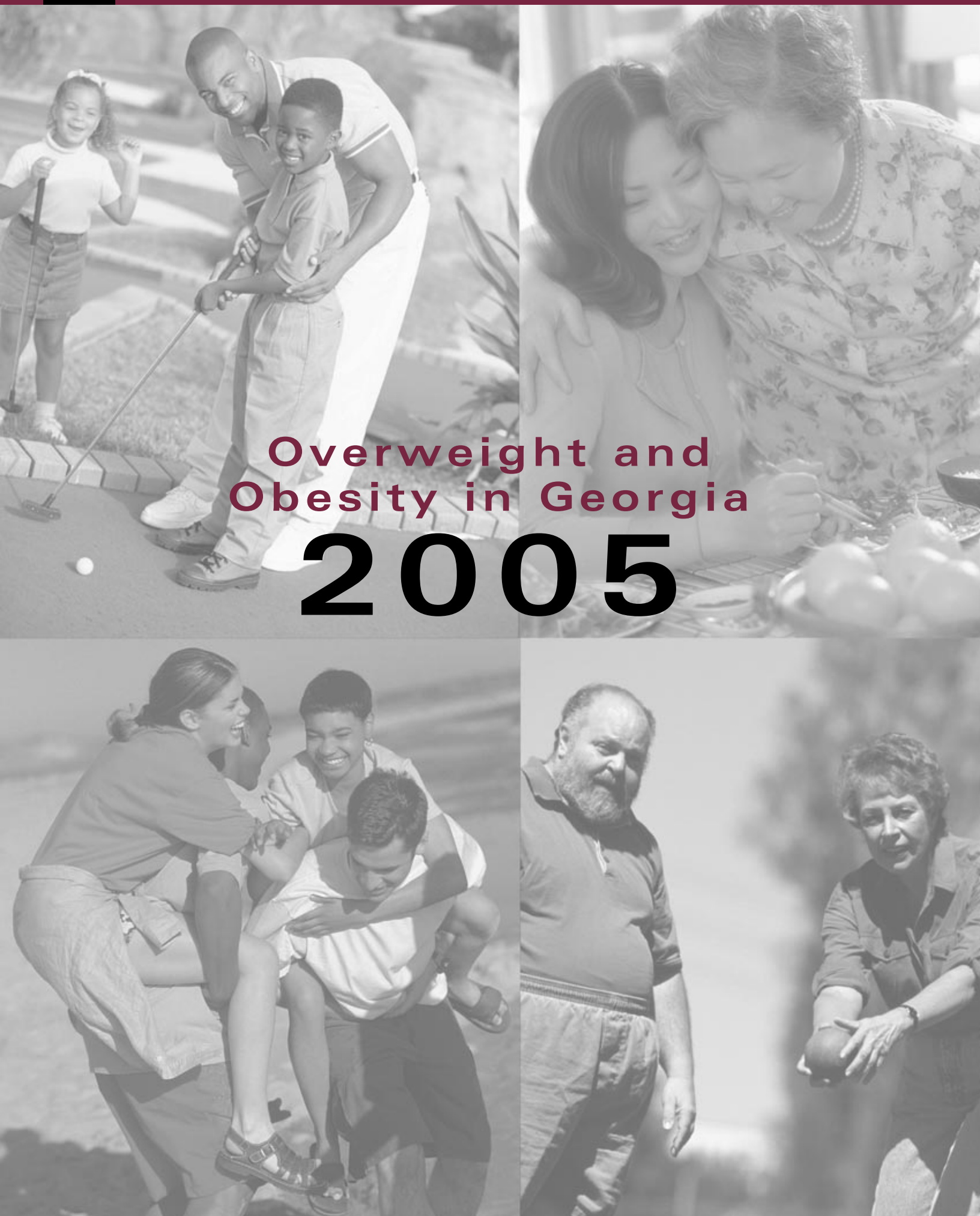

Overweight and Obesity in Georgia

2005

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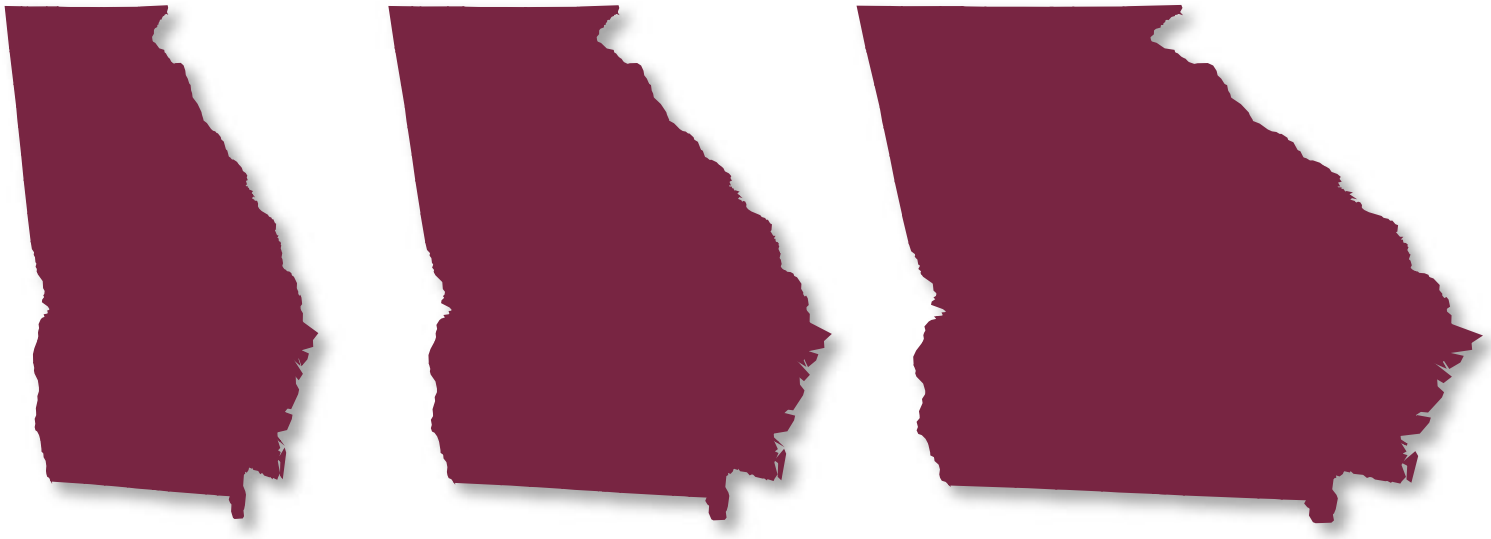
Overweight, Obesity, & Health



Introduction

Excess body fat is epidemic in Georgia and the entire United States, affecting all segments of the population.[1-5] The immediate cause of the epidemic is an imbalance between energy intake (food consumption) and energy output (physical activity). The causes of the imbalance are related to a complex and incompletely understood combination of behavioral, environmental, cultural, political, and socioeconomic influences.[6] The purpose of this report is to provide information about the health risks and costs arising from excess body fat, the scientific terms and measures used to describe the epidemic, the extent of the epidemic in Georgia, and initial plans by the Georgia Department of Human Resources, Division of Public Health to address the problem.

Health Risks

Excess body fat is associated with increased mortality. An estimated 6,700 Georgians now die every year because they are overweight or obese, approximately 10% of all deaths. These deaths are caused by heart disease, some cancers, stroke, type 2 diabetes, and other medical conditions (Table 1) that arise from the metabolic and mechanical abnormalities induced by excess body fat.[6] Fat-related diseases occur most often in adults, but overweight children and adolescents can develop type 2 diabetes, high blood lipids, hypertension, asthma, sleep apnea, early maturation, and orthopedic problems. Psychosocial consequences of excess body fat are particularly common in children.[7,8]

Table 1. Health Risks Associated with Obesity

- ➜ Premature death
  - ➜ Heart disease, stroke, hypertension, high cholesterol
    - ➜ Some cancers
      - ➜ Type 2 diabetes
        - ➜ Asthma, gall bladder disease, osteoarthritis
          - ➜ Depression, menstrual irregularities
            - ➜ Sleep apnea
              - ➜ Elevated surgical risk

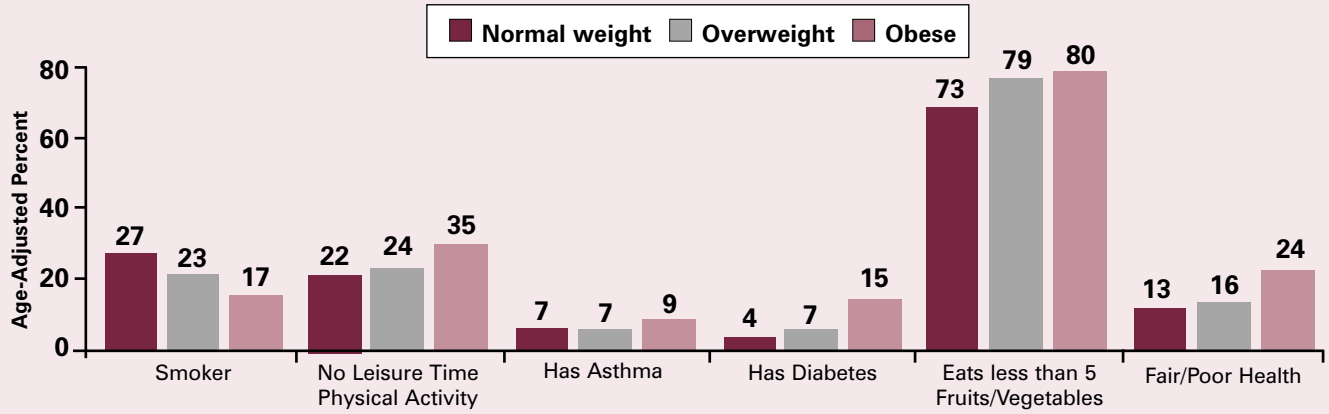
Economic Costs

The medical costs of obesity in the U.S. have been estimated at $75 - $100 billion a year.[9,10] The estimate for Georgia is about $2.1 billion per year, or $250 per Georgian per year.[9] Excess body fat is associated with both direct costs such as diagnostic and treatment services related to overweight and obesity, and indirect costs such as lost wages and reduced productivity due to illness, disability, and premature death.

Fat Loss and Prevention of Fat Gain

The adverse health and economic effects of obesity can be reduced by preventing fat gain in the general population and by losing fat among those with excess fat. Normal body weight is maintained by balancing energy intake and energy expenditure. Current recommendations for adults include eating at least 5 servings of fruits and vegetables each day, and aim for a total fat intake of no more than 30% of total calories,[11] and accumulating 30 minutes of moderate-intensity physical activity on at least five, preferably all, days of the week.[12] Overweight and obese adults in Georgia are less likely than those of normal weight to eat 5 or more servings of fruits and vegetables per day or to be physically active (Figure 1).

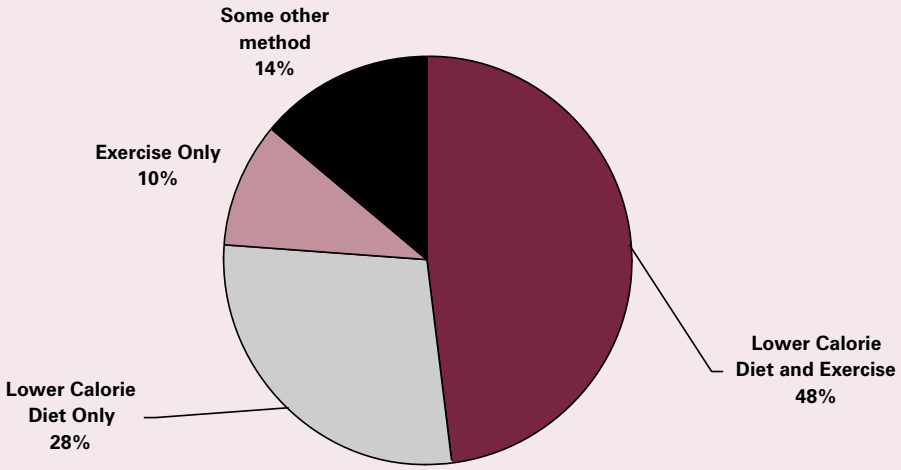
Figure 1. Health behaviors and health conditions by weight status, Georgia, 1984-2002



Age Adjusted to the 2000 Standard Population
Source: Georgia Behavioral Risk Factor Surveillance System

Weight loss is accomplished by consuming fewer calories, being more physically active, or, preferably, both.[13] Among overweight or obese Georgia adults who are trying to lose weight, less than half (48%) are eating fewer calories and using exercise. Over one-quarter are relying on lower calorie diets alone (28%), 10% are using exercise alone, and 14% are using other methods to try to lose weight (Figure 2).

Figure 2. Weight loss methods among overweight and obese adults who are trying to lose weight, Georgia, 2000



Source: Georgia Behavioral Risk Factor Surveillance System 2000

Measuring Overweight and Obesity

The percentage of a person's body that is fat can be estimated in various ways. Underwater weighing is regarded as the most accurate. Electrical impedance and skin calipers are common measures in field studies or clinical settings. The most commonly used method, however, is the calculation of body mass index (BMI) from the weight and height of an individual. BMI is calculated by dividing a person's weight in kilograms by height in meters squared:

BMI= weight (kg)/ height squared (m^2)

For adults, overweight is defined as a BMI of at least 25.0, but less than 30.0. Adults with a BMI of 30.0 or greater are considered obese (Table 2).[13] Obesity is further divided into three classes. Class I are adults with a BMI from 30.0 to less than 35.0, Class II from 35.0 to less than 40.0, and Class III 40.0 and above. See Appendix 1 for height and weight conversion chart for calculating the BMI of adults. For children and adolescents, defining obesity or overweight based on BMI is more difficult because the relationship between height and weight are age dependent and change throughout development. A standard approach to characterizing children and adolescents is the use of growth charts. Growth charts (Appendix 2) show the distribution of BMI across a range of ages for a reference population. Percentile cut-offs are chosen to classify children as at risk for overweight (BMI-for-age ≥ 85th percentile but < 95th percentile) or overweight (BMI-for age ≥ 95th percentile) (Table 3).[14]

Table 2. NIH Classification of Overweight and Obesity for Adults by BMI

CLASSIFICATION	BMI (kg/m^2)
Underweight	<18.5
Normal	18.5-24.9
Overweight	25.0-29.9
Obesity Class I	30.0-34.9
Obesity Class II	35.0-39.9
Obesity Class III	≥ 40.0

Table 3. Classification of Overweight by BMI-for-age for Children and Youth (Ages 2-20)

CLASSIFICATION	BMI-for age
Underweight	< 5th percentile
Normal	≥ 5th and < 85th
At risk for overweight	≥ 85th and < 95th percentile
Overweight	≥ 95th percentile

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chapter two
Prevalence of Overweight and Obesity among Children, Youth, and Adults

Overweight from Birth through Elementary School-aged Children in Georgia

Information about the percentage of children in Georgia who are at risk for overweight or overweight from birth through elementary school-aged children is not available. However, information is available for children, from birth to 4 years of age, who are enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), a federally funded program aimed at providing nutrition education and nutritious foods to low-income families. In 2002, approximately 37% of children aged 2 to <5 years old in Georgia were enrolled in the Women, Infants and Children's (WIC) Program. Information concerning their risk of being overweight or overweight is available for 1993 through 2002.

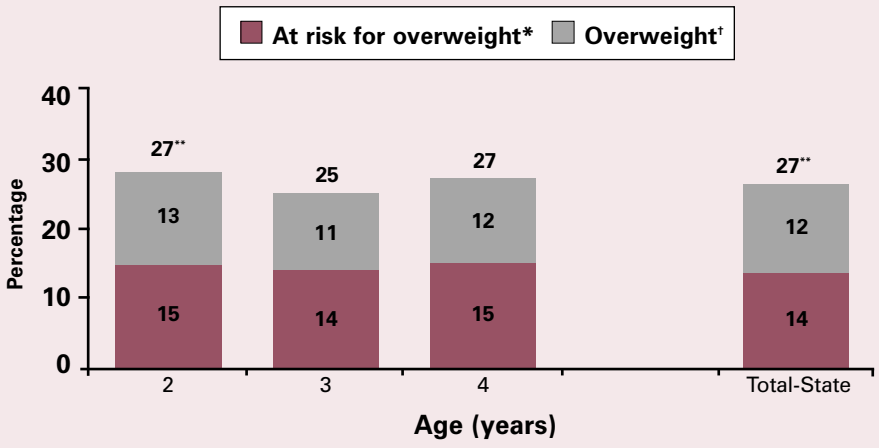
Overweight WIC Participants, Ages 2 to <5 years

Over one-quarter (27%) of children participating in the WIC program in 2002 were at risk for overweight (14%) or overweight (12%). The prevalence of at risk for overweight or overweight was 27% for two-and four-year olds and 25% for three-year olds (Figure 3). Among Hispanic participants in the WIC program, over one-third (35%) were at risk for overweight or overweight. About one in four white non-Hispanic (26%) or black non-Hispanic (24%) children who participated in WIC were at risk for overweight or overweight (Figure 4).

The prevalence of at risk for overweight or overweight among WIC participants ages 2 to <5 in 19 health districts in Georgia ranged from 22% to 33% (Figure 5).

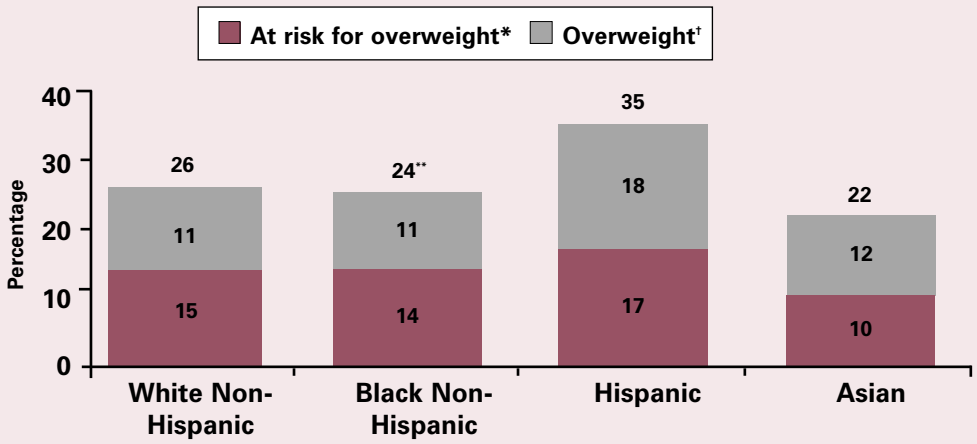
In Georgia, there has been a steady increase in the prevalence of at risk for overweight or overweight among WIC children age 2 to <5 years, rising from 21% in 1993 to 26% by 2002. This represents an average relative increase of 3% per year in the prevalence of overweight among children age 2 to <5 years over the past decade (Figure 6).

Figure 3. Prevalence of at risk for overweight and overweight among children aged 2 to <5 years in WIC Program by age, Georgia, 2002



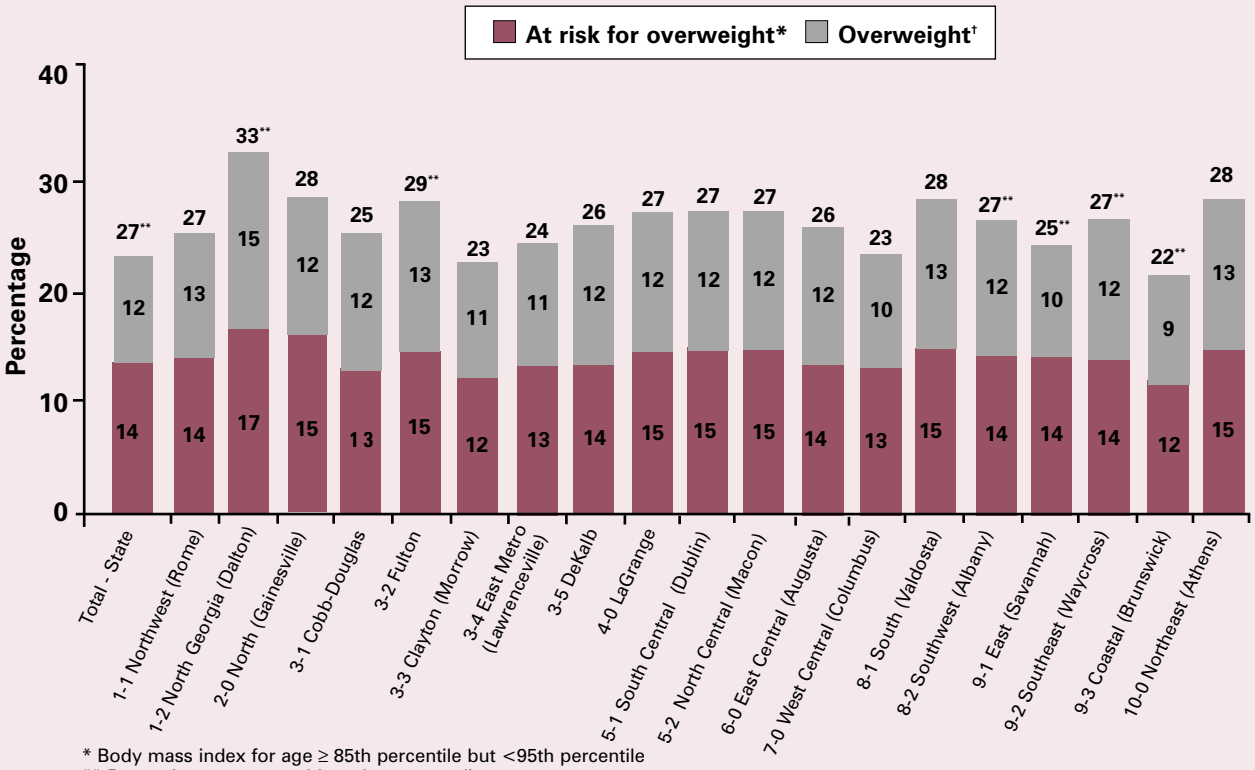
* Body mass index for age ≥ 85th percentile but <95th percentile
** Proportions may not add up due to rounding
† Body mass index for age ≥ 95th percentile
Source: Pediatric Nutrition Surveillance System (PedNSS)

Figure 4. Prevalence of at risk for overweight and overweight among children aged 2 to <5 years, by race and ethnicity, Georgia, 2002



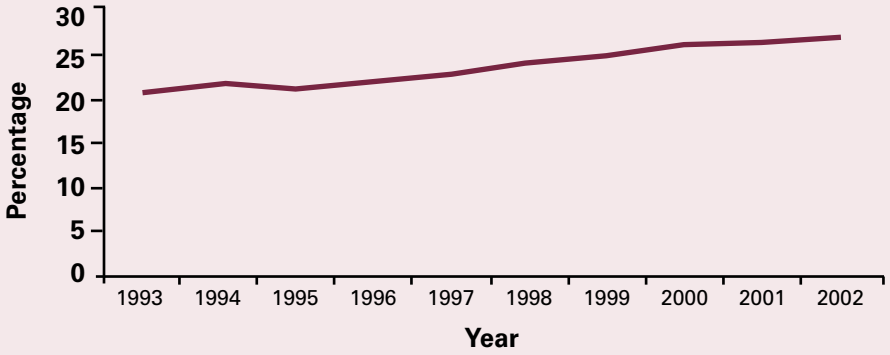
* Body mass index for age ≥ 85th percentile but <95th percentile
** Proportions may not add up due to rounding
† Body mass index for age ≥ 95th percentile
Source: Pediatric Nutrition Surveillance System (PedNSS)

Figure 5. Prevalence of at risk for overweight and overweight among children aged 2 to <5 years, by health district, Georgia, 2002



* Body mass index for age ≥ 85th percentile but <95th percentile
** Proportions may not add up due to rounding
† Body mass index for age ≥ 95th percentile
Source: Pediatric Nutrition Surveillance System (PedNSS)

Figure 6. Trends in prevalence of at risk for overweight or overweight* among children aged 2 to <5 years, Georgia, 1993-2002



* Body mass index for age ≥ 85th percentile
Source: Pediatric Nutrition Surveillance System (PedNSS)

References:

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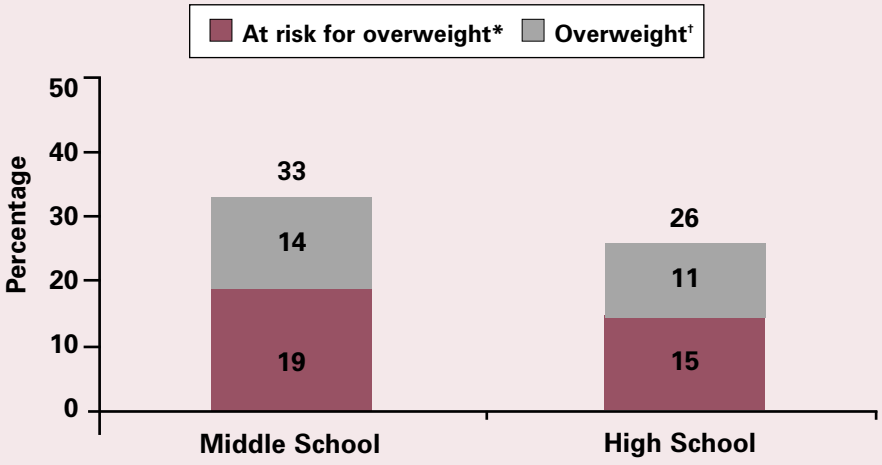
Overweight among Middle and High School Students in Georgia

One in three middle school students (33%) in 2003 were at risk for overweight (19%) or overweight (14%) (Figure 7) (Appendix III, Table 2a); more than one in four high school students (26%) were at risk for overweight (15%) or overweight (11%) (Figure 7) (Appendix III, Table 3a).[1]

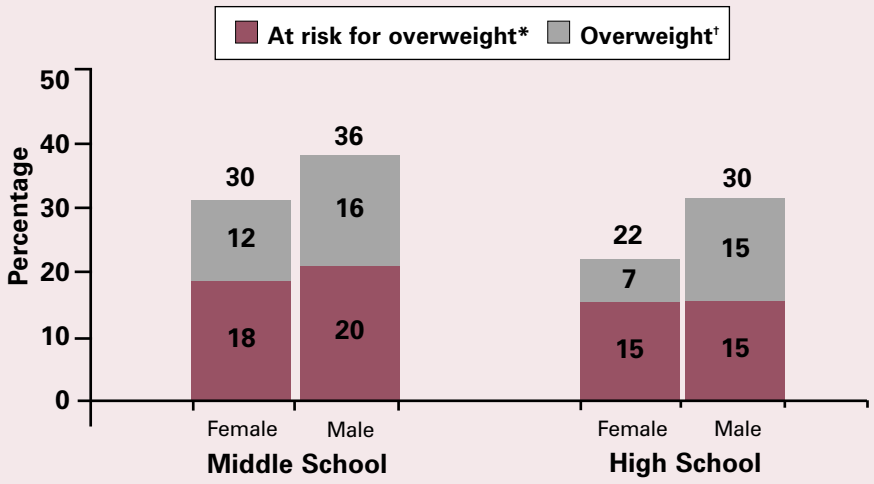
Figure 7. Prevalence of at risk for overweight and overweight among students by school type, Georgia, 2003



* Body mass index for age ≥ 85th percentile but <95th percentile
† Body mass index for age ≥ 95th percentile
Source: Georgia Student Health Survey

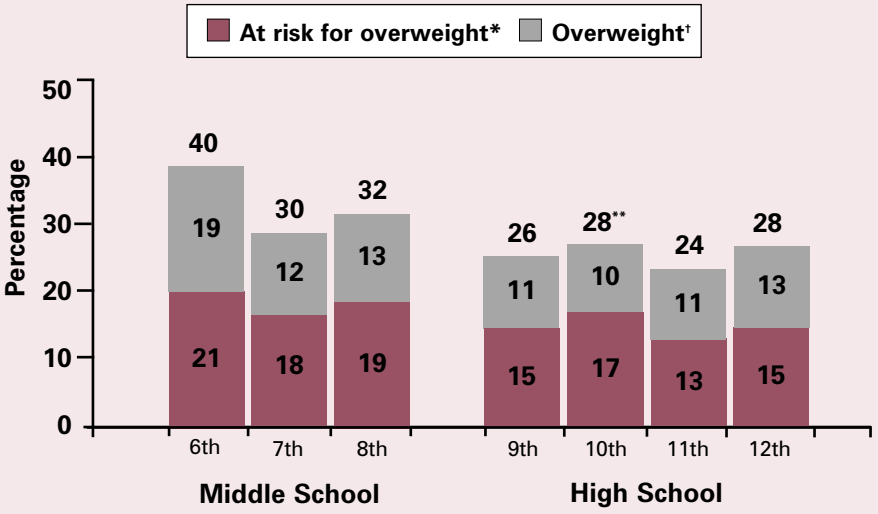
In middle and high school, males were more likely to be overweight than females (Figure 8). There are no significant differences across grades in middle and high school (Figure 9). Black/African American students in both middle and high schools were more likely to be at risk for overweight or overweight than white students (Figure 10). White females had the lowest prevalence of at risk for overweight or overweight in both middle and high schools (Figure 11). The prevalence of at risk for overweight or overweight for white high school females is about half that for all other race-, sex-groups and is equal to the prevalence expected based on the standard growth charts.

Figure 8. Prevalence of at risk for overweight and overweight among students by school type and sex, Georgia, 2003



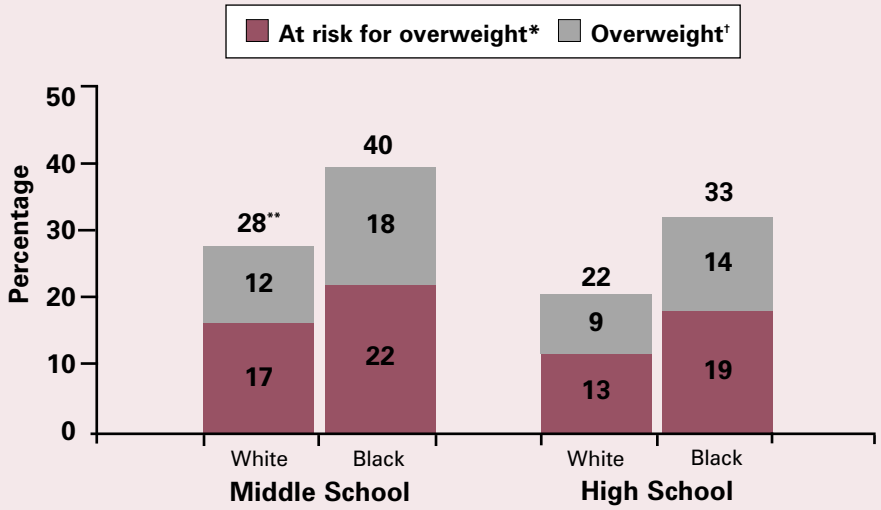
* Body mass index for age ≥ 85th percentile but <95th percentile
† Body mass index for age ≥ 95th percentile
Source: Georgia Student Health Survey

Figure 9. Prevalence of at risk for overweight and overweight among students by school type and grade, Georgia, 2003



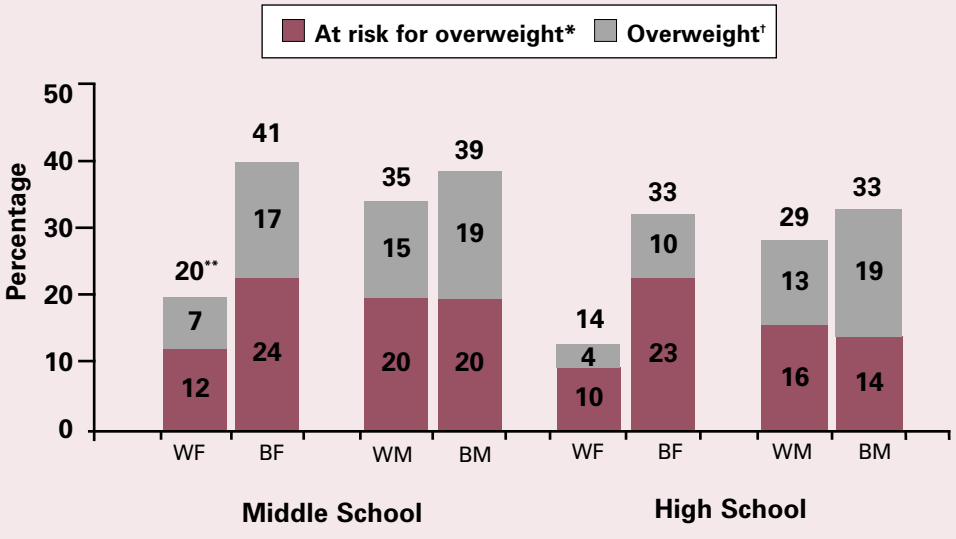
* Body mass index for age ≥ 85th percentile but <95th percentile
** Proportions may not add up due to rounding
† Body mass index for age ≥ 95th percentile
Source: Georgia Student Health Survey

Figure 10. **Prevalence of at risk for overweight and overweight among students by school type and race, Georgia, 2003**



* Body mass index for age ≥ 85th percentile but <95th percentile
** Proportions may not add up due to rounding
† Body mass index for age ≥ 95th percentile
Source: Georgia Student Health Survey

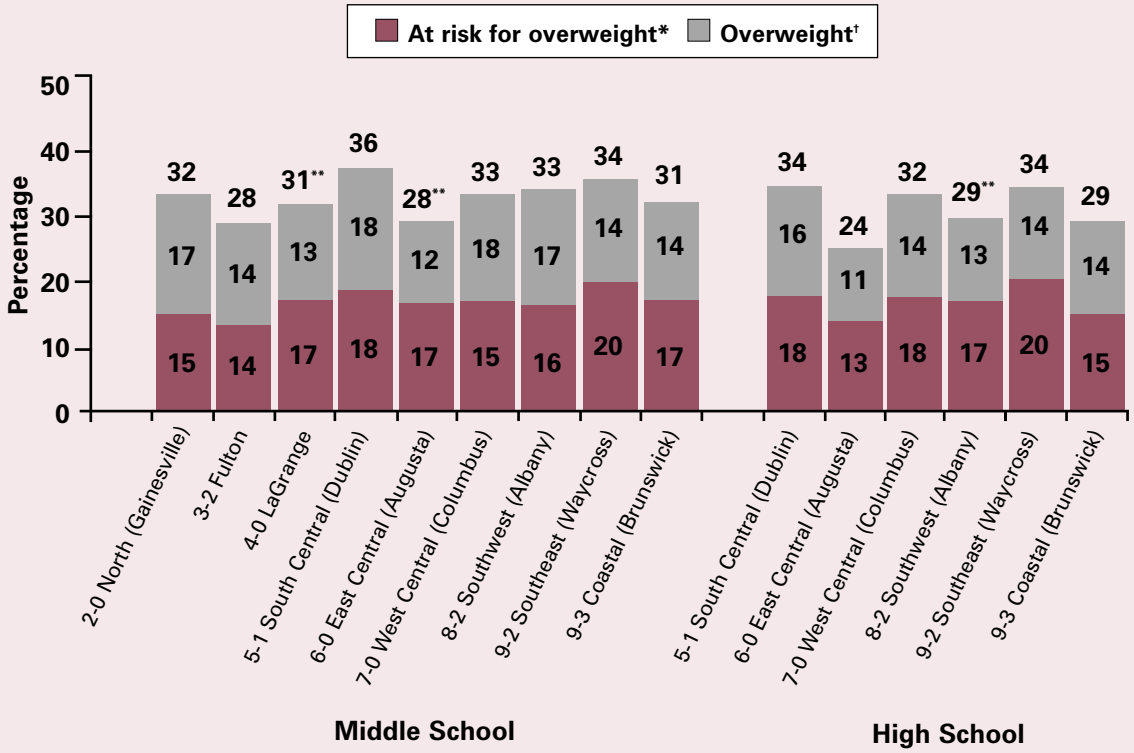
Figure 11. **Prevalence of at risk for overweight and overweight among students by school type, race and sex, Georgia, 2003**



* Body mass index for age ≥ 85th percentile but <95th percentile
** Proportions may not add up due to rounding
† Body mass index for age ≥ 95th percentile
Source: Georgia Student Health Survey

Among the health districts participating in the 2001 Georgia Youth Tobacco Survey, the prevalence of at risk for overweight or overweight ranged from 28% to 36% among middle school students (Figure 12) (Appendix III, Table 2b) and from 24% to 34% among high school students (Figure 12) (Appendix III, Table 3b).[2]

Figure 12. Prevalence of at risk for overweight and overweight among students by health district and school type, Georgia 2001



* Body mass index for age ≥ 85th percentile but <95th percentile
** Proportions may not add up due to rounding
† Body mass index for age ≥ 95th percentile
Source: Georgia Youth Tobacco Survey

References:

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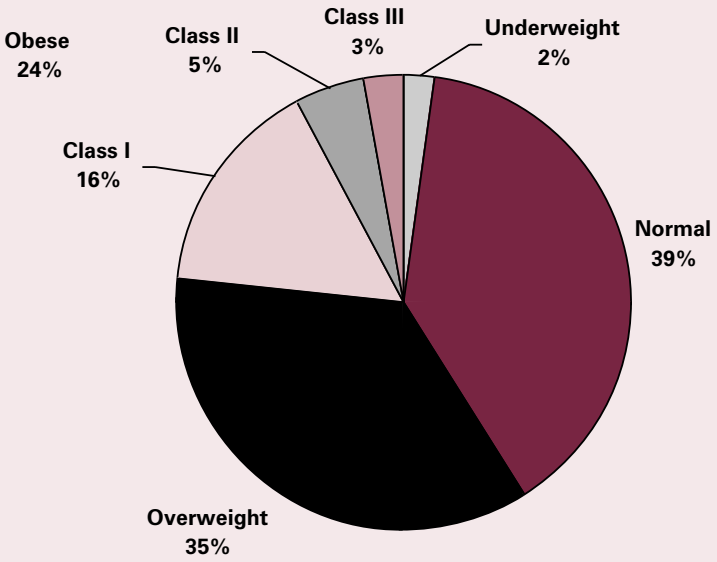
Overweight and Obesity among Adults 18 and older in Georgia

Overweight and Obese Adults

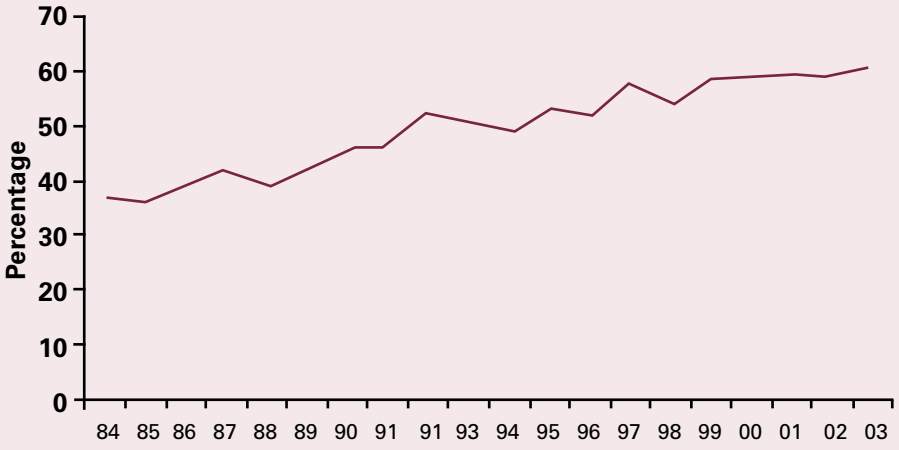
In 2002, 59% of adults in Georgia were overweight (35%) or obese (24%) (Figure 13) (Appendix III, Table 4).[1] The percent of adults who are overweight or obese has been increasing since the BRFSS data were first collected in 1984, rising from 37% in 1984 to 61% in 2003 (Figure 14). This represents an average relative increase of 3% per year.

Figure 13. Classification of Weight Status, Adults 18 and older, Georgia, 2002



Source: Georgia Behavioral Risk Factor Surveillance System

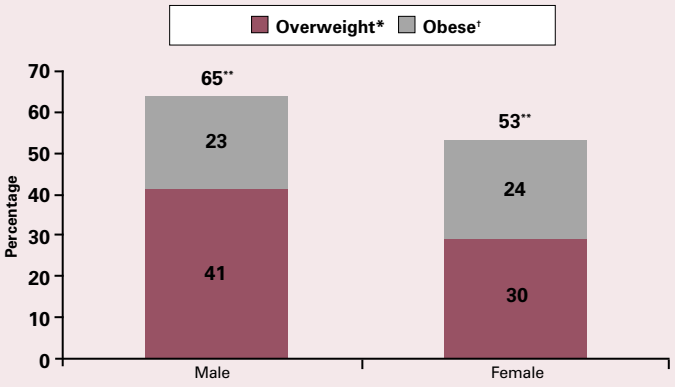
Figure 14. Overweight or obese adults, Georgia, 1984-2003



Source: Georgia Behavioral Risk Factor Surveillance System

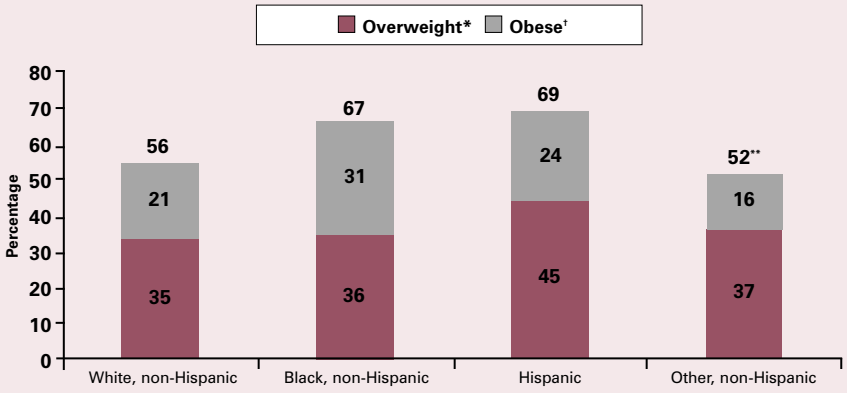
Almost two-thirds of adult men (65%) and over half of adult women (53%) were overweight or obese (Figure 15). White, non-Hispanic adults (21%) were less likely than black, non-Hispanic adults to be obese (31%) (Figure 16). White non-Hispanic females were less likely than males of any race or ethnicity to be overweight or obese; black non-Hispanic females were more likely than white non-Hispanic males or females to be obese (Figure 17).

Figure 15. Overweight and obese adults, by sex, Georgia, 2002



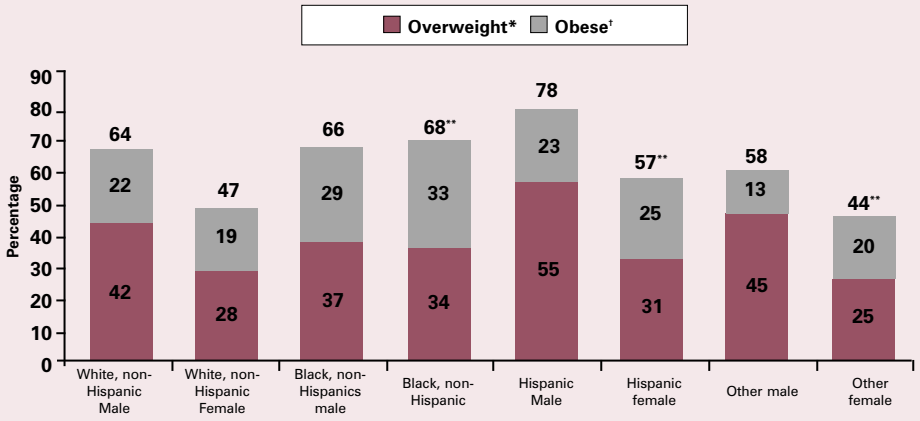
*Body mass index between 25.0-29.9
** Proportions may not add up due to rounding
†Body mass index greater than or equal to 30.0
Source: Georgia Behavioral Risk Factor Surveillance System

Figure 16. Overweight and obese adults, by race/ethnicity, Georgia, 2002



*Body mass index between 25.0-29.9
** Proportions may not add up due to rounding
†Body mass index greater than or equal to 30.0
Source: Georgia Behavioral Risk Factor Surveillance System

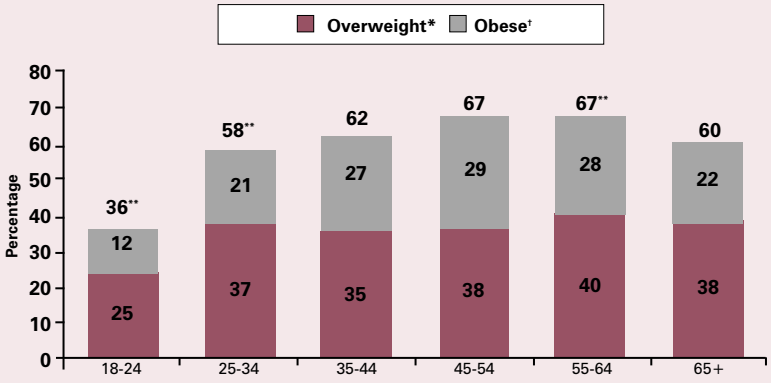
Figure 17. Overweight and obese adults, by sex and race, Georgia, 2002



*Body mass index between 25.0-29.9
** Proportions may not add up due to rounding
†Body mass index greater than or equal to 30.0
Source: Georgia Behavioral Risk Factor Surveillance System

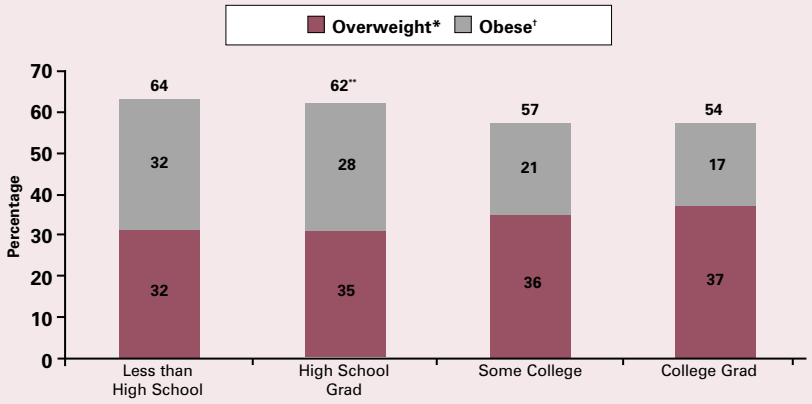
Young adults, 18-24 years of age, were less likely than any other age group to be overweight or obese (Figure 18). College graduates were less likely than adults with less than a high school education to be overweight or obese (Figure 19). Adults with a higher household income were less likely than adults with a lower income to be overweight or obese (Figure 20).

Figure 18. Overweight and obese adults, by age group, Georgia, 2002



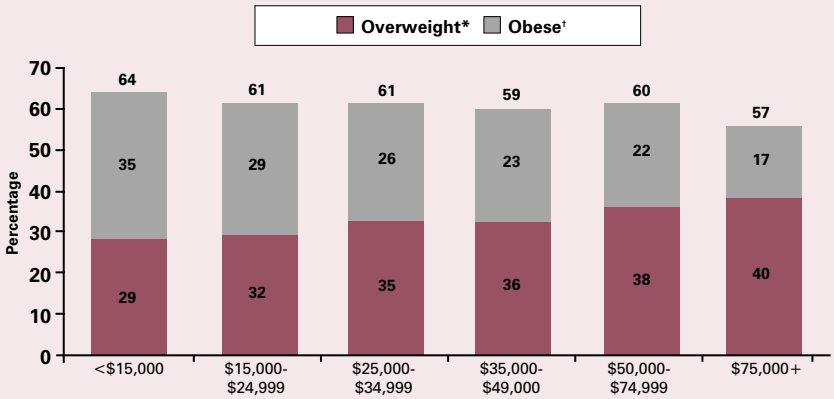
*Body mass index between 25.0-29.9
** Proportions may not add up due to rounding
†Body mass index greater than or equal to 30.0
Source: Georgia Behavioral Risk Factor Surveillance System

Figure 19. Overweight and obese adults, by years of education, Georgia, 2002



*Body mass index between 25.0-29.9
** Proportions may not add up due to rounding
†Body mass index greater than or equal to 30.0
Source: Georgia Behavioral Risk Factor Surveillance System

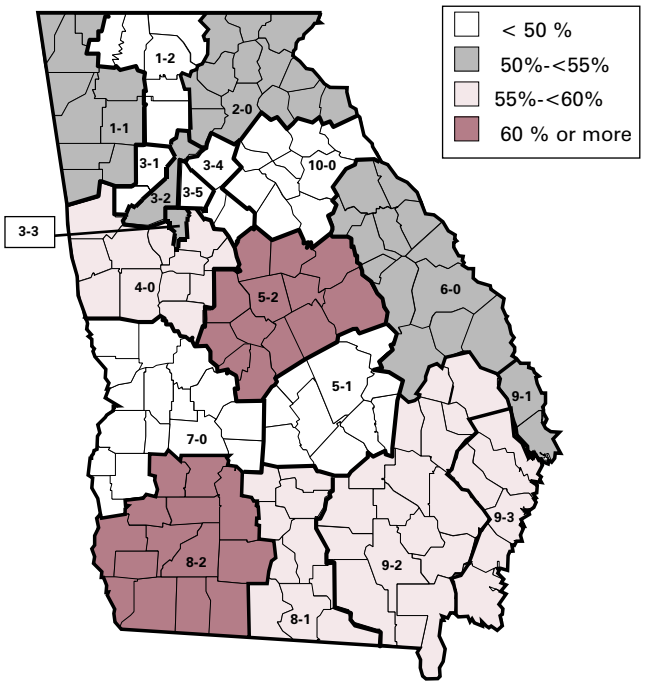
Figure 20. Overweight and obese adults, by household income, Georgia, 2002



*Body mass index between 25.0-29.9
†Body mass index greater than or equal to 30.0
Source: Georgia Behavioral Risk Factor Surveillance System

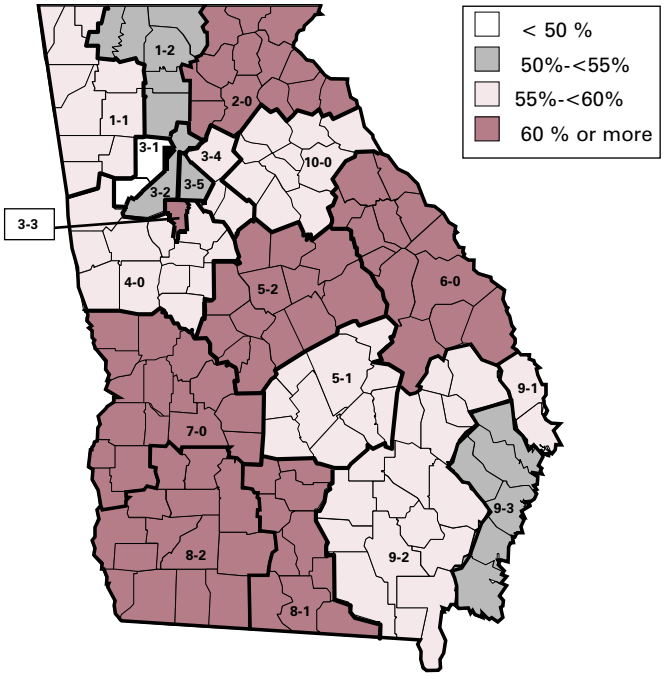
Among the 19 health districts in Georgia, the prevalence of overweight or obesity in 2002 ranged from 51% to 68% (Appendix III, Table 4). The rise in the prevalence of overweight and obesity in Georgia from 1984 to the present has affected all health districts (Figures 21a-21c).

Figure 21a. Overweight or obese adults by health district, Georgia, 1993-1996



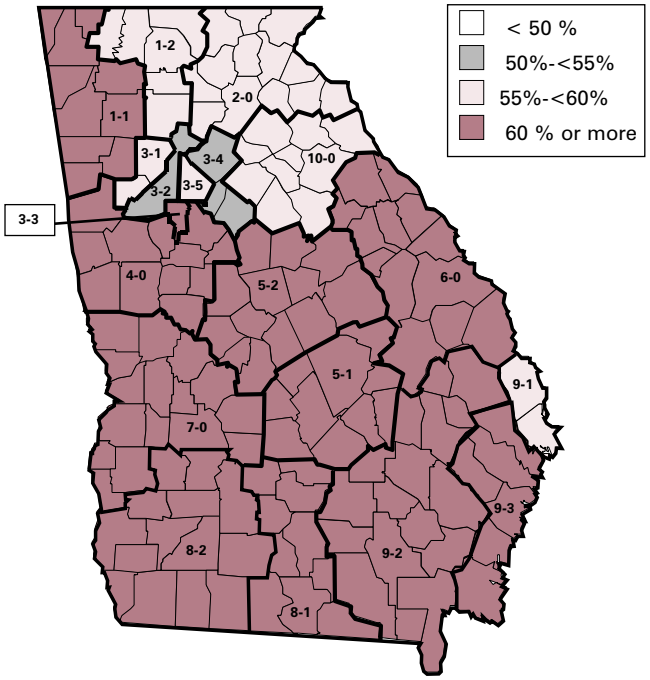
Source: Georgia Behavioral Risk Factor Surveillance System

Figure 21b. Overweight or obese adults by health district, Georgia, 1997-1999



Source: Georgia Behavioral Risk Factor Surveillance System

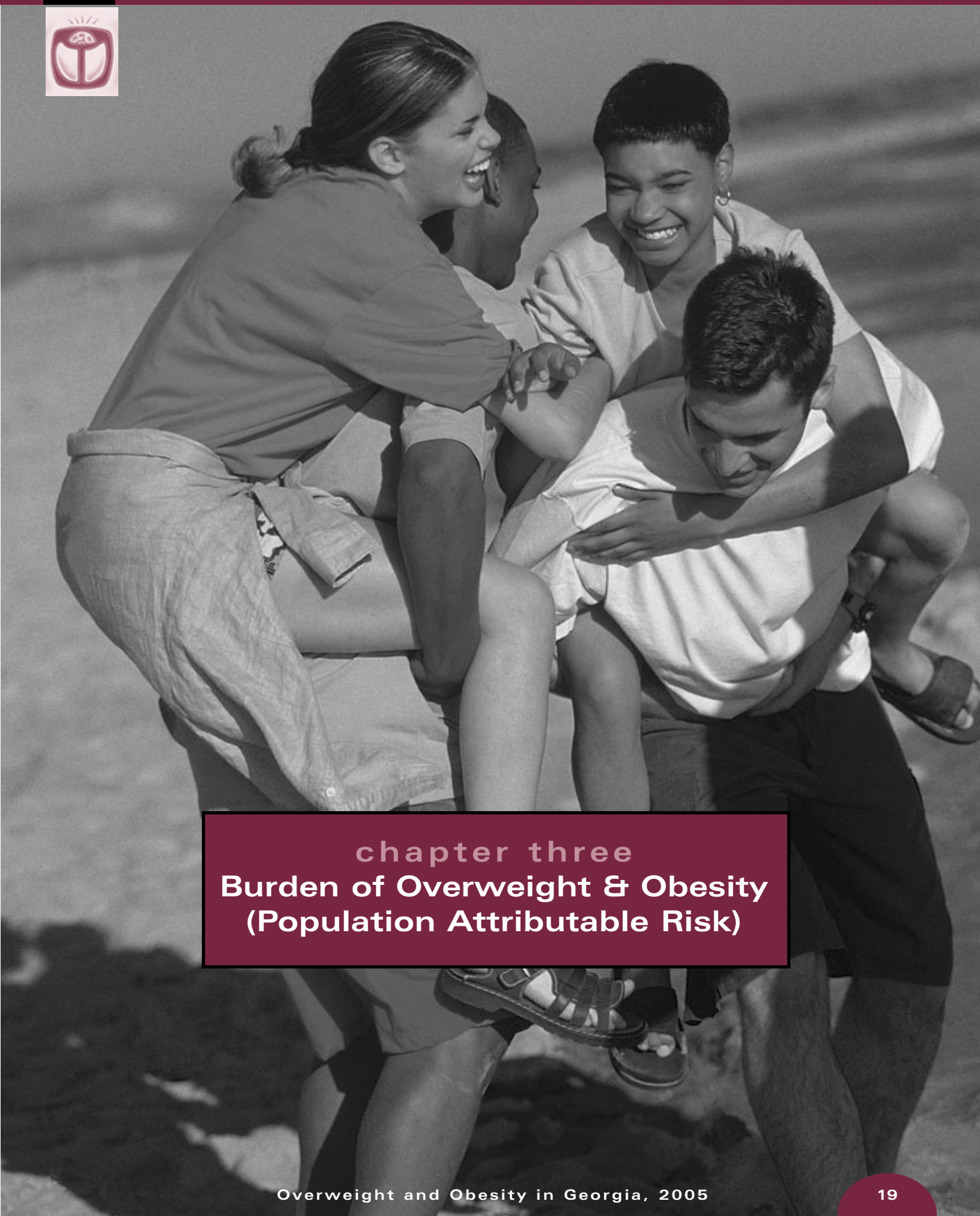
Figure 21c. Overweight or obese adults by health district, Georgia, 2000-2002



Source: Georgia Behavioral Risk Factor Surveillance System

References:

1. Behavioral Risk Factor Surveillance System: Atlanta, GA. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.



chapter three
Burden of Overweight & Obesity (Population Attributable Risk)

Preventable deaths from overweight and obesity

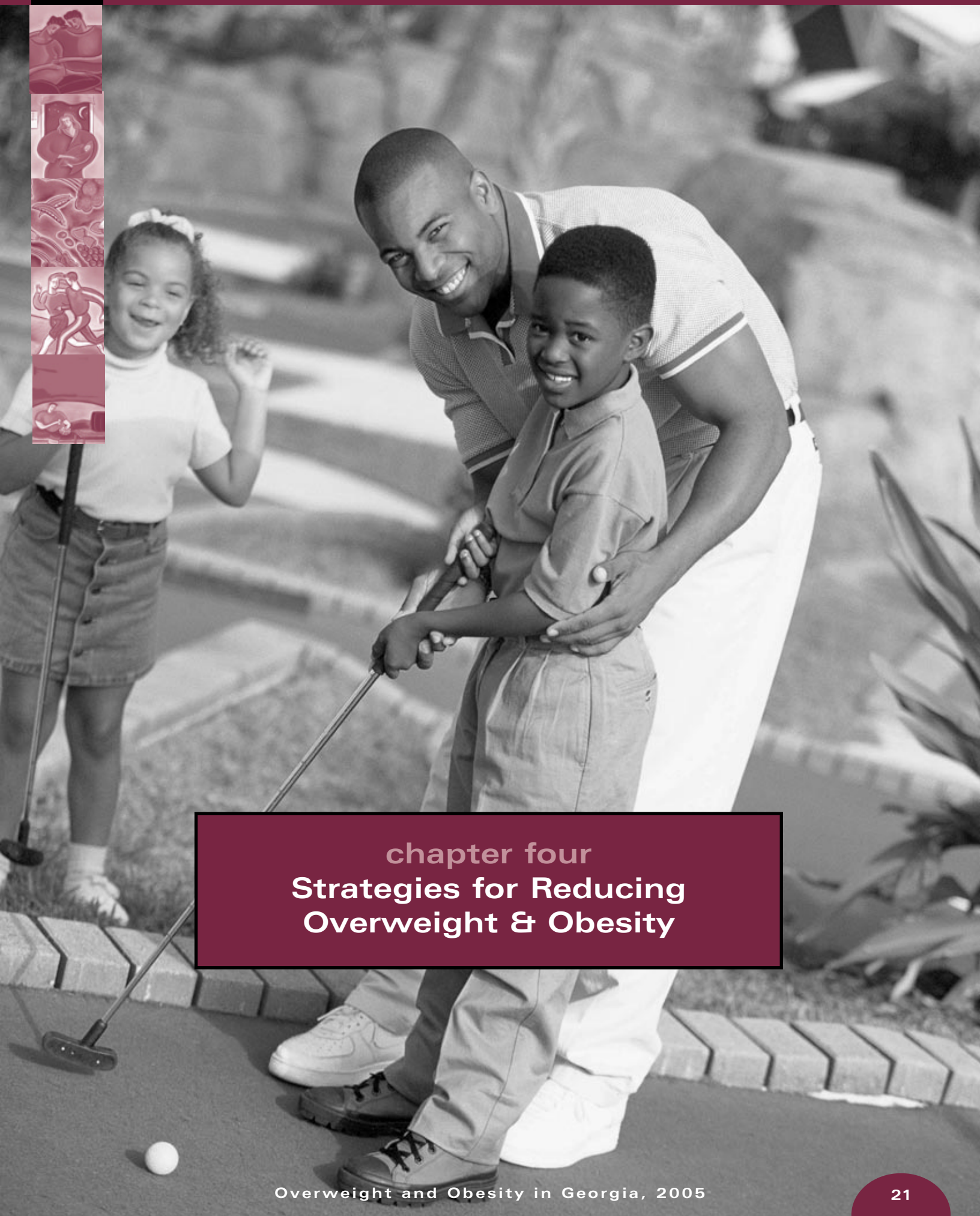
People who are overweight or obese have a higher risk for death than people of optimal (normal) weight. An estimate of excess mortality is called the population attributable risk (PAR). PAR is an estimate of the proportion of deaths caused by a particular risk factor, in this case, overweight and obesity. The PAR represents the proportion of deaths in a population that would be eliminated if the risk factor were removed from the population. The PAR for overweight and obesity is the fraction of all deaths that would not occur if everyone were of optimal (normal) weight. The PAR from overweight and obesity is estimated using the prevalence of overweight and obesity in Georgia and the relative risk for dying among overweight and obese persons compared with normal weight persons. The risk varies by age and sex. *

In Georgia, approximately 10% of the total number of deaths each year are attributable to overweight or obesity, indicating that about 6,700 Georgians die annually because they are overweight or obese. About 1,500 (22%) of the excess deaths occur among people who are overweight, and 5,200 (78%) occur among those who are obese (Table 4).

Table 4. Average Annual Deaths Attributed to Overweight and Obesity in Georgia, 2000-2003

LEVEL OF RISK	NUMBER
Overweight	1,500
Obese	5,200
Total	6,700

* Please see Appendix IV for more information about PAR

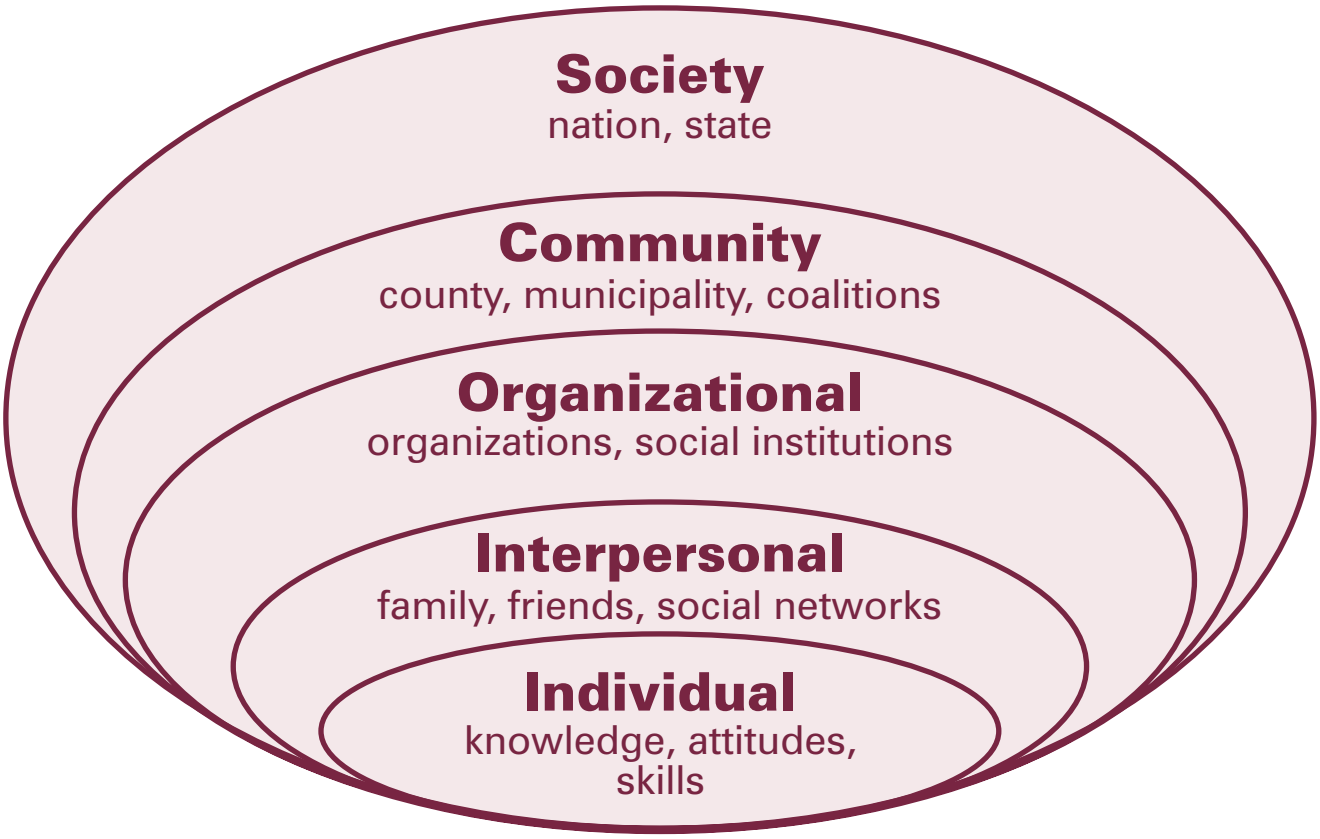


chapter four
Strategies for Reducing Overweight & Obesity

Strategies for Reducing Overweight and Obesity

Obesity is a complex health problem influenced by multiple dimensions. The Socio-Ecological Model (Figure 22) is a theoretical framework for understanding the multiple factors that influence health behavior. This theoretical model is designed to guide researchers and practitioners to comprehensively and systematically assess and intervene on each level as appropriate. The five levels of influence are ***individual factors*** such as awareness, knowledge, attitudes, beliefs, values, and preferences; ***interpersonal factors*** such as family, friends, and peers that provide social identity and support; ***organizational factors*** such as rules, policies, procedures, environment, and informal structure within an organization; ***community factors*** such as social networks and norms which exist formally or informally among individuals, groups, and organizations; and ***societal factors*** such as state and federal government policies and laws that regulate or support healthy actions and practices for disease prevention, early detection, control, and management. An underlying assumption is that a comprehensive approach is more effective than a single-level approach.[1]

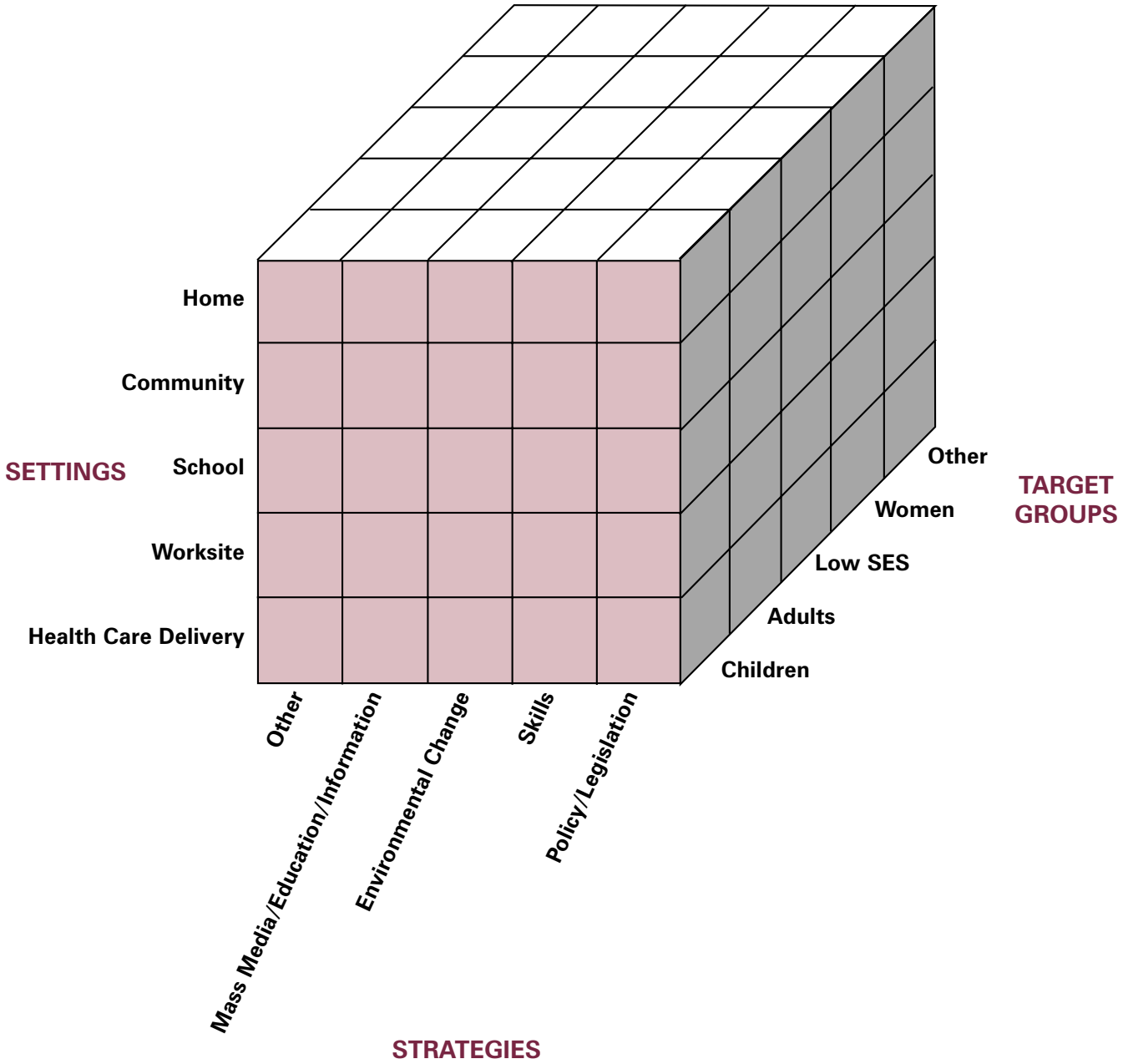
Figure 22. Socio-Ecological Model



Source: Adapted from McLeroy, et al., An ecological perspective on health promotion programs. *Health Education Quarterly* 1986; 15; 351-77.

A practical model to address the multiple dimensions affecting health behaviors is described in Figure 23. The health promotion cube has three dimensions – strategies, setting, and target groups. The most effective health promotion programs apply a variety of complementary strategies in various settings to different target groups.[2]

Figure 23. The Health Promotion Cube



Division of Public Health Plans for Overweight and Obesity

The Georgia Department of Human Resources, Division of Public Health was awarded a five-year grant in July 2003 from the Centers for Disease Control and Prevention (CDC) (Award 03022) to address the issue of obesity and other chronic diseases through nutrition and physical activity. At its initial capacity building stage, the Division of Public Health and partners are in the process of developing a comprehensive 10-year Nutrition and Physical Activity Plan for Georgia which public health and its partners can embrace and implement. The plan will apply an ecological framework (using the socio-ecological model) and address the following major focus areas: increased breastfeeding, improved nutrition including fruit and vegetable consumption, increased physical activity, and reduced television viewing/screen time. The State Plan is due to be released in the spring of 2005.

The following chapter highlights the rationale for each of these focus areas and identifies key strategies that will be included in the state plan (education, skill-building, environmental support and policy change approaches) within the home, community, schools, worksite, and healthcare settings. These strategies are not a result of a systematic literature review but represent key strategies identified as effective or promising in changing behavior.

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Breastfeeding Rationale

Breastfeeding has many health and personal benefits for mothers and babies and is consequently recommended as the best start for life regardless of its effect on childhood overweight (Table 5). In addition to these benefits, a growing body of evidence suggests that breastfeeding may also reduce the risk of childhood overweight. Although more research is needed, studies suggest that children who were exclusively or mostly breastfed are less likely to be overweight than children who were exclusively or mostly formula fed.[1-4] The protective effect has been observed from childhood through adolescence. Recent studies show that the prevalence of overweight in childhood is lower among children (3 to 6 years of age) who were breastfed compared to children who were never breastfed.[2, 4] For older children (9 to 14 years of age) the risk of becoming overweight (BMI > 95th percentile) was lower for children who were exclusively or mostly breastfed when compared to children who were fed mostly formula.[3] Older children who were breastfed at least 7 or more months were also 20 percent less likely to be overweight than children who were breastfed 3 months or less. A similar outcome has been observed in studies involving younger children.[3]

Table 5. Benefits of Breastfeeding (HHS)

For Baby	For Mother
- Breastmilk is tailored to baby's needs	- Minimizes postpartum bleeding
- Breastmilk is easier to digest	- Promotes uterine involution
- Enhanced immune system	- Reduced risk of uterine, ovarian, premenopausal breast cancer
- Improved cognitive development	- Economic benefits to mothers
- Lower rates of chronic diseases	- Economic benefits to employers (less absenteeism)
- Resistance to infectious diseases	
- Promotes physical contact, bonding	
- Baby controls intake based on hunger	

Source: The National Women's Health Information Center

Healthy People 2010 Objectives related to Breastfeeding

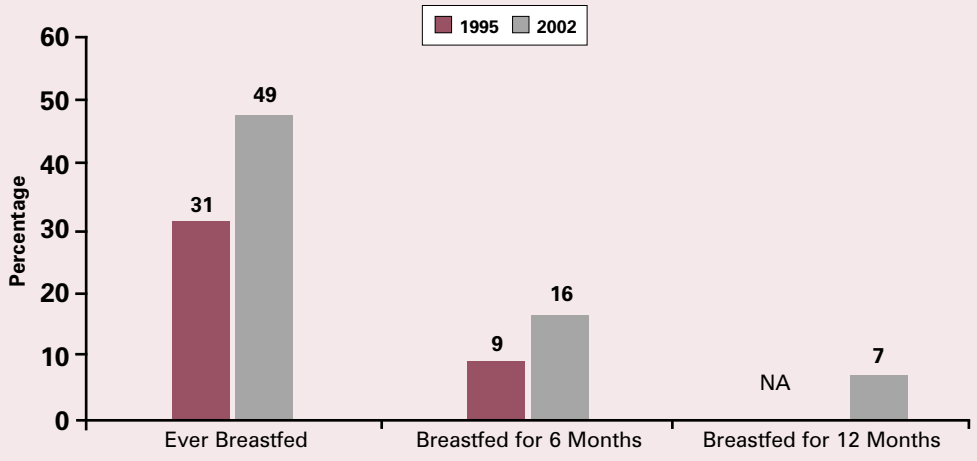
16-19a Increase the proportion of mothers who breastfeed their babies in early postpartum period (Target: 75%)

16-19b Increase the proportion of mothers who breastfeed their babies at 6 months (Target: 50%)

16-19c Increase the proportion of mothers who breastfeed their babies at 1 year (Target 25%)

Breastfeeding rates in Georgia have been steadily increasing, though they are still below the Healthy People 2010 goals. According to the Georgia Pregnancy Risk Assessment Monitoring System,[6-7] the percentage of mother initiating breatfeeding increased from 50% in 1993 to 64% in 1998, and the percentage breastfeeding 10 weeks after delivery from 36% in 1993 to 59% in 1998. A similar trend was noted among the WIC population in Georgia. The percentage of breastfed infants increased from 31% in 1995 to 49% in 2002. Six-month duration rates increased from 9% in 1995 to 16% in 2002 (Figure 24).[8]

Figure 24. Percent of infants ever breastfed and breastfed at least 6 and 12 months among WIC children, Georgia, 1995 and 2002*



*Source: Georgia Pediatric Nutrition Surveillance System
NA Data not available for 1995

Breastfeeding Strategies

Home

Information

- Provide prenatal education regarding the benefits of breastfeeding as infant feeding choices are often made early in the pregnancy.[9-11]
- Provide education to families about the benefits and basics of breastfeeding, so that in-home support can be provided to new mothers.[9,12]
- Provide access to breastfeeding support through the use of warm- or hot-lines.[13]

Skill Building

- Provide women and their families with the information and skills needed to breastfeed successfully.[14]

Environmental Support and Policy Change

- Increase access to breast pumps for mothers who are separated from their babies for medical, employment or education reasons.[15,16]
- Provide follow-up home visits or phone calls, and use peer counselors and mother-to-mother support groups to encourage and help mothers with breastfeeding.[17]

Schools

Information

- Include lactation/breastfeeding subject matter as part of any curriculum dealing with human development and health education (from science to family and consumer science).[18, 19, 20]

Skill Building

- Provide education for professors and teachers, both to influence attitudes of students towards breastfeeding, and to support students who are breastfeeding.[21]

Environmental Support and Policy Change

- Provide time, access to private space and, if possible, use of a hospital-grade breast pump for teachers and students who are mothers of infants.[22]
- Create breastfeeding support policies for instructors, students, and school workers.[22]

Worksites

Information

- Educate mothers and their families about breastfeeding and working.[22]
- Educate employers about the benefits of supporting breastfeeding, and how to support breastfeeding mothers at work.[22, 15]

Skill Building

- Provide support groups for breastfeeding woman.

Environmental Support and Policy Change

- Encourage worksites to change or adapt their work environments to be supportive of breastfeeding employees.[17, 15]
- Require local health departments to develop employee policies that support breastfeeding such as providing time and private space for employees to express breastmilk.
- Encourage businesses to adopt the Resolution Regarding Employers and Breastfeeding Mothers (Senate Bill 29 1999-2000 Session).

Community

Information

- Participate in health fairs and other community activities, to provide information to the community promoting the message of breastfeeding as the norm.[20]
- Conduct mass media campaigns to increase awareness of the benefits of breastfeeding among individuals throughout the state. Support mass media campaigns developed for national broadcast. Provide a toll-free number for individuals to get more information about media messages.[17, 20, 23]
- Portray breastfeeding as the norm for infant feeding through media and health care providers.[23]

Skill Building

- Provide support groups and peer counselor support for breastfeeding women.[20, 24-26]

Environmental Support and Policy Change

- Establish community coalitions that include representation from agencies or groups that work or interact with mothers and infants, such as the medical community, public health, hospitals, industry, education, breastfeeding advocacy groups and community members.[20]
- Partner with community agencies or groups associated with mothers and families, in order to promote breastfeeding throughout the community.[17, 20]
- Work with childcare partners to establish policies that support mothers who breastfeed; train childcare workers on how to care for breastfed infants and support the mothers.[22, 27, 28]

Health Care

Information

- Maintain partnerships with state medical organizations in order to share information.[17]

Skill Building

- Train health care staff on the importance of breastfeeding, its promotion and support.[29]
- Provide bedside counseling as soon after birth as possible, in order to assist the mother in initiating breastfeeding and prevent potential problems.[30-33]

Environmental Support and Policy Change

- Provide access to an in-hospital lactation consultant for women experiencing difficulties with breastfeeding.[34]
- Encourage hospitals to adopt the Baby Friendly Hospital 10-Step Program.[25, 33, 35]
- Encourage local health districts to adapt WIC Program Regulations across all programs including breastfeeding friendly clinic areas, staff trained in lactation management, and a referral system for clients requiring assistance with breastfeeding.[36]
- Work with third-party health care payers to provide reimbursement for breastfeeding expenses, such as breast pumps and counseling.[37]

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Fruit and Vegetable Consumption Rationale

Overweight and obesity are a result of an imbalance between energy intake and energy output within a complex interaction of biological, behavioral, cultural, and environmental influences. On the energy intake side, a number of dietary determinants of this energy imbalance have been identified as potential contributors such as increased dietary fat, decreased dietary fiber, increased energy density of foods, increased sweetened beverage consumption, increased fast food consumption, and increased portion size. The role of family/parental involvement, family meal times, and access to healthy choices are several potential environmental factors noted in the literature which affect dietary intake.

The role of dietary fruits and vegetables in reducing certain types of cancer, cardiovascular disease, hypertension, osteoporosis and arthritis is well-established.[1] Most recently documented is the relationship between fruit and vegetable consumption and weight management. The consumption of fruits and vegetables can help reduce energy intake, promote satiety, and aid in weight management because of their high water and fiber content, low fat content, and low energy density.[2] Energy density refers to the caloric content of one gram of a specific food. Water and fiber reduce the energy density of foods like fruits and vegetables, whereas fat content increases it. Water has the biggest impact on energy density, because it adds weight (volume/bulk) without calories. When researchers experimentally reduced the energy density of diets by replacing high calorie foods with fruits and vegetables, they observed a spontaneous reduction in energy intake.[3] Thus, consumption of fruits and vegetables combine a number of components that have been shown to affect satiety and energy intake and may be beneficial for weight management.[2]

The association between fruit and vegetable consumption and weight regulation has several stipulations. The form in which fruits and vegetables are consumed is very important. Whole fruits and vegetables satisfy and are more filling than purees or juices.[2] Significant quantities of fruits and vegetables need to be added to foods if they are to affect satiety and therefore lower energy intake. Finally, fruits and vegetables need to be substituted for high energy dense foods, not simply added on to an individual's diet (e.g., snacks such as chips and cookies should be replaced with a whole apple or mini carrots).[3] Also, coupling the advice of increased fruit and vegetable consumption with advice to decrease energy intake may also facilitate weight loss as it emphasizes a positive message as opposed to a restrictive diet message.[2]

Current US Dietary Guidelines for Americans[4] and Healthy People 2010 Objectives[5] recommend eating a variety of fruits and vegetables everyday. The Food Guide Pyramid recommends the consumption of 5-9 servings of fruits and vegetables every day as part of a healthy diet. In Georgia, only 23% of adults eat the recommended daily minimum of 5 servings of fruits and vegetables. Only 17% of high school students eat the recommended daily minimum of 5 servings of fruits and vegetables (Figure 25).

US Dietary Guidelines for Americans (2000)

AIM FOR FITNESS...

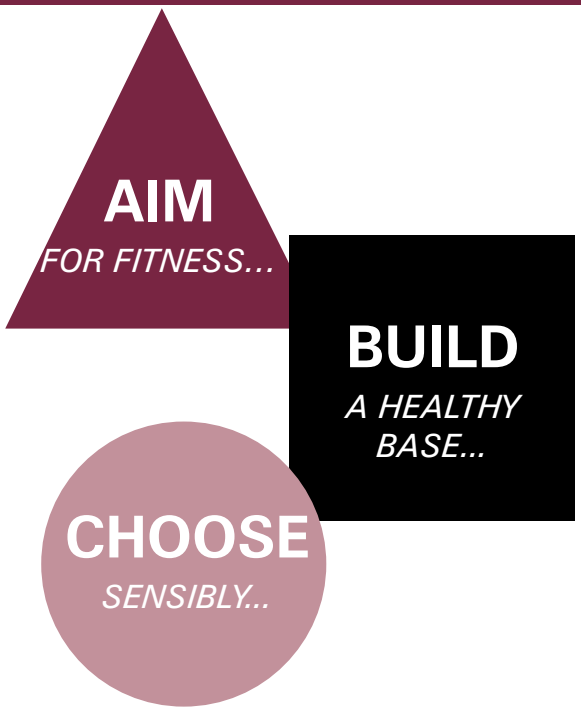
- Aim for a healthy weight.
- Be physically active each day.

BUILD A HEALTHY BASE...

- Let the Pyramid guide your food choices.
- Choose a variety of grains daily, especially whole grains.
- Choose a variety of fruits and vegetables daily.
- Keep food safe to eat.

CHOOSE SENSIBLY...

- Choose a diet that is low in saturated fat and cholesterol and moderate in total fat.
- Choose beverages and foods to moderate your intake of sugars.
- Choose and prepare foods with less salt.
- If you drink alcoholic beverages, do so in moderation.

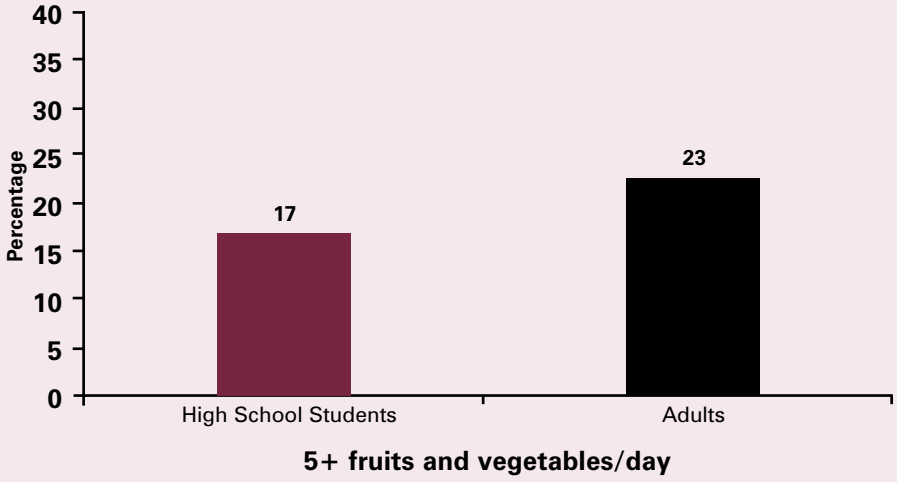


...FOR GOOD HEALTH

Healthy People 2010 Objectives related to Nutrition

19-5	Increase the proportion of persons aged 2 years and older who consume at least two daily servings of fruit (Target: 75%)
19-6	Increase the proportion of persons aged 2 years and older who consume at least three daily servings of vegetables, with at least one-third being dark green or orange vegetables (Target: 50%)
19-7	Increase the proportion of persons aged 2 years and older who consume at least six daily servings of grain products, with at least three being whole grains. (Target 50%)
19-8	Increase the proportion of persons aged 2 years and older who consume less than 10 percent of calories from saturated fat. (Target: 75%)
19-9	Increase the proportion of persons aged 2 years and older who consume no more than 30 percent of calories from total fat. (Target: 75%)
19-10	Increase the proportion of persons aged 2 years and older who consume 2,400 mg or less of sodium daily. (Target: 65%)
19-11	Increase the proportion of persons aged 2 years and older who meet dietary recommendations for calcium. (Target: 75%)
19-15	Increase the proportion of children and adolescents aged 6 to 19 years whose intake of meals and snacks at school contributes to good overall dietary quality. (Developmental)
19-16	Increase the proportion of worksites that offer nutrition or weight management classes or counseling. (Target: 85%)

Figure 25. Percent of high school students (2003)* and adults (2002) who consume 5+ fruits and vegetables/day, Georgia**



*Source: Georgia Student Health Survey
**Source: Georgia Behavioral Risk Factor Surveillance System

Fruit and Vegetable Consumption Strategies

Many of the following strategies apply to healthy eating in general, of which fruit and vegetable consumption are assumed to be an essential component.

Home

Information

- Educate and empower parents about the need to serve as good role models by practicing healthy eating habits and engaging in regular physical activity in order to instill lifelong healthy habits in their children.[7,8]
- Encourage quality family meal times as frequently as possible as part of healthy eating pattern.[8,9]
- Follow the Dietary Guidelines for Americans and the United States Department of Agriculture's Food Guide Pyramid and Food Guide Pyramid for Young Children.[8]
- Educate parents/caregivers on proper early childhood nutrition and developmentally appropriate feeding practices, (e.g., through the national Healthy Start and WIC programs).[10]
- Raise consumer awareness about appropriate food and beverage portion sizes.[7]
- Ensure media campaigns simplify complex eating and physical activity behavior into steps that are easier for consumers to understand and act on.[11]

Skill Building

- Utilize self-monitoring of behaviors such as goal setting and recording food intake, as well as personal and environmental cues.[8]
- Involve children in food shopping, meal planning, and preparation.
- Empower families to manage weight and health through skill building in parenting, meal planning and behavioral management.[7]

Environmental Support and Policy Change

- Ensure that fruits, vegetables, low-sugar cereals and low fat dairy products are readily available as snacks.[9,10]

School

Information

- Promote fruit and vegetable consumption through in-school media events, and point-of-purchase cafeteria promotion.[11]
- Create and distribute 5-A-Day brochures and other printed nutrition education materials for students and families.[3]
- Incorporate nutrition education into school health education programs and as an integrated component of science, math and other school curricula.[7,11]
- Offer families information about groups/classes relevant to healthy eating such as heart-healthy cooking.[12]

Skill Building

- Offer curricula that include skill building opportunities related to adopting healthy eating behaviors.[7,13]
- Utilize curricula to maximize skill building through fun, interesting and interactive activities such as hands-on food preparation, computer programs and supermarket tours.[11]
- Incorporate nutrition courses into core classroom curriculum for the professional preparation of teachers for all grades and as a continuing education requirement.[7,13]
- Provide nutrition education training to school food service staff.[11]

Environmental Support and Policy Change

- Implement comprehensive school health programs.
- Increase availability of fruits and vegetables in school cafeterias through salad bars and snack programs.[3,11]
- Offer refrigerated vending machines that allow vegetables, fruit and 100% vegetable and fruit juice options.[3]
- Provide and competitively price nutrient dense, low-calorie foods in school vending machines, snack bars and school stores.[14]
- Restrict access to vending machines, snack bars, school stores and other venues that may compete with healthy school meals.[15]
- Provide a pleasant, positive eating environment with sufficient time (at least 15-20 minutes) for lunch.[15]
- Assess school's nutritional environment and policies with the CDC's School Health Index. (see www.cdc.gov/nccdphp/dash/SHI/index.htm)
- Develop school fruit and vegetable gardens maintained by students and allow distribution and consumption of produce grown.
- Encourage students and parents to become actively involved in addressing issues related to improving healthy eating and physical activity in the school environment.
- Incorporate healthy eating activities into after-school programs.
- Integrate nutrition and healthy eating into the health education component of school curriculum and all other core curriculum components.[7,13]
- Promote healthier nutrient dense, low-calorie foods (such as fruits and vegetables or low-fat snacks) by lowering prices relative to alternative food choices in schools cafeterias and vending machines.[16,17]
- Develop a school snack policy for school events and fundraising efforts. (http://www.nasbe.org/HealthySchools/healthy_eating.html)
- Set school policies and standards that reflect national health objectives for nutrition and physical activity. Program examples include Planet Health and USDA's Changing the Scene.[15]
- Ensure that all school meal programs, including a la carte foods meet USDA school breakfast and lunch guidelines.

Information

- Launch a worksite program that promotes healthy eating and physical activity such as the Centers for Disease Control and Prevention's (CDC) Personal Energy Plan (PEP) program. (see www.cdc.gov/nccdphp/dnpa/pep.htm)
- Provide point of purchase nutrition information such as 5-A-Day information and nutritional content of foods in cafeterias and near vending machines.[3,11]
- Launch kickoff events to raise awareness about worksite wellness initiative.[11]

Skill Building

- Incorporate social support, incentives and competitions to motivate employees to participate in work-site wellness interventions.[11]
- Offer small group programs, interactive lunch and learns, and educational materials to enhance skill development.[11]

Environmental Support and Policy Change

- Ensure that vegetables and fruits are available on-site in places such as vending machines, break rooms, and cafeterias.[3,11]
- Establish worksite wellness committees.[11]
- Develop nutrition policy guidelines for meetings, special events, trainings and fund-raisers.
- Develop vending machine guidelines to ensure inclusion of healthy choices.
- Develop cafeteria nutrition policy guidelines for foods prepared/served.

Community

Information

- Develop an effective media campaign to promote healthy eating behaviors such as the use of the 5-A-Day Program for Better Health campaign.[3]
- Promote the national 5-A-Day Program for Better Health during national 5-A-Day Month in September throughout the community including retail stores, churches, community centers, etc.[3]
- Partner with faith-based organizations to promote healthy eating.[3,18]
- Assure access to high quality community programs that provide parent and caregiver education on early childhood nutrition and physical activity.[10]
- Ensure media campaigns simplify complex behavior change into steps that are easier for consumers to understand and act on.[11]

Skill Building

- Create and implement nutritional and physical education training and leadership programs for pre-school teachers and daycare providers (and programs such as Head Start).[10]
- Provide point-of-purchase nutrition information and programs in retail establishments such as super-markets, restaurants and fast food outlets.[7]

Environmental Support and Policy Change

- Work with preschool and child care partners to strengthen policies that ensure adequate physical activity and healthy food choices.[14]
- Increase access to affordable fruits and vegetables through community gardening projects and local farmers markets.[10]
- Expand WIC Farmers Market Nutrition Program which enables WIC participants to purchase fresh fruits and vegetables at participating local farmers markets.[10]
- Promote and expand the Seniors Farmer's Market Nutrition program.[10,19]
- Incorporate healthy eating (including fruit and vegetables) and physical activity components into after-school programs.
- Encourage restaurants to offer and label healthier choices through a healthy dining program.[7]
- Ensure that preschools and daycare centers provide foods that meet dietary guidelines and provide 60 minutes of daily activity for each child.[10]
- Develop a state-wide food and nutrition policy to ensure that all people at all times have equitable access to safe, healthy and culturally appropriate foods, including fruits and vegetables.[11]

Health Care

Information

- Include nutrition education/information (such as tailored self-help materials, newsletters, etc.) as a component of low/medium/high intensity behavioral counseling.[20]

Skill Building

- Provide adults with a combination of medium to high intensity (i.e. more than six contacts lasting more than 30 minutes) behavioral dietary counseling with follow-up and interactive nutrition education (individual and group level) by a dietitian or specially trained primary care clinician (e.g. physician, nurse, nurse practitioner) in a primary care setting.[20,21]
- Offer intensive individual and/or group nutrition counseling to promote behavior change in adults through a multi-disciplinary team involving a physician, registered dietitian, mental health specialist and physical activity instructor.[9]
- Incorporate self-monitoring of behaviors such as goal setting and recording food intake, personal and environmental cues as part of individual counseling or small group strategy.[9,22]

Environmental Support and Policy Change

- Provide and promote reimbursement for services of registered dietitians or other proven interventions for nutrition, physical activity and obesity treatment as per the Institute of Health Medicine Report recommendations for heart attack, stroke, and diabetes.[3]
- Promote the collection of BMI and use of growth charts.[3] Available at: www.cdc.gov/nccdphp/aag/aag_dnpa.htm.
- Encourage health care professionals to focus on anticipatory guidance with parents and children addressing knowledge, attitudes and beliefs about eating and activity behavior and patterns such as Bright Futures in Practice: Physical Activity and Bright Futures in Practice: Nutrition.[9,14]

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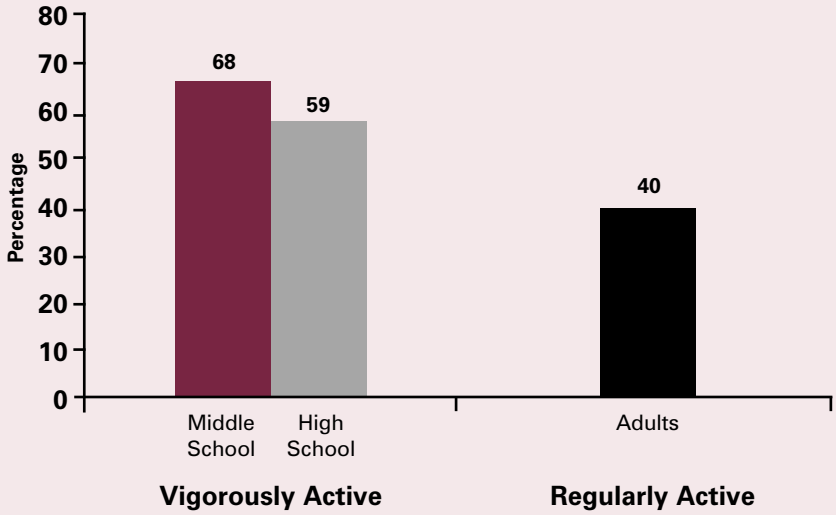
Physical Activity Rationale

The benefits of physical activity are described and affirmed by numerous governmental and non-governmental organizations and are supported by the Surgeon General's Report on Physical Activity and Health.[1] In addition to the benefits of reducing risk for chronic disease, physical activity is important in preventing and treating overweight and obesity and is extremely helpful in maintaining weight loss, especially when combined with healthy eating.[2]

According to the U.S. Surgeon General, adults can obtain significant health benefits by including 30 minutes of moderate physical activity on most, if not all, days of the week. Increasing the frequency, duration, or intensity of physical activity may lead to additional health benefits. Individuals can select a variety of activities, from walking and bicycling to gardening, basketball, dancing, household chores, sports and many other recreational activities. In addition, the recommended 30 minutes of physical activity need not be done all at once. The 30 minutes can be broken down to two 15-minute sessions or three ten-minute sessions during the day. For people who are inactive, physical activity should be initiated slowly and the intensity should be increased gradually (e.g., start with a 10-minute walk three times a week; increase the total walking time no more than 10% per week). Individuals should select enjoyable activities that fit into daily life and try to involve friends and family as a means of support. In Georgia, only 40% of adults are regularly active and 68% of middle school students and 59% of high school students are vigorously active (Figure 26).

Elementary school-aged children should accumulate at least 30 to 60 minutes of age- and developmentally appropriate physical activity from a variety of physical activities on all or most days of the week. The National Association of Sports and Physical Education recommends toddlers and preschoolers engage in at least 60 minutes up to several hours of unstructured physical activity each day. Toddlers should accumulate 30 minutes and preschoolers 60 minutes of structured physical activity.

Figure 26. Percent of middle and high school students (2003)* who are vigorously active and adults (2001) who are regularly active, Georgia**



*Source: Georgia Student Health Survey
**Source: Georgia Behavioral Risk Factor Surveillance System

Healthy People 2010 Objectives related to Physical Activity

22-1.	Reduce the proportion of adults who engage in no leisure-time physical activity. (Target 20%)
22-2.	Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day. (Target 30%)
22-3.	Increase the proportion of adults who engage in vigorous physical activity that promotes the development and maintenance of cardio respiratory fitness 3 or more days per week for 20 or more minutes per occasion. (Target 30%)
22-4.	Increase the proportion of adults who perform physical activities that enhance and maintain muscular strength and endurance. (Target 30%)
22-5.	Increase the proportion of adults who perform physical activities that enhance and maintain flexibility. (Target 43%)
22-6.	Increase the proportion of adolescents who engage in moderate physical activity for at least 30 minutes on 5 or more of the previous 7 days. (Target 35%)
22-7.	Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardio respiratory fitness 3 or more days per week for 20 or more minutes per occasion. (Target 85%)
22-8.	Increase the proportion of the nation's public and private schools that require daily physical education for all students. (Target Middle and Junior 25%; High 5%)
22-9.	Increase the proportion of adolescents who participate in daily school physical education. (Target 50%)
22-10.	Increase the proportion of adolescents who spend at least 50 percent of school physical education class time being physically active. (Target 50%)

Physical Activity Strategies

Home

Information

- Include education for parents and guardians as part of youth physical activity promotion initiatives.[3]

Skill Building

- Encourage parents and children to plan and participate in family physical activities together such as hiking, cycling, walking, etc.[4]
- Encourage physical activities that families can engage in together such as walking to church, school, the library, or walking the dog.[5]

Environmental Support and Policy Change

- Establish a "Walking School Bus" with children in the community.

Schools

Information

- Incorporate physical activity messages and activities into academic subjects and core curriculum.

Skill Building

- Plan, establish, and implement activities to promote regular physical activity among school staff.[6]
- Provide lifetime physical skills in physical education program.[1]
- Promote daily, quality physical education for pre-K through grade 12.[3]

Environmental Support and Policy Change

- Promote retention of existing neighborhood schools and placement of new schools in areas that facilitate walking and biking to school.[7,8]
- Improve playground areas to promote increased physical activity during recess.
- Encourage and develop schedules that provide time within every school day for preschool, kindergarten, and elementary school students to enjoy supervised recess.[6]
- Increase collaboration among recreation agencies, education, health, and other organizations to help schools and communities implement physical activity programs.[3]
- Increase collaboration with recreation and other community organizations to coordinate and enhance opportunities available to students and staff for physical activity during their out-of-school time.[3,4]
- Require skills-based instruction on the benefits of lifelong physical activity as a part of the health education curriculum.
- Require certification and provide ongoing professional development opportunities for physical education teachers.[6]

Worksite

Information

- Promote the benefits and recommended amounts of physical activity through worksite communications avenues such as newsletters, bulletin boards, PA announcements and payment envelopes/stubs.
- Conduct campaigns to promote walking and bicycling to work (active commuting).

Skill Building

- Design point-of-decision prompts throughout the work place to remind employees to be more physically active.[9]
- Offer employee physical activity programs in the worksite.[1]
- Offer physical activity classes (aerobics, yoga, tai chi, etc.) for employees and provide adequate exercise equipment.[1]
- Promote physical activity through work functions or related events such as corporate walk or run.
- Collaborate with other agencies or companies to implement their promotional programs and health promotion efforts such as American Cancer Society's Active for Life program, Division of Public Health's 20% Boost program or Georgia Striders Program.

Environmental Support and Policy Change

- Collaborate with local government to provide safe, accessible walking and biking routes to worksites.
- Collaborate with the recreation and park agencies to identify and promote the use of parks and trails near worksites.
- Beautify stairwells to promote usage.
- Encourage employers and employee associations to implement policies and offer programs that promote physical activity among their employees and members.[1]
- Work with the business community to support worksite policies of "exercise flex-time".[10]
- Develop policies that allow local community members to use company facilities.
- Provide health insurance discounts to regularly active employees.[11]
- Design awards program for worksites in the state that promote and allow physical activity during work time.[10]

Information

- Promote the benefits of physical activity and the recommended amounts of physical activity through radio, television, newspaper, organization newsletters, church newsletters and other local media.[9]
- Conduct community-wide campaigns to encourage people to become more physically active.[9]
- Conduct community-wide campaigns to encourage policy and environmental changes to make physical activity more accessible.[9]

Skill Building

- Encourage parents to participate in physical activity and to make enjoyable physical activity a part of family life.
- Through recreation and other community agencies, provide programs that offer social support for increasing physical activity such as walking clubs and other group activities.[9]

Environmental Support and Policy Change

- Establish a "Walking School Bus" with children in the community.
- Promote community and transportation design that facilitates walking and bicycling, including lighting for safety, traffic calming techniques, frequent and safe pedestrian and bicycle crossings.[9]
- Increase funding for improving and expanding bike lanes, sidewalks, bike paths, and trails in communities.[8]
- Encourage the development of paths and trails in parks and in other natural settings to encourage walking and bicycling for exercise and transportation, including rails-to-trails conversion.[8,9]
- Increase community availability and accessibility of physical activity opportunities and facilities.[3]
- Provide recognition or awards for walking and bicycling advocates, organizations, and programs whose efforts lead to increases in walking and bicycling.
- Develop city/county policies that require safe, accessible sidewalks, bike paths and recreation facilities in all new housing developments.[8]

Health Care

Information

- Place educational materials about physical activity benefits and recommendations in health care office, waiting rooms, bulletin boards, etc.
- Recruit health care systems and providers to co-sponsor community-wide campaigns and events.
- Encourage physician and other health care providers to provide written and verbal information to patients about physical activity benefits and recommendations related to health and chronic disease.[1,12]

Skill Building

- Provide appropriate physical activity opportunities, through hospital and rehabilitation programs, for individuals with chronic diseases.
- Provide educational conferences and physical activity assessment and counseling tools for health care staff to encourage patients to be more active.
- Encourage health care providers to model physically active lifestyles.
- Promote strategies that encourage walking, bicycling, and taking public transit to work.

Environmental Support and Policy Change

- Construct physical activity facilities in all health care and hospital settings.
- Institute a required physical activity and behavior change training for all health care staff.
- Expand the number of health care sites that implement policies and programs to promote physical activity among their employees.
- Include physical activity and nutrition counseling as a standard of care requirement.
- Engage health care providers to advocate for increased physical activity opportunities and policies with local, regional, and state policymakers.

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Television Viewing Rationale

US children spend as much time watching television in the course of a year as they do attending school.[7] Children 6-11 years of age view television an average of 24 hours per week.[7] Children 1, 2, 3, and 4 years of age watched TV/video an average of 11, 15, 16, and 18 hours per week, respectively.[3] Thirty one percent of children ages 2 through 5 years and 35% of children 6 through 11 years have a TV set in their bedroom. These children are more likely to be overweight and spend more time watching TV than children without a TV in their bedroom (18 hours of TV viewing/week versus 13 hours of TV viewing/week).[3] Adults spend more time watching TV than children. Adult males spend approximately 29 hours per week watching TV compared to females at 34 hours per week.[8]

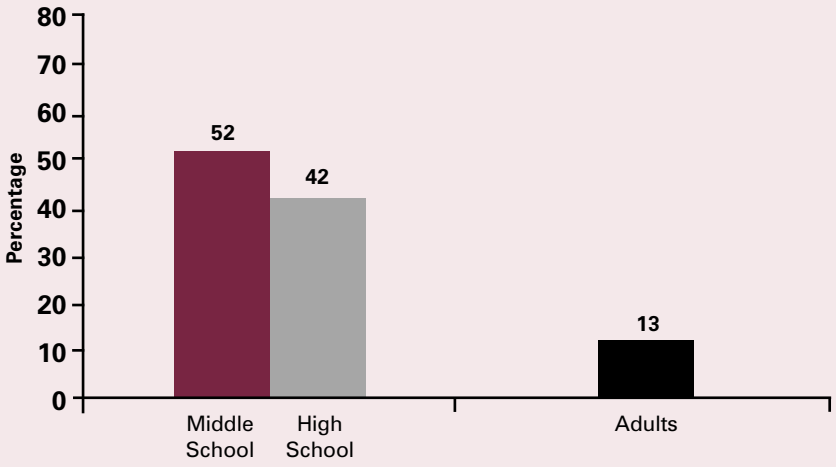
The number of hours children watch television is associated with the prevalence of overweight.[1-3] Among children age 8 to 16 years, the prevalence of overweight is lowest among children watching one hour or less and highest among those watching 4 plus hours per day.[2] Longitudinal and experimental studies have suggested a causal relationship between increased television viewing hours and overweight in children.[4, 5] Among girls 10-15 years of age, there is a dose-response relationship between hours of TV viewing and change in body weight.[5] Two school-based randomized controlled trials found that children who reported a decrease in TV viewing time also had a reduction in overweight.[4, 5] Television viewing may be one of the most easily modifiable causes of obesity among children.[4]

Television viewing has been proposed to effect adiposity in four ways: 1) increasing between meal snacking, 2) increasing consumption of foods advertised on TV which tend to be high calorie, high fat and low nutrient density, 3) increasing sedentary behavior, and 4) normal weight role models on prime-time television may indirectly suggest to children that eating and drinking high caloric foods does not affect weight.[4, 6-7]

According to the former US Surgeon General, David Satcher, MD, PhD, "Given our national television habit, it is no surprise that we are raising the most sedentary and most overweight generation of youngsters in American history. As they grow, these children will run increased risks of heart disease, diabetes, and other health problems– unless they turn off the tube and become physically active." Health agencies, concerned organizations, communities, schools, families and individuals must look for ways to turn off the TV, reduce sedentary behavior, increase physical activity and increase healthy eating not only in children, but in the adult population as well.

In Georgia, 13% of adults watch 22 or more hours of television per week and 52% of middle school students and 42% of high school students watch 3 or more hours of television per school day (Figure 27).

Figure 27. Percent of middle and high school students (2003)* who watch TV 3+ hours/school day and adults (1999) who watch TV 22+ hours/week, Georgia**



*Source: Georgia Student Health Survey
**Source: Georgia Behavioral Risk Factor Surveillance System

Recommendations for TV Viewing from the **American Academy of Pediatrics - Committee on Public Education, Adolescents and Television**[9]:

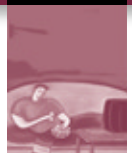
1. Limit total media time to no more than 1 – 2 hours per day.

2. Remove TV from children's bedrooms.

3. Discourage TV viewing for children younger than 2 years.

Healthy People 2010 Objectives related to reduction in TV viewing:

22-1	Reduce the proportion of adults who engage in no leisure-time physical activity.
22-11	Increase the proportion of adolescents who view TV 2 or fewer hours on a school day.



Television Viewing Strategies

Home

Information

- Educate families about the association between TV/video viewing and increased risk of obesity and help them to remain knowledgeable about the health risk of excessive TV viewing.
- Use American Academy of Pediatrics' (AAP) Media History form to help parents recognize the extent of their children's media viewing.[9]
- Educate families about the AAP recommendations for TV/video viewing.[9]

Skill Building

- Educate families about the increased risk of TVs in the bedroom and empower them to remove them.[3,9]
- Educate parents on alternative activities for entertainment for children.[7,9]

Environmental Support and Policy Change

- Limit children's total media time (with entertainment media) to no more than 1 to 2 hours of quality programming per day.[9]

School

Information

- Assist schools in implementing campaigns which include school food service, physical education teachers, school personnel wellness programs, and families (e.g. classroom-based campaigns such as "Eat Well and Keep Moving").[6]

Skill Building

Environmental Support and Policy Change

- Assist schools to incorporate health lessons, including TV/video viewing topics into the existing standard curriculum for math, science, language arts, and social studies classes.[4,6]

Information

Skill Building

Environmental Support and Policy Change

Information

- Develop local community events/projects such as "Turn off the TV Week" in communities.[9]
- Promote national TV Turn Off Week, April 25-May 1 (see http://www.tvturnoff.org/index.html) in communities.

Skill Building

Environmental Support and Policy Change

Health Care

Information

- Develop campaign messages which address reducing sedentary activity, and increasing physical activity.[8,10]
- Incorporate reduction in TV viewing/screen time as part of client education.

Skill Building

Environmental Support and Policy Change

- Serve as good role models by using television appropriately in waiting rooms and by implementing reading programs using volunteer readers in waiting rooms and hospital in-patient units.[9]
- Use a comprehensive family-based behavioral weight control program, which includes dietary and behavior change information and physical activity information to reduce sedentary behaviors.[11]

References:

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Appendices

Appendix I.

Body Mass Index by Height and Weight

To use the table, find the appropriate height in the left-hand column labeled Height. Move across to a given weight. The number at the top of the column is the BMI at that height and weight. Pounds have been rounded off.

BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Height (inches)	Body Weight (pounds)																
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287

Overweight and Obesity in Adults: The Evidence Report. National Institutes of Health Publication No. 98-4083.

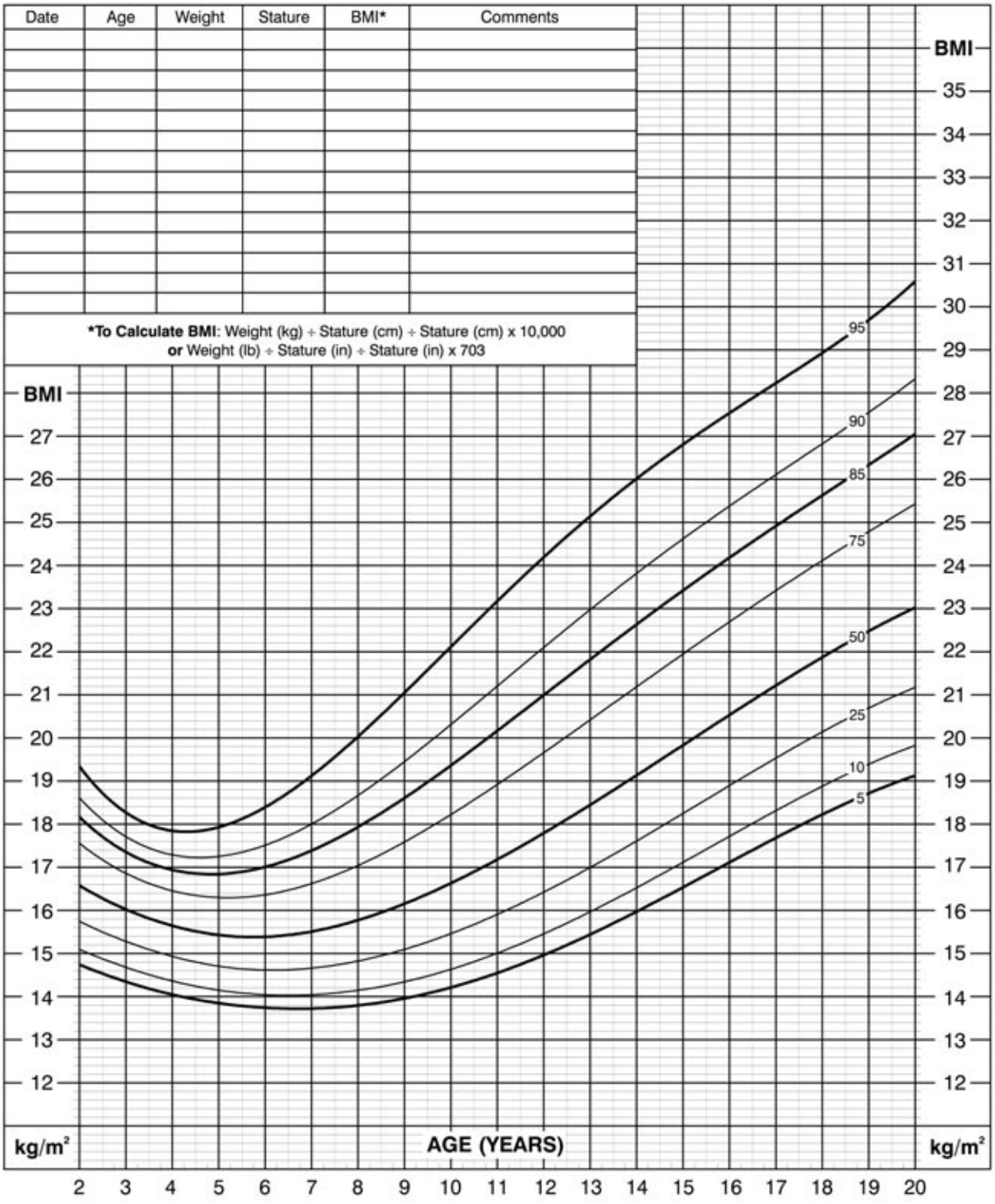
2 to 20 years: Boys
Body mass index-for-age percentiles

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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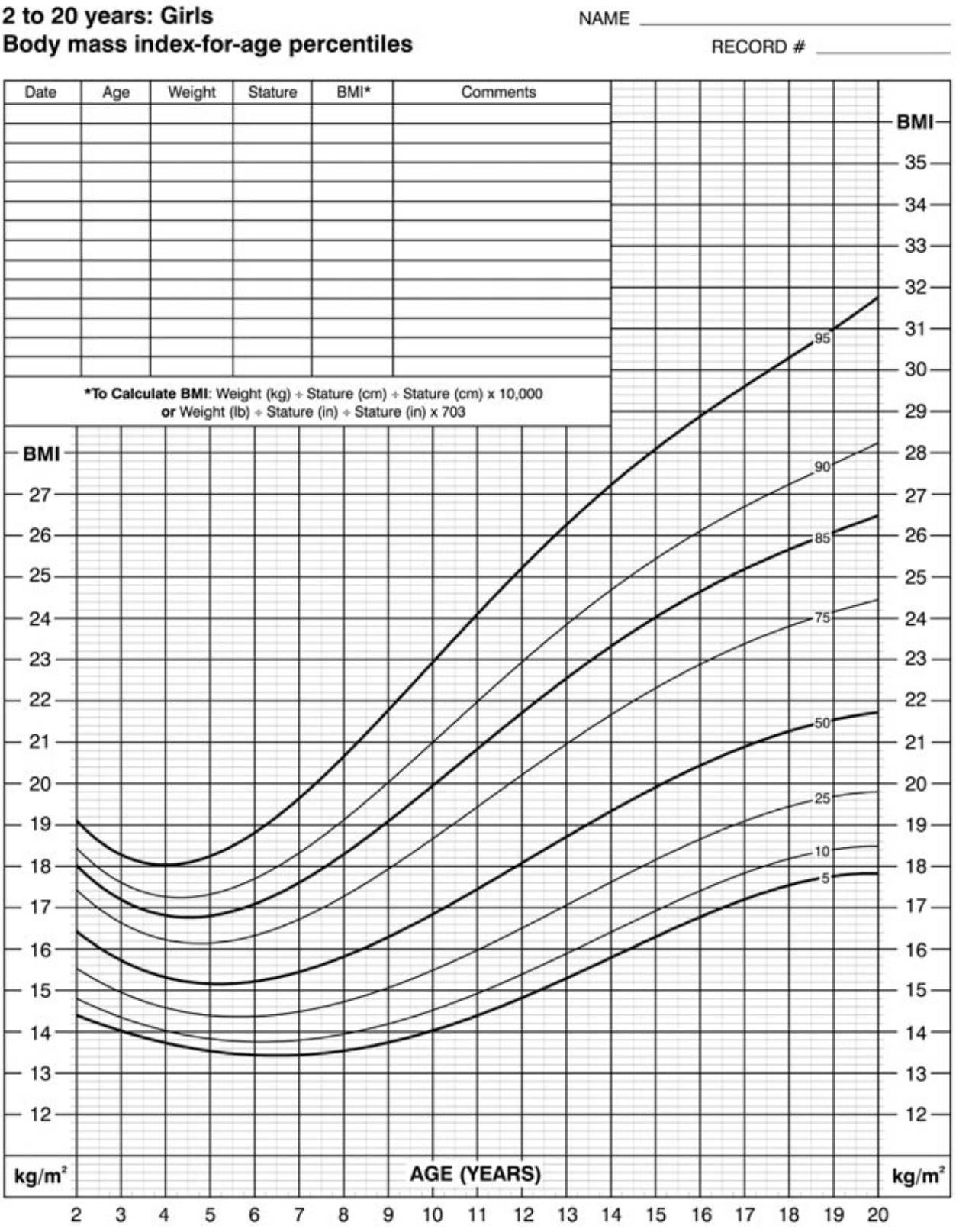

Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

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Appendix III. Data Tables

Table 1. Prevalence of at risk for overweight and overweight among WIC participants by sex, race, age, and health district – Georgia, 2002*

Category	At risk for becoming overweight†		Overweight§		At risk for overweight or overweight	
	Percent	95%CI	Percent	95%CI	Percent	95%CI
Total	14.4	(14.2-14.7)	12.1	(11.9-12.3)	26.5	26.2-26.8
Sex						
Female	14.0	(13.7-14.3)	11.5	(11.2-11.8)	25.5	25.1-25.9
Male	14.9	(14.6-15.2)	12.6	(12.3-12.9)	27.5	27.0-27.9
Race						
White/Non-Hispanic	14.6	(14.1-14.9)	11.1	(10.7-11.5)	25.7	25.1-26.1
Black/Non-Hispanic	13.6	(13.2-13.8)	10.8	(10.5-11.1)	24.4	24.0-24.8
Hispanic	17.2	(16.6-17.8)	17.6	(16.9-18.1)	34.8	34.0-35.5
Asian	9.8	(8.0-11.7)	12.2	(10.2-14.2)	22.0	19.7-24.7
Sex/Race						
Female, White/Non-Hispanic	13.8	(13.2-14.4)	10.4	(9.9-10.9)	24.2	23.5-24.9
Male, White/Non-Hispanic	15.3	(14.7-15.9)	11.8	(11.2-12.3)	27.1	26.3-27.8
Female, Black/Non-Hispanic	13.2	(12.8-13.7)	10.6	(10.2-11.0)	23.8	23.2-24.3
Male, Black/Non-Hispanic	13.9	(13.5-14.4)	11.2	(10.8-11.6)	25.1	24.5-25.7
Female, Hispanic	17.2	(16.4-18.1)	16.8	(15.9-17.7)	34.0	32.9-35.1
Male, Hispanic	17.2	(16.3-18.0)	18.3	(17.4-19.2)	35.5	34.3-36.5
Female, Asian	9.0	(6.6-11.5)	11.2	(8.5-13.9)	20.2	16.8-23.7
Male, Asian	10.6	(78.0-13.4)	13.3	(10.3-16.3)	24.0	20.5-27.9
Age						
2	14.7	(14.3-15.1)	12.6	(12.2-13.0)	27.3	26.9-27.8
3	13.7	(13.3-14.1)	11.3	(11.0-11.7)	25.0	24.5-25.5
4	14.9	(14.5-15.4)	12.2	(11.8-12.6)	27.1	26.6-27.7
Health District						
1-1 Northwest (Rome)	14.3	(13.4-15.2)	13.0	(12.2-14.0)	27.3	26.2-28.5
1-2 North Georgia (Dalton)	17.2	(16.0-18.4)	15.3	(14.2-16.5)	32.5	31.0-34.0
2-0 North (Gainesville)	15.8	(14.8-16.8)	12.3	(11.4-13.3)	28.1	26.9-29.4
3-1 Cobb-Douglas	13.2	(12.0-14.4)	12.1	(11.0-13.3)	25.3	23.8-26.9
3-2 Fulton	15.4	(14.7-16.2)	13.2	(12.5-13.9)	28.7	27.7-29.6
3-3 Clayton (Morrow)	12.2	(11.0-13.4)	11.0	(9.9-12.2)	23.3	21.8-24.8
3-4 East Metro (Lawrenceville)	13.1	(12.1-14.0)	11.3	(10.4-12.3)	24.4	23.1-25.7
3-5 DeKalb	14.3	(13.5-15.1)	11.8	(11.0-12.5)	26.1	25.1-27.1
4-0 LaGrange	14.8	(13.8-15.8)	12.1	(11.1-13.0)	26.7	25.6-28.2
5-1 South Central (Dublin)	15.1	(13.5-16.7)	12.4	(10.9-13.9)	27.5	25.5-29.6
5-2 North Central (Macon)	15.4	(14.6-16.3)	12.0	(11.2-12.7)	27.4	26.4-28.5
6-0 East Central (Augusta)	14.3	(13.4-15.3)	11.6	(10.7-12.5)	25.9	24.8-27.1
7-0 West Central (Columbus)	13.4	(12.5-14.2)	10.0	(9.2-10.7)	23.4	22.3-24.4
8-1 South (Valdosta)	14.5	(13.3-15.7)	13.1	(12.0-14.3)	27.7	26.1-29.2
8-2 Southwest (Albany)	14.4	(13.4-15.4)	12.4	(11.5-13.3)	26.9	25.6-28.1
9-1 East (Savannah)	14.3	(13.1-15.8)	10.2	(9.0-11.3)	24.7	23.0-26.3
9-2 Southeast (Waycross)	14.3	(13.5-15.2)	12.3	(11.5-13.1)	26.6	25.5-27.7
9-3 Coastal (Brunswick)	12.1	(11.1-13.1)	9.4	(8.5-10.3)	21.5	20.2-22.8
10-0 Northeast (Athens)	14.8	(13.5-16.0)	13.4	(12.2-14.6)	28.2	26.6-29.8

* Data were collected in the Pediatric Nutrition Surveillance System (PedNSS)
† Children 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.
§children who were ≥ 95th percentile for body mass index for age based on reference data from the National Health and Nutrition Examination Survey I.

Appendix III. Data Tables

Table 2a. Prevalence of at risk for overweight and overweight among middle school students by sex, race and grade – Georgia, 2003*

Category	At risk for becoming overweight†		Overweight§		At risk for overweight or overweight	
	Percent	95%CI	Percent	95%CI	Percent	95%CI
Total	19.0	(17.1-21.0)	14.1	(12.1-16.0)	33.1	(29.8-36.5)
Sex						
Female	17.6	(14.4-20.8)	12.0	(9.7-14.2)	29.6	(24.9-34.3)
Male	20.4	(17.5-23.3)	16.0	(13.6-18.5)	36.4	(32.8-40.0)
Race						
White	16.5	(14.1-18.8)	11.5	(9.4-13.6)	28.0	(24.4-31.5)
Black	21.8	(18.4-25.2)	18.0	(15.0-20.9)	39.8	(35.0-44.6)
Sex/Race						
Female, White	12.4	(9.2-15.5)	7.4	(5.4-9.4)	19.8	(15.9-23.6)
Male, White	20.0	(15.8-24.2)	15.0	(11.8-18.2)	35.0	(29.4-40.6)
Female, Black	23.6	(19.0-28.1)	17.1	(12.5-21.8)	40.7	(34.2-47.2)
Male, Black	20.0	(15.3-24.7)	18.9	(15.1-22.6)	38.9	(32.1-45.5)
Grade						
6th	20.7	(15.3-26.1)	18.9	(14.6-23.1)	39.6	(31.9-47.2)
7th	17.6	(14.2-21.1)	12.1	(8.6-15.5)	29.7	(24.6-34.9)
8th	19.3	(16.7-21.9)	12.8	(10.5-15.0)	32.1	(28.2-35.9)

Table 2b. Prevalence of at risk for overweight and overweight among middle school students by health district – Georgia, 2001**

Health District	At risk for becoming overweight†		Overweight§		At risk for overweight or overweight	
	Percent	95%CI	Percent	95%CI	Percent	95%CI
Total	16.3	(15.0-17.5)	13.4	(11.7-15.1)	29.7	(27.5-31.8)
1-2 North Georgia (Dalton)	14.7	(12.6-16.8)	17.4	(14.2-20.5)	32.1	(27.0-37.0)
3-2 Fulton	13.6	(12.1-15.1)	14.2	(9.9-18.4)	27.8	(22.5-33.0)
4-0 LaGrange	17.1	(12.9-21.3)	13.4	(11.6-15.3)	30.5	(27.7-33.4)
5-1 South Central (Dublin)	18.4	(16.0-20.9)	17.7	(14.0-21.5)	36.1	(32.5-39.9)
6-0 East Central (Augusta)	16.5	(11.7-21.4)	11.7	(7.5-15.9)	28.2	(19.5-37.0)
7-0 West Central (Columbus)	15.1	(13.5-16.7)	17.7	(14.8-20.7)	32.8	(28.7-36.9)
8-2 Southwest (Albany)	15.9	(14.3-17.5)	17.2	(13.2-21.2)	33.1	(29.6-36.7)
9-2 Southeast (Waycross)	19.9	(17.8-22.0)	14.2	(12.4-16.0)	34.1	(32.0-36.1)
9-3 Coastal (Brunswick)	17.1	(14.2-19.9)	13.7	(11.0-16.4)	30.8	(27.7-33.8)

* Data were collected in the 2003 Georgia Student Health 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 Nutrition Examination Survey I.
** Data were collected in the 2001 Georgia Youth Tobacco Survey

Appendix III. Data Tables

Table 3a. Prevalence of at risk for overweight and overweight among high school students by sex, race, and grade – Georgia, 2003*

Category	At risk for becoming overweight†		Overweight§		At risk for overweight or overweight	
	Percent	95%CI	Percent	95%CI	Percent	95%CI
Total	15.1	(13.2-16.9)	11.1	(9.5-12.6)	26.2	(23.8-28.4)
Sex						
Female	15.1	(12.4-17.8)	6.6	(4.7-8.5)	21.7	(17.8-25.6)
Male	15.0	(12.7-17.4)	15.4	(12.8-18.1)	30.4	(27.5-33.4)
Race						
White	12.7	(10.7-14.6)	8.8	(6.8-10.9)	21.5	(18.7-24.4)
Black	18.6	(14.7-22.5)	14.3	(12.3-16.2)	32.9	(28.9-36.9)
Sex/Race						
Female, White	9.6	(7.5-11.1)	3.9	(2.1-5.8)	13.5	(11.0-16.1)
Male, White	15.5	(12.6-18.4)	13.2	(10.4-16.0)	28.7	(24.6-32.7)
Female, Black	22.9	(17.0-28.8)	9.6	(6.2-13.1)	32.5	(24.5-40.6)
Male, Black	14.0	(10.3-17.8)	19.2	(15.3-23.1)	33.2	(28.2-38.3)
Grade						
9th	15.0	(12.2-17.9)	11.0	(8.0-14.0)	26.0	(22.0-30.2)
10th	17.2	(13.3-21.0)	10.3	(8.0-12.5)	27.5	(23.9-31.0)
11th	12.9	(9.7-16.1)	10.7	(8.1-13.4)	23.6	(19.3-28.0)
12th	14.8	(10.7-19.0)	12.7	(9.5-15.9)	27.5	(21.4-33.6)

Table 3b. Prevalence of at risk for overweight and overweight among high school students by health district – Georgia, 2001**

Health District	At risk for becoming overweight†		Overweight§		At risk for overweight or overweight	
	Percent	95%CI	Percent	95%CI	Percent	95%CI
Total	15.5	(13.3-17.7)	11.2	(9.5-13.0)	26.8	(24.5-29.0)
5-1 South Central (Dublin)	18.1	(16.0-20.2)	15.5	(13.7-17.3)	33.6	(30.6-36.6)
6-0 East Central (Augusta)	13.4	(11.2-15.7)	10.9	(9.2-12.7)	24.3	(21.0-27.6)
7-0 West Central (Columbus)	17.6	(15.8-19.4)	14.4	(9.6-19.3)	32.0	(26.9-37.1)
8-2 Southwest (Albany)	16.6	(14.8-18.3)	12.8	(9.6-15.9)	29.4	(25.7-33.1)
9-2 Southeast (Waycross)	20.0	(17.8-22.3)	13.8	(12.5-15.0)	33.8	(31.6-36.0)
9-3 Coastal (Brunswick)	14.7	(12.4-17.1)	14.1	(11.0-17.2)	28.8	(25.1-32.6)

* Data were collected in the 2003 Georgia Student Health 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 Nutrition Examination Survey I.
** Data were collected in the 2001 Georgia Youth Tobacco Survey

Appendix III. Data Tables

Table 4. Prevalence of overweight and obesity among adults (age 18+) by sex, race, age, education, income, and health district – Georgia, 2002*

Category	Overweight†		Obese§		Overweight or Obese§	
	Percent	95%CI	Percent	95%CI	Percent	95%CI
Total	35.4	(33.7-37.2)	23.5	(21.9-25.1)	58.9	(57.1-60.7)
Sex						
Female	29.7	(27.7-31.8)	23.7	(21.9-25.5)	53.4	(51.1-55.6)
Male	41.4	(38.5-44.2)	23.2	(20.8-25.9)	64.6	(61.8-67.4)
Race						
White/Non-Hispanic	35.0	(33.0-37.0)	20.7	(19.1-22.4)	55.7	(53.6-57.8)
Black/Non-Hispanic	35.5	(31.8-39.4)	31.2	(27.6-35.0)	66.7	(63.0-70.4)
Hispanic	45.1	(33.2-57.6)	23.9	(14.2-37.4)	69.0	(58.2-79.8)
Other/Non-Hispanic	36.5	(26.7-46.3)	15.6	(8.8-22.4)	52.1	(42.0-62.2)
Sex/Race						
Female, White/Non-Hispanic	28.0	(25.8-30.4)	19.2	(17.3-21.3)	47.2	(44.6-49.9)
Male, White/Non-Hispanic	42.0	(38.8-45.3)	22.3	(19.7-25.0)	64.3	(61.1-67.5)
Female, Black/Non-Hispanic	34.4	(30.3-38.8)	33.3	(29.4-37.5)	67.7	(63.4-72.0)
Male, Black/Non-Hispanic	36.8	(30.5-43.7)	28.7	(22.4-35.9)	65.5	(59.3-71.7)
Female, Other/Non-Hispanic	24.6	(13.8-35.5)	19.7	(8.9-30.6)	44.3	(30.4-58.2)
Male, Other/Non-Hispanic	44.8	(30.8-58.7)	12.8	(4.2-21.3)	57.5	(43.8-71.3)
Female, Hispanic	31.4	(19.4-46.6)	25.4	(14.8-40.2)	56.9	(41.9-71.9)
Male, Hispanic	54.6	(36.2-71.8)	22.9	(9.8-44.8)	77.4	(63.3-91.5)
Age						
18-24	24.5	(19.5-30.4)	11.8	(8.7-15.9)	36.4	(30.5-42.3)
25-34	37.0	(33.1-41.1)	20.8	(17.8-24.2)	57.9	(53.9-61.8)
35-44	35.4	(31.7-39.3)	26.6	(22.8-30.8)	62.0	(58.1-66.0)
45-54	37.5	(33.7-41.4)	29.4	(25.8-33.2)	66.9	(63.2-70.5)
55-64	39.6	(35.3-44.1)	27.7	(23.9-31.8)	67.3	(63.0-71.7)
65+	38.0	(34.1-42.0)	22.4	(19.1-26.2)	60.4	(56.5-64.3)
					T-test 7.53	(p-value <0.0001)
Education						
Less than High School	32.1	(27.5-37.0)	31.9	(26.9-37.4)	64.0	(59.1-69.0)
High School or G.E.D.	34.8	(31.7-38.0)	27.6	(24.8-30.6)	62.4	(59.1-65.7)
Some College	36.2	(32.8-39.8)	21.0	(18.5-23.8)	57.2	(53.7-60.8)
College Graduate	37.1	(34.0-40.3)	17.2	(14.9-19.9)	54.3	(51.1-57.6)
					T-test 3.65	(p-value 0.0003)
Household Income						
Less than $15,000	29.3	(24.7-34.4)	35.2	(30.2-40.6)	64.6	(59.1-70.0)
$15,000-24,999	31.5	(27.2-36.0)	29.1	(24.5-34.2)	60.6	(55.7-65.4)
$25,000- 34,999	35.2	(30.7-39.9)	26.1	(22.1-30.6)	61.3	(56.6-66.0)
$35,000- 49,999	35.6	(31.3-40.2)	23.4	(20.0-27.2)	59.0	(54.5-63.6)
$50,000- 74,999	37.5	(33.3-41.8)	22.0	(18.5-25.9)	59.5	(55.1-63.9)
$75,000+	39.8	(35.6-44.1)	17.0	(13.9-20.6)	56.8	(52.6-61.0)
					T-test 2.17	(p-value 0.03)
Health District						
1-1 Northwest (Rome)	41.2	(34.2-48.2)	24.7	(18.9-30.5)	65.9	(58.9-72.9)
1-2 North Georgia (Dalton)	35.7	(28.2-43.2)	23.2	(15.8-30.6)	58.9	(51.2-66.6)
2-0 North (Gainesville)	33.4	(26.6-40.2)	25.0	(18.2-31.8)	58.3	(51.0-65.6)
3-1 Cobb-Douglas	31.8	(25.4-38.2)	19.6	(14.2-25.0)	51.4	(44.6-58.1)
3-2 Fulton	31.9	(25.1-38.7)	23.9	(17.6-30.2)	55.8	(48.7-62.9)
3-3 Clayton (Morrow)	39.2	(30.5-47.9)	22.6	(15.4-29.8)	61.7	(53.1-70.3)
3-4 East Metro (Lawrenceville)	36.0	(29.0-43.0)	16.1	(11.4-20.8)	52.2	(44.7-59.6)
3-5 DeKalb	35.7	(27.8-43.6)	15.3	(10.4-20.2)	51.1	(42.6-59.5)
4-0 LaGrange	37.1	(30.2-44.0)	24.4	(16.9-31.9)	61.5	(54.3-68.7)
5-1 South Central (Dublin)	32.0	(24.8-39.2)	27.7	(20.6-34.8)	59.7	(52.3-67.2)
5-2 North Central (Macon)	33.7	(25.9-41.5)	30.0	(22.6-37.4)	63.7	(56.4-70.9)
6-0 East Central (Augusta)	33.2	(26.7-39.7)	29.8	(23.0-36.6)	63.0	(56.2-69.8)
7-0 West Central (Columbus)	38.1	(30.6-45.6)	21.2	(15.5-26.9)	59.3	(51.9-66.8)
8-1 South (Valdosta)	35.8	(28.3-43.3)	31.2	(24.4-38.0)	67.0	(60.0-74.0)
8-2 Southwest (Albany)	39.9	(33.4-46.4)	27.8	(22.2-33.4)	67.7	(61.7-73.8)
9-1 East (Savannah)	39.5	(31.9-47.1)	20.6	(14.6-26.6)	60.0	(52.5-67.5)
9-2 Southeast (Waycross)	25.0	(18.9-31.1)	31.5	(24.7-38.3)	56.4	(49.4-63.4)
9-3 Coastal (Brunswick)	40.4	(34.0-46.8)	23.9	(18.2-29.6)	64.3	(58.1-70.5)
10-0 Northeast (Athens)	35.7	(29.1-42.3)	20.7	(15.1-26.3)	56.3	(49.5-63.2)

* Data were collected in the 2002 Georgia Behavioral Risk Factor Surveillance System (BRFSS)
† BMI between 25.0-29.9
§ BMI greater than or equal to 30.0
§ BMI greater than or equal to 30.0

Appendix IV. Details about estimating the burden of overweight and obesity

Population Attributable Risk:
Population attributable risk (PAR) is an estimate of the proportion of deaths or other measures of disease burden caused by a particular risk factor. The PAR estimates the proportion of disease in a population that would be eliminated if the risk factor were removed from the population. For example, the PAR for overweight and obesity is the fraction of deaths that would not occur if everyone were of normal weight.

As a formula, PAR is expressed:

$$(1)\ PAR = \frac{\#\ of\ Total\ Deaths\ (actual) - \#\ of\ Total\ Deaths\ (if\ all\ normal\ weight)}{\#\ of\ Total\ Deaths\ (actual)}$$

Because the value for "# of Total Deaths (if all normal weight)" cannot be directly measured, PAR is usually calculated using another formula that requires the prevalence of the risk factor and the relative risk for dying among those with the risk factor compared to those without the risk factor.

$$(2)\quad PAR = \frac{\sum P_{exp(i)} * (RR_i - 1)}{1 + \sum [P_{exp(i)} * (RR_i - 1)]}$$

In this equation, P_{exp} is the prevalence of the exposure, RR is the relative risk, and (i) is the level of exposure to the risk factor if there is more than one level of the risk factor. The categories of excess weight used in this report provide two levels of risk, one level for those who are overweight and one level for those who are obese.

Calculating the PAR using formula 2, above, assumes that the prevalence of other risk factors would not change if the risk factor of interest disappeared, and that other risk factors, known or unknown, are unassociated with the risk factor of interest. These assumptions and others make the PAR an imperfect estimate of the proportion of deaths caused by a specific risk factor. Nevertheless, the PAR provides a useful approximation of the potential gains from reducing the prevalence of a particular risk factor, in this case excess body weight.

Relative risk for death from overweight and obesity:
In 1995, the World Health Organization (WHO) recommended a classification for three "grades" of overweight using BMI cutoff points of 25, 30, and 40.[1] In 1998, the expert panel from the US National Institutes of Health (NIH) released a report that provided definitions for overweight and obesity similar to those used by the WHO. The panel identified overweight as a BMI > 25 kg/m^2 to less than 30 kg/m^2 and obesity as a BMI ≥ 30 kg/m^2. These definitions are widely used by the US federal government and by the broader medical and scientific communities.

The majority of epidemiologic studies show that all-cause mortality begins to increase with BMIs above 25 kg/m^2, [1-5] and the increase in mortality tends to be modest until a BMI of 30 kg/m^2 is reached.[1,2,4,5] For persons with a BMI of 30 kg/m^2 or above, mortality rates from all causes are 50 to 100 percent above that of persons with BMIs in the range of 20 to 25 kg/m^2.[1,4,5] In the few studies with sufficient numbers of older persons (>64 years of age), the relative risk for death due to overweight and obesity was lower among older persons than younger.

Details of the PAR calculations in this report:
In this report, we classify overweight and obesity according to the NIH published guidelines: overweight was defined as BMI between 25.0 to <30.0 kg/m^2 and obesity as BMI 30.0 kg/m^2 and above.

The prevalences of overweight and obesity among adults in Georgia were obtained from the Georgia Behavior Risk Factor Surveillance System (BRFSS) for years 2000-2003.

The relative risks for dying from overweight and obesity were derived through comprehensive literature review. We included those studies which 1) used the BMI groupings that allowed use of the current NIH categories; 2) had as the reference group those with BMI value between 18.5 and 24.9 kg/m^2; 3) measured adjusted relative risk for all-cause mortality based on multivariate analysis; 4) included at least 1000 subjects in the study. A total of nine articles describing thirteen studies were selected to estimate the relative risk for all-cause mortality from overweight and obesity.[6-14] Because relative risk is lower among older persons [6,7,9] and because the prevalence of overweight and obesity differs between sexes, we calculated PARs for eight BMI-age-sex-specific groups (2 BMI groups, 2 age groups, 2 sex groups)

(Table IV-1). We used weighted averages of the relative risks from the thirteen studies for persons 18-74 years of age. Although the evidence of reduced relative risk of mortality from overweight and obesity was convincing, the articles provided insufficient consistent quantitative estimates for persons 75 years and older for us to use directly or to average as we had done for younger adults. Instead, for persons 75 years and older we arbitrarily reduced the relative risk by half for overweight males and females and obese males. We reduced the relative risk by three-quarters for obese females because the available data suggested it.

The total number of deaths among Georgia residents from 2000 to 2003 was obtained from Georgia Vital Statistics data.

Table IV-1. Relative risks, prevalence, and population attributable risk due to overweight and obesity by age-sex groups, Georgia, 2000-2003

	Male		Female		Total
	18-74 yrs	75+ yrs	18-74 yrs	75+ yrs	
Average annual total number of deaths	18712	12135	12712	19512	
Relative Risk (estimated from literature)					
BMI 25-29	1.10	1.05	1.10	1.05	
BMI 30+	1.60	1.30	1.60	1.15	
Prevalence (from BRFSS)					
BMI 25-29	42.7%	39.7%	27.5%	29.3%	
BMI 30+	24.4%	13.0%	28.9%	22.7%	
PAR %					
BMI 25-29	3.6%	1.9%	2.3%	1.4%	
BMI 30+	12.3%	3.7%	14.4%	3.2%	
Total	15.9%	5.6%	16.7%	4.6%	
PAR number, average annual					
BMI 25-29	670	230	290	270	1460
BMI 30+	2300	450	1840	630	5220
Total	2980	670	2130	910	6680

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Appendix V. Details about data collection methods for estimating prevalence of overweight and obesity

The Pediatric Nutrition Surveillance System (PedNSS)[1] is a program-based surveillance system that uses data collected from the Women, Infants, and Children Supplemental Food Program (WIC) program participants. Data are collected on socio-demographic variables, including ethnicity/race, age, geographic location, anthropometric indices (height/length, weight), and breastfeeding. Data are submitted to the Centers for Disease Control and Prevention on a monthly basis, and analyzed by CDC and the state for program planning, management, and evaluation of state and local maternal and child health programs and activities.

The Georgia Student Health Survey[2] is a paper-and-pencil questionnaire administered to Georgia public middle and high school students in the spring of 2003. The middle school questionnaire included 55 questions and the high school questionnaire included 94 questions. Both questionnaires were modeled after the core Youth Risk Behavior Survey (YRBS), developed by the Centers for Disease Control and Prevention (CDC), covering five topics: behaviors that result in unintentional injuries and violence; tobacco use; alcohol and other drug use; dietary behaviors; and physical activity. Both questionnaires included self-reported 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 87% (n=2,195) for the middle school sample and 90% (n=2,066) for the high school sample.

The Georgia Youth Tobacco Survey (GYTS)[3] is a paper-and-pencil questionnaire administered to Georgia public middle and high school students in the fall of 2001. 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% (n=2,975) for the high school sample. In conjunction with the statewide survey, nine of the 19 Health Districts (HD) in Georgia collected local YTS data. All nine participating health districts were successful in collecting district-specific data for middle schools and six heath districts were successful in collecting district-specific data for both middle and high schools.

The Behavioral Risk Factor Surveillance System (BRFSS)[4] is a telephone survey of a random sample of the adult population in Georgia that collects information on a range of health behaviors and conditions. In 2002, 5,065 adults responded to the survey, the average monthly cooperation rate was 70%. A weighting variable was calculated for each respondent record to represent the age-, race-, and sex-distribution of the adult population in Georgia and to compensate for an individual's probability of selection. Self-reported height and weight were used to calculate body mass index (BMI), and adults were classified as overweight if BMI was 25.0 to <30.0 or obese if BMI was 30.0 or greater. Obesity and overweight are likely to be under-estimated in self-reported data. Nevertheless, the data are useful for describing the burden of obesity and overweight among Georgia adults.

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