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Role of Parks and Public Spaces in Public Health



Sonja A. Wilhelm Stanis, PhD
MU School of Natural Resources



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Some Broad-Based Benefits of Parks & Green Space

- Protect the environment (reduced pollution, flood control, reduced urban heat island effect.)
- Enhance real estate values; attracting & retaining businesses
- Promote youth development
- Facilitate community pride, connectedness, social capital
- **Promote individual mental & physical health**





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Contact with Nature: Mental & Physical Health Benefits



- Reducing Stress
- Restoring Attention
- Promoting Physical Activity



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Contact with Nature: Mental & Physical Health Benefits



- **Reducing Stress**
- Restoring Attention
- Promoting Physical Activity



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Stress

- Defined as the process used by individuals to respond **psychologically** and **physiologically** to situations that challenge or threaten well-being
- Although not all stress is bad, a major factor impacting health in modern day societies



Baum et al. 1985; Grahn & Stigsdotter 2003; Pretty 2004

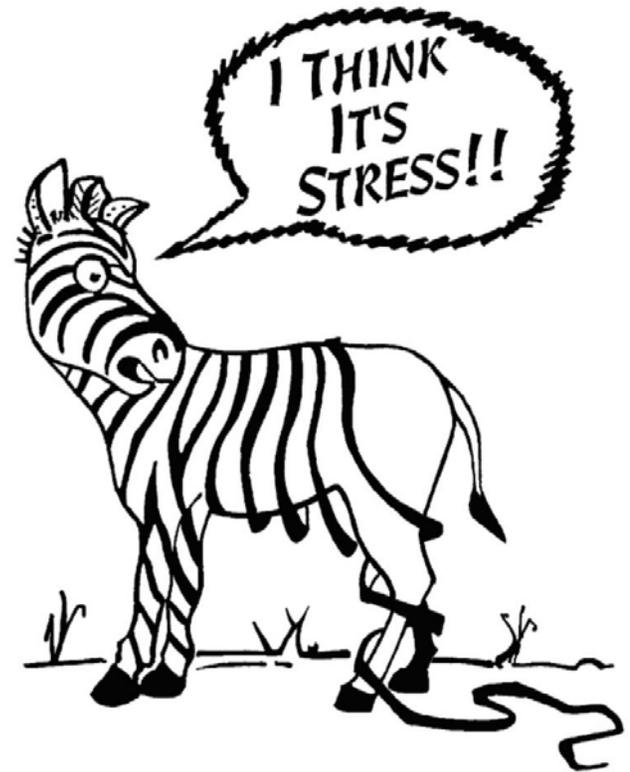


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Chronic stress has adverse health consequences

- Undermines the immune system
- Delayed wound healing
- Progression of cancer
- Linked with cardiovascular disease & type 2 diabetes
- Impacts mood and life satisfaction
- Headaches
- Poor sleep habits
- Cognitive function, anxiety disorders & depression







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What can nature contact do? **Stress**

Reduction in stress & stress-related symptoms

- Lessens annoyance, anger, frustration, aggression
- Lowers blood pressure, heart rate & muscle tension
- Reduces risk of cardiovascular disease



Studies show that stress levels can fall within *minutes* of viewing green spaces

Frumkin & Fox, 2011; Nielsen & Hanson 2007; Lee et al. 2009; Derbyshire 2007



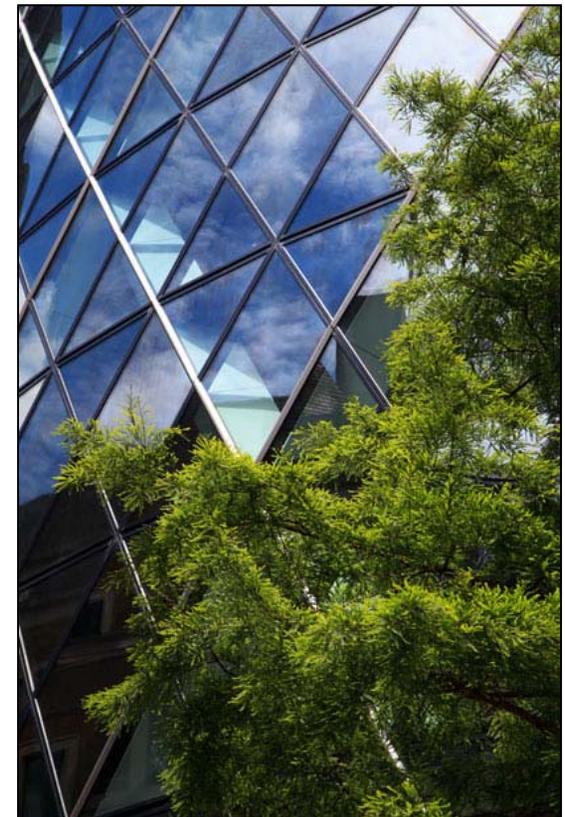
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What can nature contact do? **Workplace Stress**

Multiple studies have identified the benefits of views of nature through a window and office plants for employees.

- Reduced stress
- Fewer ailments & sick leave
- Less frustration & more patience
- Higher job & life satisfaction
- Enhanced concentration & work performance
- Decreased intentions to quit





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What can nature contact do? **Driving Stress**



- Drivers stuck in traffic with view of nature less stress compared to drivers stuck in densely built-up areas
- Driving to work in urban settings increased work stress; driving in green settings protective against work stress

Ulrich 1981; Parsons et al 1998



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What can nature contact do? **Surgery/Illness Recovery**

Recovery of surgical patients with window views overlooking stand of trees compared to those looking onto a brick wall

- Faster recovery/shorter hospitalizations
- Less need for painkillers
- Lower levels of stress, fear & anger
- Another study showed viewing nature pictures (compared to abstract pictures or white panels) had similar results







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What can nature contact do? **Surgery/Illness Recovery**

In other studies, contact with nature has been associated with:

- Fewer sick calls and stress symptoms among prisoners
- Better pain control in patients
- Improved health for people with chronic & terminal illnesses
- Improved immunity & cardiovascular function
- Lower blood pressure & anxiety among dental patients





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What can nature contact do? **Improves Mood**

Contact with nature (viewing images; walks in nature) has significant positive effects on mood.

- Reduce anxiety, depression, anger & aggression
- Increase positive feelings
- Feel more hopeful & less hopeless about confronting life issues

Comparing mood profiles for people active in natural settings vs. gyms showed that those in nature were significantly less depressed





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What can nature contact do? **Importance of Parks**



Park visits associated with

- Improved mood
- Lower stress/anxiety
- Less sadness & depression

Mental health is significantly related to residential distance from parks: highest mental health scores for residents in short walking distances of parks.

High quality parks (attributes such as water features, shade, birdlife, trails) lowers psychological distress of neighborhood residents irrespective of whether or not they used the park.



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What can nature contact do? **Youth Stress**

The stress-reducing potential of natural environments is applicable to children as well as to adults.

- Children exposed to nearby nature experience less stress and a faster recovery rate from stressful incidents
- Research suggests children may perform better throughout the day if provided breaks in green settings at school





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Contact with Nature: Mental & Physical Health Benefits



- Reducing Stress
- **Restoring Attention**
- Promoting Physical Activity



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Attention fatigue

Two types of attention:

- **Effortless attention/fascination** (inherently interesting, such as observing wildlife)
- **Directed attention** (completing a work task, reading a text book)

Directed attention subject to **fatigue** after sustained mental effort, making it difficult to concentrate.





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Nature & Attention Restoration

- Numerous studies show viewing and spending time in nature reduces attention fatigue and improves ability to concentrate across all ages.
- Attention Restoration Theory (ART):





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Cognitive functioning & directed attention

Studies across a variety of populations & settings show improved performance on cognitive tasks with exposure to nature:

- Residents living in greener environments
- Workplace offices with plants
- Natural views from windows
- Walks in nature (parks, forest)
- Contact with nature in nursing homes



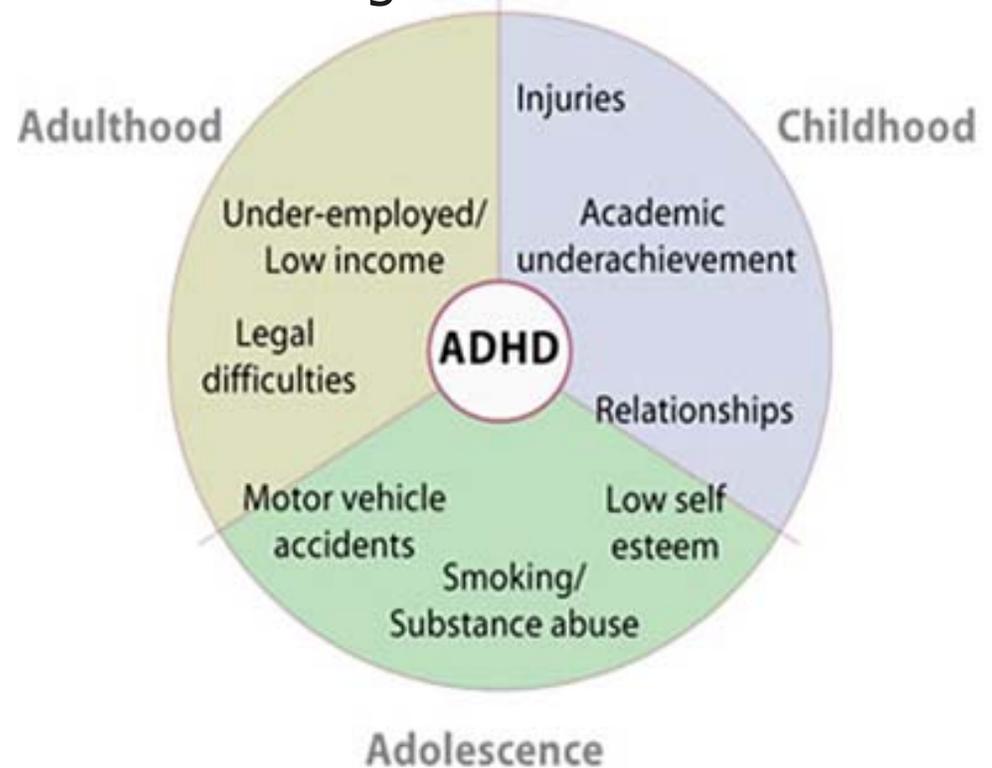
Kuo, 2001; Lohr et al., 1996; Tennessen & Cimprich 1995; Berman et al., 2008; Taylor et al., 2002; Ottosson & Grahn, 2008



Attention fatigue & ADHD

Individuals with Attention Deficit Hyperactivity Disorder (ADHD) are particularly susceptible directed attention fatigue

- ADHD is one of the most commonly diagnosed behavioral disorders in childhood, affecting 1 in 20 children in the US
- Inattention & related impacts often persist into adolescence & adulthood





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Nature & Attention Restoration

Compare ADHD symptoms & cognitive task performance before and after activities in nature vs urban environments

- Youth activities in nature settings yielded significantly greater improvements
- Performance boost similar to widely prescribed ADHD medications on similar task.
- Recent MU study showed similar findings in college students with ADHD





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Contact with Nature: Mental & Physical Health Benefits



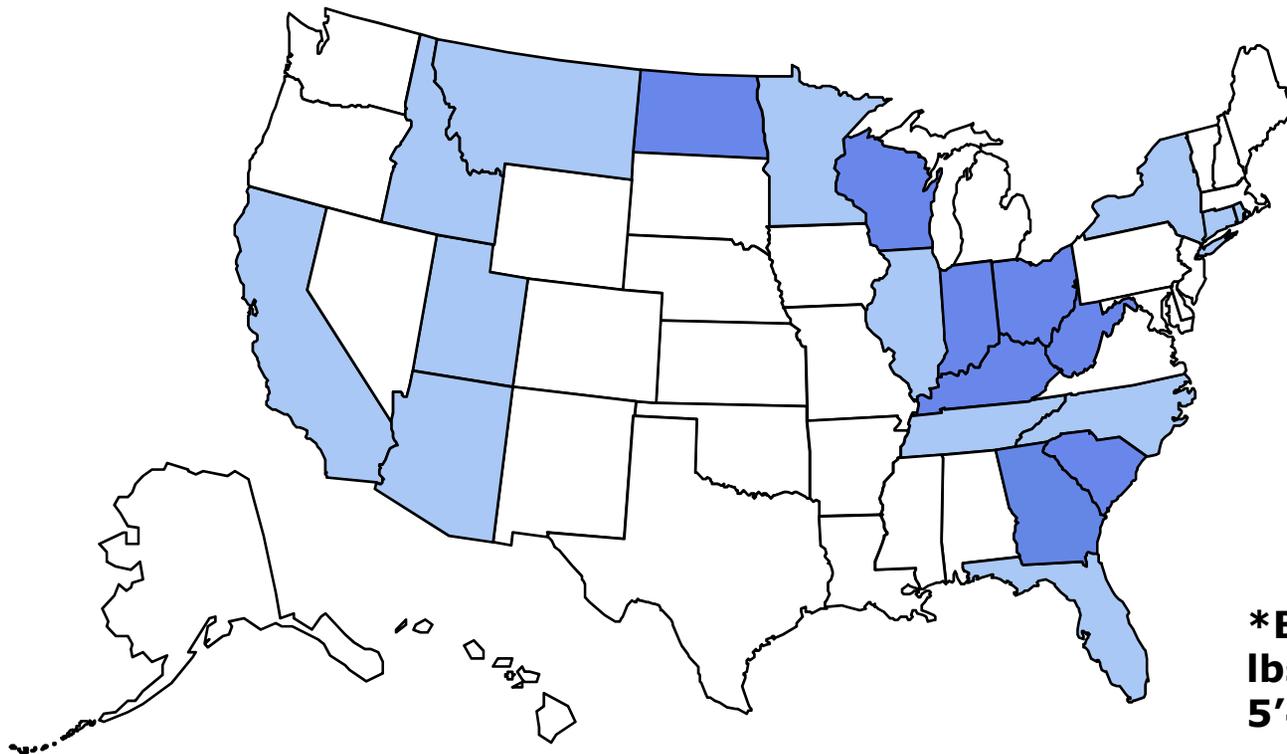
- Reducing Stress
- Restoring Attention
- **Promoting Physical Activity**



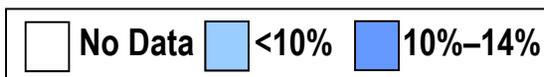
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Obesity* Trends Among U.S. Adults, 1985



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



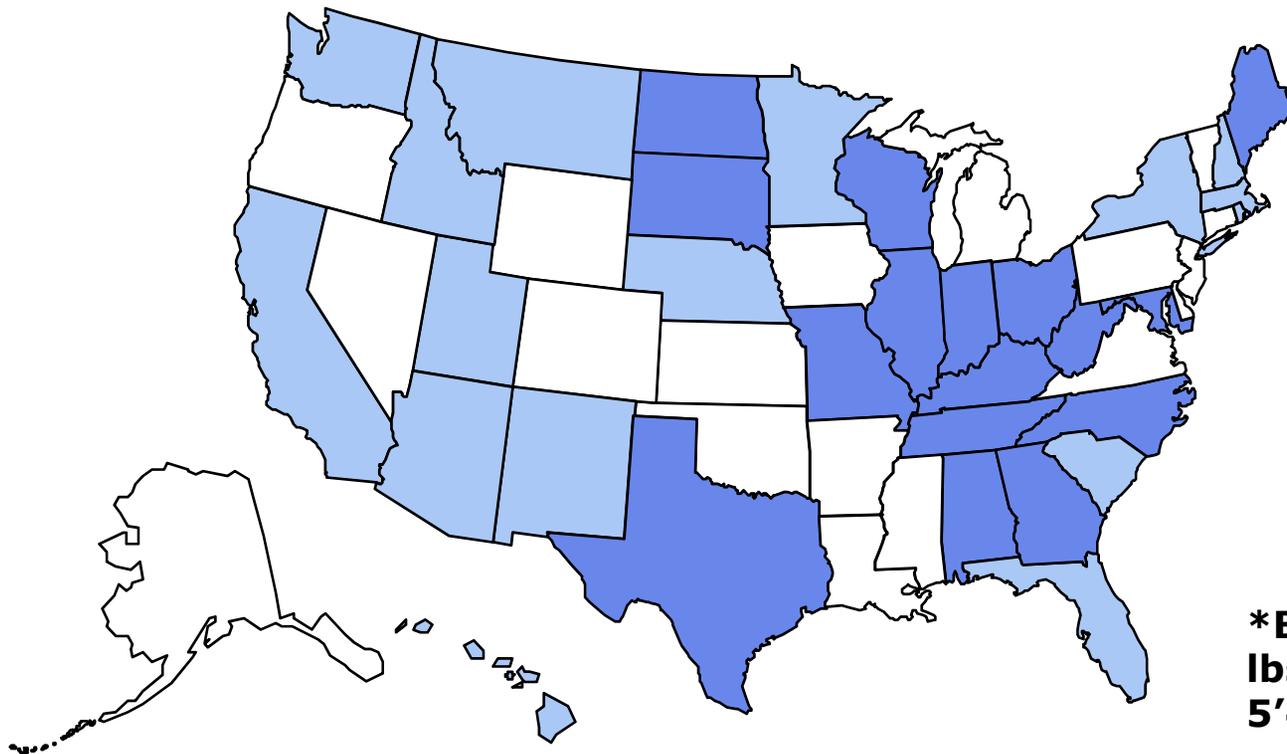
Source: Behavioral Risk Factor Surveillance System, CDC



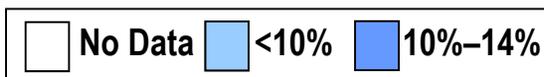
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Obesity* Trends Among U.S. Adults, 1987



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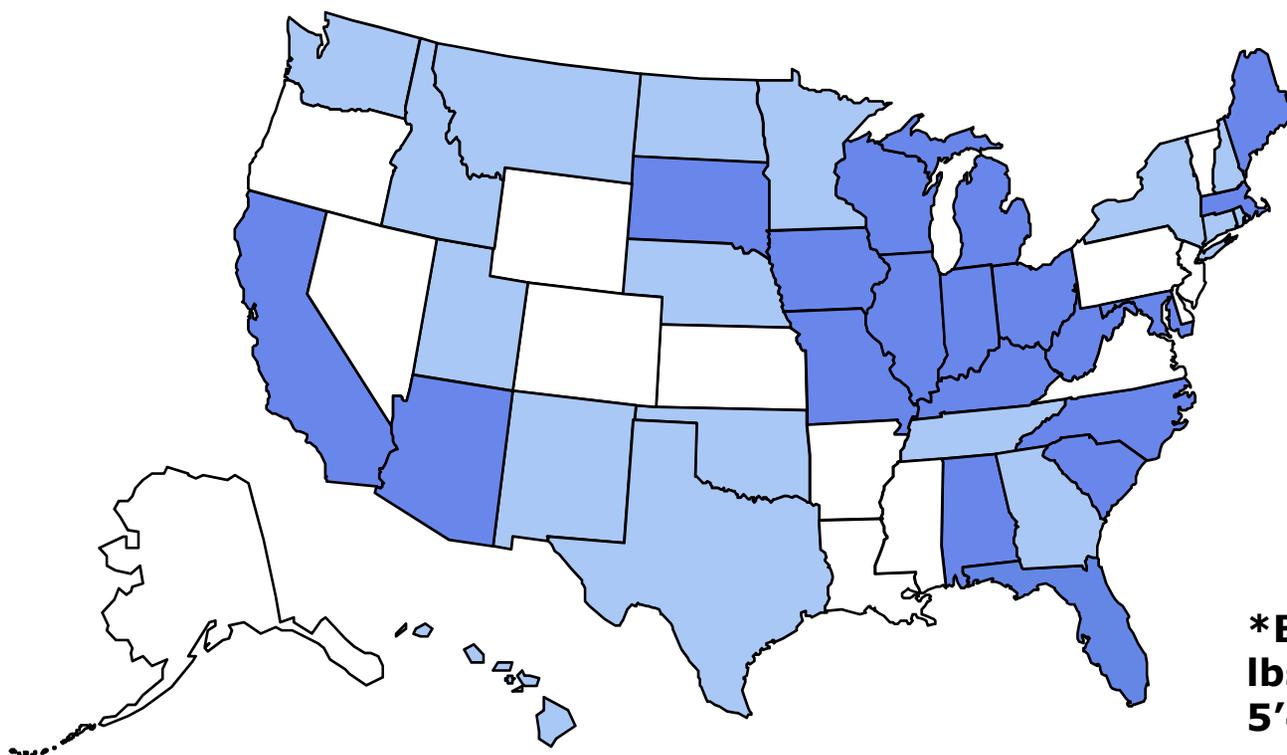
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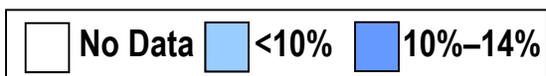
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Obesity* Trends Among U.S. Adults, 1988



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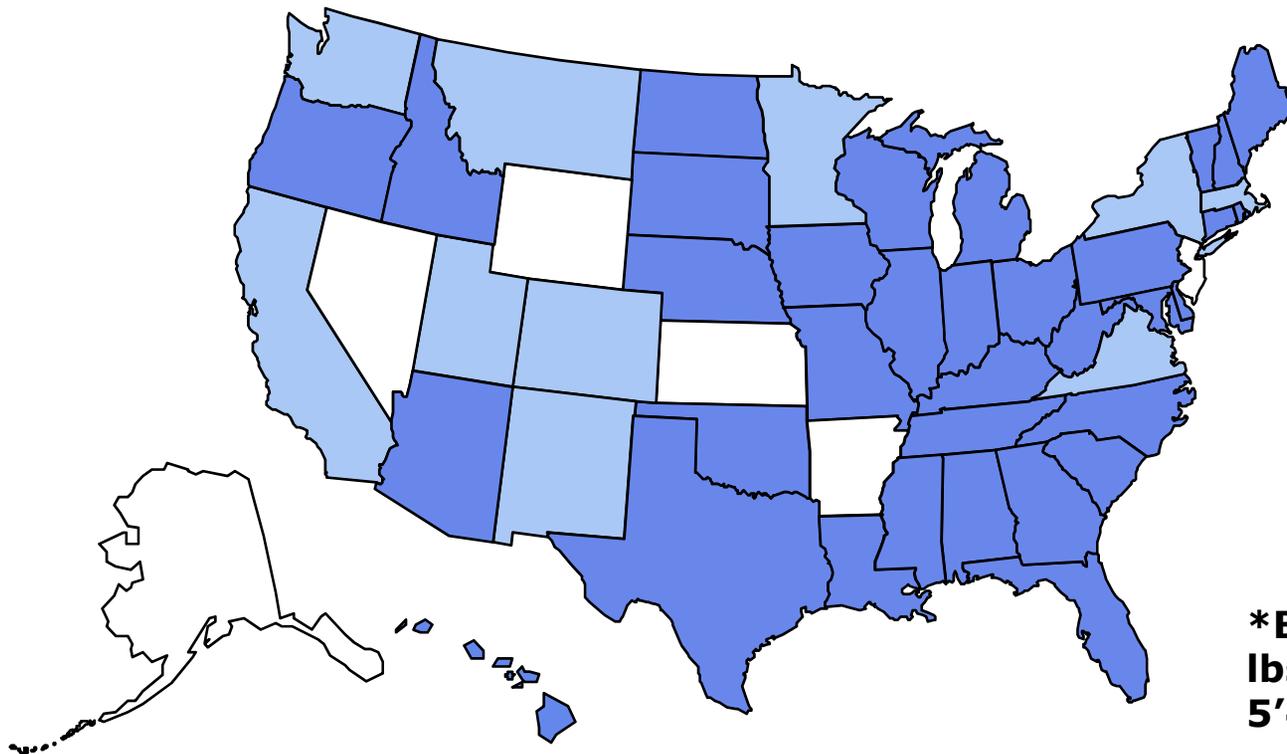
Source: Behavioral Risk Factor Surveillance System, CDC



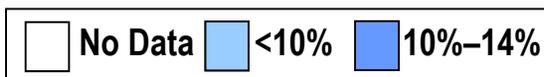
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Obesity* Trends Among U.S. Adults, 1990



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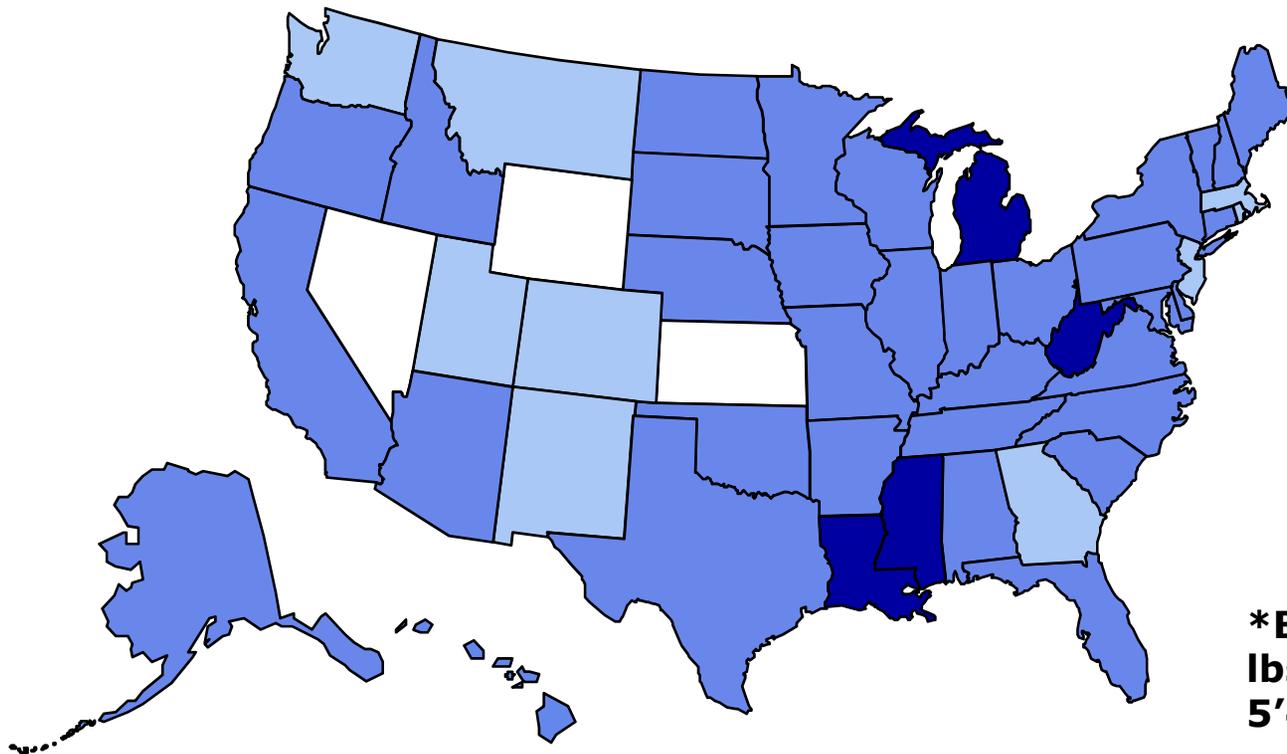
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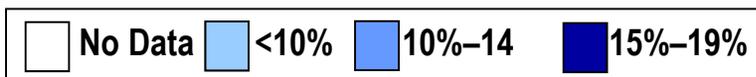
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Obesity* Trends Among U.S. Adults, 1991



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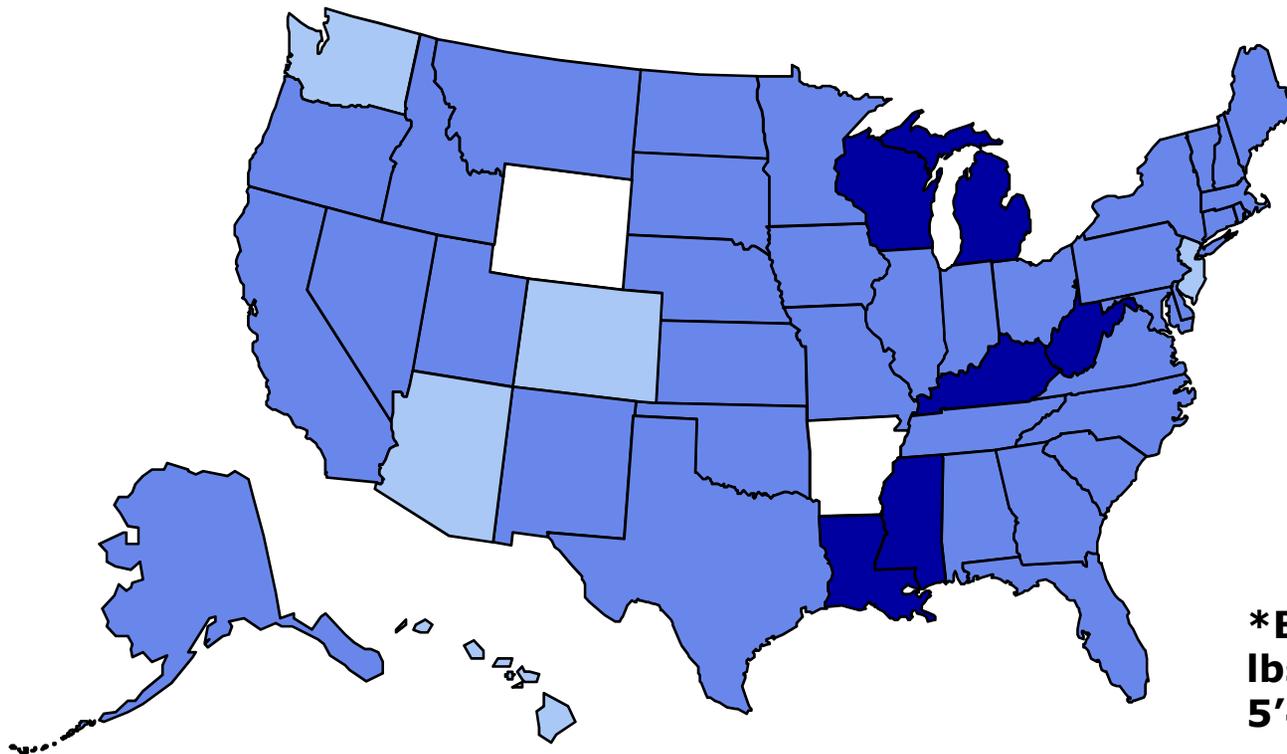
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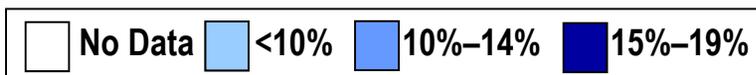
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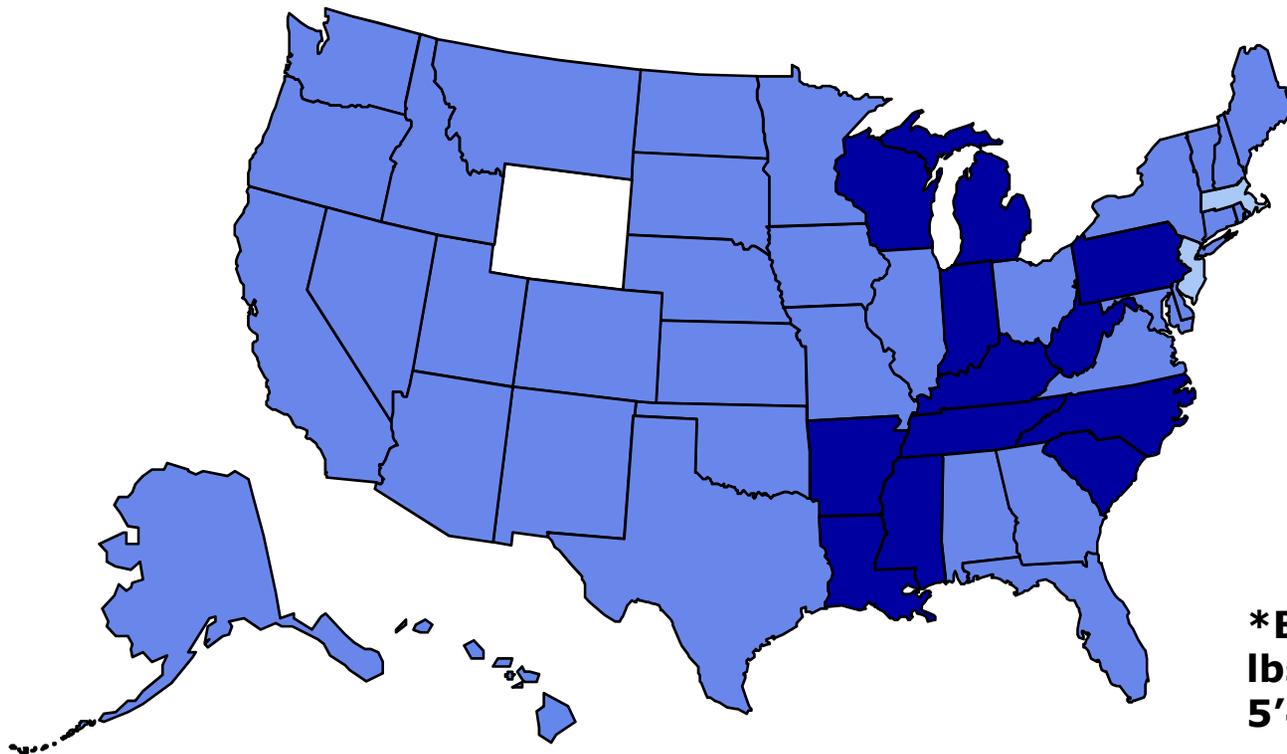
Source: Behavioral Risk Factor Surveillance System, CDC



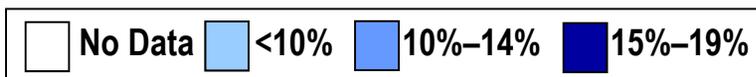
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Obesity* Trends Among U.S. Adults, 1993



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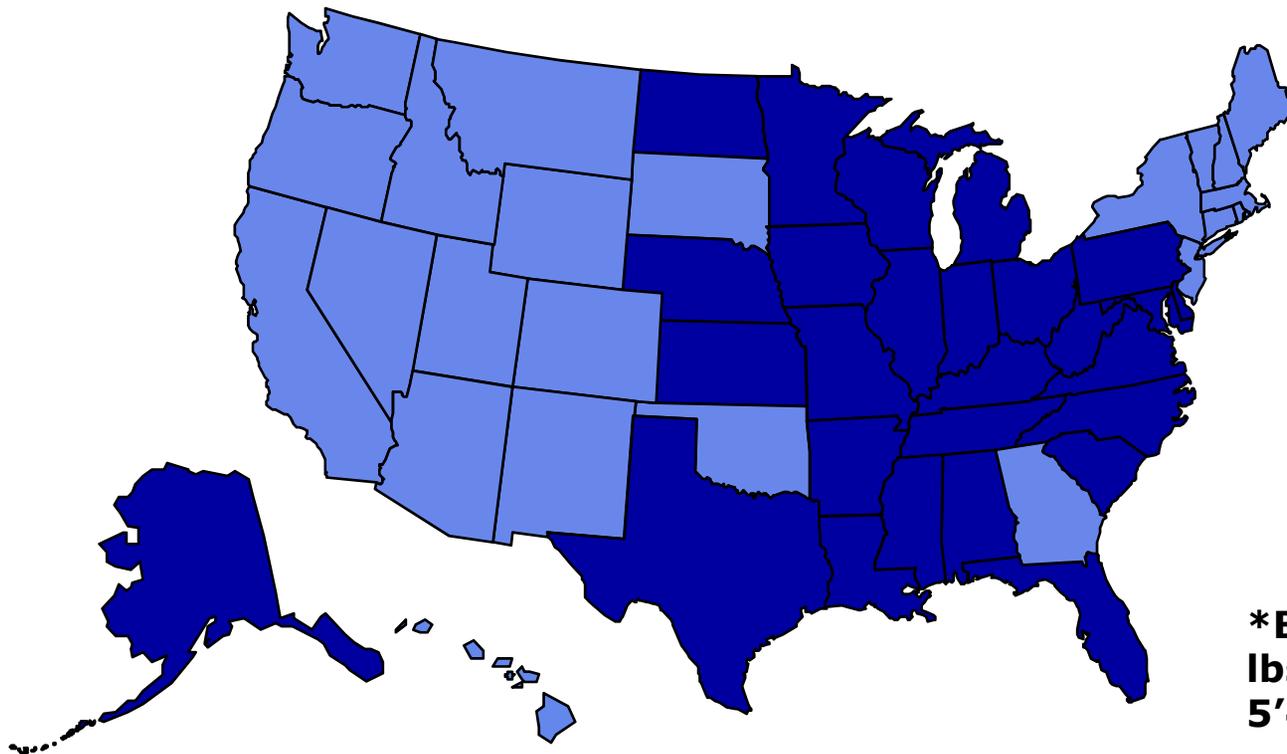
Source: Behavioral Risk Factor Surveillance System, CDC



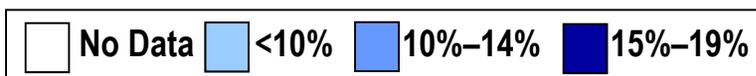
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Obesity* Trends Among U.S. Adults, 1995



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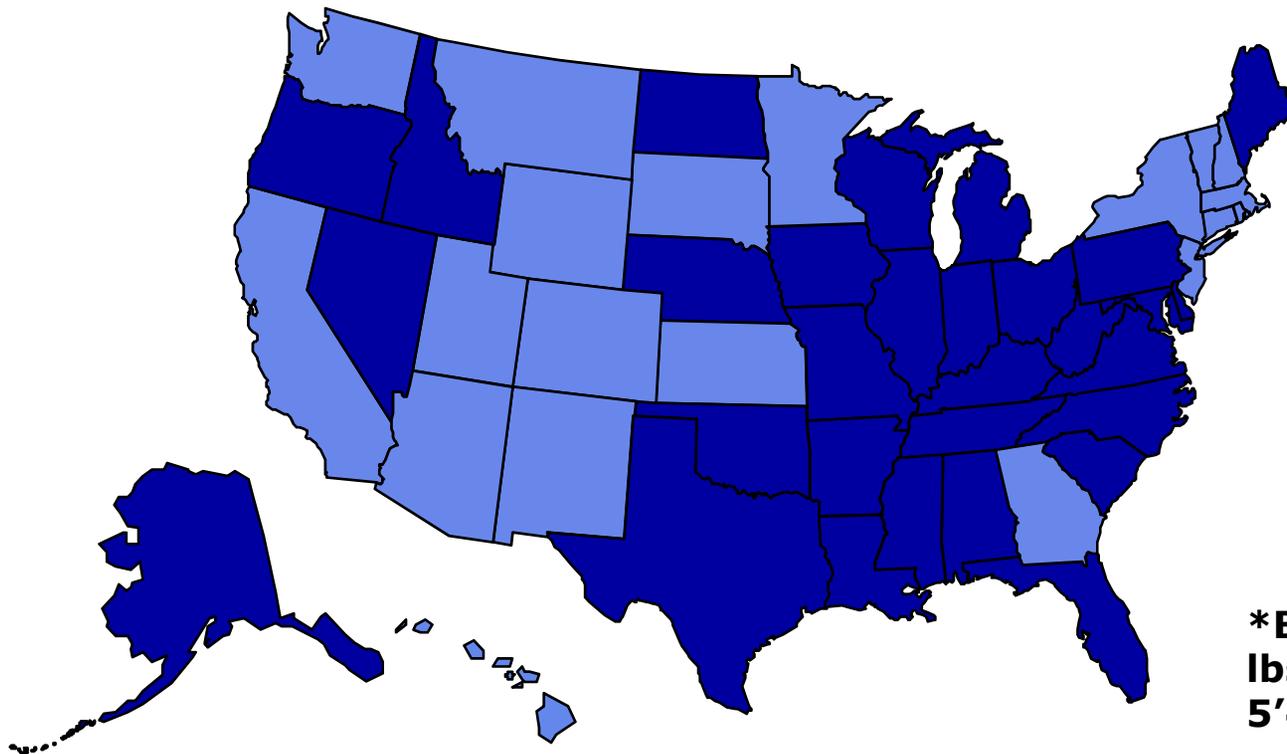
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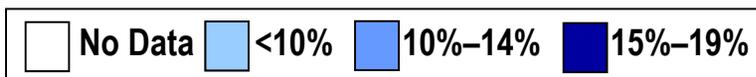
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Obesity* Trends Among U.S. Adults, 1996



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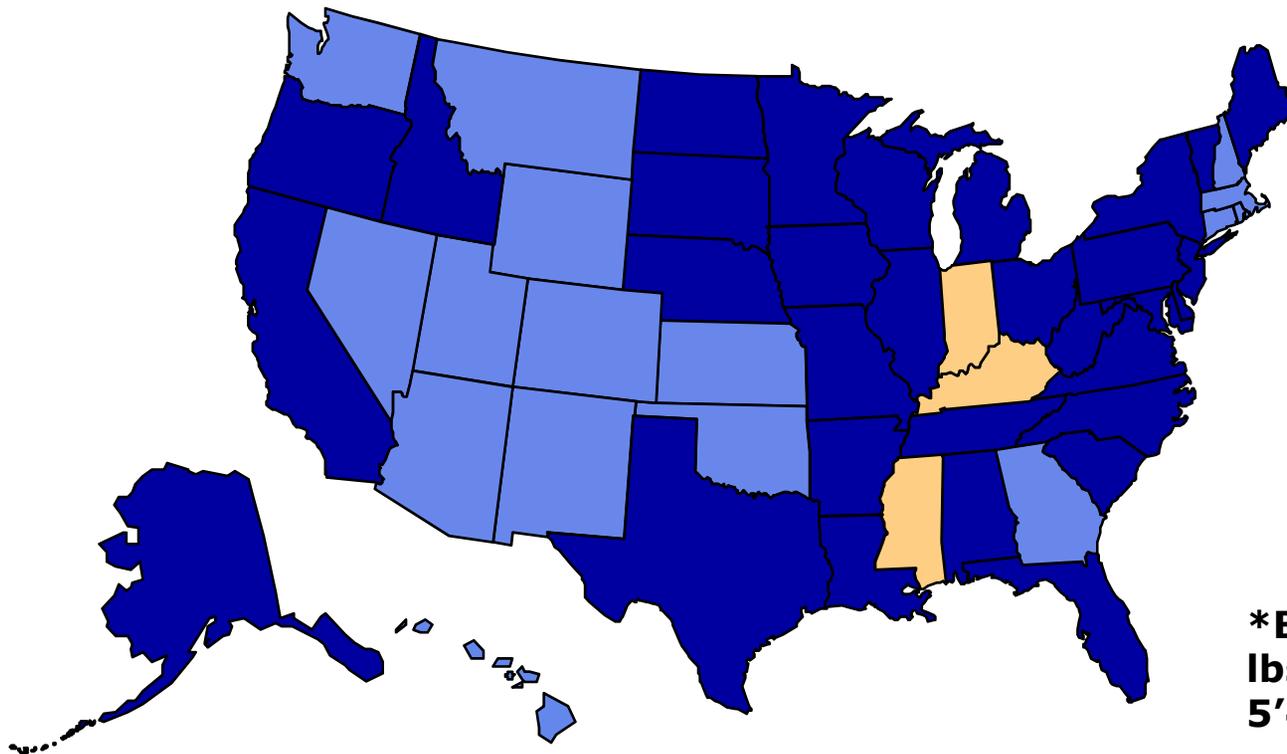
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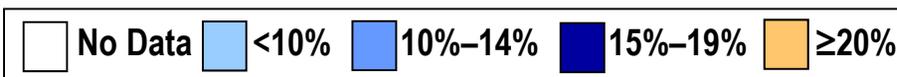
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Obesity* Trends Among U.S. Adults, 1997



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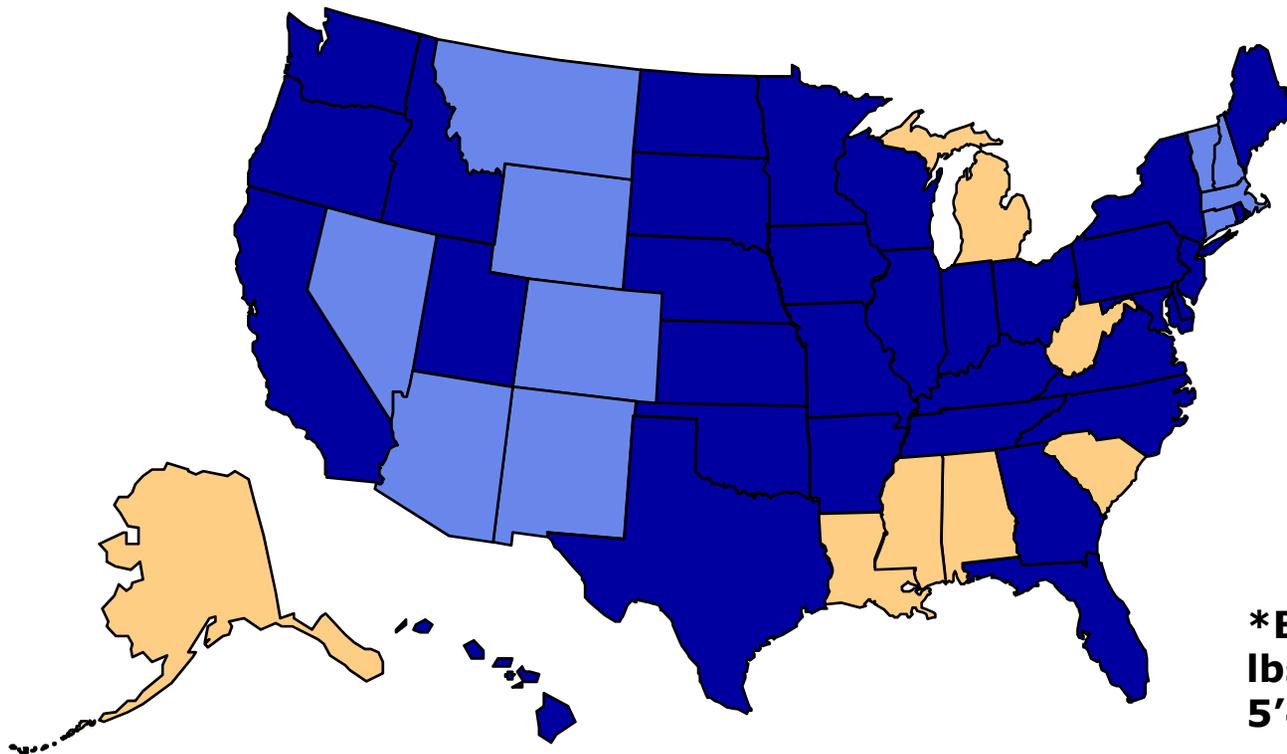
Source: Behavioral Risk Factor Surveillance System, CDC



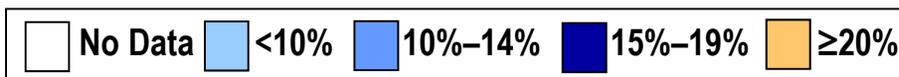
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Obesity* Trends Among U.S. Adults, 1998



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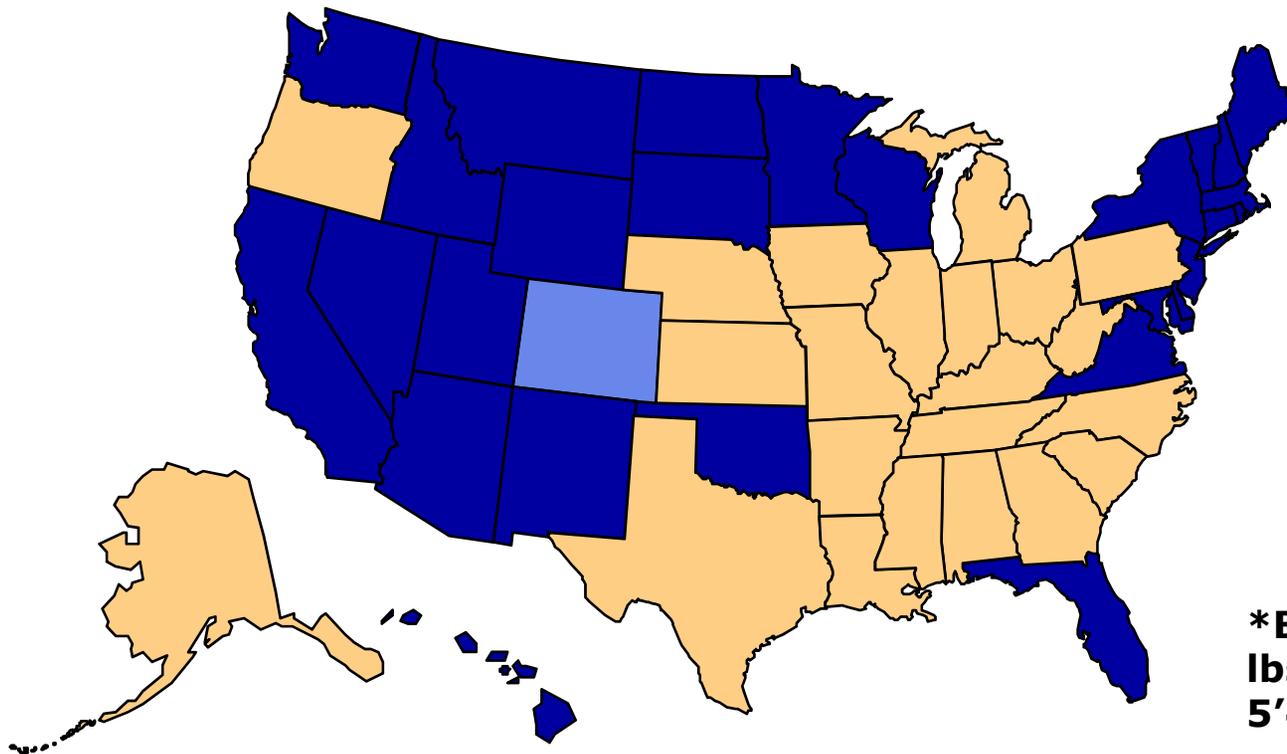
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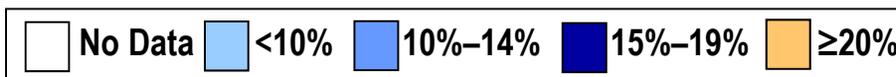
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Obesity* Trends Among U.S. Adults, 2000



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



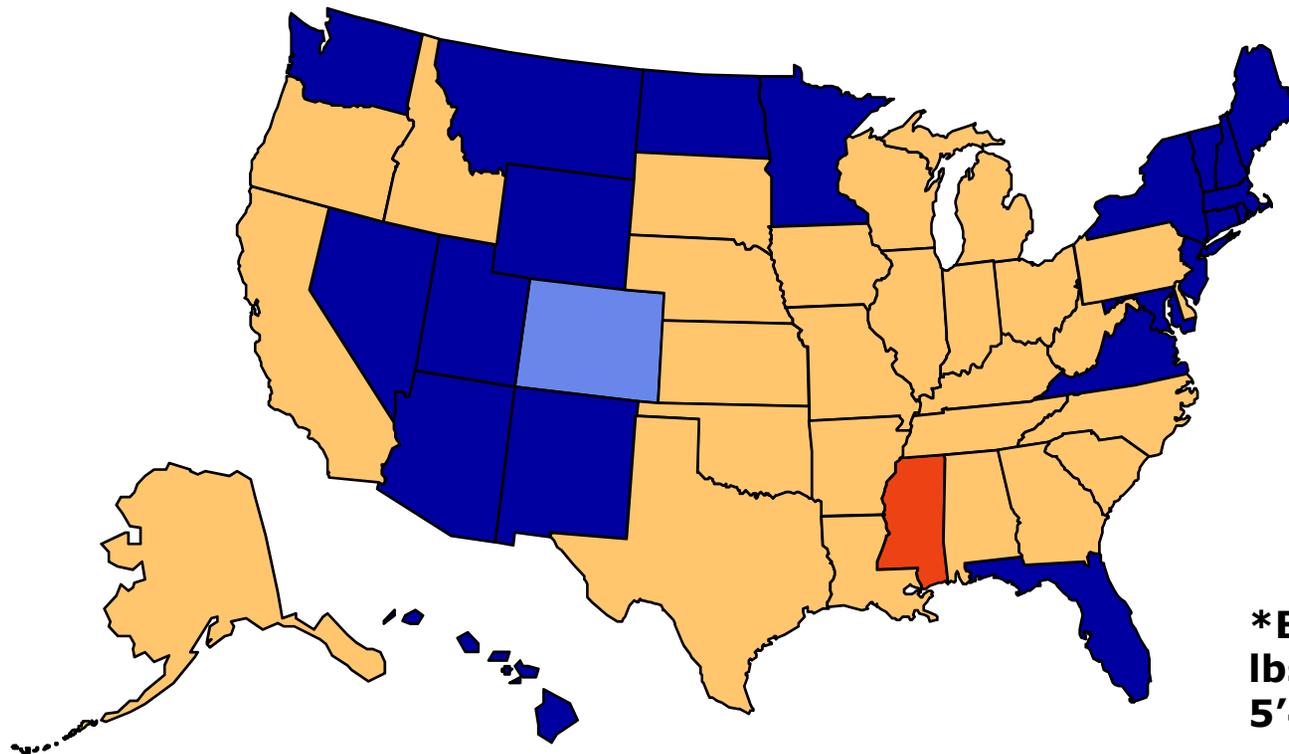
Source: Behavioral Risk Factor Surveillance System, CDC



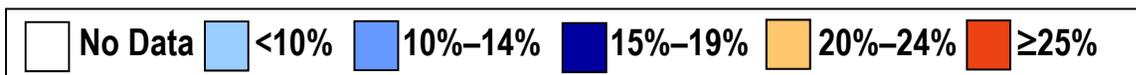
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Obesity* Trends Among U.S. Adults, 2001



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



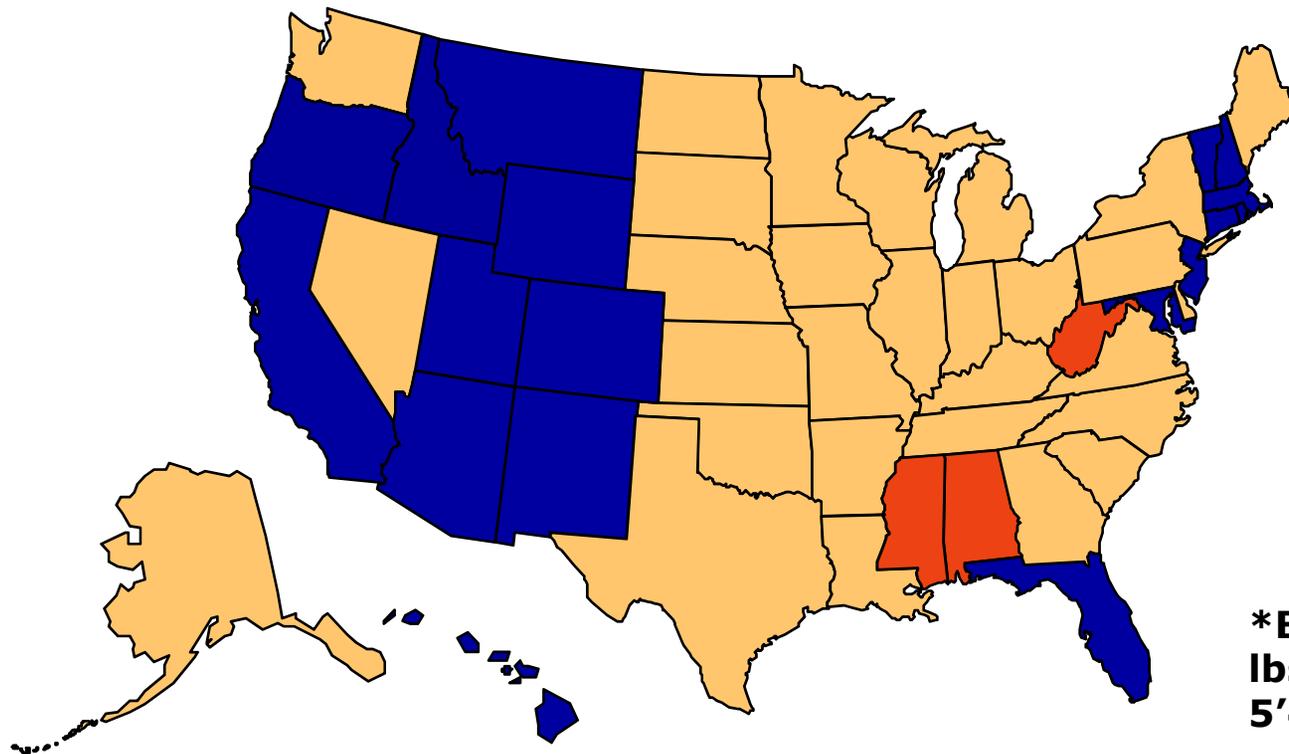
Source: Behavioral Risk Factor Surveillance System, CDC



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Obesity* Trends Among U.S. Adults, 2002



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



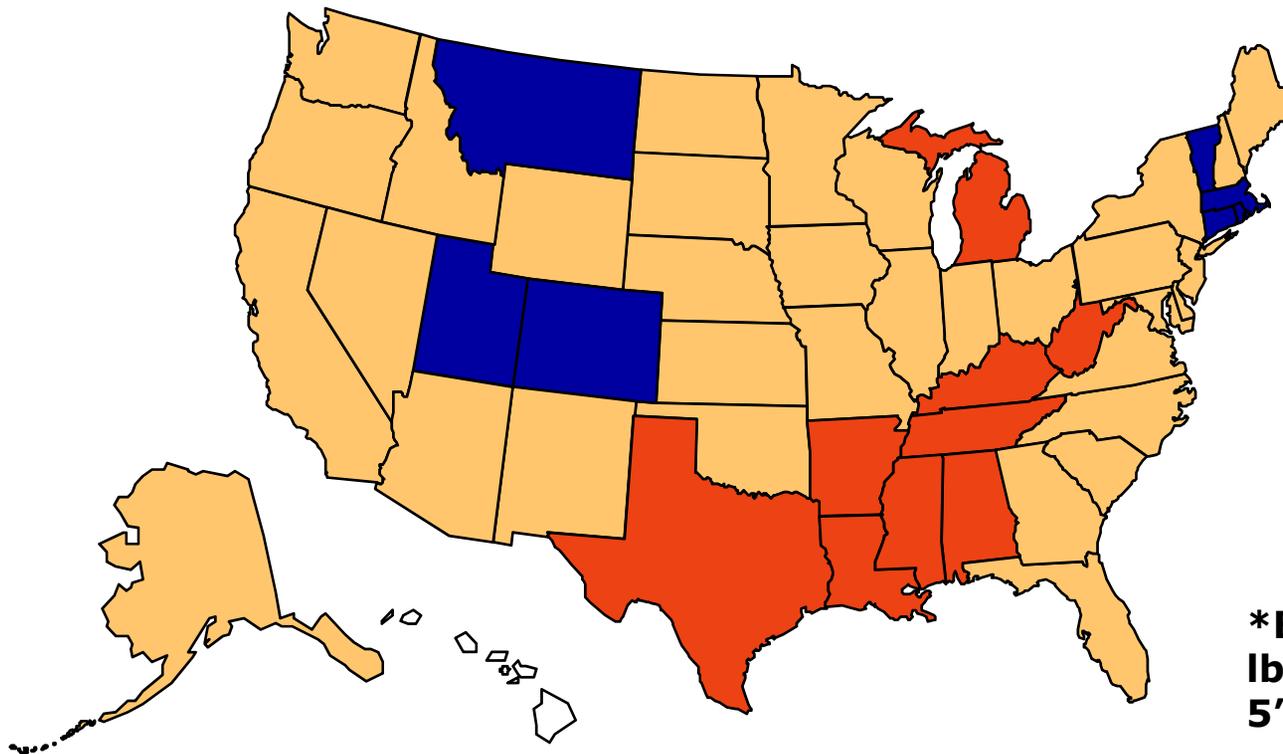
Source: Behavioral Risk Factor Surveillance System, CDC



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Obesity* Trends Among U.S. Adults, 2004



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



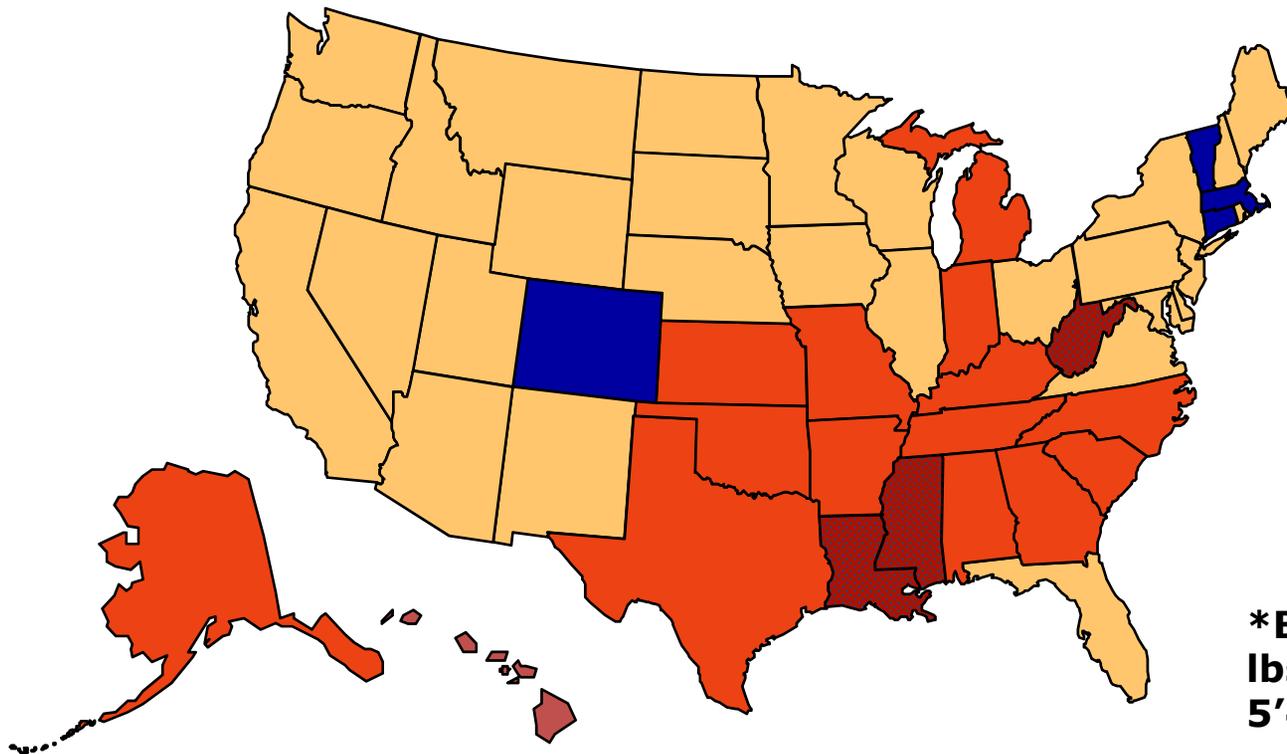
Source: Behavioral Risk Factor Surveillance System, CDC



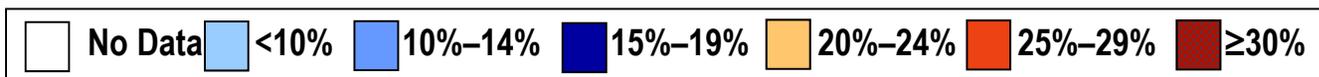
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Obesity* Trends Among U.S. Adults, 2005



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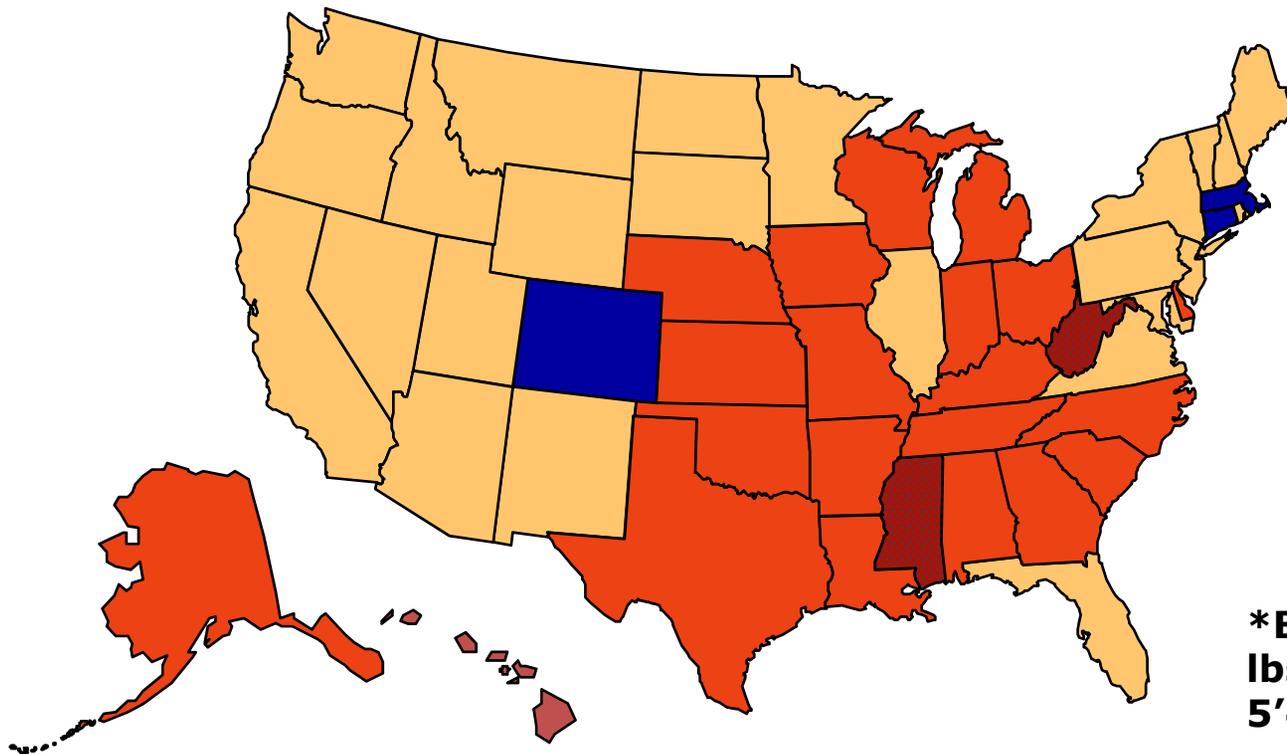
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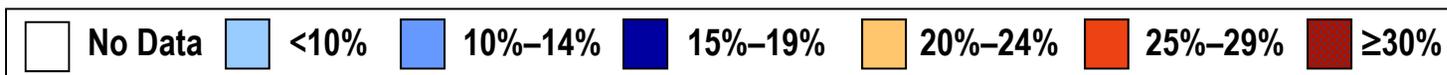
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Obesity* Trends Among U.S. Adults, 2006



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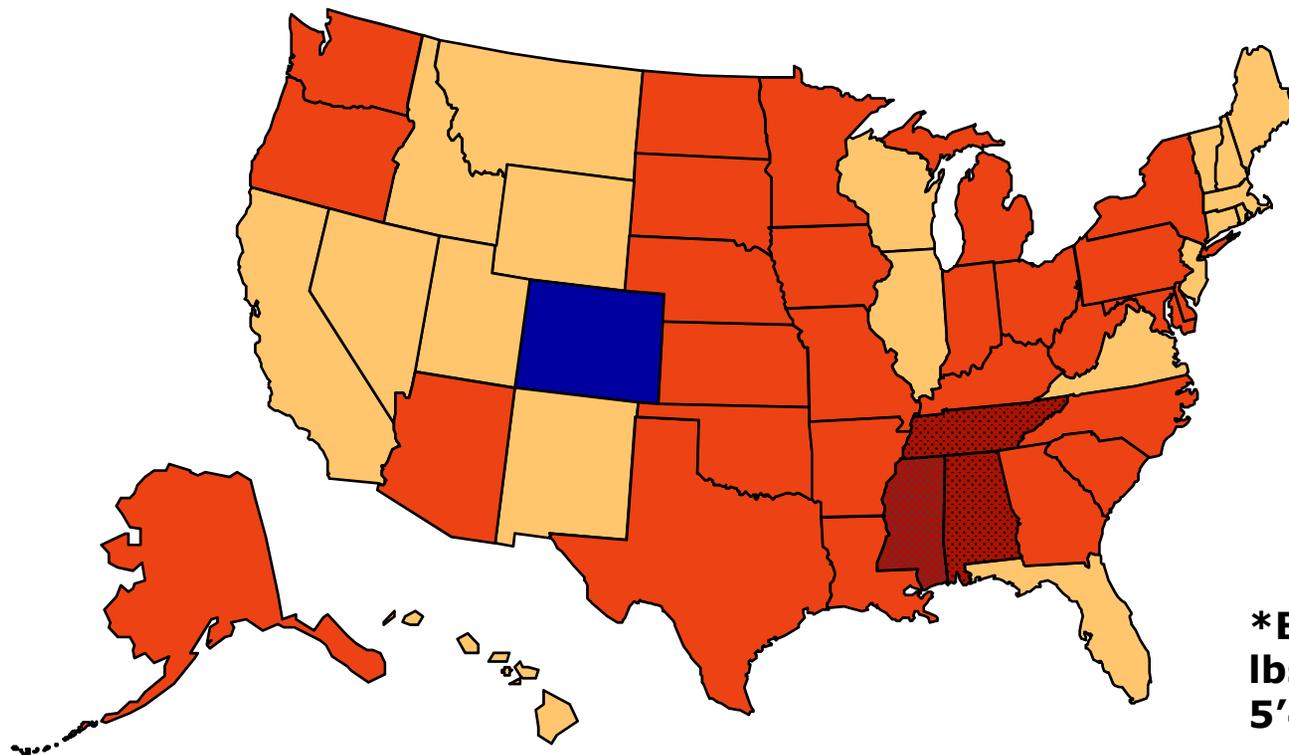
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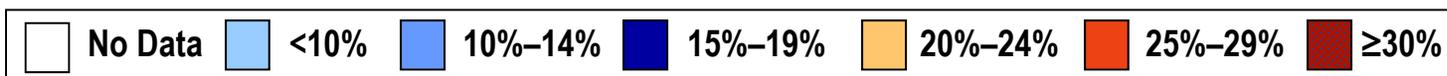
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Obesity* Trends Among U.S. Adults, 2007



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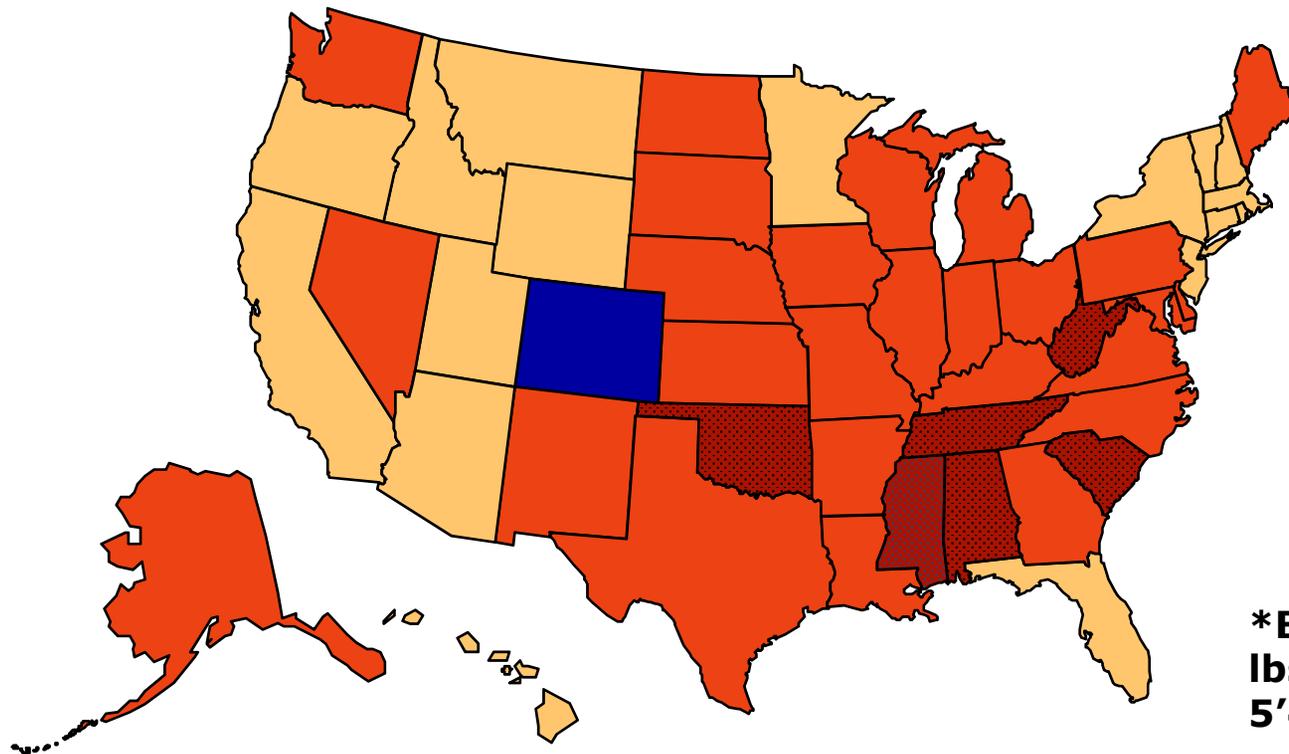
Source: Behavioral Risk Factor Surveillance System, CDC



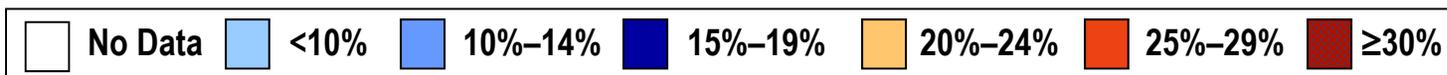
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Obesity* Trends Among U.S. Adults, 2008



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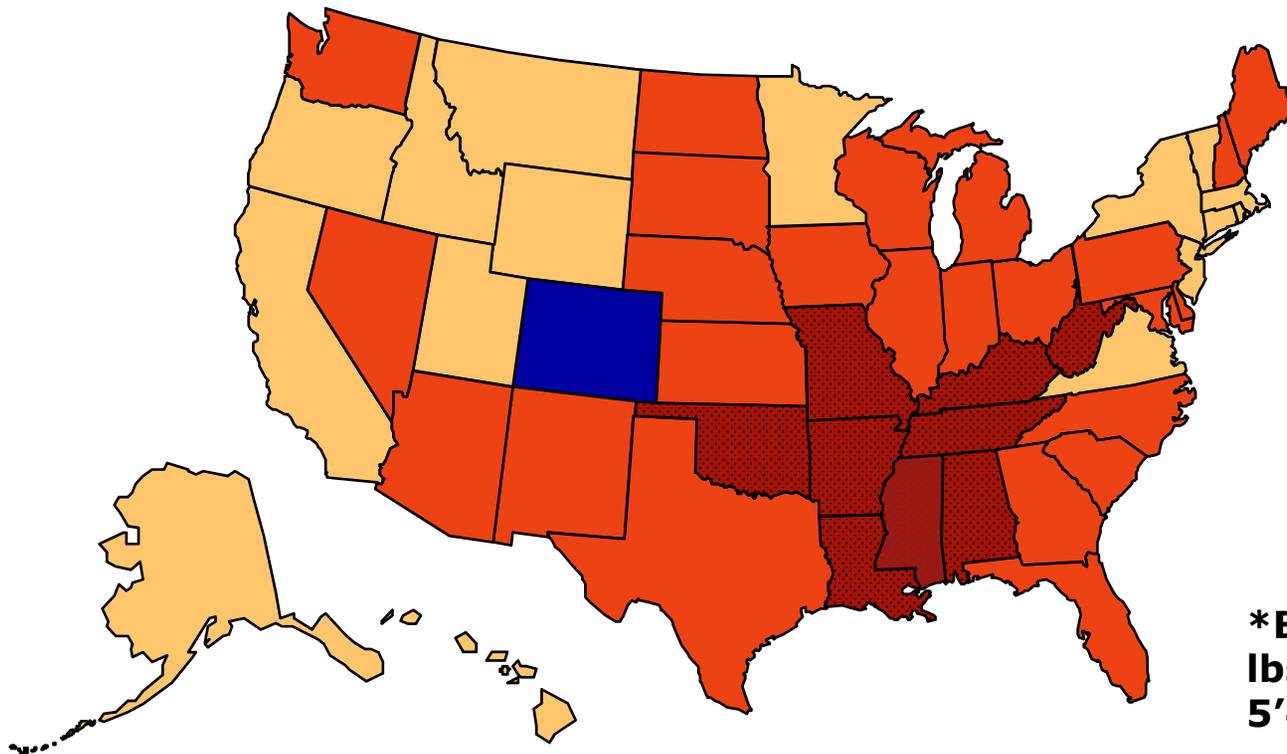
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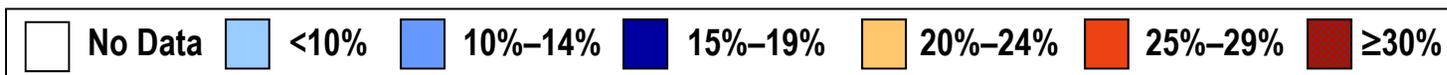
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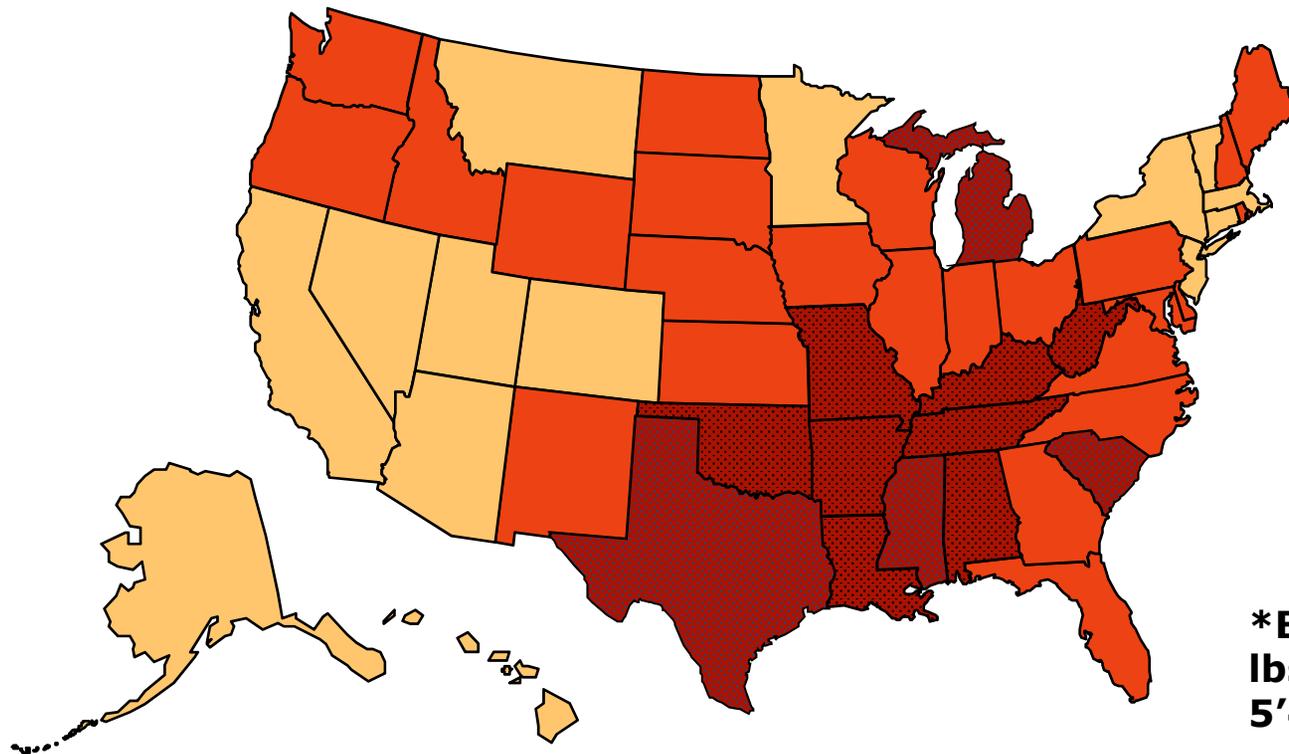
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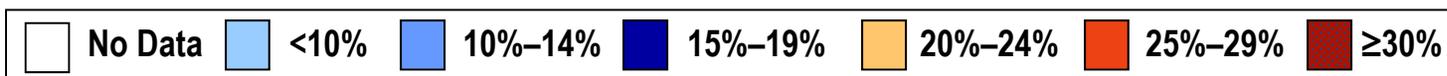
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Obesity* Trends Among U.S. Adults, 2010



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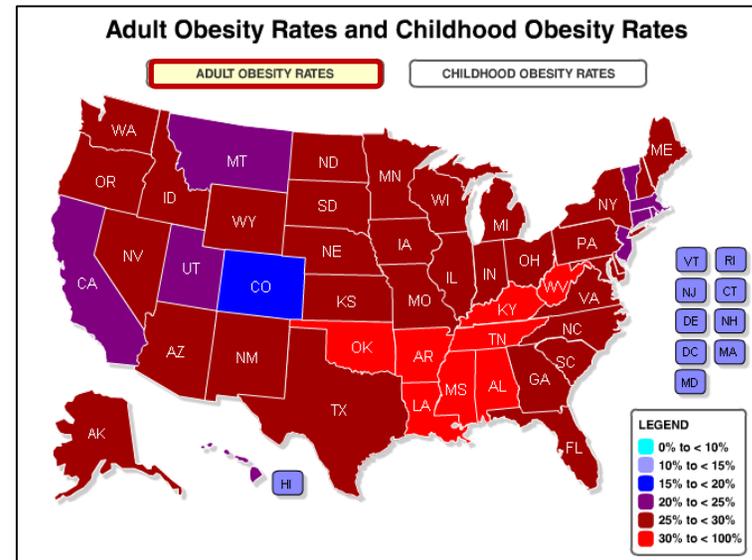
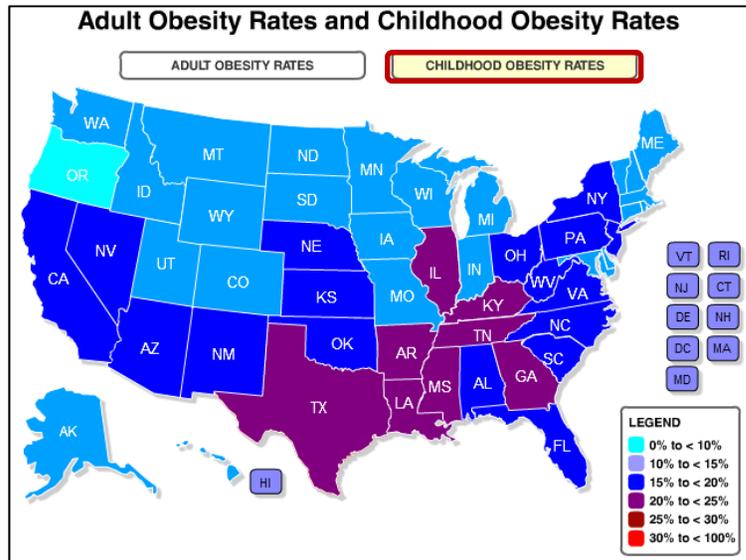


Source: Behavioral Risk Factor Surveillance System, CDC



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• **33%** youth in US overweight or obese • **70%** adults in US overweight or obese

- Health-related issues (mental & physical)
- Staggering costs of medical care
- Overweight children are more likely to be overweight or obese as adults

Flegal et al. 2016; Ogden et al. 2016; CDC 2010; Franks et al. 2010; Yeung et al. 2010



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Physical Activity (PA)

- PA can reduce risk of obesity & related diseases
- Also shown to have a beneficial effect on psychological health & well-being
- Most Americans (youth & adults) do not meet recommended PA guidelines





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Parks provide important “behavior settings” in communities that can promote physical activity (PA)



Coupled with other motivations for park visits, park-based PA can be intrinsically enjoyable & satisfying, and help to achieve recommended levels.



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Parks & Green Space as Important PA Resources

Evidence suggests that green spaces encourages PA in all age groups

- *Time outdoors & in parks* are powerful predictors of PA, particularly in children





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Parks & Green Space as Important PA Resources

Evidence suggests that green spaces encourages PA in all age groups

- *Time outdoors & in parks* are powerful predictors of PA, particularly in children
- *Preferences* for tree-lined and scenic routes for walking and running





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Parks & Green Space as Important PA Resources

Evidence suggests that green spaces encourages PA in all age groups

- *Time outdoors & in parks* are powerful predictors of PA, particularly in children
- *Preferences* for tree-lined and scenic routes for walking and running
- *Access* to green space is associated with increased PA and park use
 - Supply & proximity (more & closer are better)



Cohen et al 2006; Cohen et al. 2007; Kaczynski & Henderson 2007; Wilhelm Stanis et al 2012; Kaczynski et al. 2009; Li et al., 2005; Besenyi et al. 2016



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Parks & Green Space as Important PA Resources

Park features & access characteristics also important

- Number & types of features/facilities
- Quality of park and features (e.g., renovations)
- Ease of accessing the park from surrounding neighborhood



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Parks & Green Space as Important PA Resources

Park features & access characteristics also important

- **Number & types of features/facilities**
- Quality of park and features (e.g., renovations)
- Ease of accessing the park from surrounding neighborhood

➤ Youth 2.5x more likely to achieve PA recommendations if had a park **with a playground** within 1/2 mile of home

➤ Importance of **trails** for PA across age groups

➤ Park amenities such as **shade** is associated with greater PA





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Parks & Green Space as Important PA Resources

Park features & access characteristics also important

- Number & types of features/facilities
- **Quality of park and features (e.g., renovations)**
- Ease of accessing the park from surrounding neighborhood

- **Renovations** to playgrounds and park features result in increase use and PA.
- Park quality and renovations also associated with increased perceptions of park **safety**, which promotes use and PA





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Parks & Green Space as Important PA Resources

Park features & access characteristics also important

- Number & types of features/facilities
- Quality of park and features (e.g., renovations)
- **Ease of accessing the park from surrounding neighborhood**

- Residents less likely to use park if must cross **high-speed road** on their way to the closest park
- Residents with greater **intersection density** (street connectivity) were more likely to use parks and engage in PA in parks





Contact with Nature: Mental & Physical Health Benefits



- Reducing Stress
- Restoring Attention
- Promoting Physical Activity

**Strong evidence of the
benefits – what's next?**



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Moving forward...

- Consider ways to add “green” to our lives
- Disparities & environmental justice
- Park prescription programs
- Investments in parks and green space





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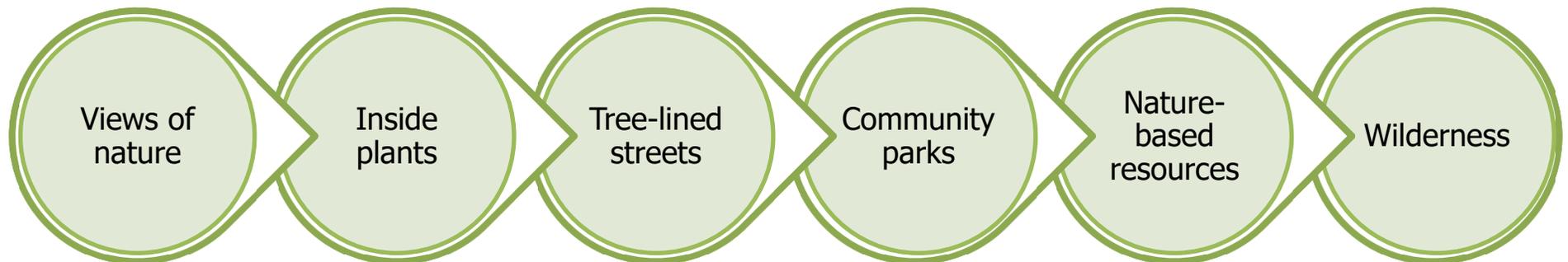


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Adding Green

Consider the range from small micro-restorative encounters (views of nature) to “deep restoration” in wilderness



- Around schools: views out window can help teachers' stress, youth cognitive restoration, & promote youth PA at recess
- Green travel routes: decrease driving stress, mitigate work stress, encourages more active transportation



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Moving forward...

- Consider ways to add “green” to our lives
- **Disparities & environmental justice**
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Environmental Justice

- Green space availability, park features & quality, and safe access are generally **worse in low income and/or high-minority areas**
- Given nature's importance for mental and physical health, considered the next wave of environmental justice
- An important way to make changes is to engage community members to take action to address community-based issues





Community Park Audit Tool (CPAT)

- Developed with & for community members to quickly & reliably assess parks for their potential to promote PA
- Comprehensive (key areas covered) yet user-friendly (length, format)
- 6 pages with 4 sections:
 - Park Information
 - Access & Surrounding Neighborhood
 - Park Activity Areas
 - Park Quality and Safety

Section 2: Access and Surrounding Neighborhood

This section asks about factors related to accessing the park and about features of the neighborhood surrounding the park. Several questions include follow-up responses if you answered yes. After completing all questions, provide any additional comments in the space at the end of the section. When thinking about the surrounding neighborhood, consider all areas that are visible from all sides of the park.

When rating the access and surrounding neighborhood, please use the following definition:

- Useable: everything necessary for use is present and nothing prevents use (e.g., sidewalks are passable)

1. Can the park be accessed for use? (e.g., not locked/fenced, available for activity, etc.) No Yes
2. Are there signs that state the following (could be same sign)? (check all that are present)
 - Park name Park hours Park contact information Park/facility rental information
 - Park rules Park map Rental equipment information Event/program information
3. How many points of entry does the park have? More than 5 (or park boundary is open) 2-5 Only 1
4. Is there a public transit stop within sight of the park? No Yes
5. What types of parking are available for the park? (check all that are present)
 - None Parking Lot On street parking Bike rack(s)
6. Are there sidewalks on any roads adjacent to the park? (could be on opposite side of road) No Yes
If yes ... Are they useable? All or most are useable About half None or few useable
Are there curb cuts and/or ramps on any sidewalks bordering or entering the park? No Yes
7. Is there an external trail or path connected to the park? No Yes
If yes ... Is it useable? No Yes
8. Are there marked bike lanes on any roads adjacent to the park? No Yes
9. Are there nearby traffic signals on any roads adjacent to the park? (e.g., crosswalk, stop light/sign) No Yes
If yes ... Are they on heavy traffic roads? No Yes There are not any heavy traffic roads
10. What are the main land use(s) around the park? (check all that apply)
 - Residential Commercial Institutional (e.g., school) Industrial (e.g., warehouse) Natural
11. Which of the following safety or appearance concerns are present in the neighborhood surrounding the park? (check all that are present in the surrounding neighborhood within sight on any side of the park)
 - Inadequate lighting (e.g., absent or poor lighting on surrounding neighborhood streets)
 - Graffiti (e.g., markings or paintings that reduce the visual quality of the area)
 - Vandalism (e.g., damaged signs, vehicles, etc.)
 - Excessive litter (e.g., noticeable amounts of trash, broken glass, etc.)
 - Heavy traffic (e.g., steady flow of vehicles)
 - Excessive noise (e.g., noticeable sounds that are unpleasant or annoying)
 - Vacant or unfavorable buildings (e.g., abandoned houses, liquor store)
 - Poorly maintained properties (e.g., overgrown grass, broken windows)
 - Lack of eyes on the street (e.g., absence of people, no houses or store fronts)
 - Evidence of threatening persons or behaviors (e.g., gangs, alcohol/drug use)
 - Other _____

Comments on Access or Surrounding Neighborhood Issues:

Community Park Audit Tool Page 2 of 6



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Community Park Audit Tool (CPAT)

Currently:

- Electronic format (eCPAT)
- Advocacy efforts with youth
- Workshop trainings in communities



Data collection on
Mobile Device + App



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Moving forward...

- Consider ways to add “green” to our lives
- Disparities & environmental justice
- **Park prescription programs**
- Investments in parks and green space



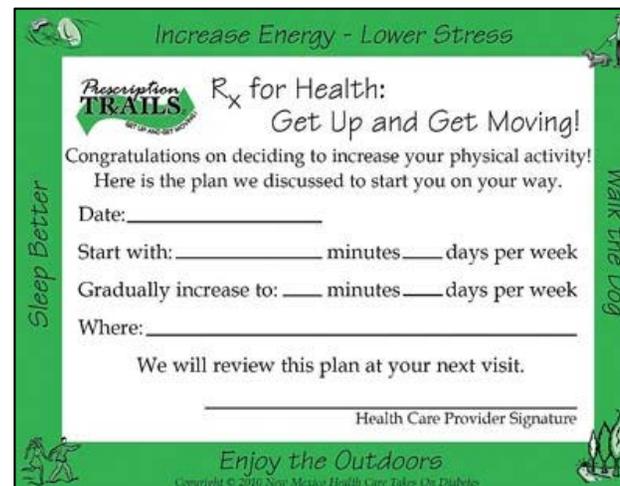
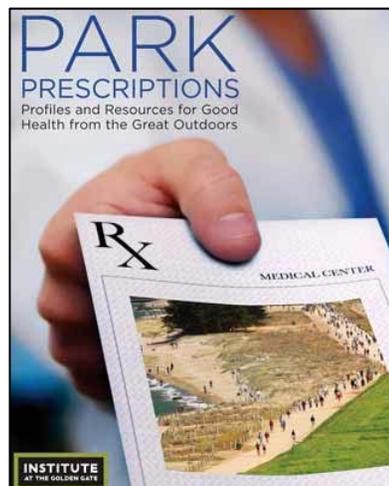


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Park Prescriptions

- Growing movement of park prescription programs designed to better connect the health care community and public lands to create healthier people
- Goal to increase the prescription of outdoor activity in recognition of the many mental and physical health benefits





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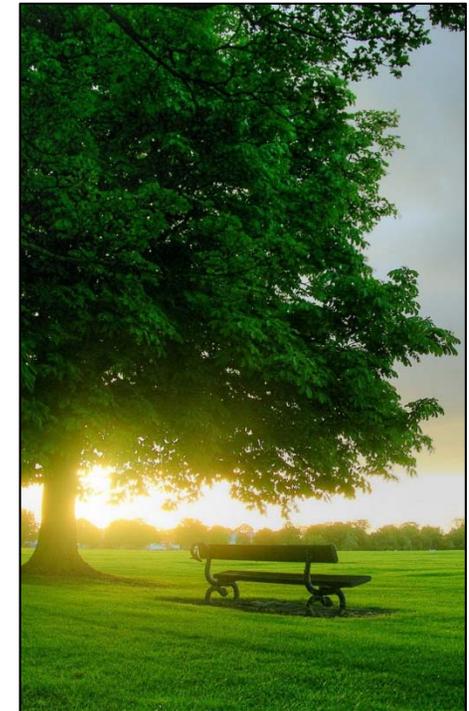


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Investments in green space as a public health resource

- Recognize parks & green space as an essential component of the **health care system**
- Ensure parks & green space providers are **aware of & promote** health outcomes
- **Design & renovate** parks, buildings, neighborhoods to facilitate contact with nature
- Develop new **policies** around nature & health
- Enhance **partnerships** between green space providers & health related organizations (can't do it alone!)
- Continue to **evaluate & document** the contributions





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Summary

- The evidence is clear that contact with nature provides many mental & physical health benefits
- Parks & green spaces are important public health resources
- Opportunities to extend the benefits and impacts





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Thank you!

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