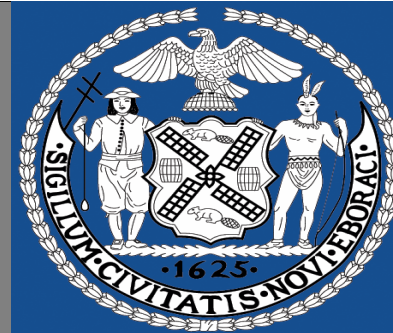


Healthy and Green Design



BEAUTIFUL WASHINGTON PARK

Karen K. Lee, MD, MHSc, FRCPC
Deputy Director,
Bureau of Chronic Disease Prevention and Control
New York City Department of Health and Mental Hygiene

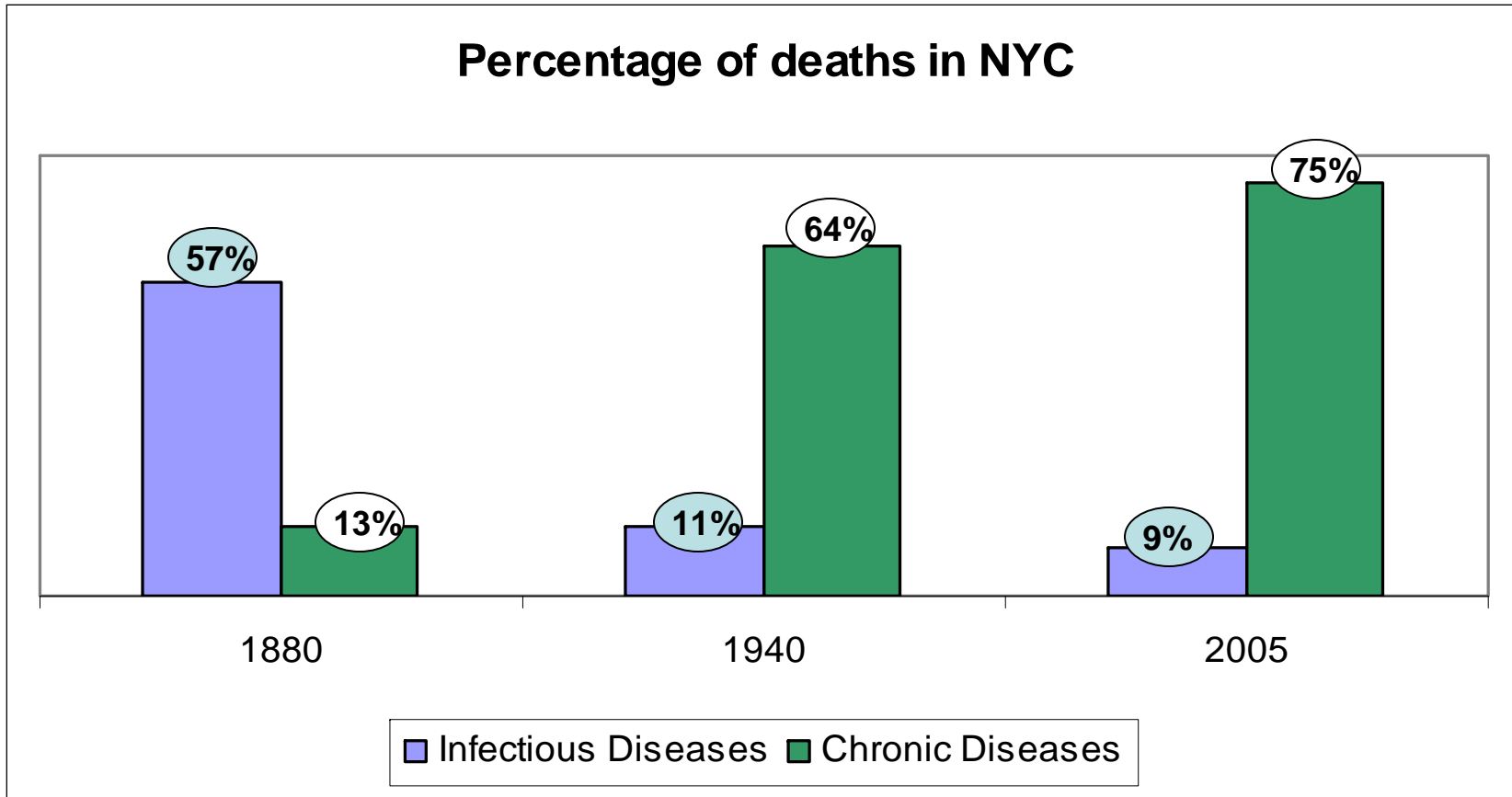


- **Health Priorities for Affordable Housing**
- **Evidence-Based Solutions - from a building/site design, construction and management perspective**

CHRONIC DISEASES HAVE NOW REPLACED INFECTIOUS DISEASES AS THE PREDOMINANT CAUSE OF DEATH

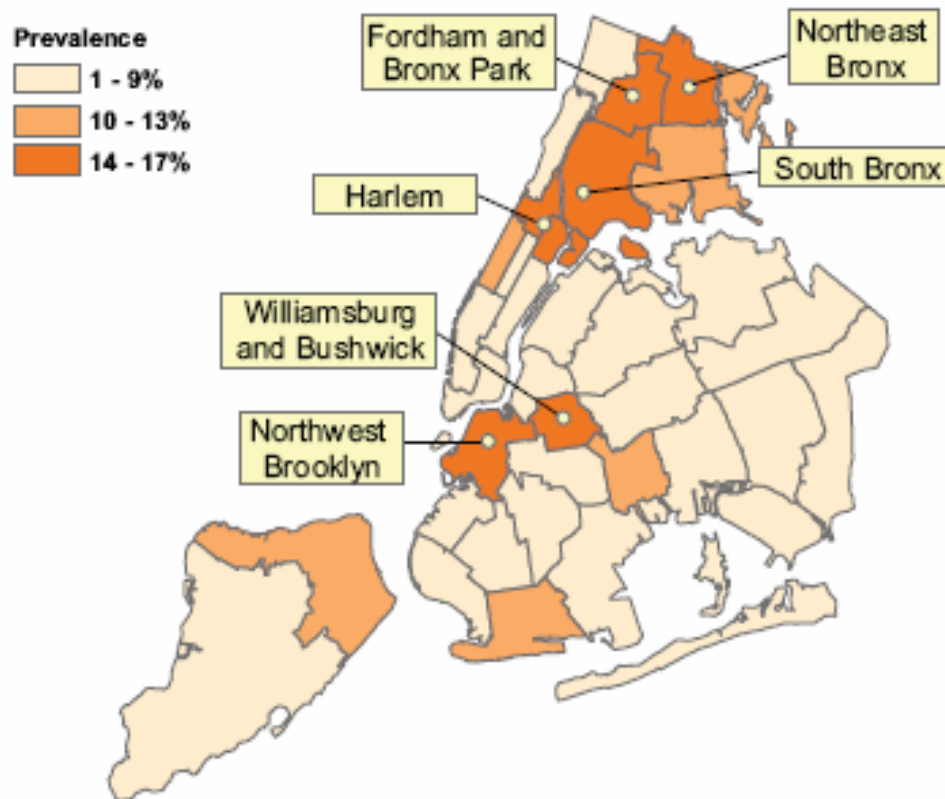


Percentage of deaths in NYC



Asthma in NYC

Current Asthma Among Children (0-17 years)
by Residence, New York City





CHILDREN:

Asthma – 14-17% of children in our poor neighborhoods

Overweight and Obesity – 43% of elementary school kids

ADULTS:

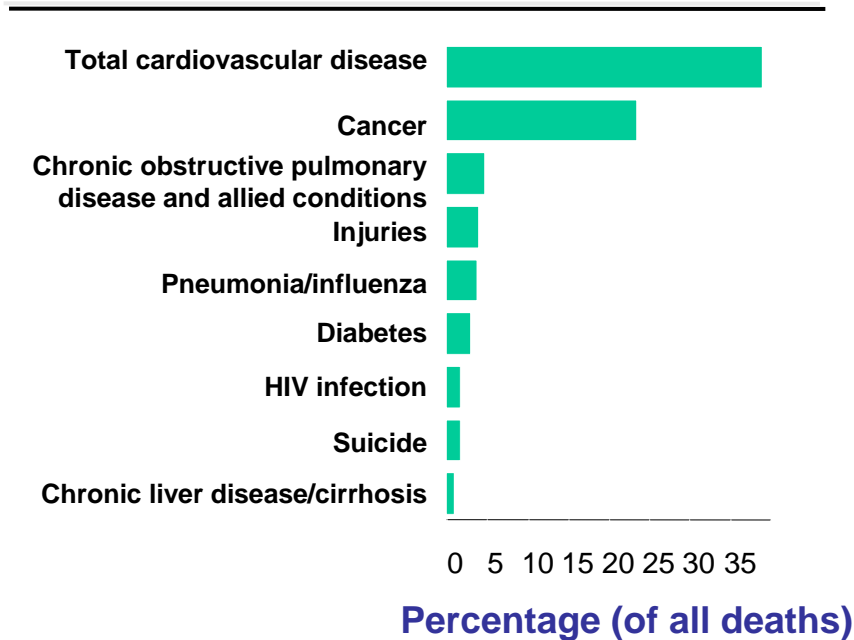
Asthma – ~11% of adults

Overweight and Obesity – ~60% of adults

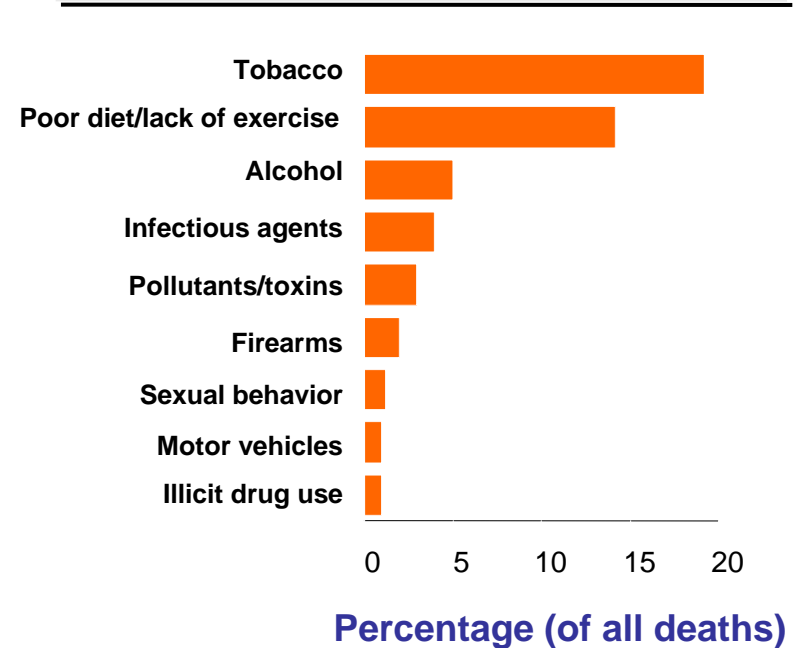
CHRONIC DISEASES AND RELATED RISK FACTORS ARE THE LEADING CAUSES OF DEATH TODAY



Most Common Causes of Death, United States, 1996*



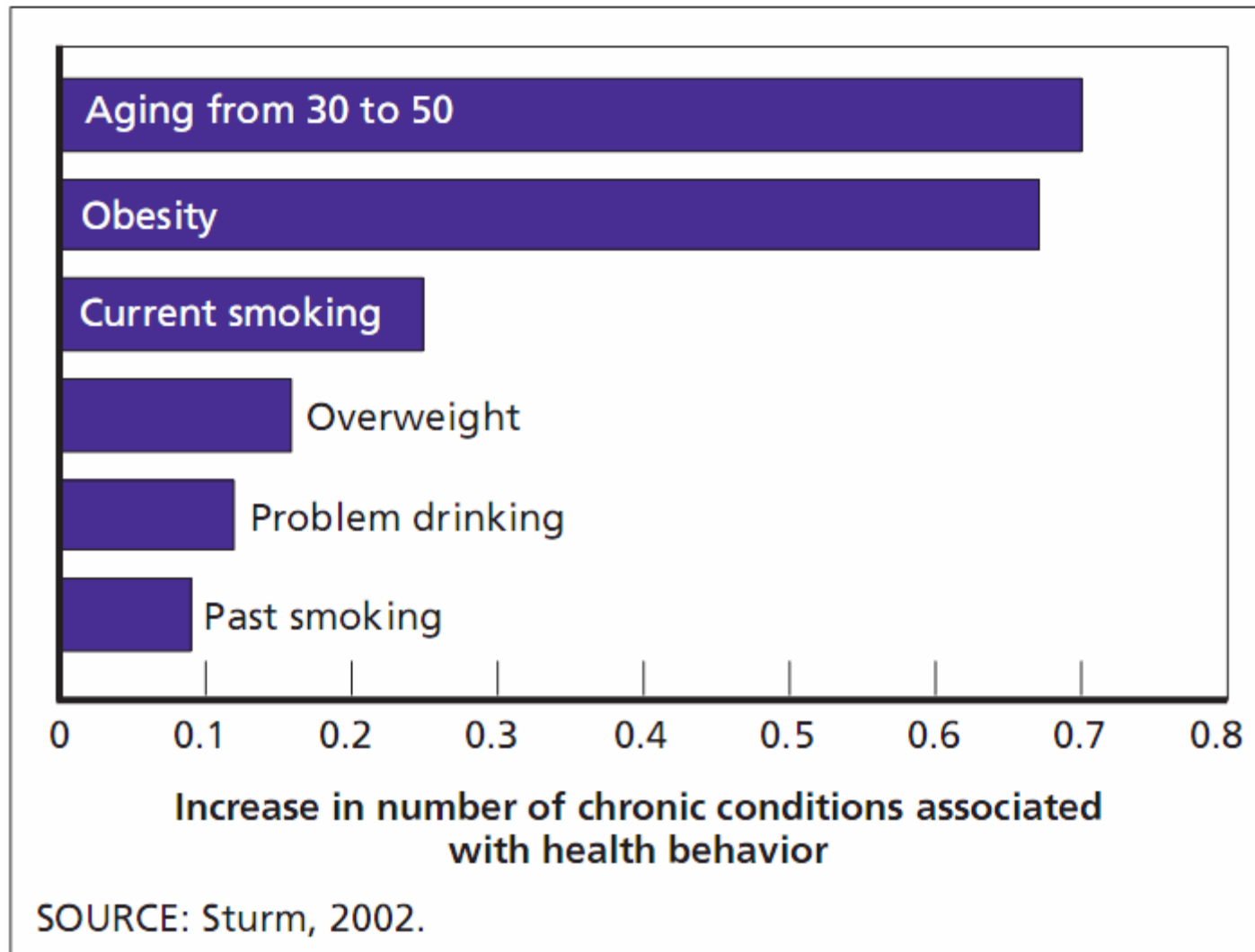
Actual Causes of Death, United States, 1990†



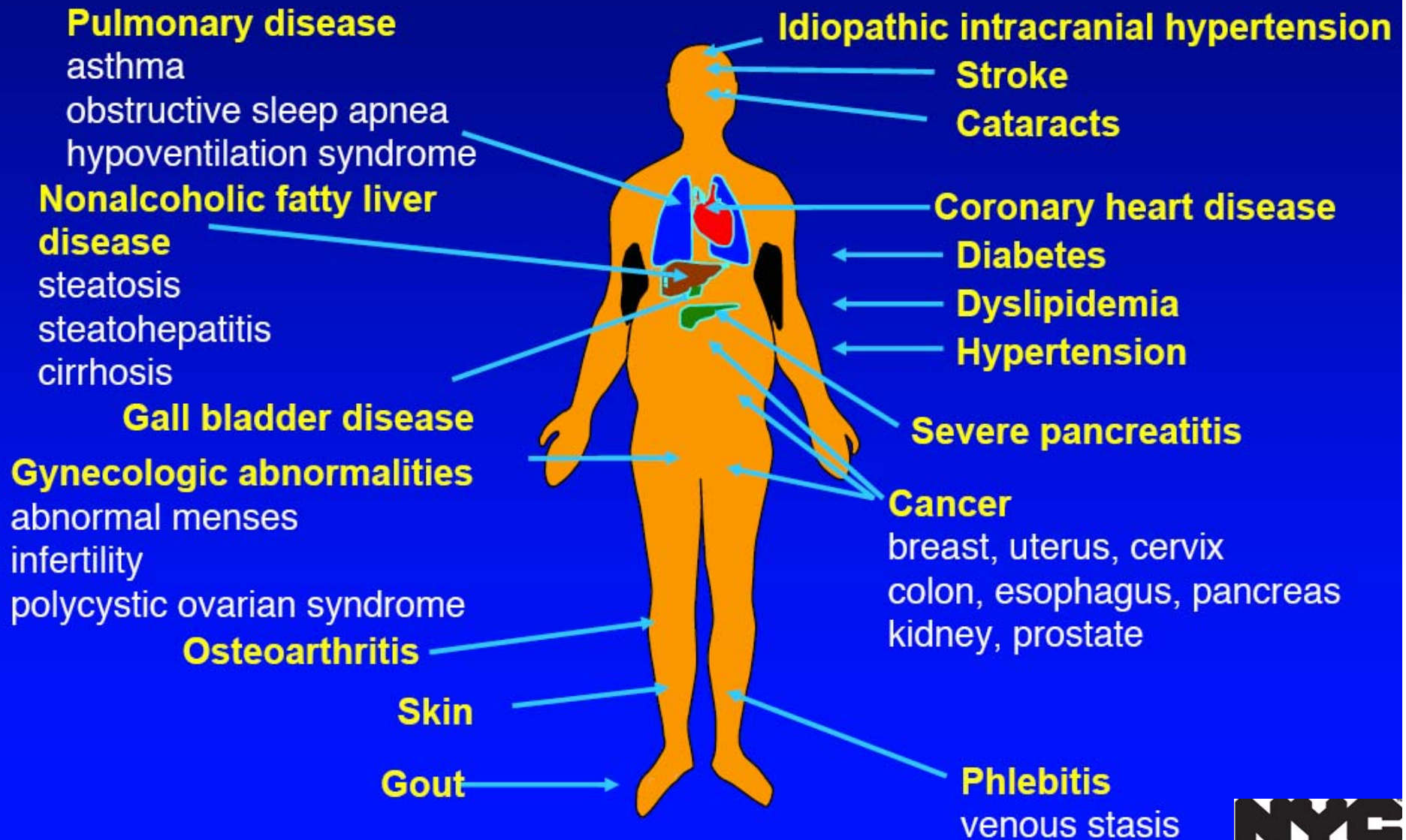
Sources: *National Vital Statistics Report; 47 (9) November 10, 1998

†McGinnis JM, Foege WH. Actual causes of death in the United States. JAMA 1993; 270:2207-12

OBESITY IS HIGHLY ASSOCIATED WITH CHRONIC CONDITIONS



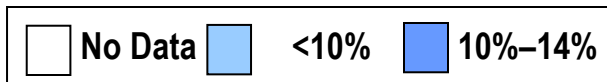
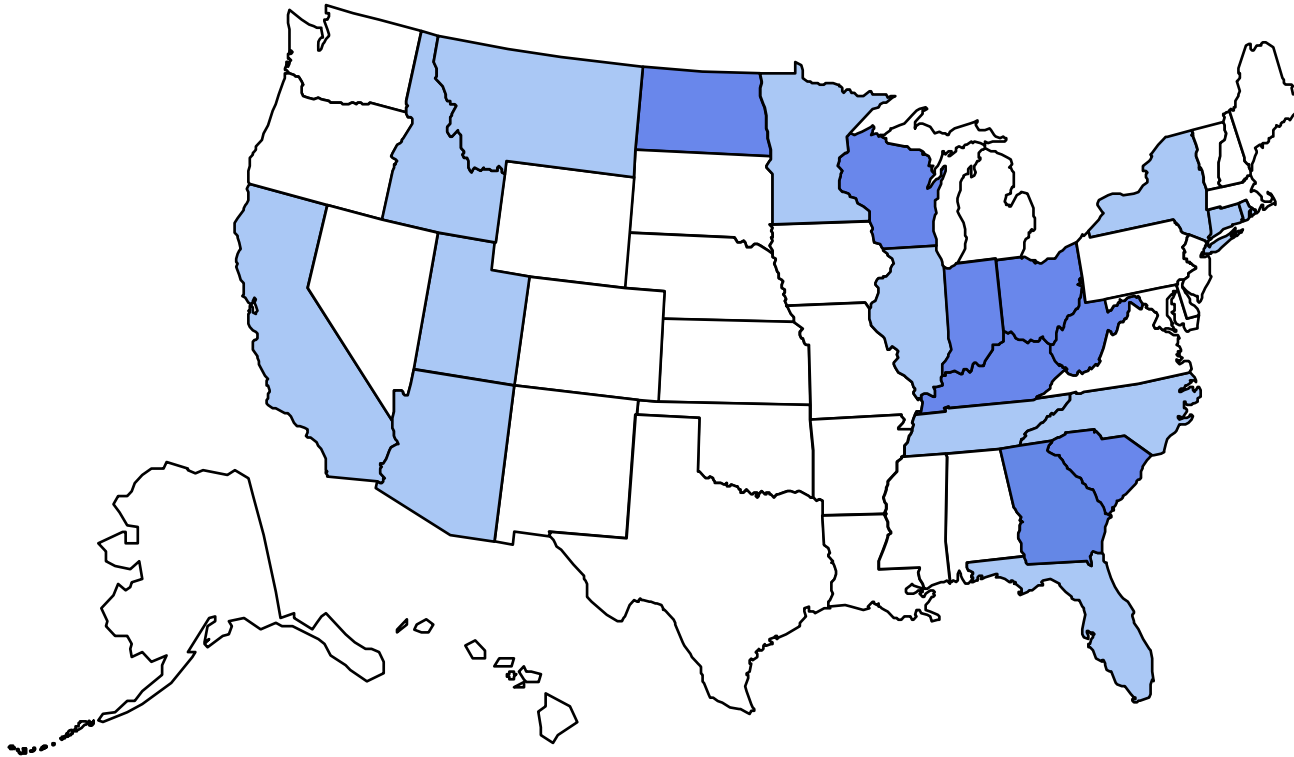
Medical Complications of Obesity: Almost every organ system is affected



Obesity Trends* Among U.S. Adults

BRFSS, 1985

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

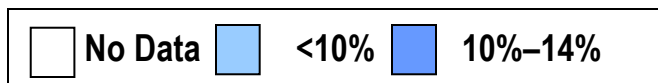
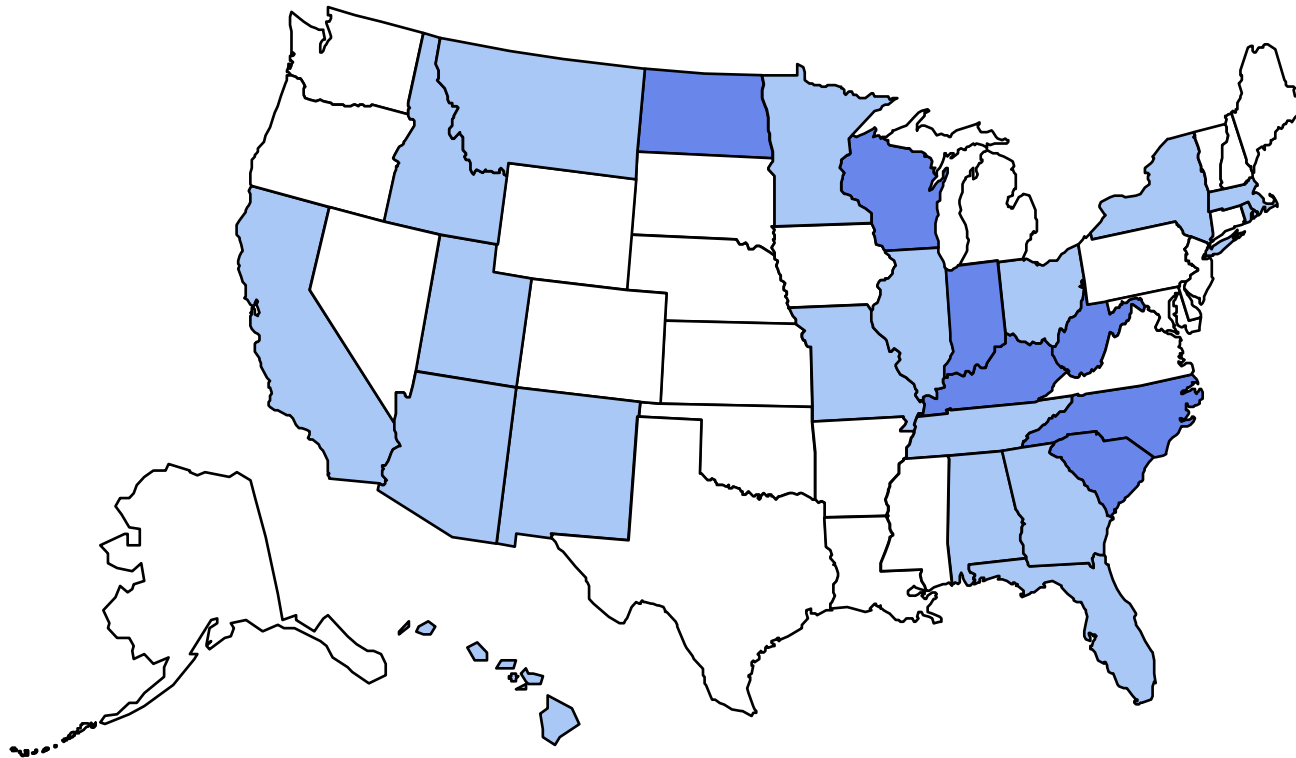


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1986

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

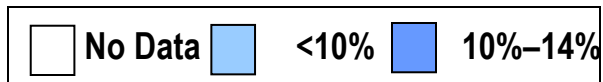
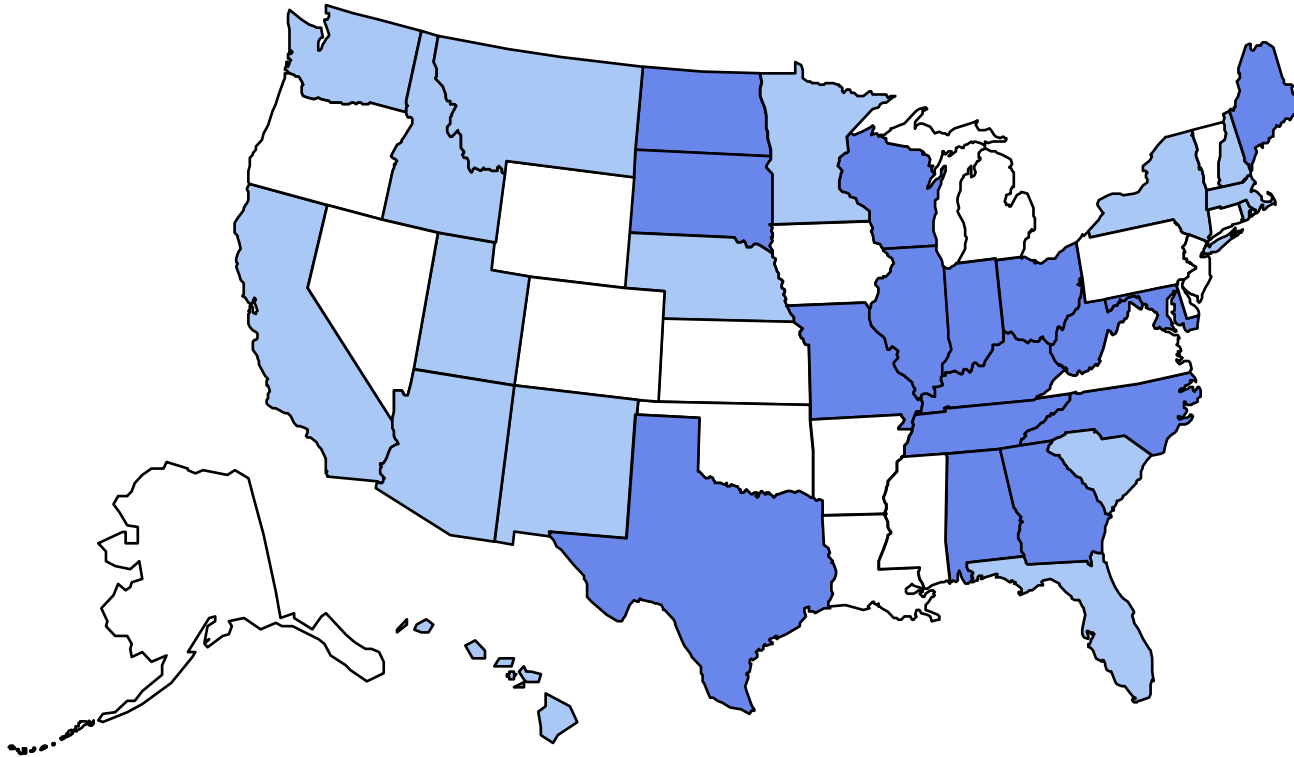


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1987

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

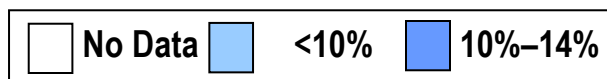
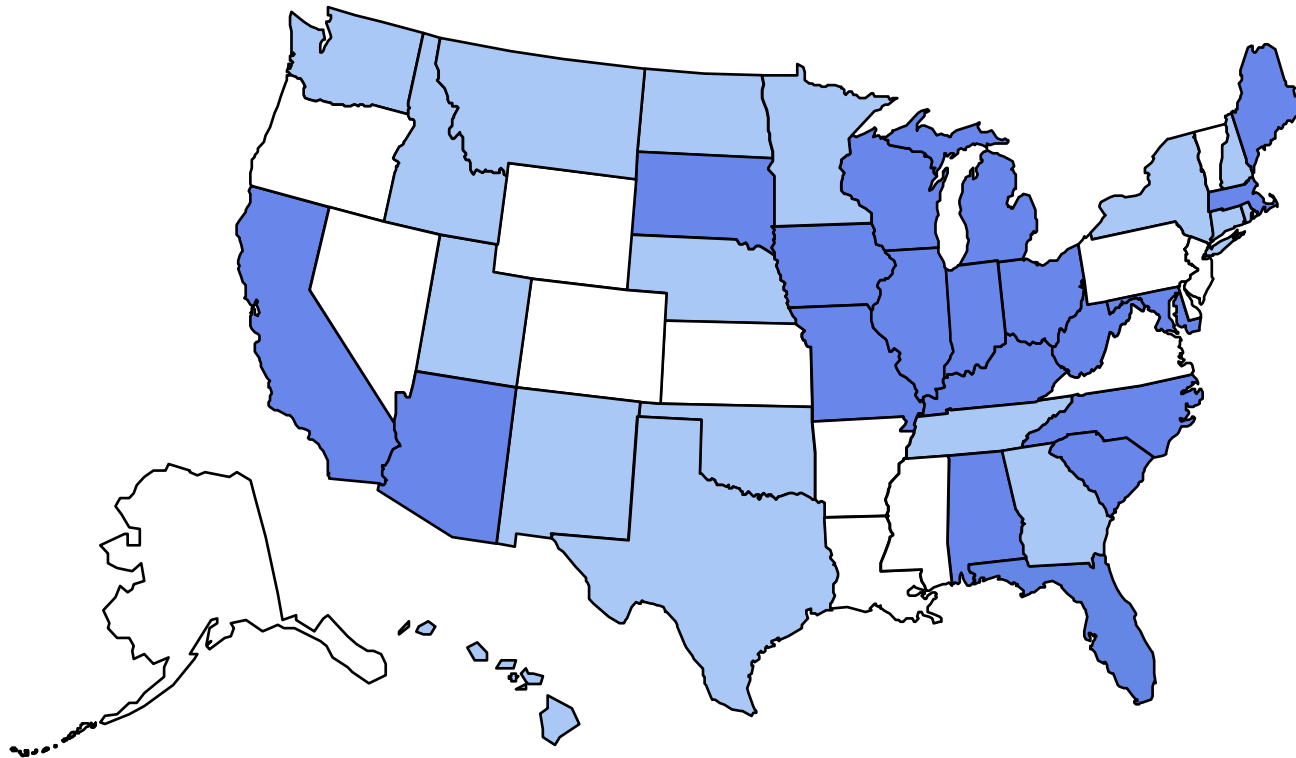


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1988

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

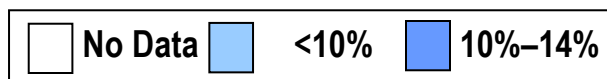
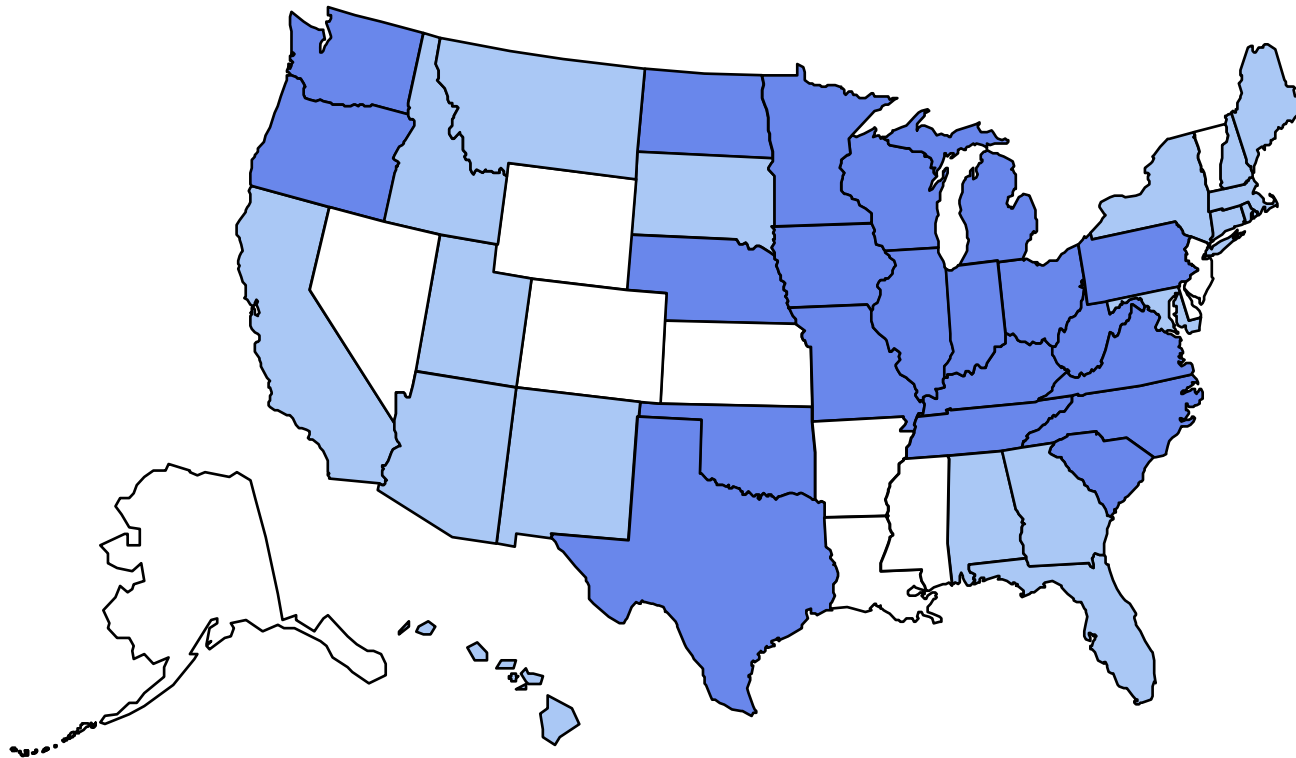


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1989

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

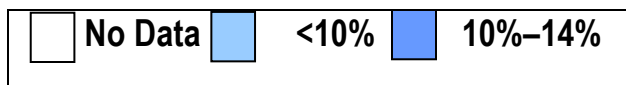
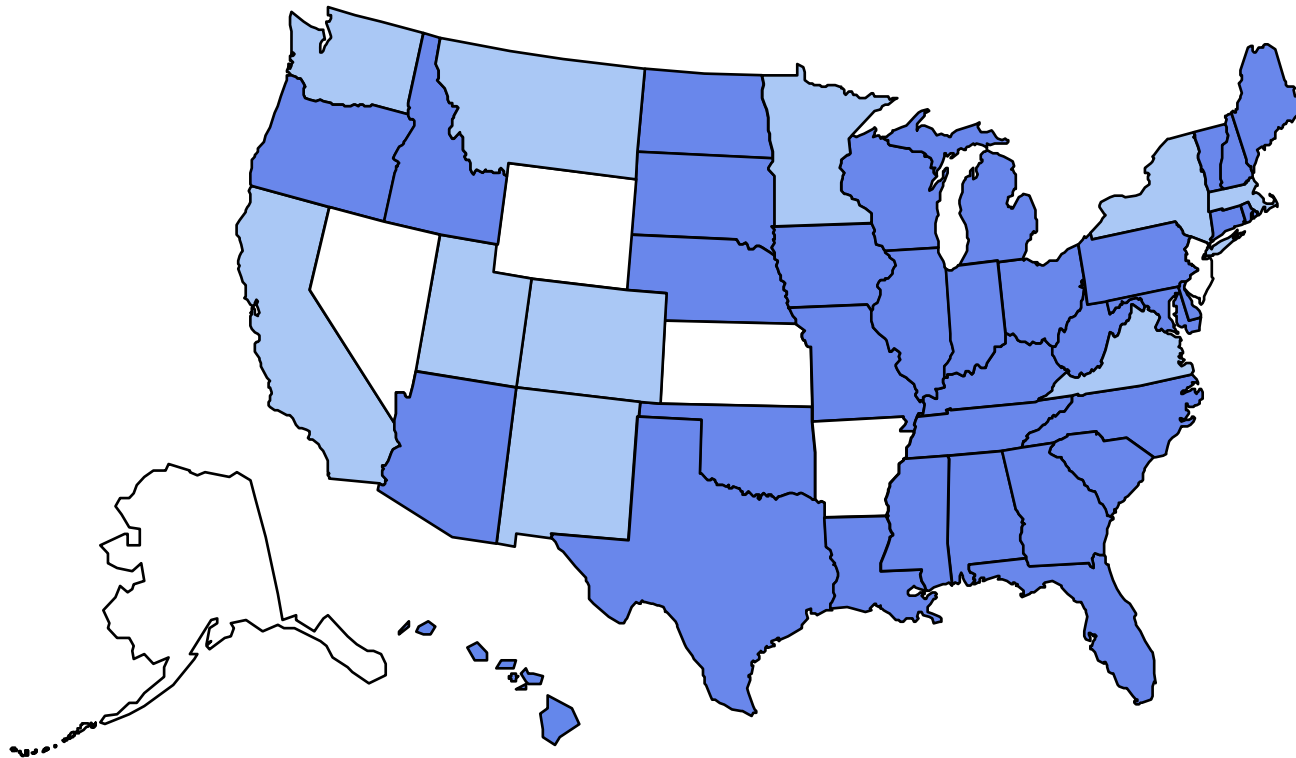


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

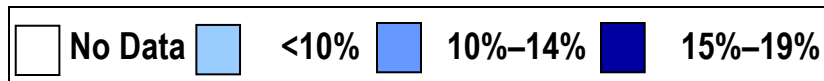
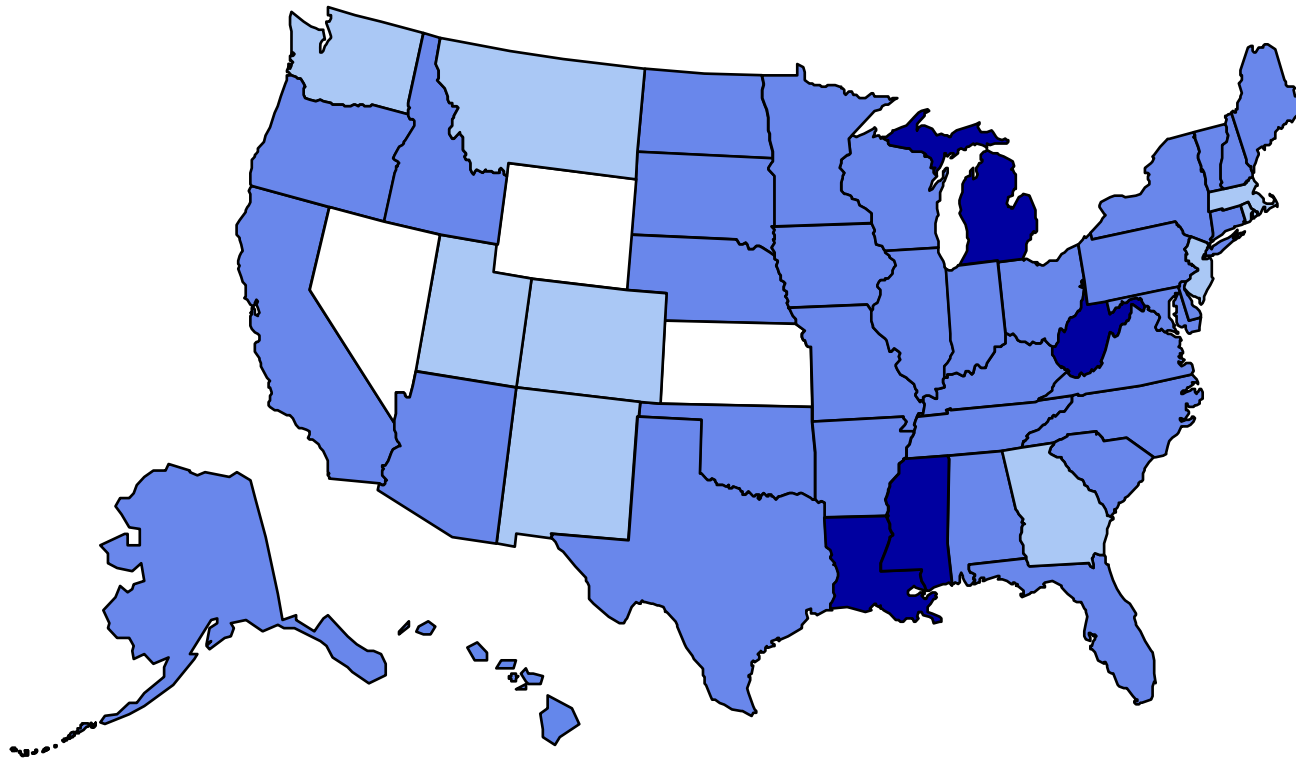


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1991

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

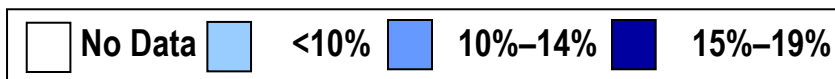
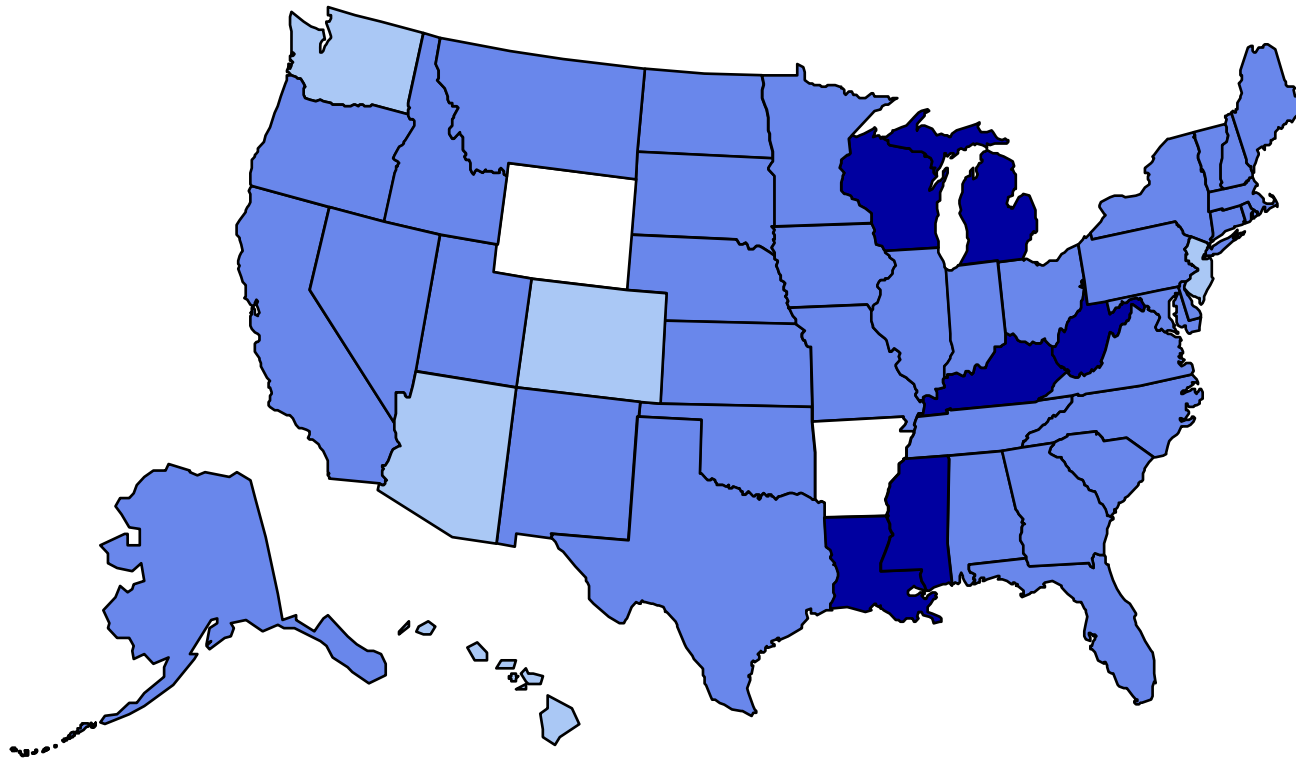


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1992

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

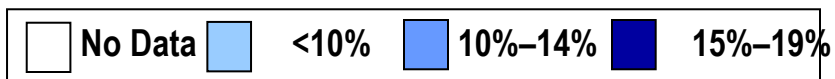
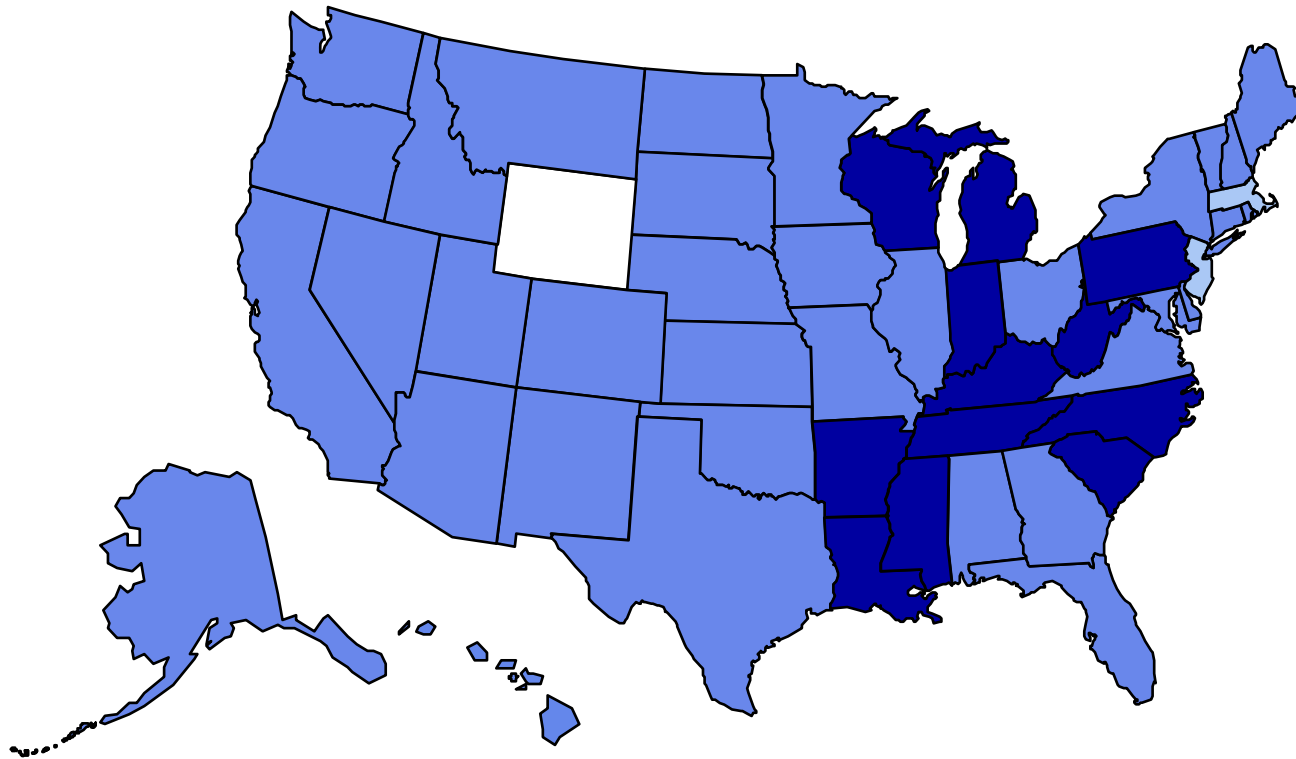


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1993

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

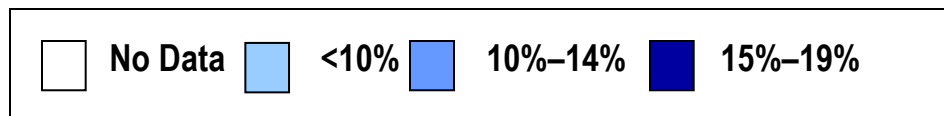
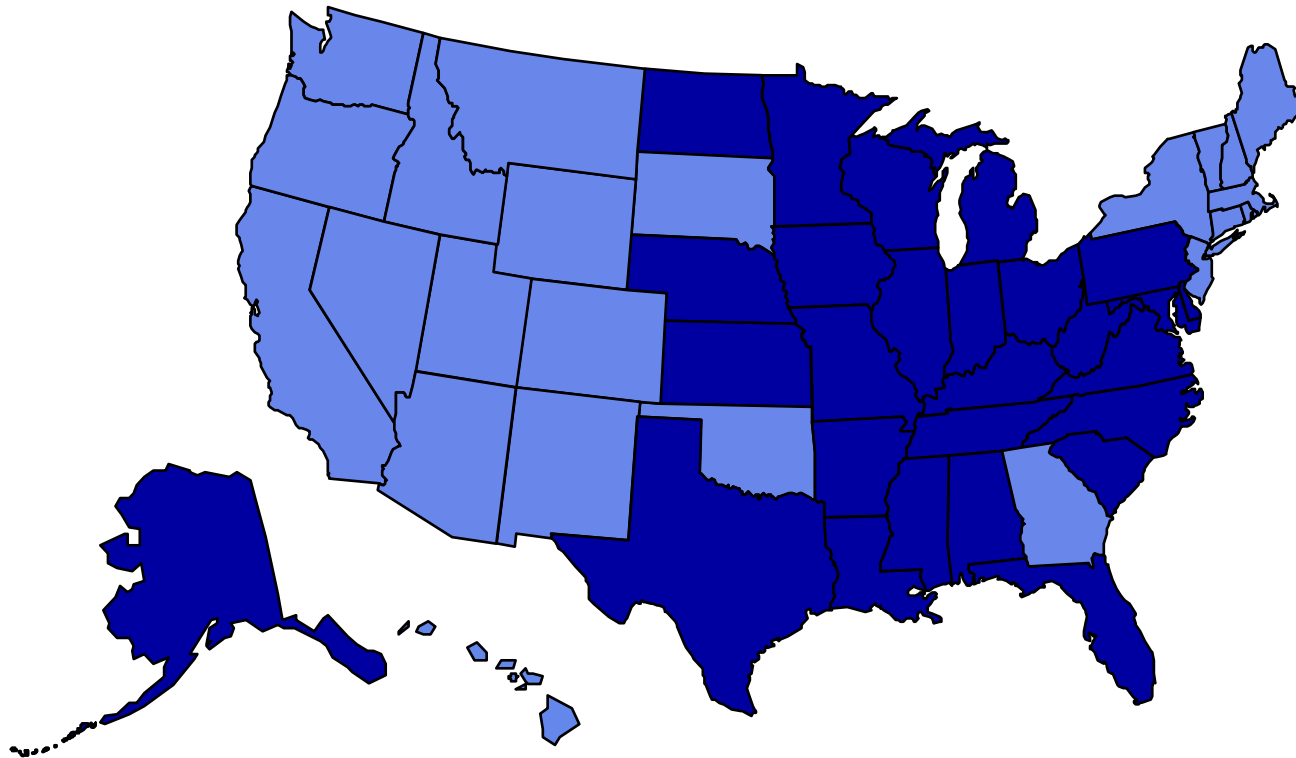


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1995

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

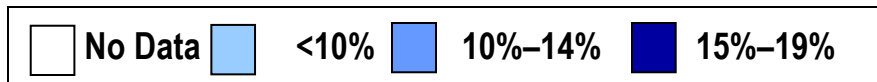
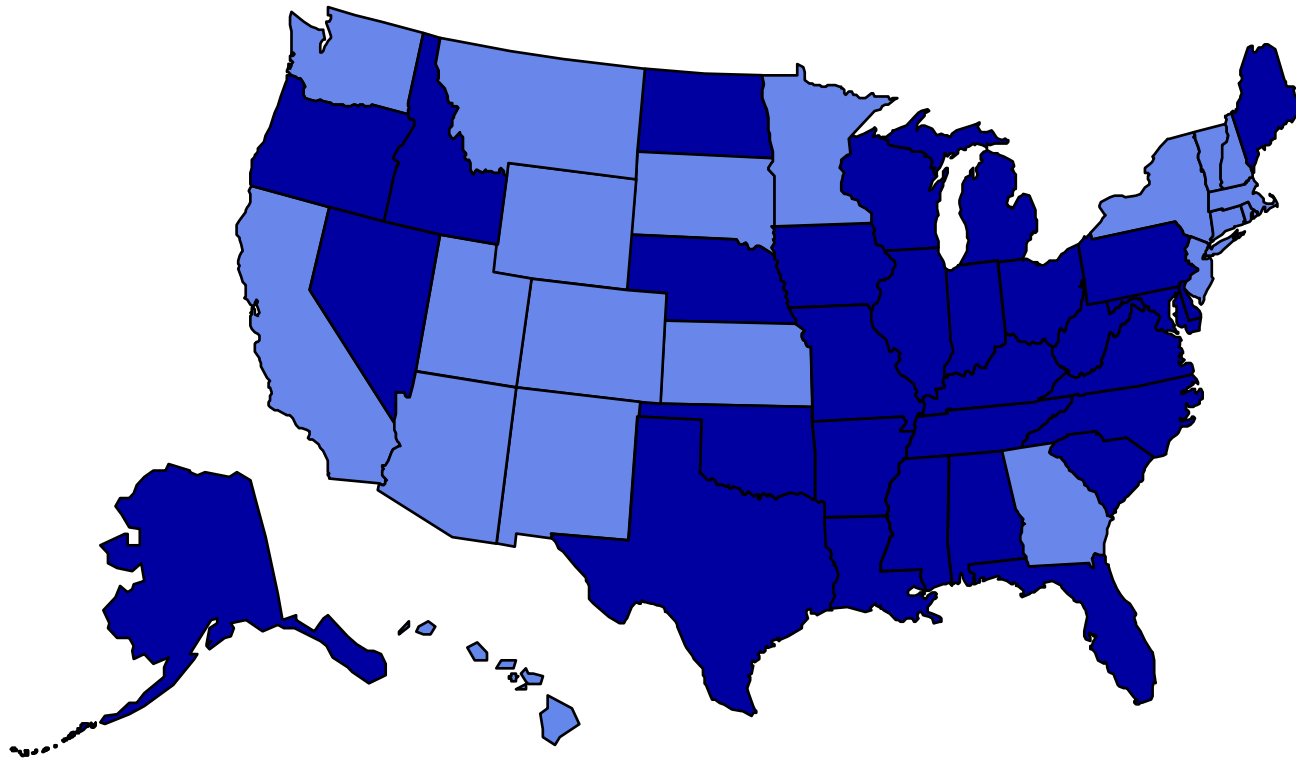


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1996

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

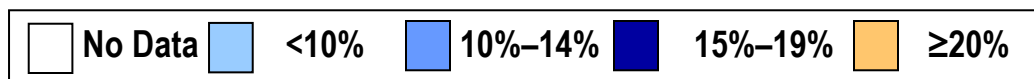
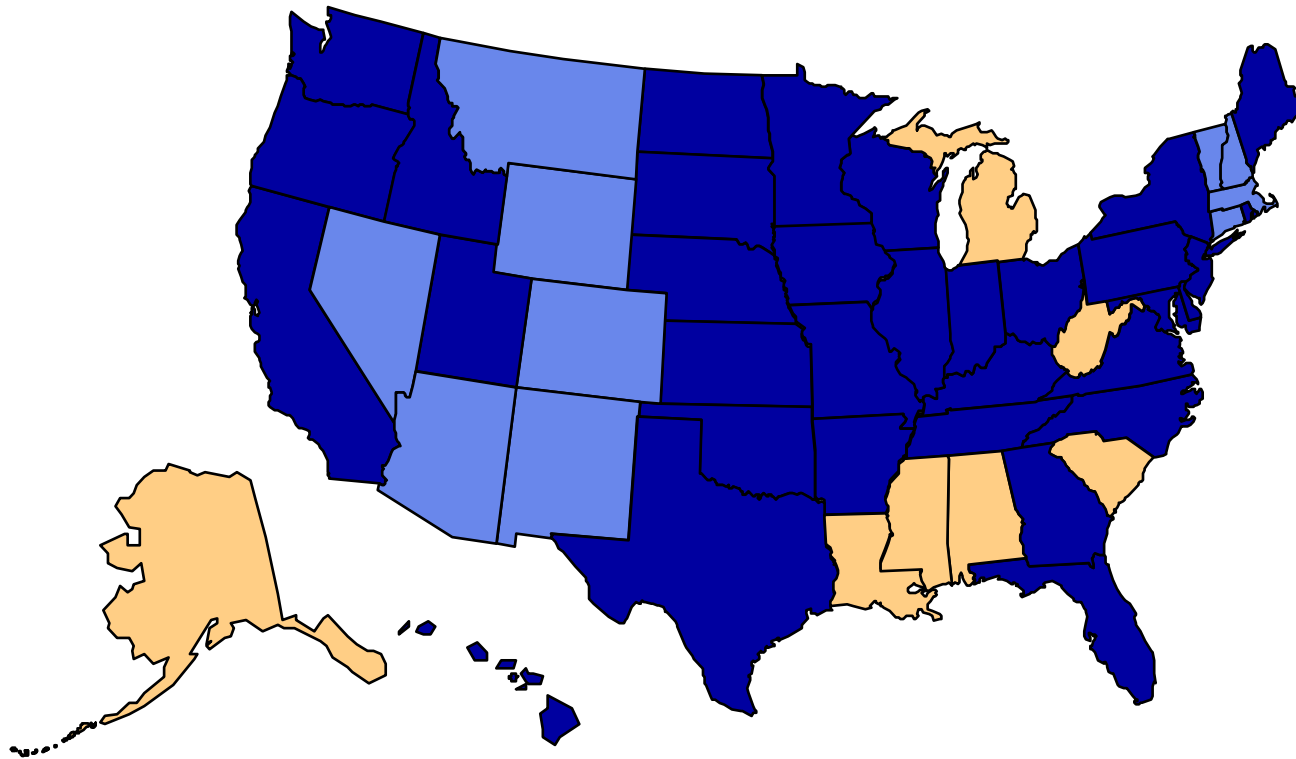


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1998

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

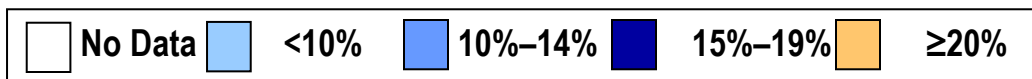
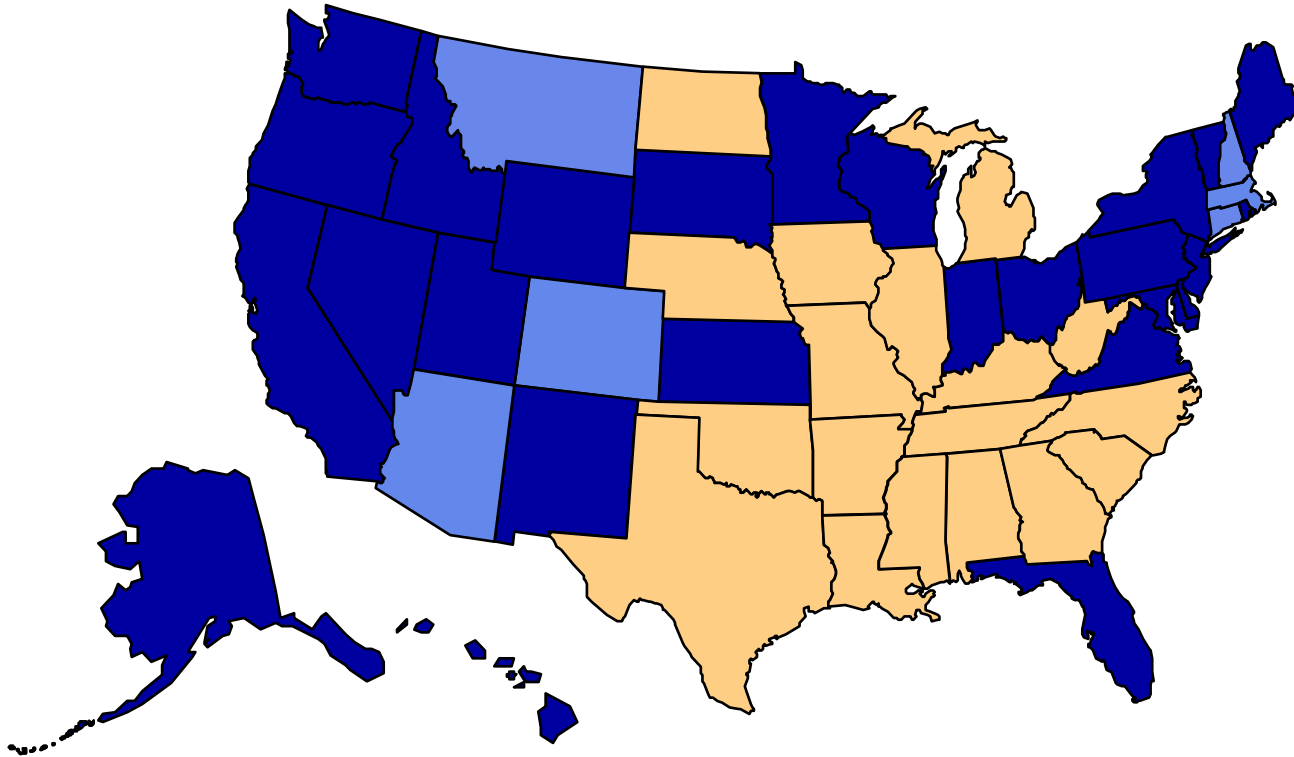


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 1999

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

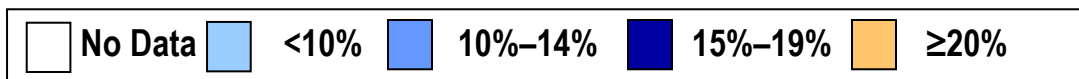
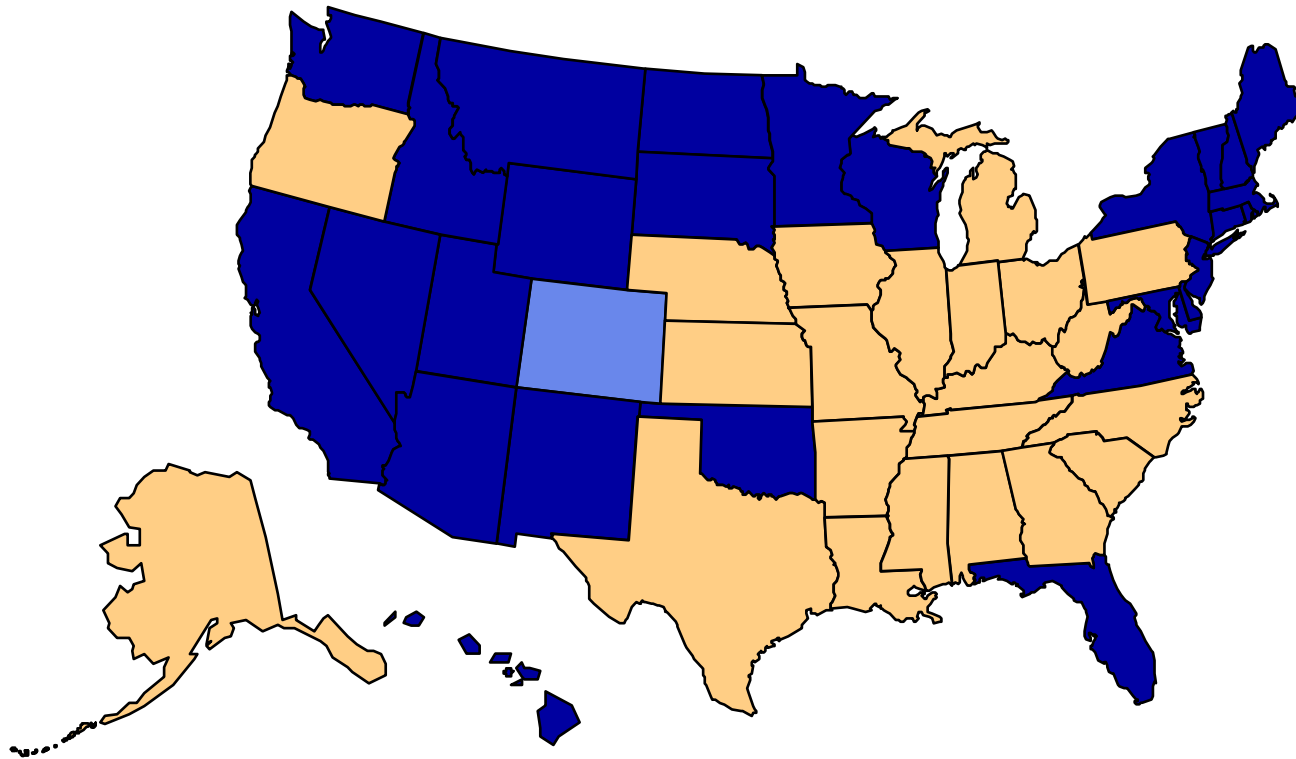


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 2000

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

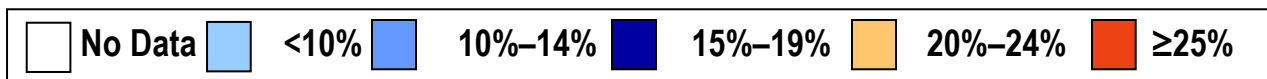
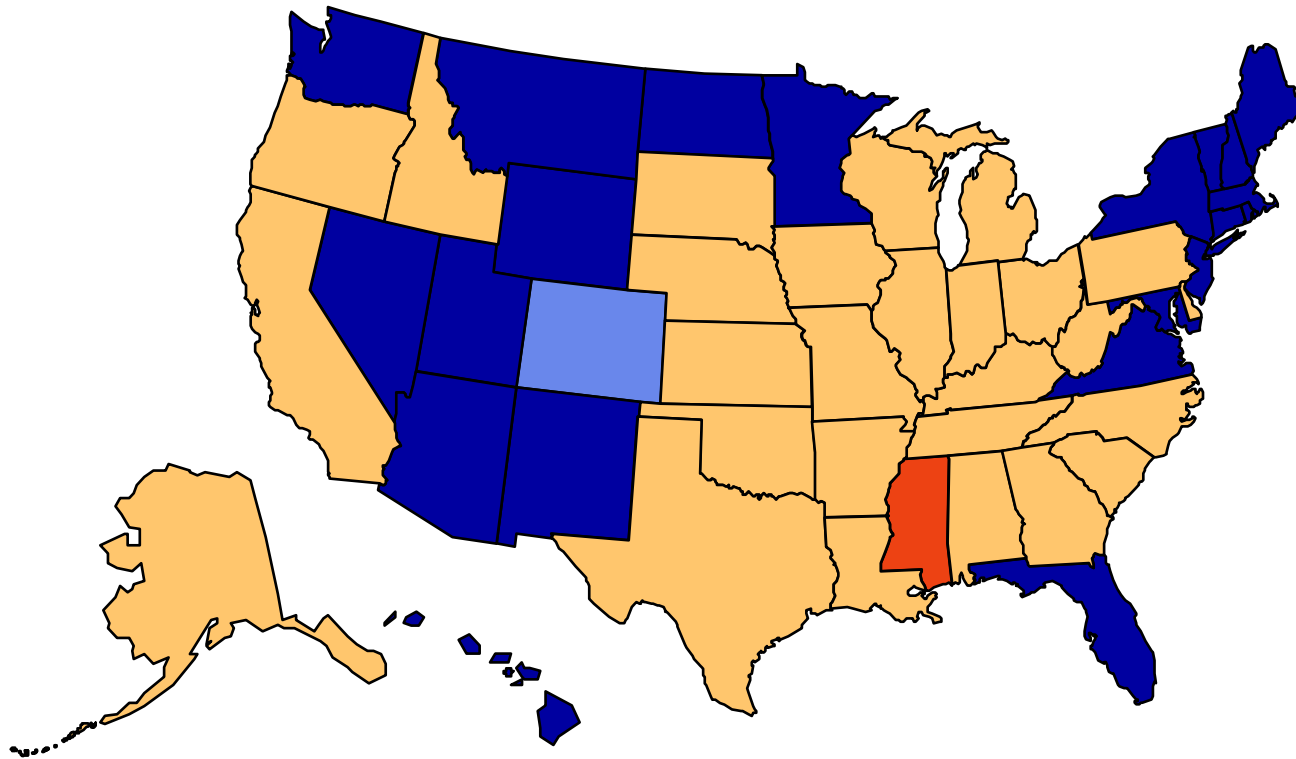


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 2001

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

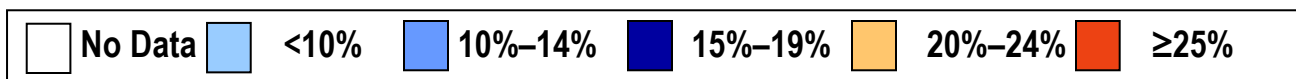
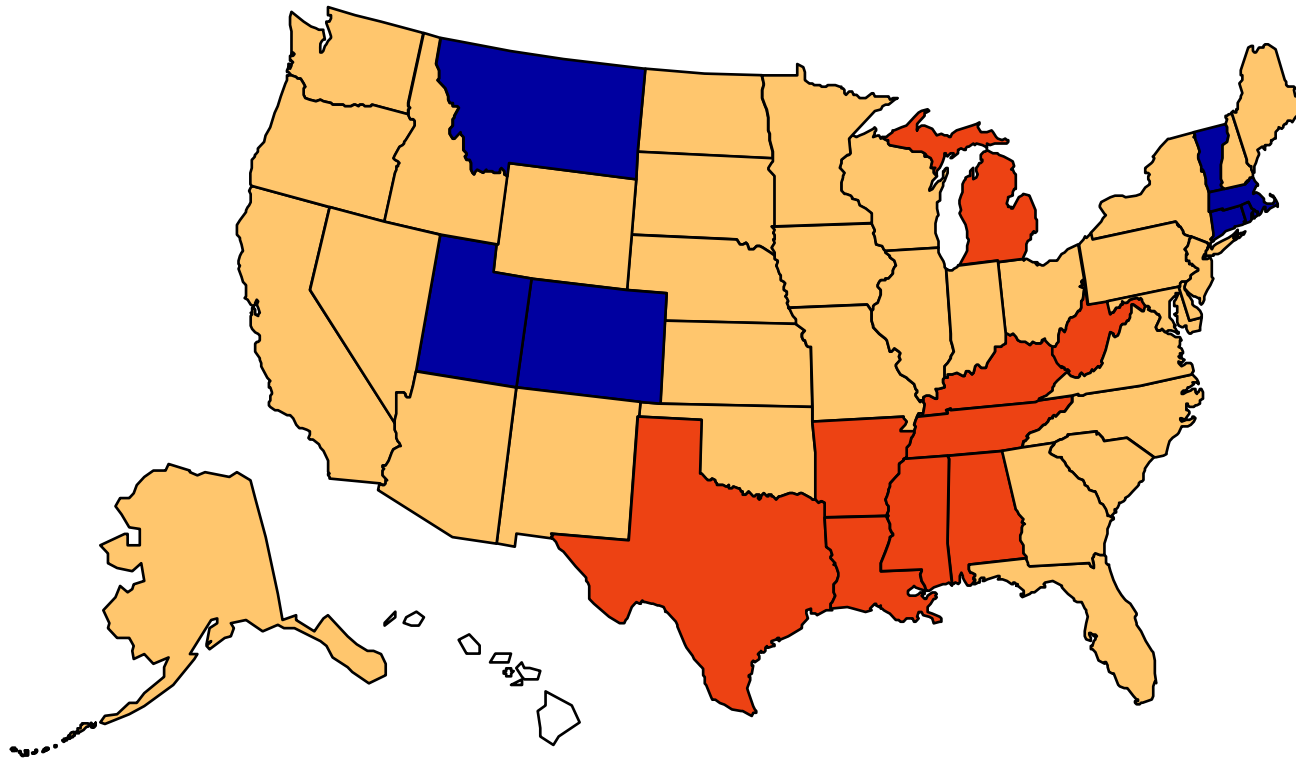


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 2004

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

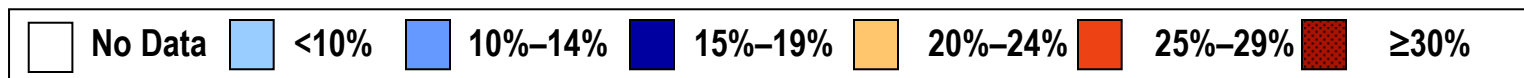
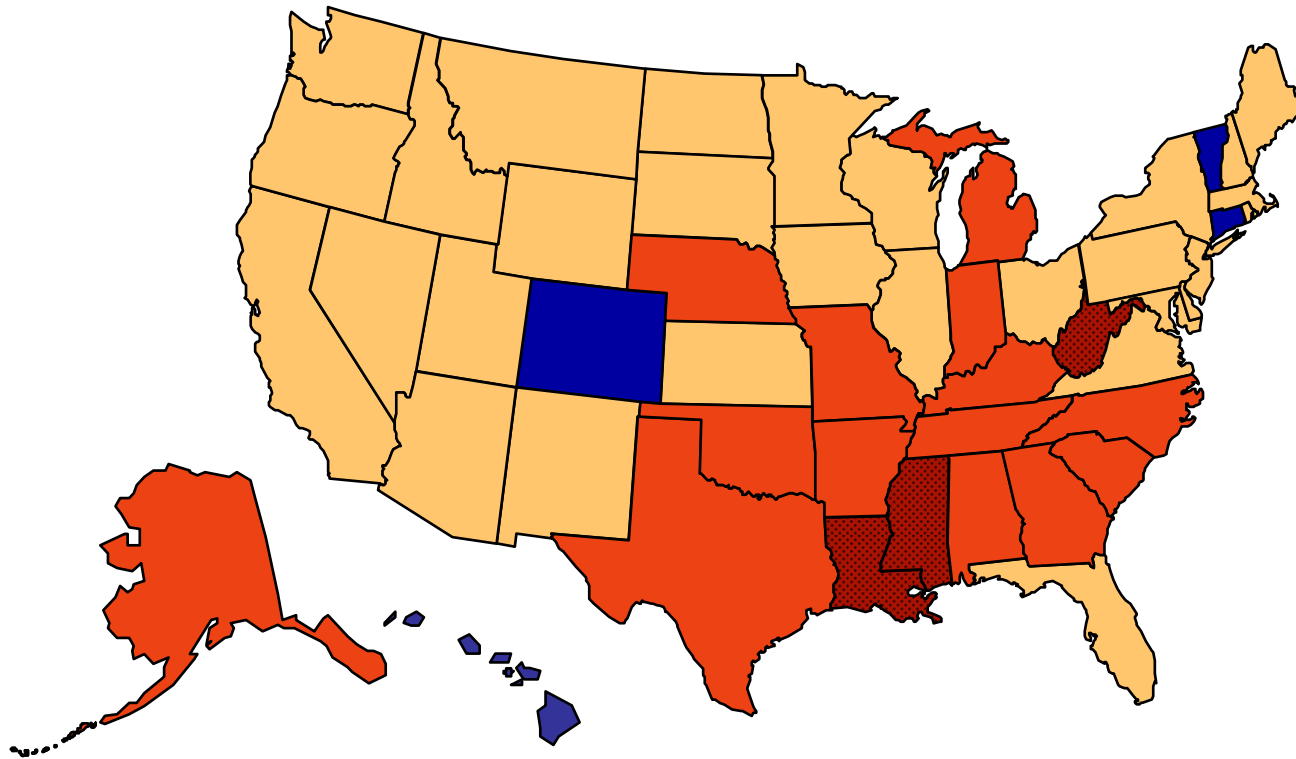


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 2005

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

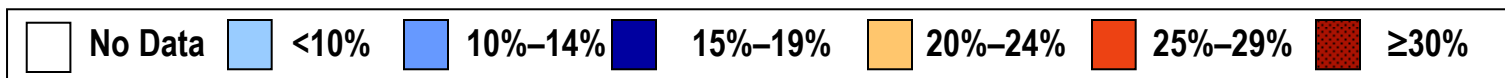
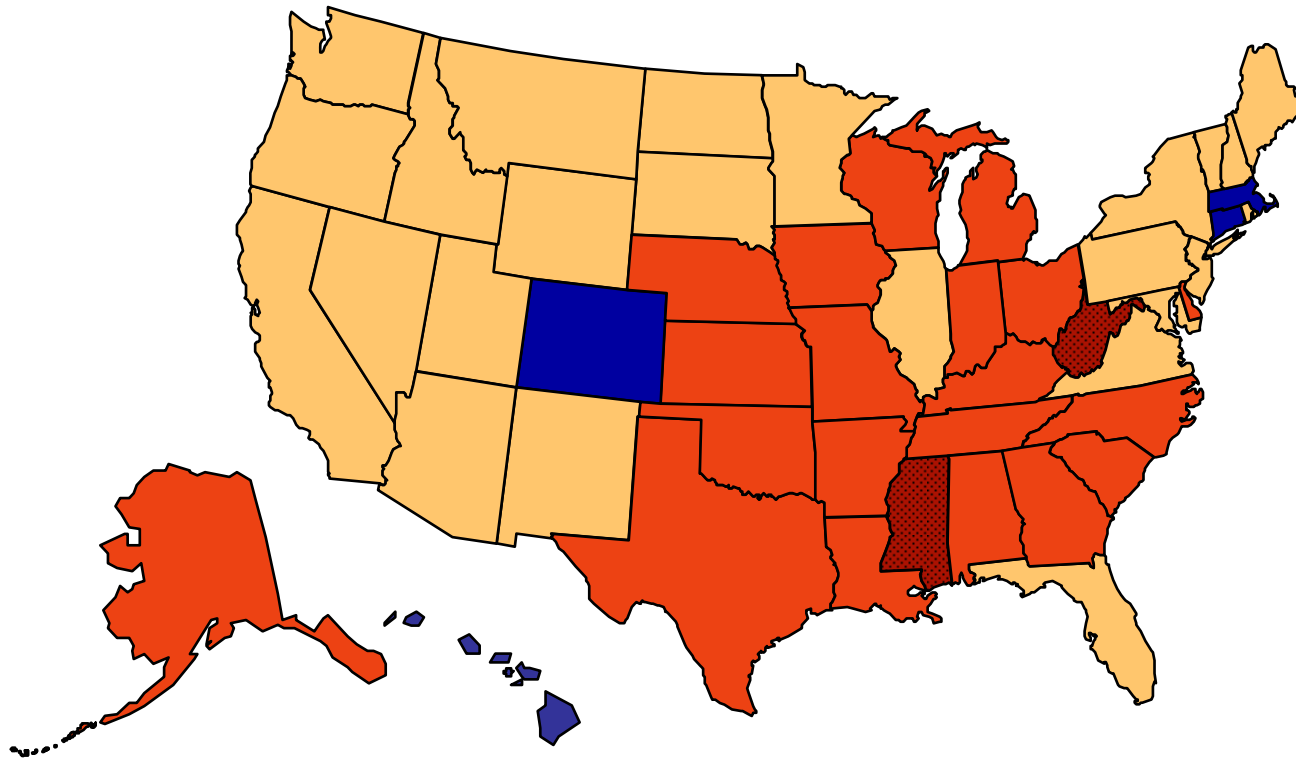


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 2006

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)

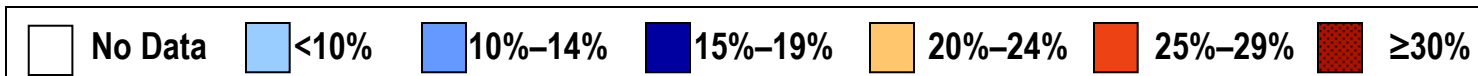
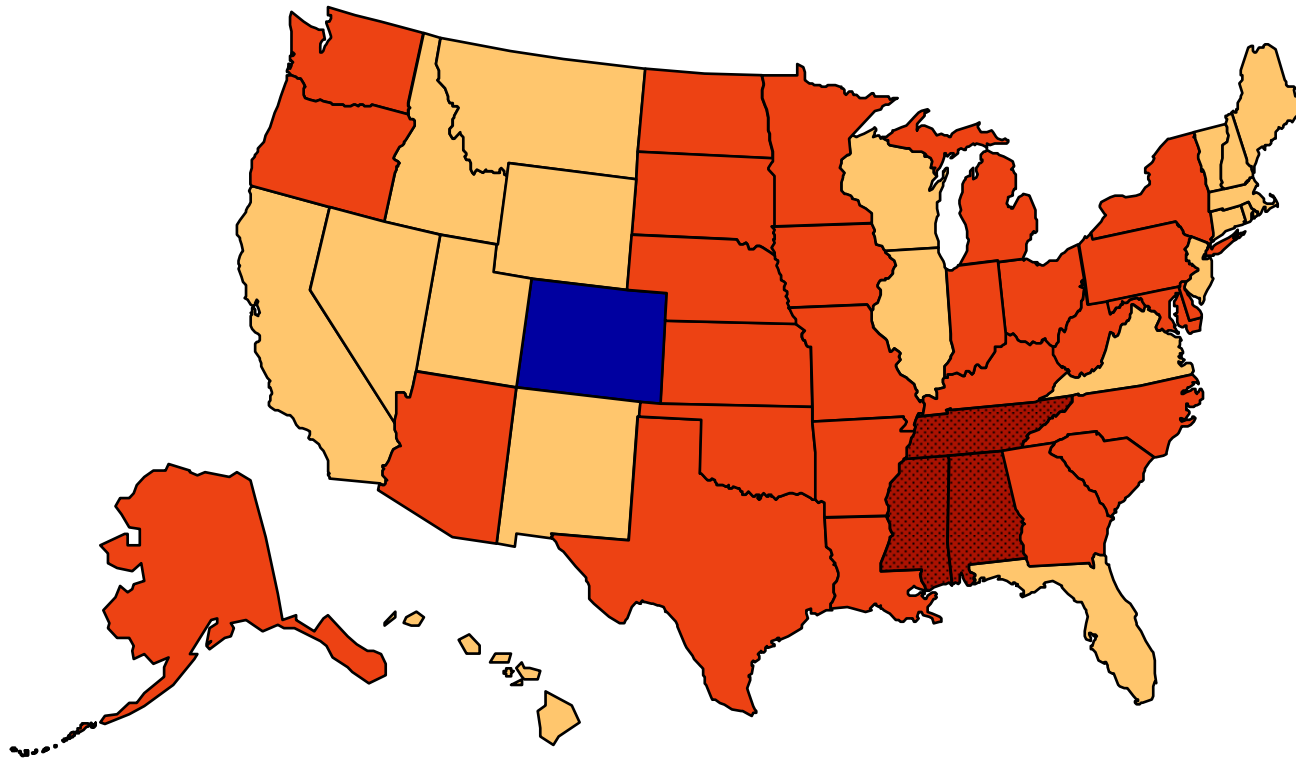


Source: U.S. Centers for Disease Control and Prevention (CDC)

Obesity Trends* Among U.S. Adults

BRFSS, 2007

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



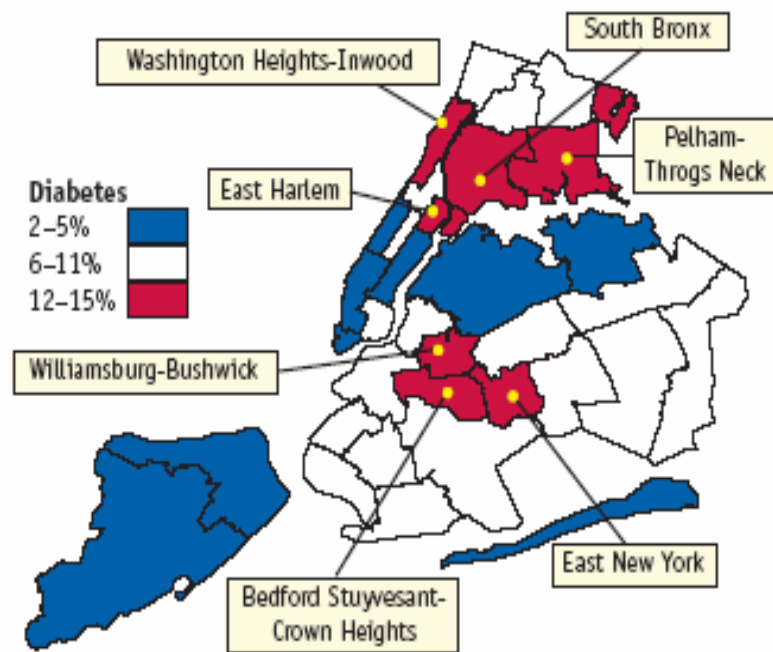
Source: U.S. Centers for Disease Control and Prevention (CDC)

OBESITY AND DIABETES RATES, BY NEW YORK CITY NEIGHBORHOOD

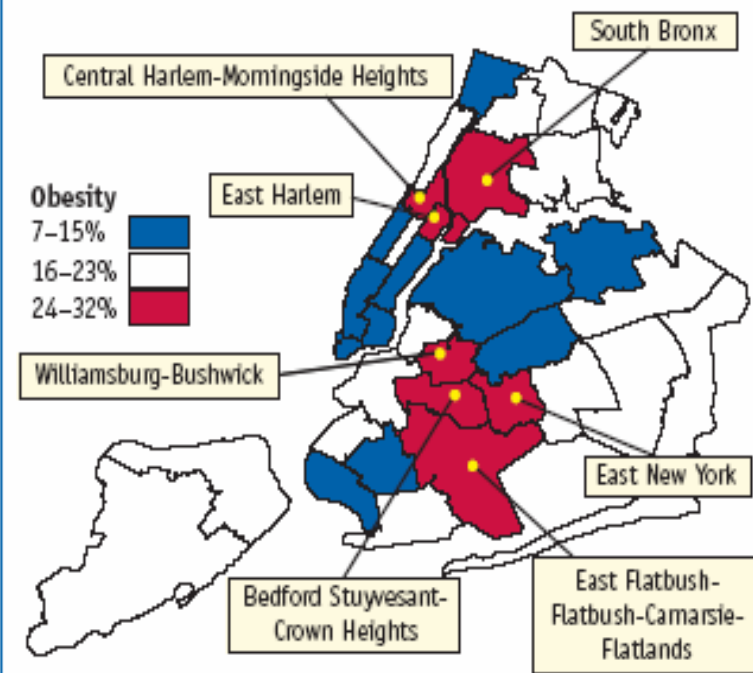


Neighborhoods with more obesity have more diabetes

Diabetes in NYC's Neighborhoods



Obesity in NYC's Neighborhoods

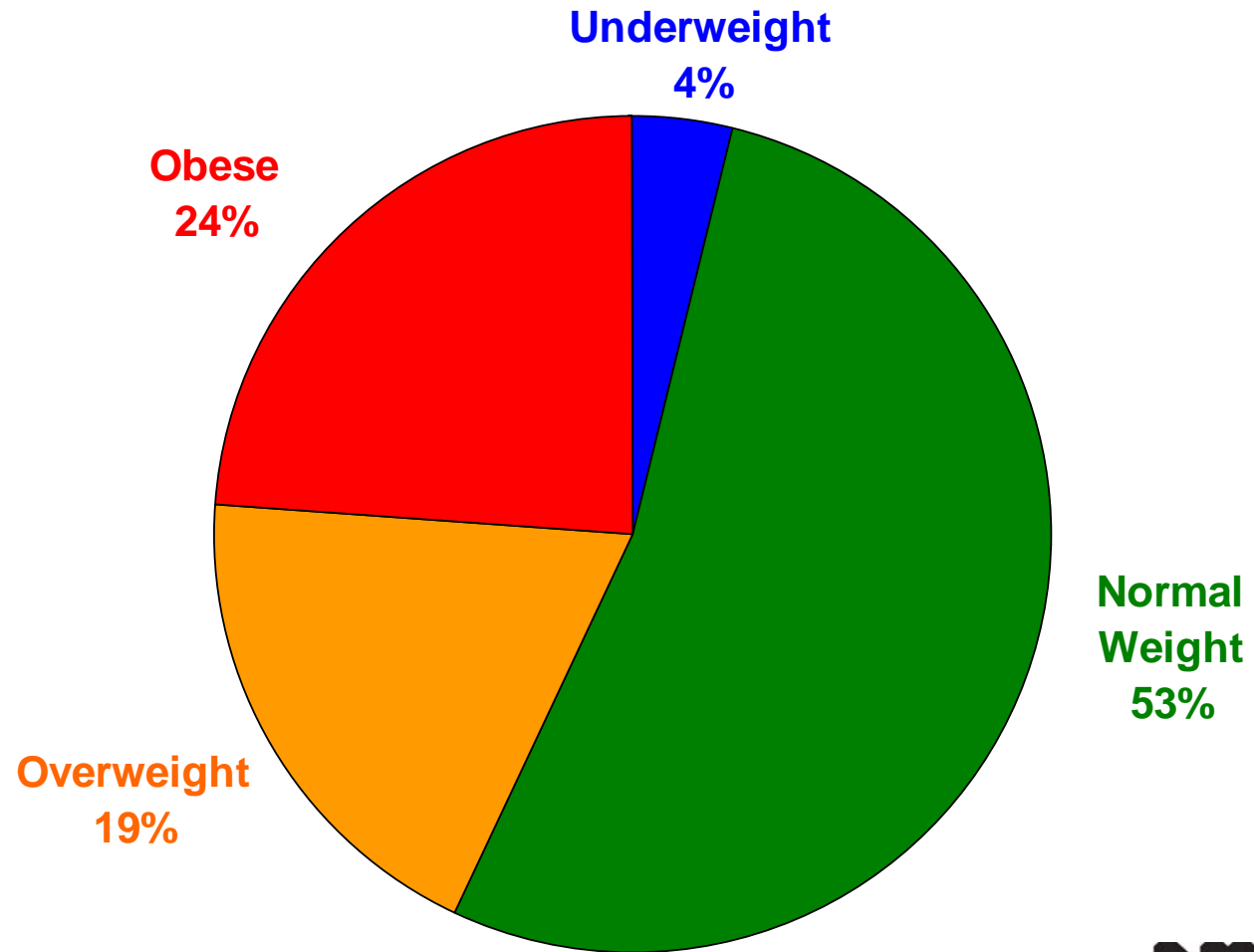


Source: NYC Community Health Survey, NYC Department of Health and Mental Hygiene

Very High Rates of Childhood Overweight & Obesity in NYC

Only Half of NYC's Elementary School Children Are at a Healthy Weight

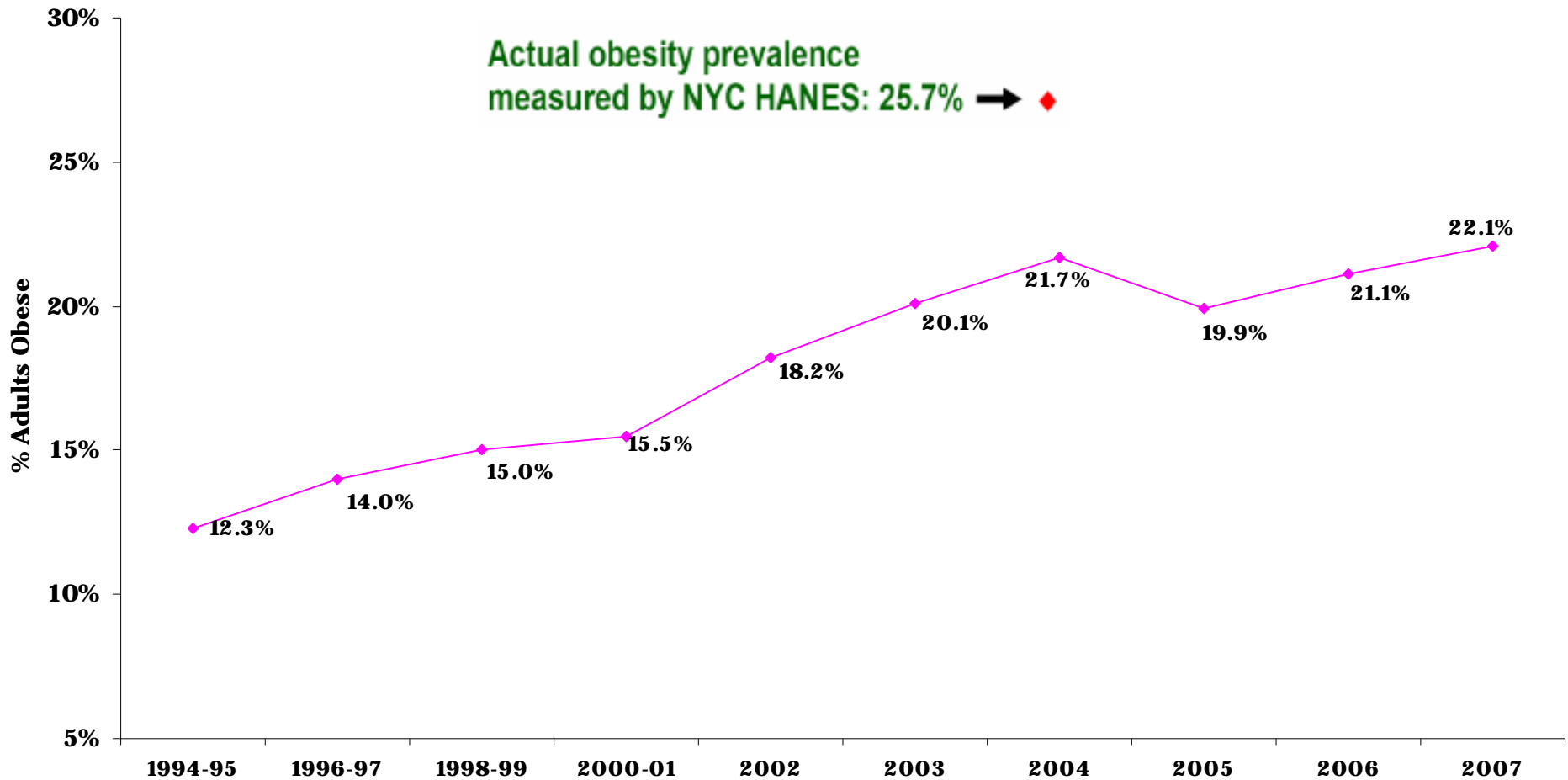
More than 4 in 10 are overweight or obese in Grades K-5



Source: NYC Department of Health and Mental Hygiene, NYC Vital Signs, 2003.

EPIDEMIC OF OBESITY IN NYC

Adults with Self Reported Obesity, 1994-2007

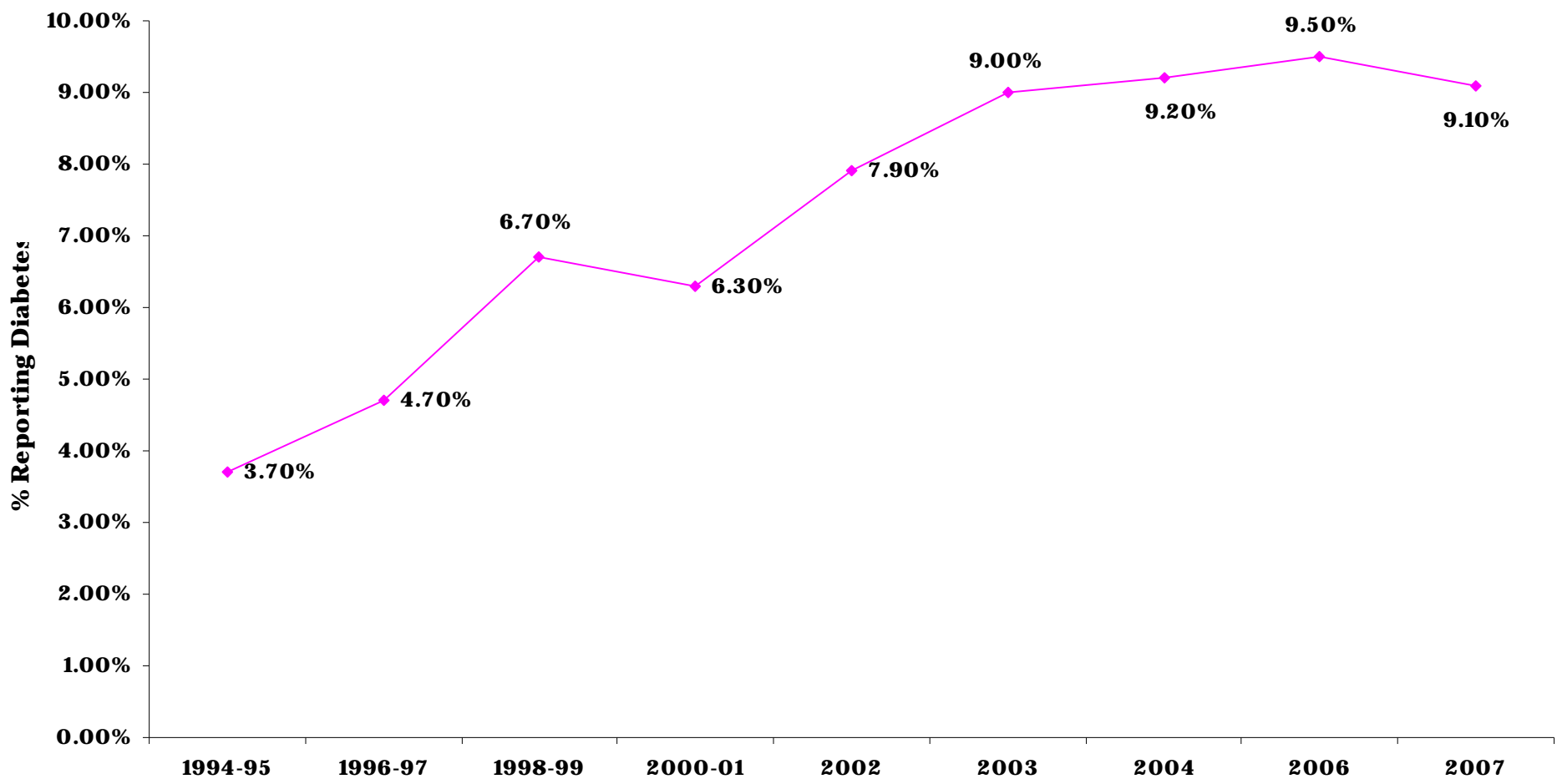


Sources: Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, 1994-2001; NYC Community Health Survey, New York City Department of Health and Mental Hygiene, 2002-2004; NYC Health and Nutrition Examination Survey, New York City Department of Health and Mental Hygiene, 2004



EPIDEMIC OF DIABETES IN NYC

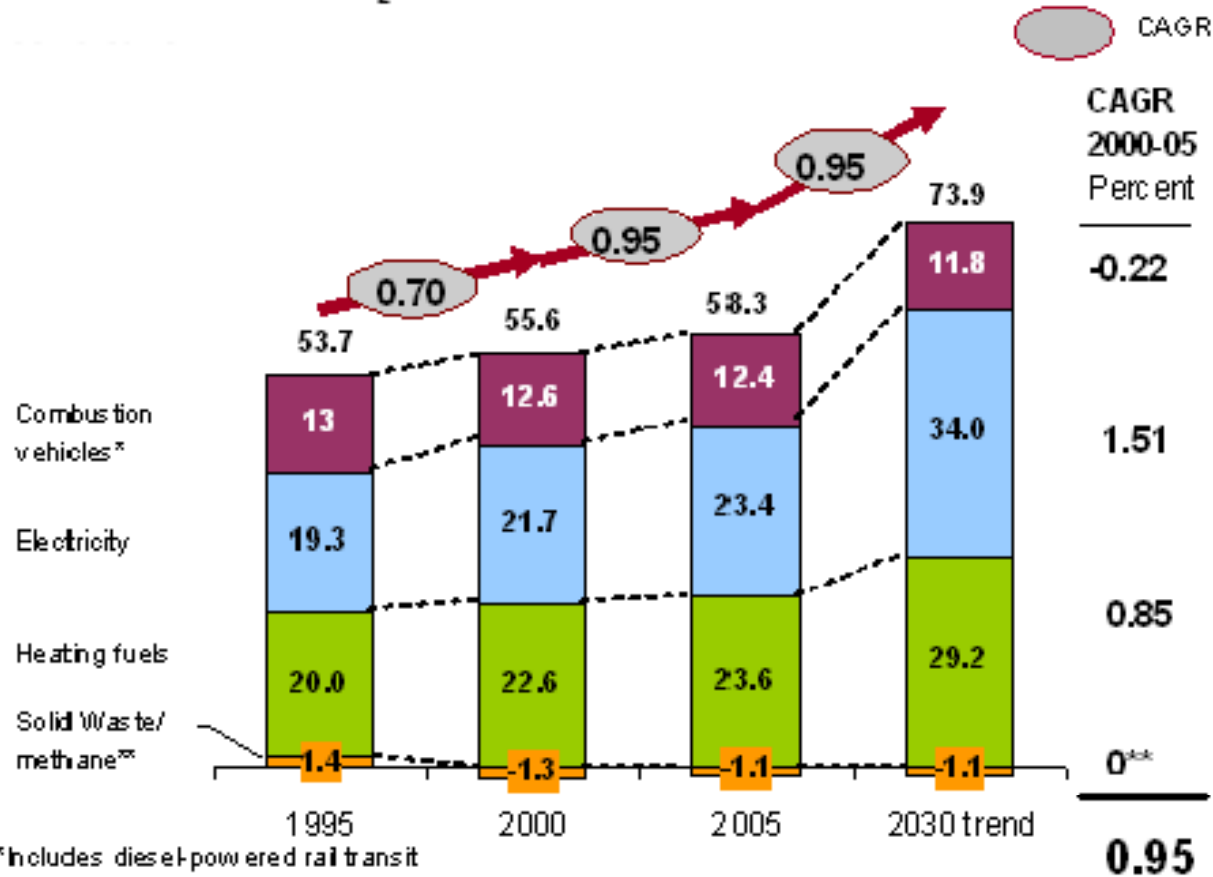
Adults with Self Reported Diabetes, 1994-2007



CARBON EMISSIONS HAVE INCREASED OVER SAME TIME PERIOD



New York Citywide CO₂ Equivalent, Millions of Metric Tons



*Includes diesel-powered rail transit

**Between 1995 and 2000, methane capture from landfills made solid waste overall a net negative CO₂e figure. Because of this, the CAGR for this sector has been zeroed.

Source: PlaNYC 2030 http://nyc.gov/html/planyc2030/html/emissions/emissions_ourdata.shtml#citywide



HEALTH AND ENVIRONMENTAL SUSTAINABILITY ARE LINKED



	Petro-chemical Use/ Use of Electricity	Air Quality	Obesity/Diabetes
Using automotive transport rather than biking or walking	√	√	√
Taking elevators and escalators rather than stairs	√	√	√
Watching television rather than engaging in physical activity	√	√	√
Drinking bottled and canned beverages rather than tap water	√	√	√
Eating unhealthy processed foods rather than fresh local produce	√	√	√

EVIDENCE-BASED SOLUTIONS



Increase Stair Use

- just 2 minutes of stair climbing a day burns enough calories to prevent average U.S. adult annual weight gain
- men climbing 20-34 floors of stairs per week (~3-5 floors per day) had a >20% lower risk of stroke
- (elevators also routinely account for 3-10% of a building's energy use)

Create or improve access to places for physical activity

- increases energy expenditure and leisure-time physical activity
- weight loss and decreases in body fat are also reported in most of these studies

Improve walkability through street-scale and community-scale design

- e.g. improving street lighting, increasing safety of street crossing, enhancing street landscaping
- can result in 35-161% increase in physical activity (e.g. walking)

Sources: U.S. Centers for Disease Control and Prevention (CDC), *The Guide to Community Preventive Services*,
<http://www.thecommunityguide.org/pa/environmental-policy/index.html>

Zimring C. Influences of building design and site design on physical activity: research and intervention opportunities. *AJPM*, 2005. 28(2S2): pp. 186-193.

Lee I, Paffenbarger RS. Physical activity and stroke incidence: the Harvard Alumni Health Study. *Stroke* 1998; 29: pp. 2049-2054.



Burn Calories, Not Electricity



Take the Stairs!

Walking up the stairs just 2 minutes a day helps prevent weight gain. It also helps the environment.

Learn more at www.nyc.gov or call 311.

Michael R. Bloomberg
Mayor

NYC
GOVERNMENT



REBNY
REAL ESTATE BOARD OF NEW YORK

At a 10-story NYC affordable housing site, stair use increased >67% 7-9 weeks after Stair Prompts were posted

ONE KEY SOLUTION TO OUR ENVIRONMENTAL CRISIS & DISEASE EPIDEMICS TODAY IS TO INCREASE THE USE OF HUMAN ENERGY



Designing to increase stair use

Stair Access

Stairwell prompts

Signs placed at elevators & escalators encouraging stair use, w/ info on benefits of stair use increase stair use by 50%

Aesthetic interventions in stairwells

Music & art in stairwells increase stair use

Stair visibility

Consider fire-rated glass on doors and/or magnetic hold opens

Stair location / convenience

Design stairs to be more convenient/ elevators less convenient –

- see stairs before elevators
- see stairs but not elevators from entrance
- stairs within 25 ft of entrance
- stairs are on and visible from main path of travel on each

floor

Elevator design

Skip stop elevators

Slowing elevator door opening and closing times

HEALTHY VS UNHEALTHY FOOD ACCESS



Figure 4. Healthy food availability by neighborhood

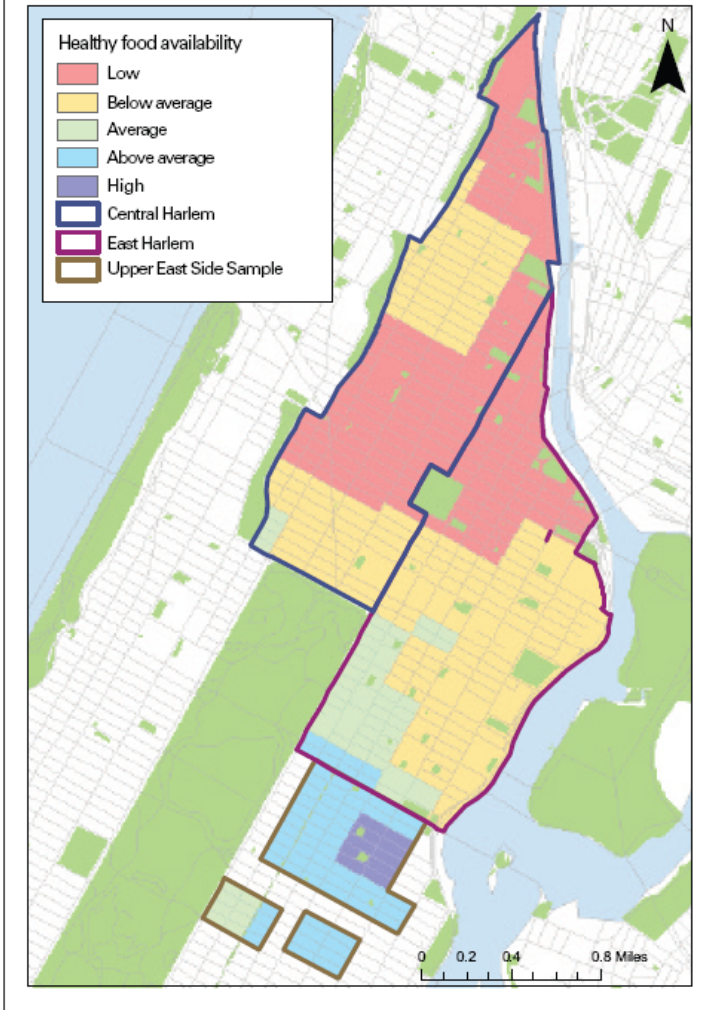
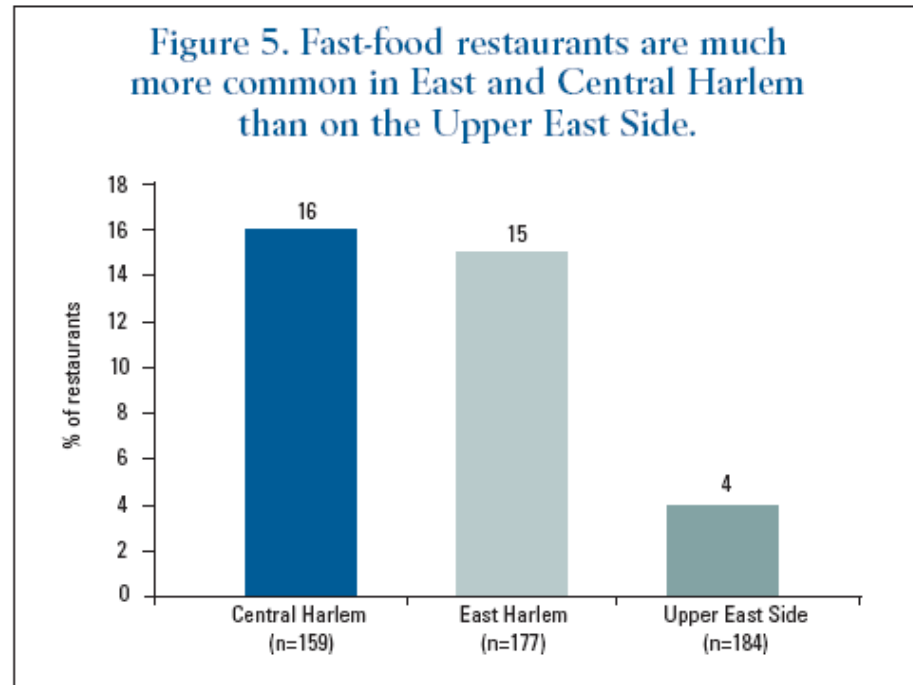


Figure 5. Fast-food restaurants are much more common in East and Central Harlem than on the Upper East Side.



Source: NYC Department of Health and Mental Hygiene, 2007

HEALTHY VS UNHEALTHY FOOD ACCESS, AND HEALTH



Food Retail – Supermarkets and Grocery Stores vs Fast Food

- Supermarket availability is associated with lower rates of neighborhood obesity.
- High density of fast food restaurants is associated with increased weight and obesity in area residents.

Farmers Markets

- Residents who shop at farmers markets eat more fruits and vegetables.

Community Gardens

- People with a household member who participated in a community garden ate more fruits and vegetables per day; Garden-based nutrition education improved adolescent fruit and vegetable intake.

Access to Tap Water (fountains) vs Bottled and Canned Beverages (vending)

- Biggest source of calories in the US diet (9% of calories) are from carbonated and non-carbonated soft drinks; Children & Adolescents are getting 10-15% of total calories from sugar-sweetened beverages and 100% fruit juice.

Sources: Moreland K et al., Supermarkets, other food stores, and obesity. *AJPM* 2006; 30(4): pp. 333-339.

Mehta NK, Chang VW. Weight status and restaurant availability: a multi-level analysis. *AJPM* 2008; 34(2): pp. 127-133.

Alaimo K, Packnett E, Miles RA, Kruger DJ. Fruit and vegetable intake among urban community gardeners. *J Nutr Educ Behav.* 2008; 40(2): pp. 94-101. McAleese JD, Rankin LL. Garden-based nutrition education affects fruit and vegetable consumption in sixth-grade adolescents. *J Am Diet Assoc.* 2007 Apr;107(4):662-5.

Block G. Foods contributing to energy intake in the US: data from NHANES III and NHANES 1999–2000. *J Food Comp Anal.* 2004;17: pp. 439–47.

Wang Y, Bleich S, Gortmaker S. Increasing caloric consumption from sugar-sweetened beverages and 100% fruit juices among US children and adolescents, 1988–2004. *Pediatrics* 2009; 124(6): pp. 1604–1614.

Indoor Air Quality and Health

- People spend far more time indoors than outdoors
- Many pollutants concentrate indoors, compared to outdoors
 - VOCs, CO, CO₂, NOx, **tobacco smoke**
 - Inadequate fresh air intake due to poorly planned and executed building energy efficiency efforts
 - Fresh air intakes are often located near sources of pollutants
 - Chemical emissions from building materials, furnishings, carpets
 - Pesticides and other chemicals persist longer away from air and sunlight
- Deferred maintenance contributes to a variety of air quality concerns
 - Pests, and the perceived need for pesticide use
 - Leaks and defective HVAC systems contribute to moisture buildup and the growth of mold
 - Poorly maintained and unbalanced HVAC system result in inadequate ventilation and fresh air distribution

Health Consequences

- Asthma is more common in residential buildings in disrepair and in homes with cockroaches and mice
- Upper respiratory and eye irritation result from contaminant buildup and low humidity
- Allergic sensitization and exacerbations occur from mold, dander, pests
- Acute poisonings are common from use of unsafe cleaning and pesticide products
- Chronic exposures to pesticides and some cleaning chemicals are associated with negative birth outcomes and cognitive developmental delays

Recommendations for Indoor Air Quality

- Don't defer maintenance
- Check building air quality
 - Ensure adequate intake of fresh air
 - Tune and maintain boilers, HVAC systems
- Aim for synergistic repairs
 - Practice integrated pest management; avoid spray pesticides, pay for better pest control services
 - Seal cracks and crevices, use door sweeps
 - Regularly inspect interior spaces, make rapid repairs
- Use least toxic cleaning supplies
- Select low VOC building materials, furniture and paints

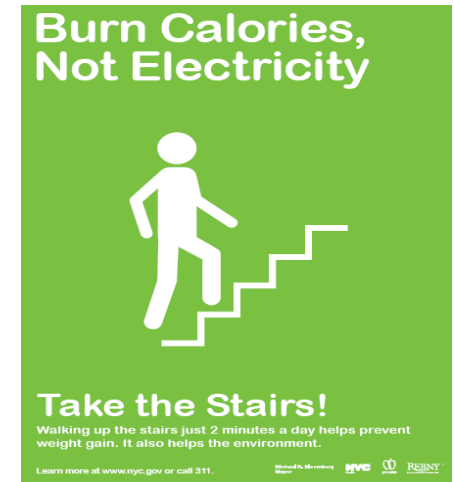
Additional Recommendations for Health

- Lead poisoning in NYC is declining but is still a serious public health issue
 - All repair and renovation work, including weatherization and window replacement, must be done using safe work practices

AVAILABLE RESOURCES



- **Stair Prompts – available for free by calling 311**
- **Active Design Guidelines – summer/fall 2009**
- **Fit City Conferences – Fit City 4 at AIANY June 8**



- **LEED NC**

- **Innovation Credit for Physical Activity submitted for DOHMH Health Center**
- **Existing Sustainable Site Credits that promote green and physical activity:**
 - **Bicycle Storage and Showers**
 - **Proximity to Public Transit**
 - **Community Connectivity and Walkability**

- **NYC Dept of Health and Mental Hygiene**

