



# Actuated Architecture

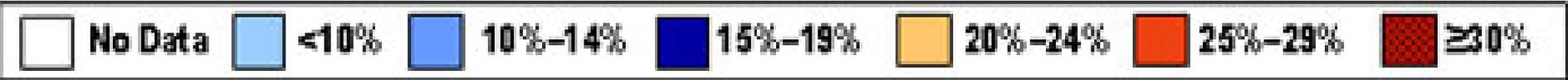
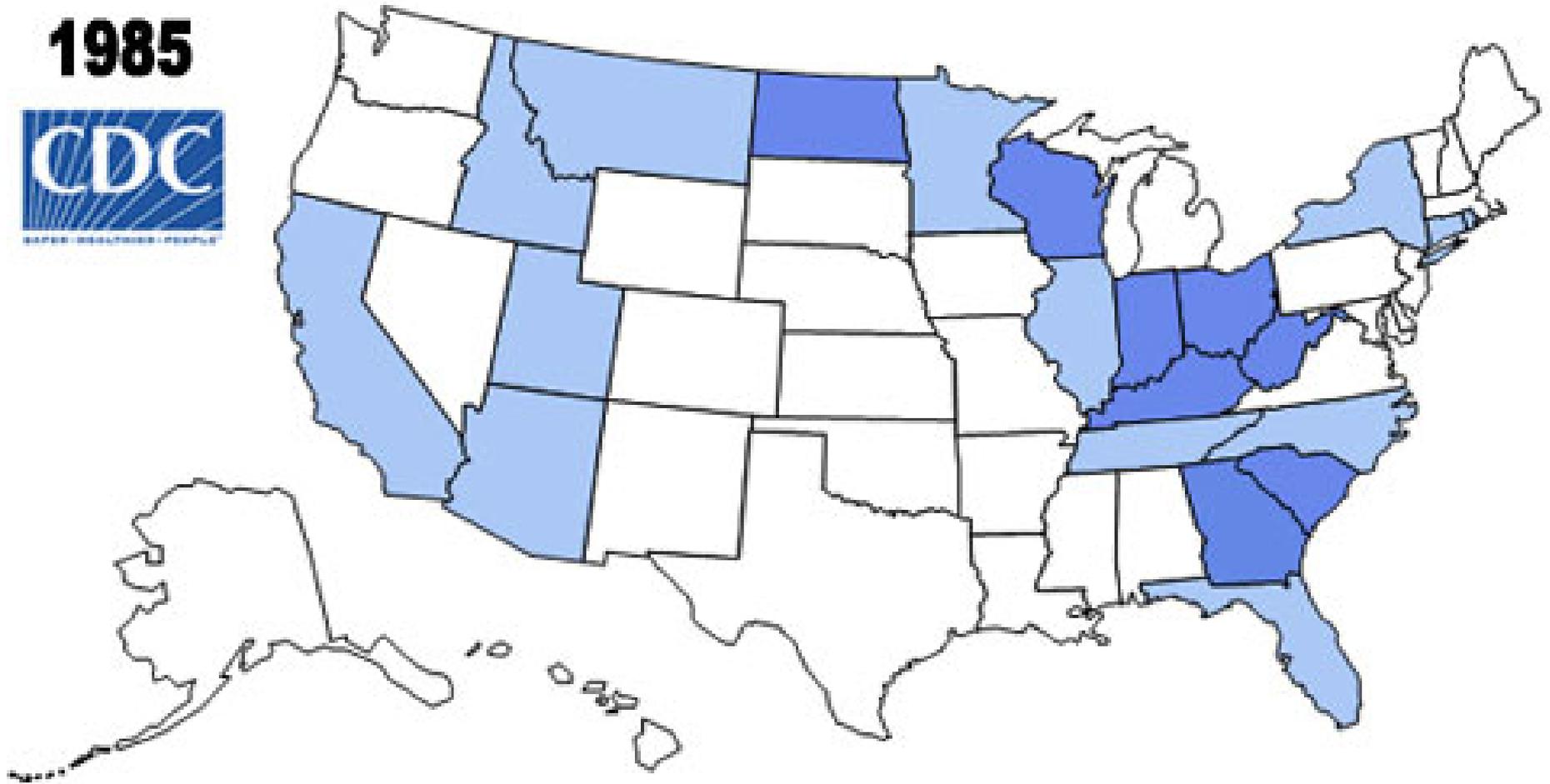
# Intent: The Problem

**300,000 deaths** each year in the United States are associated with obesity.

**Obesity** is a medical condition used to describe a high body weight from excess, unwanted, and **unhealthy fat**. This fat has unfortunate effects on health and leads to reduced life expectancy and **increased health problems**.

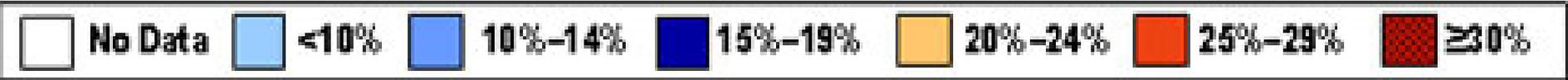
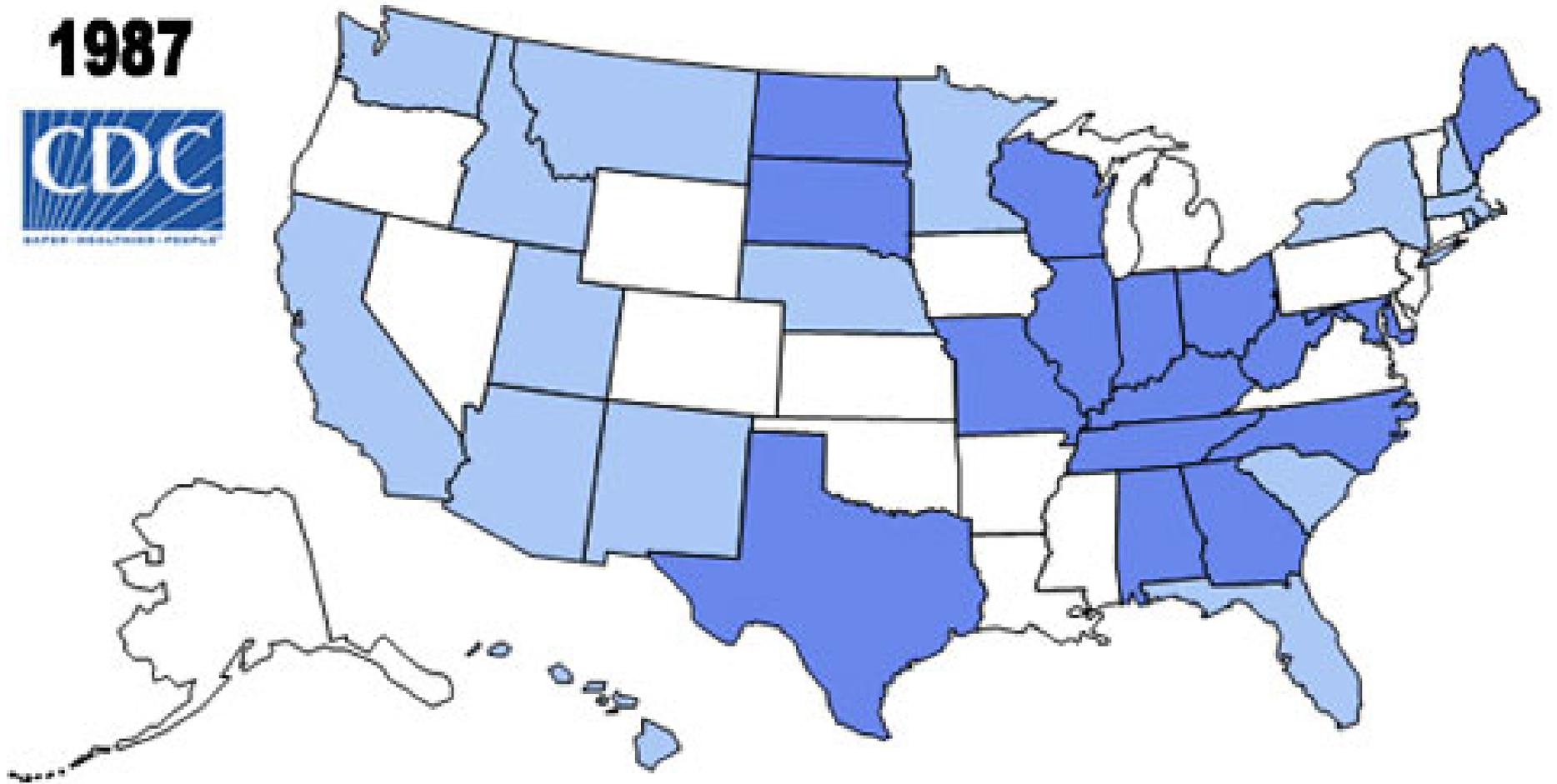
Obesity is a leading **preventable** cause of death worldwide. In the 21st century, authorities see obesity growing into a massive public health problem.

**1985**

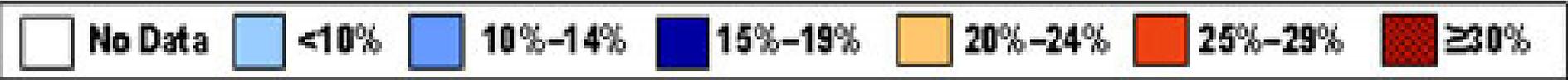
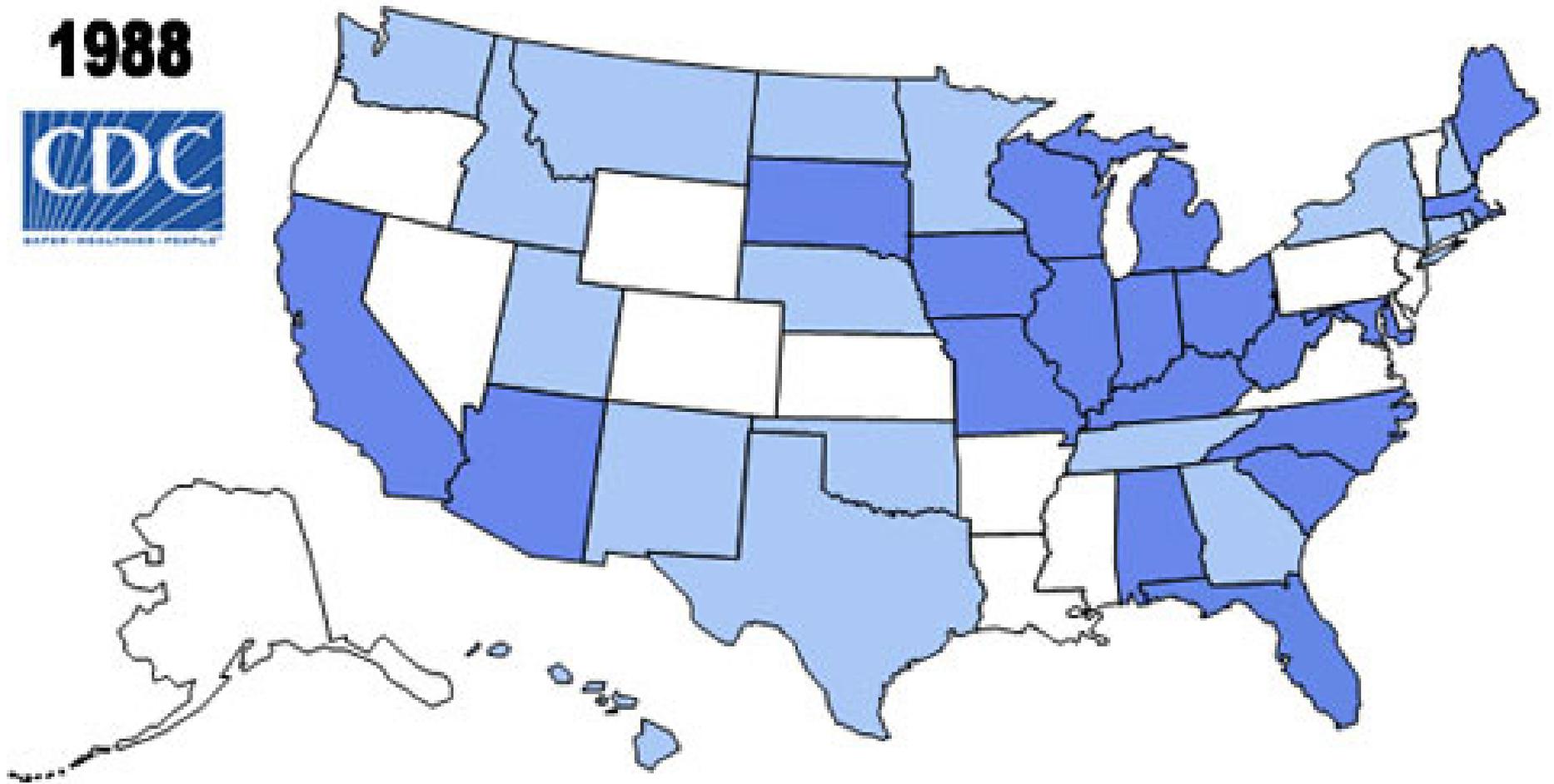




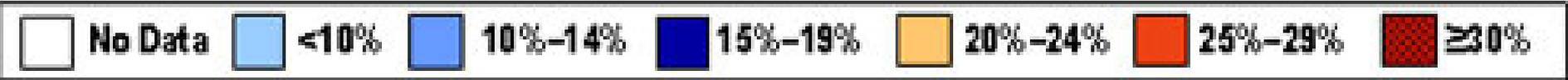
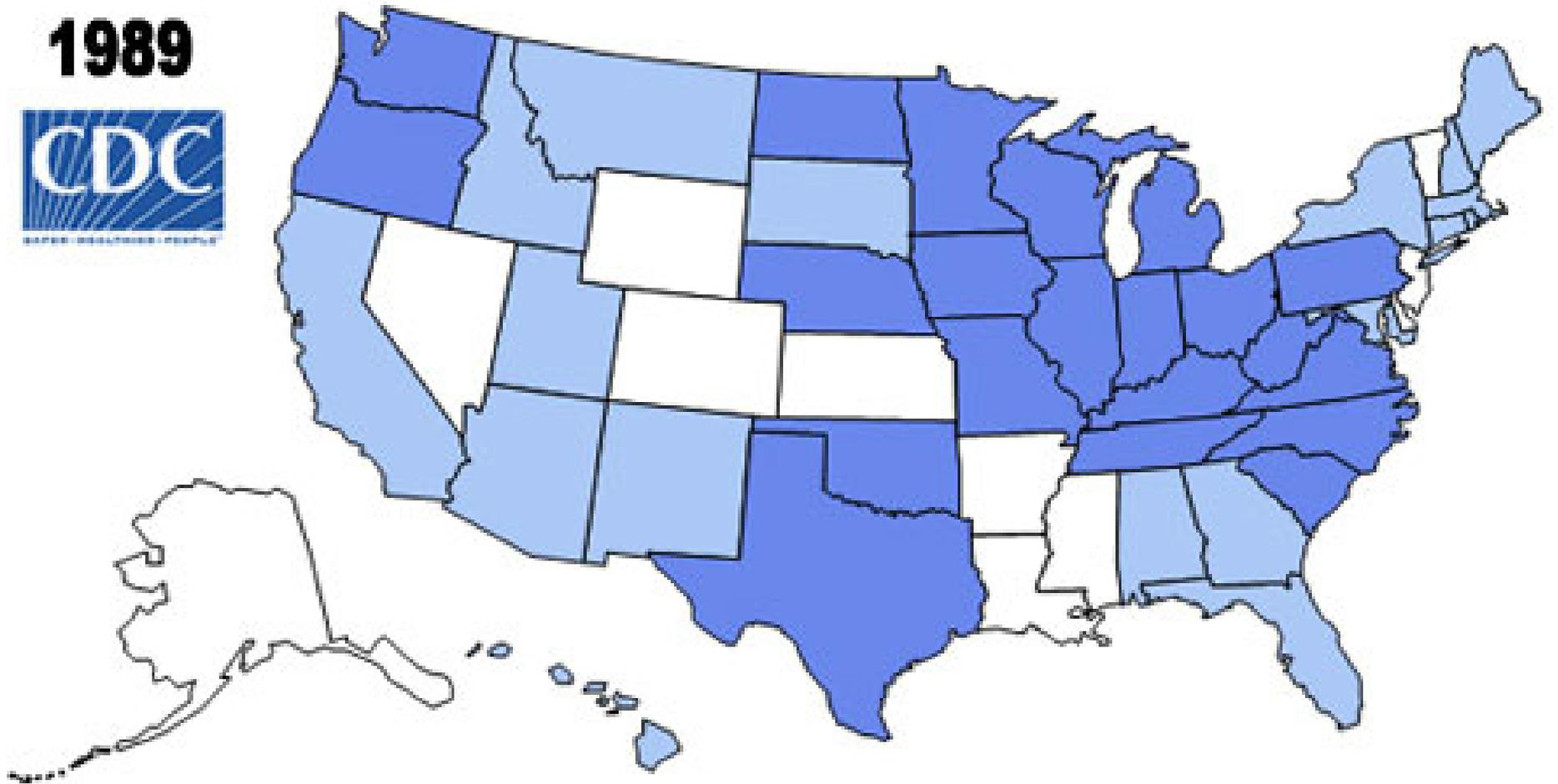
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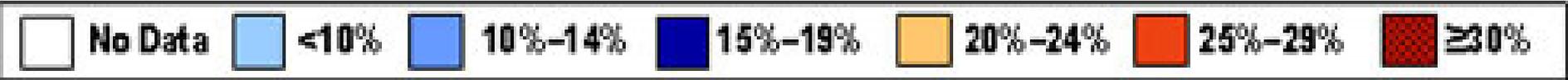
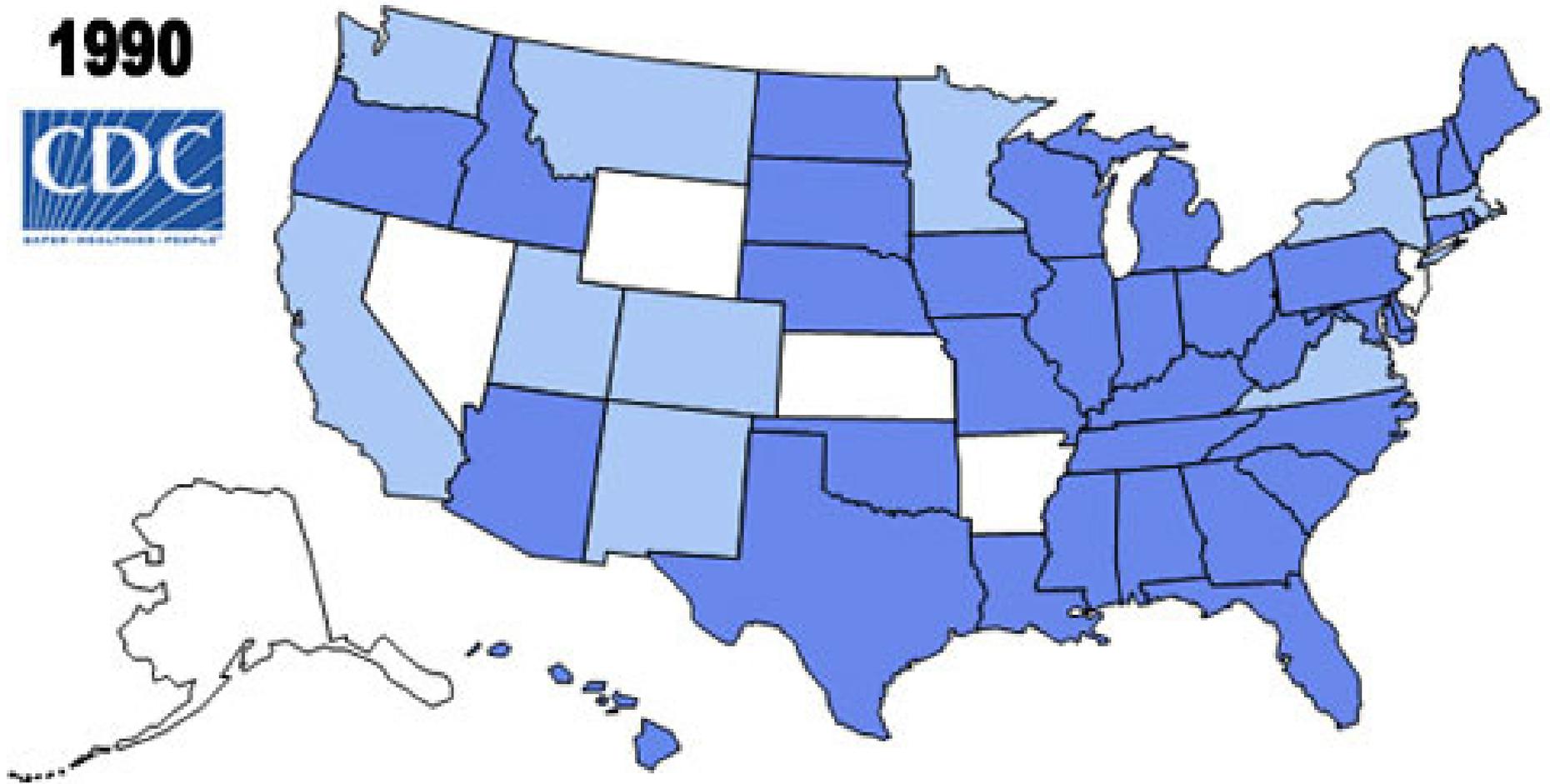
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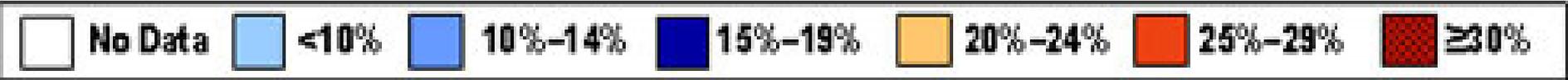
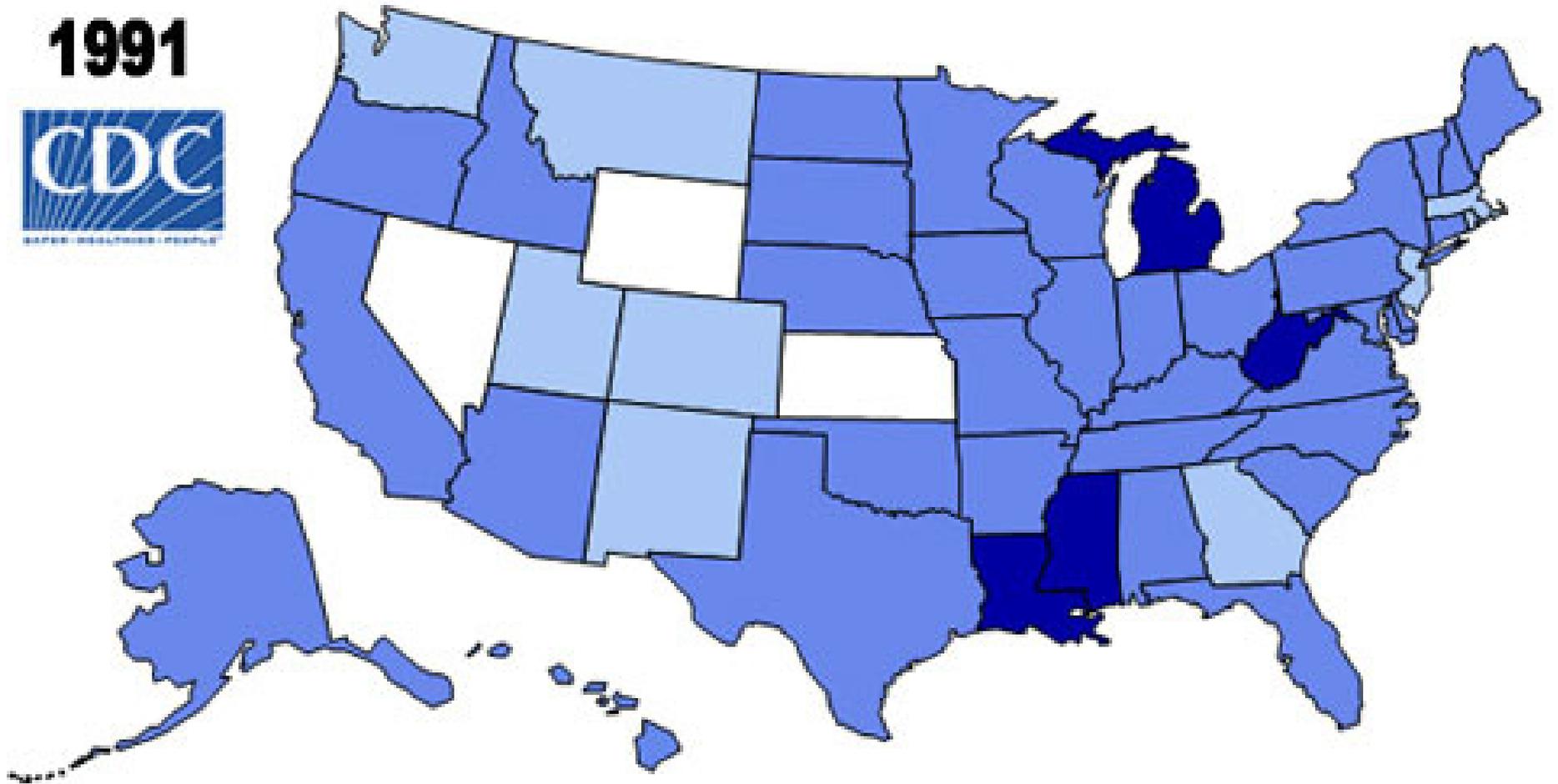
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**1990**

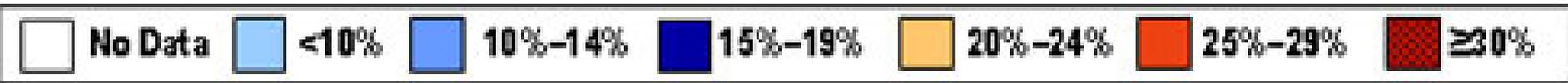
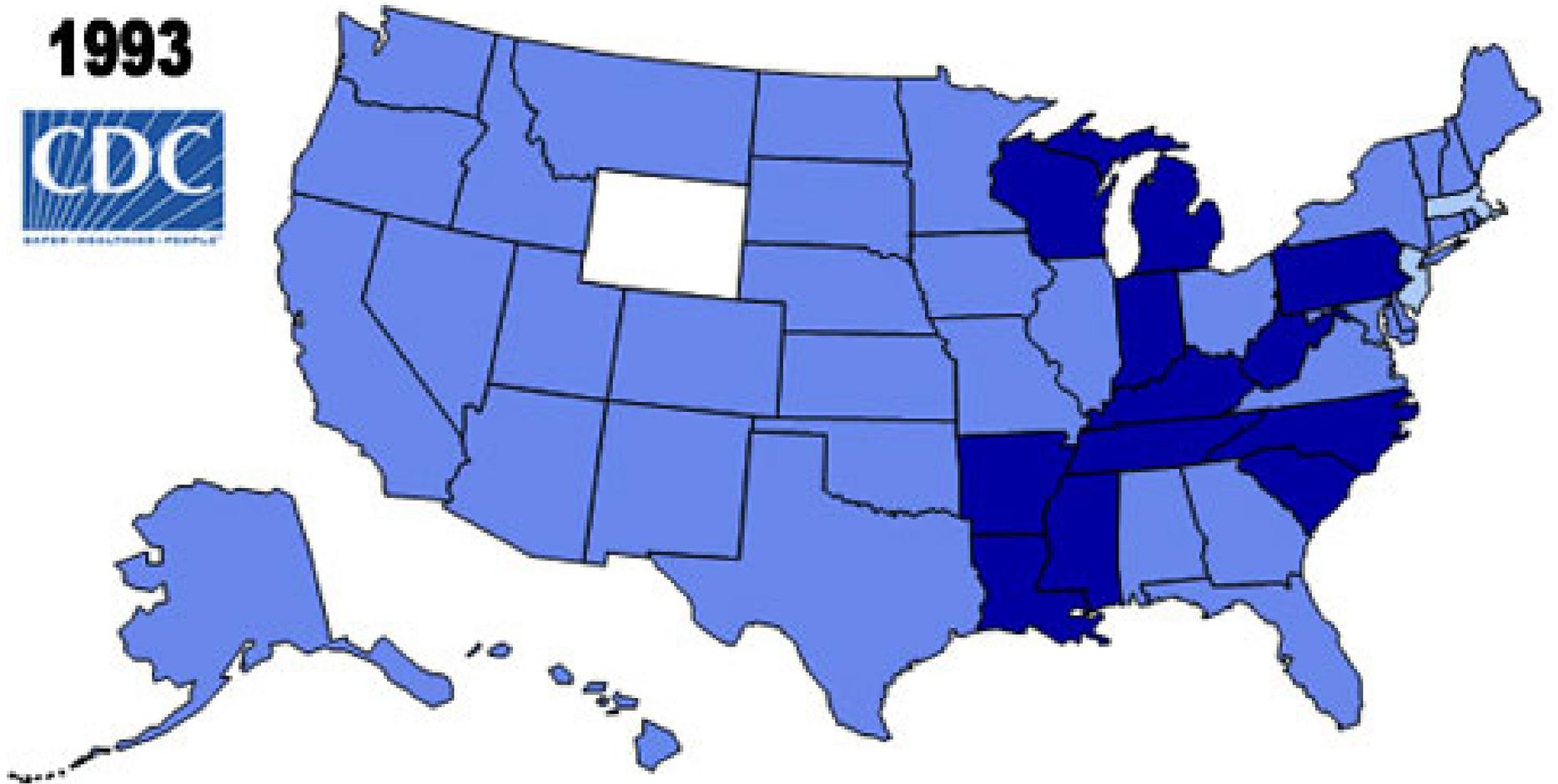


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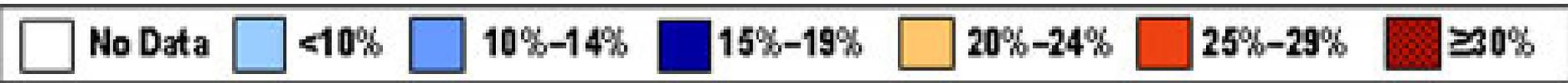
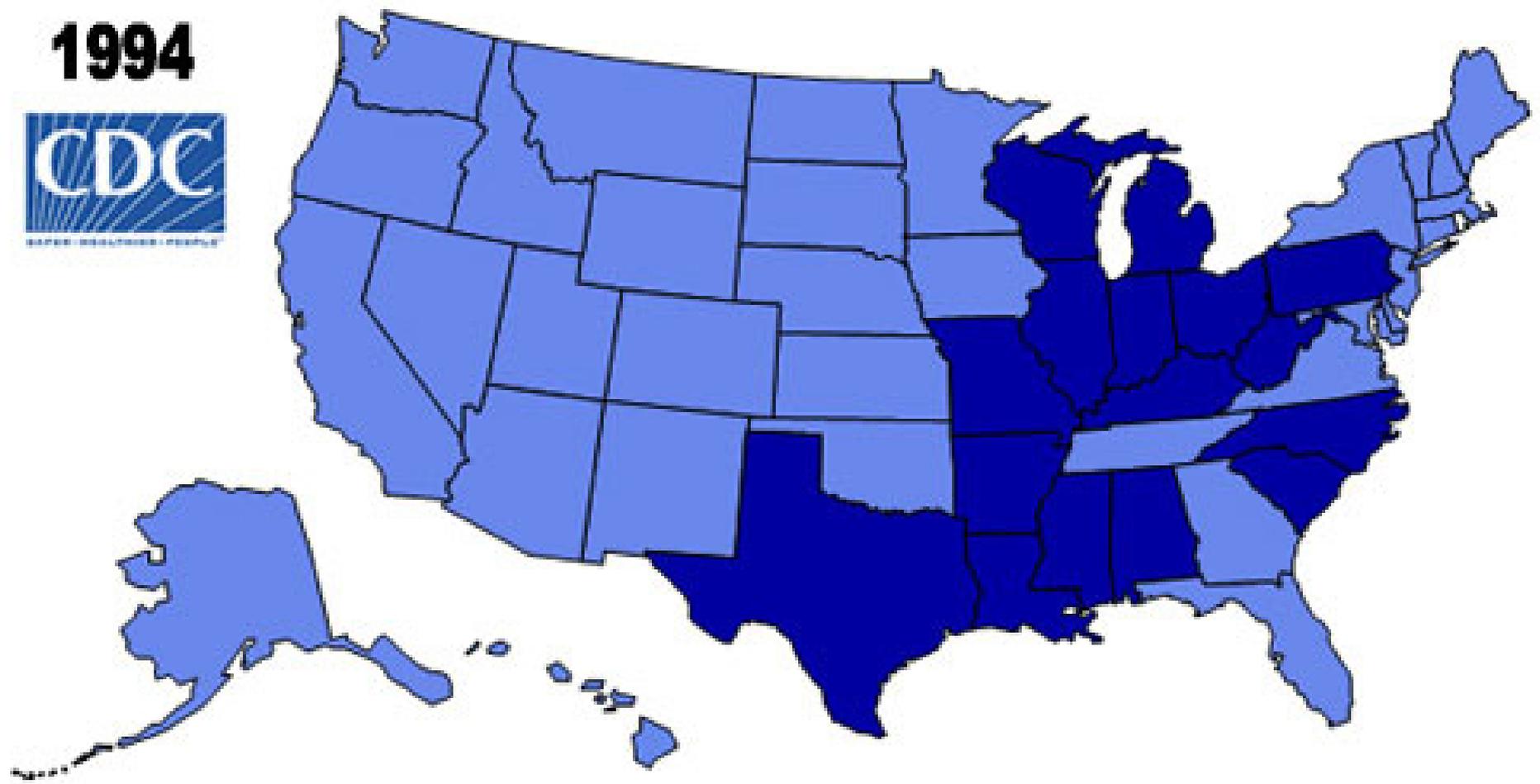




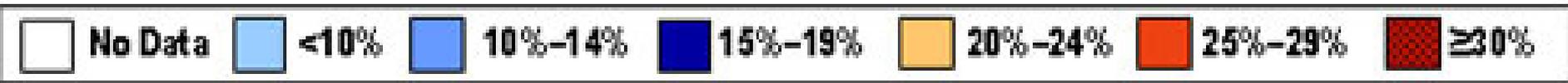
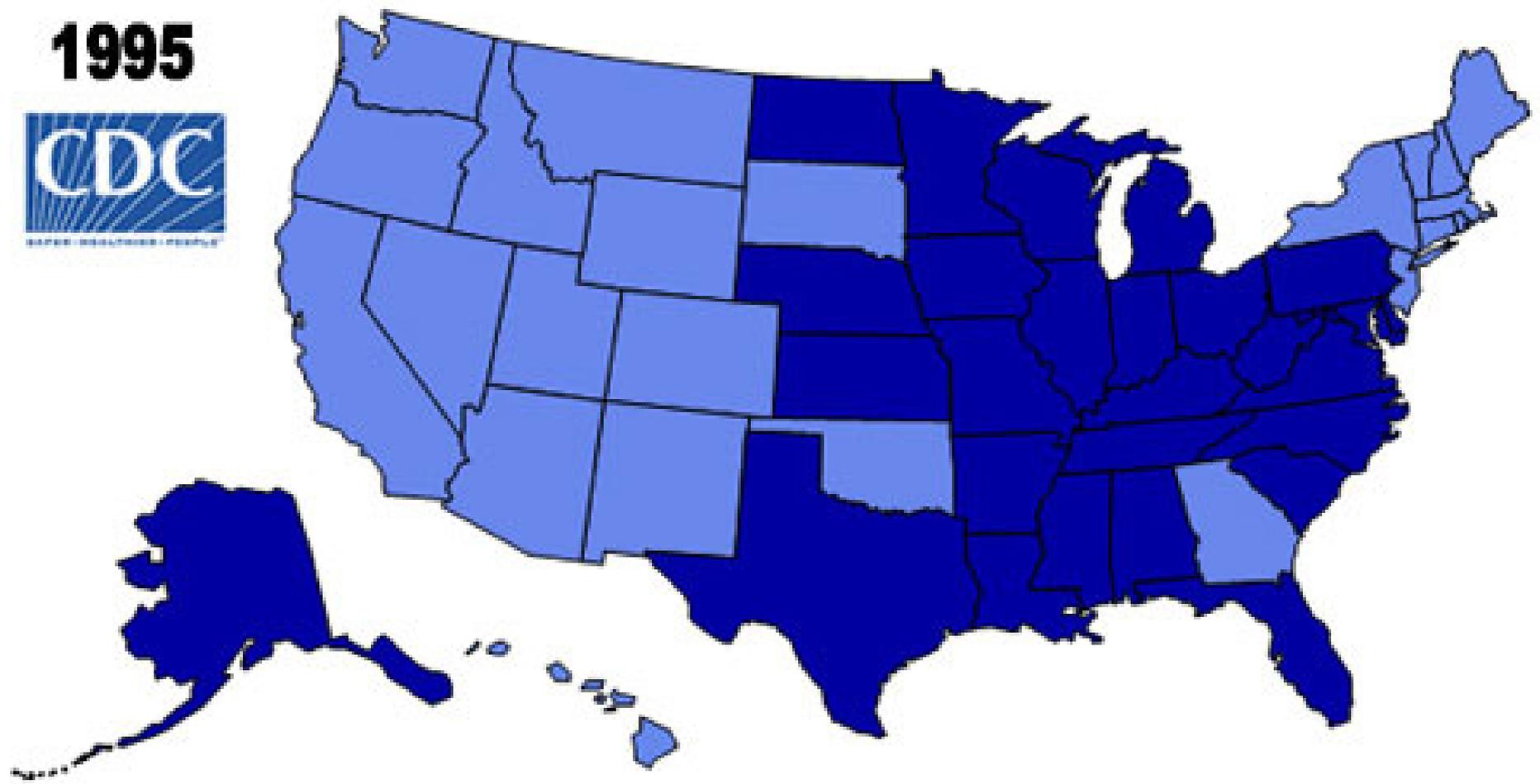
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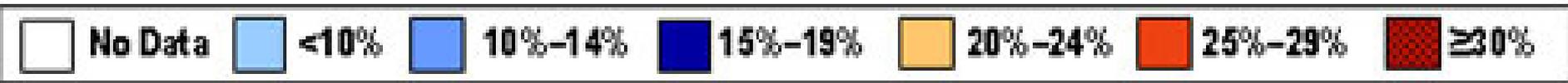
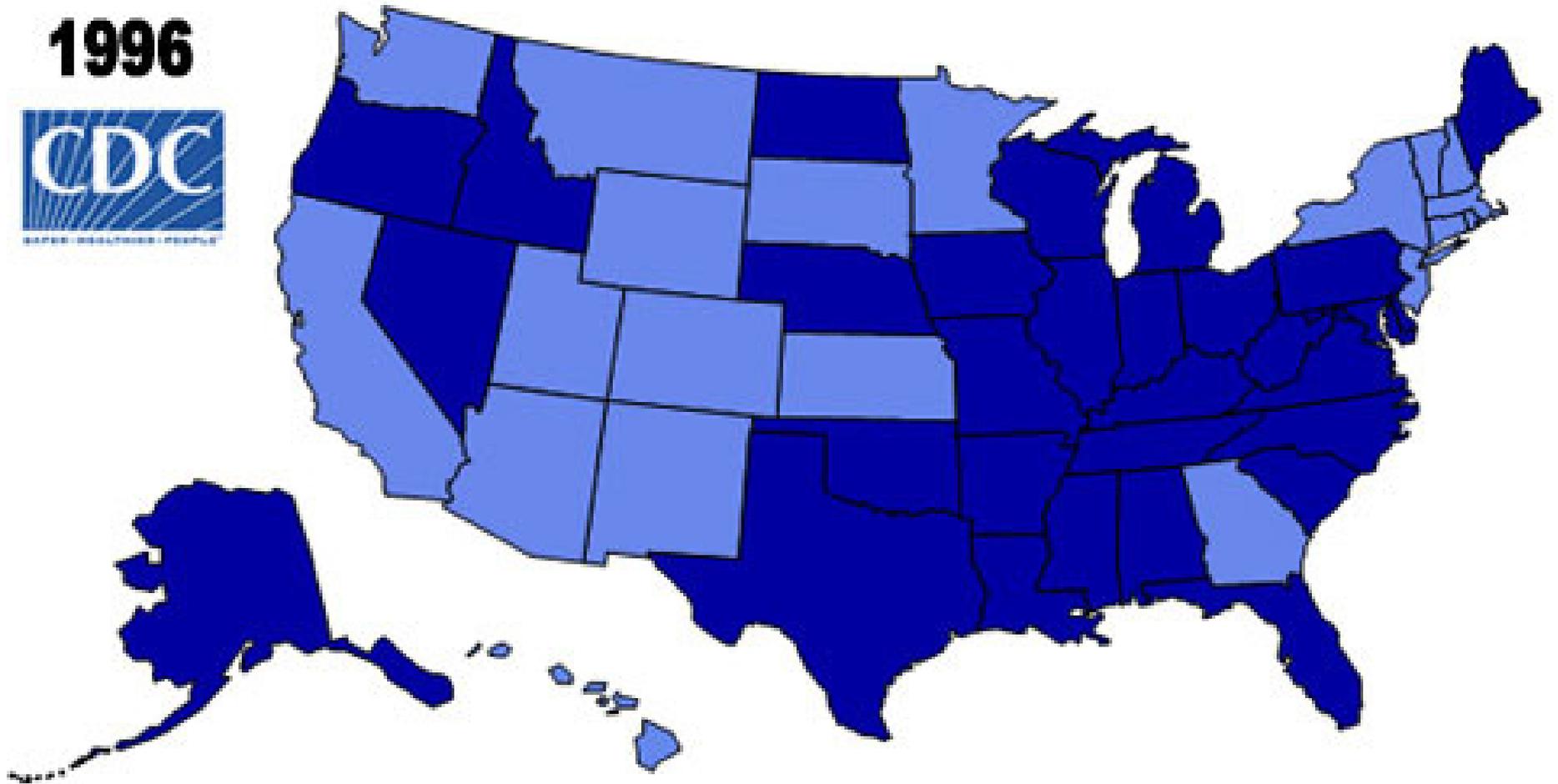
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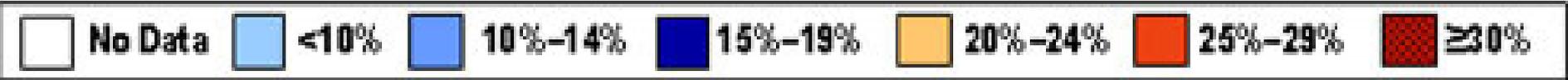
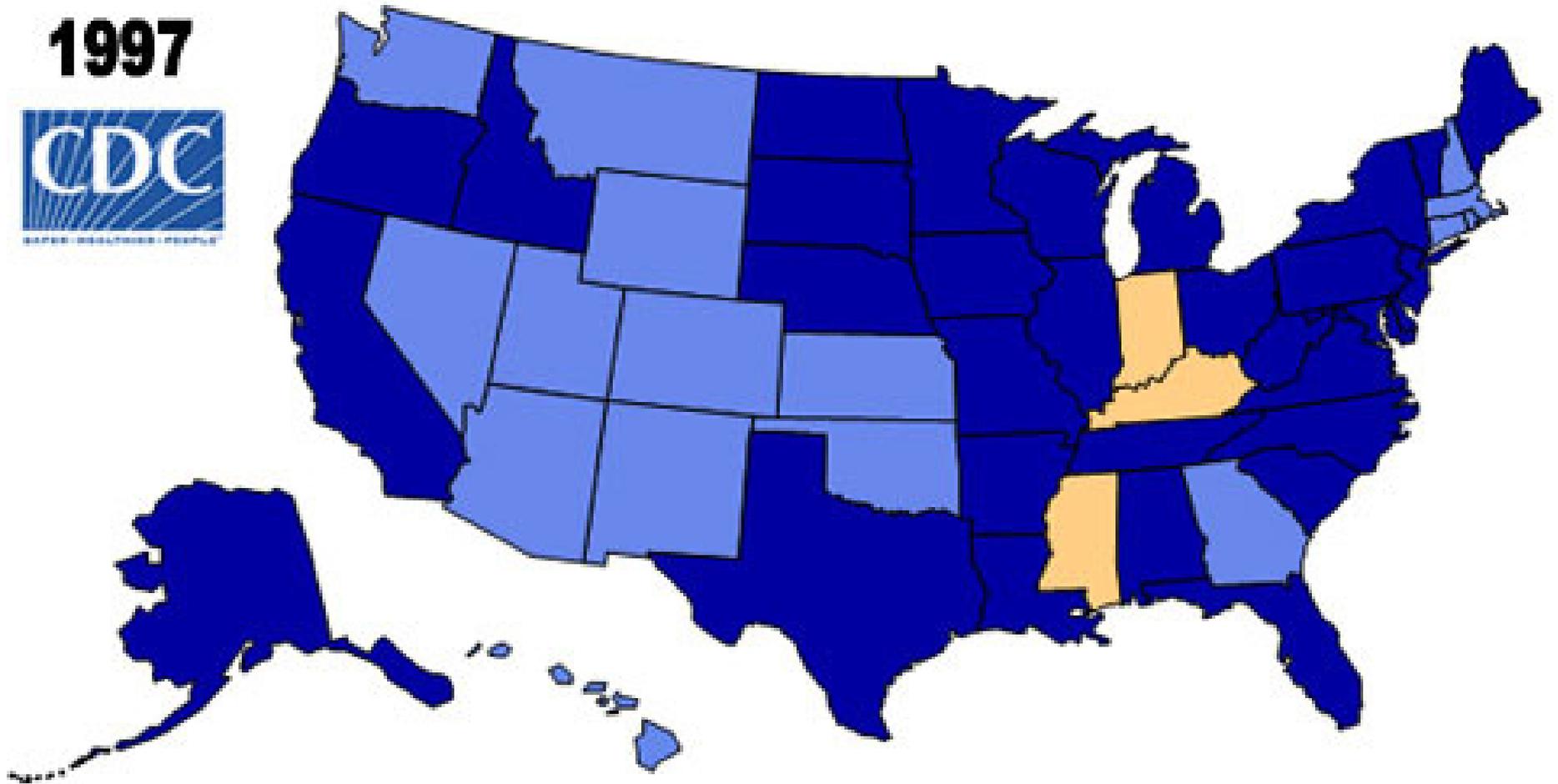
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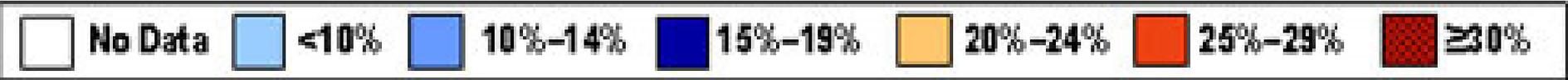
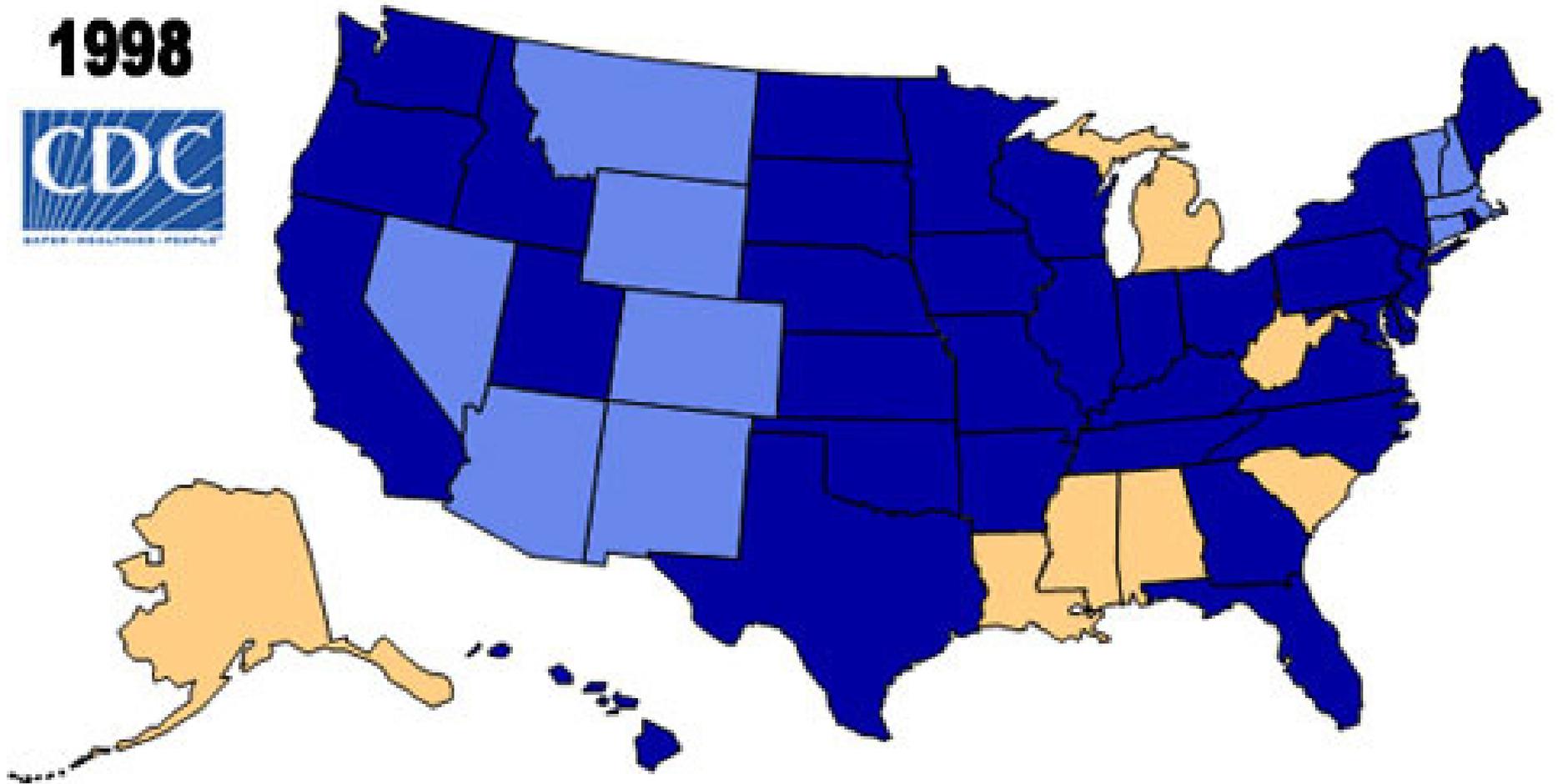
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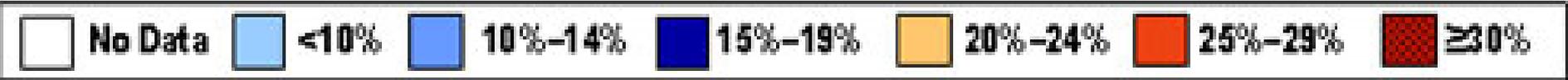
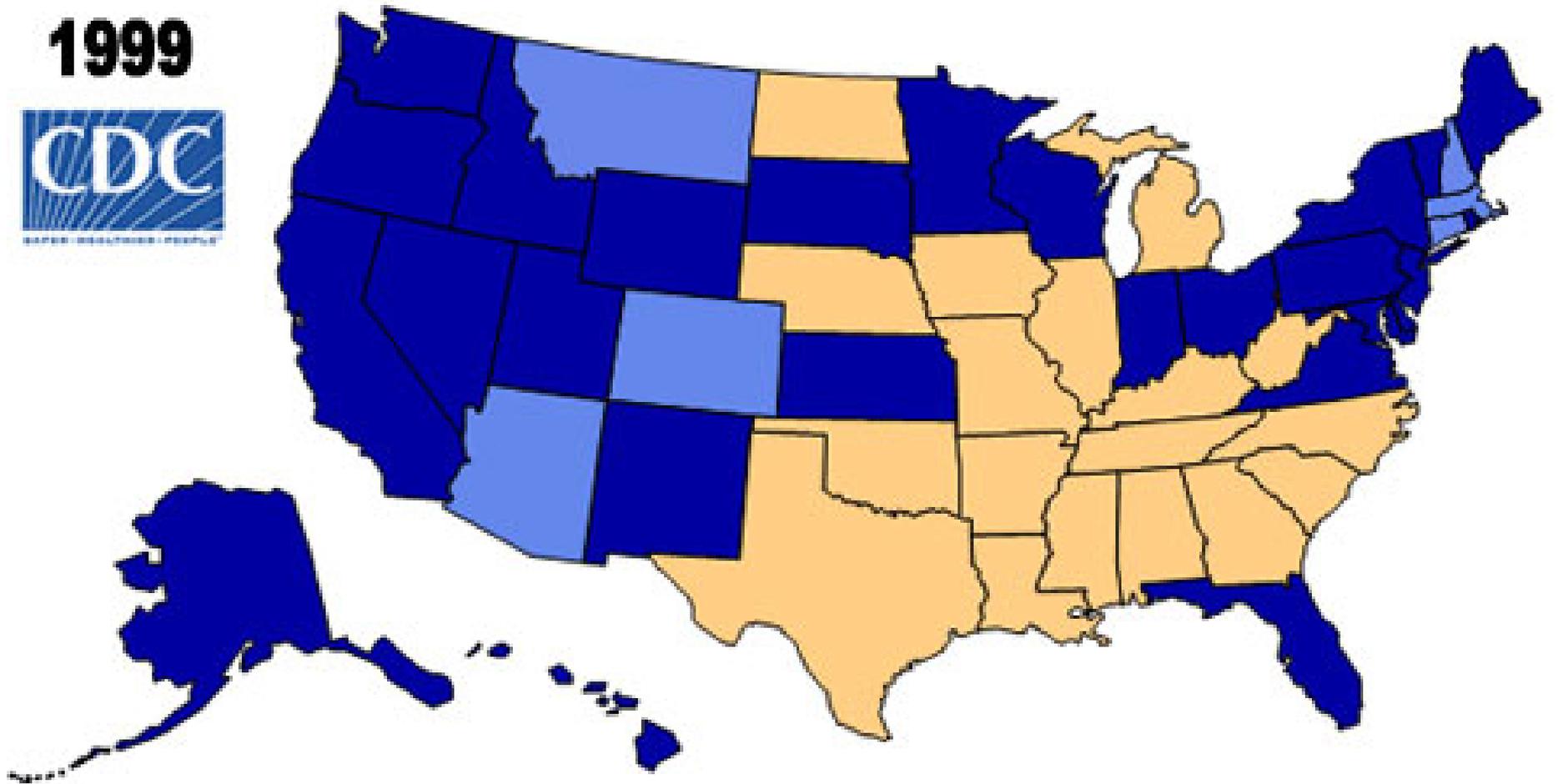
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**1998**

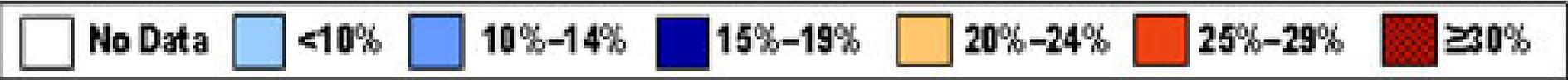
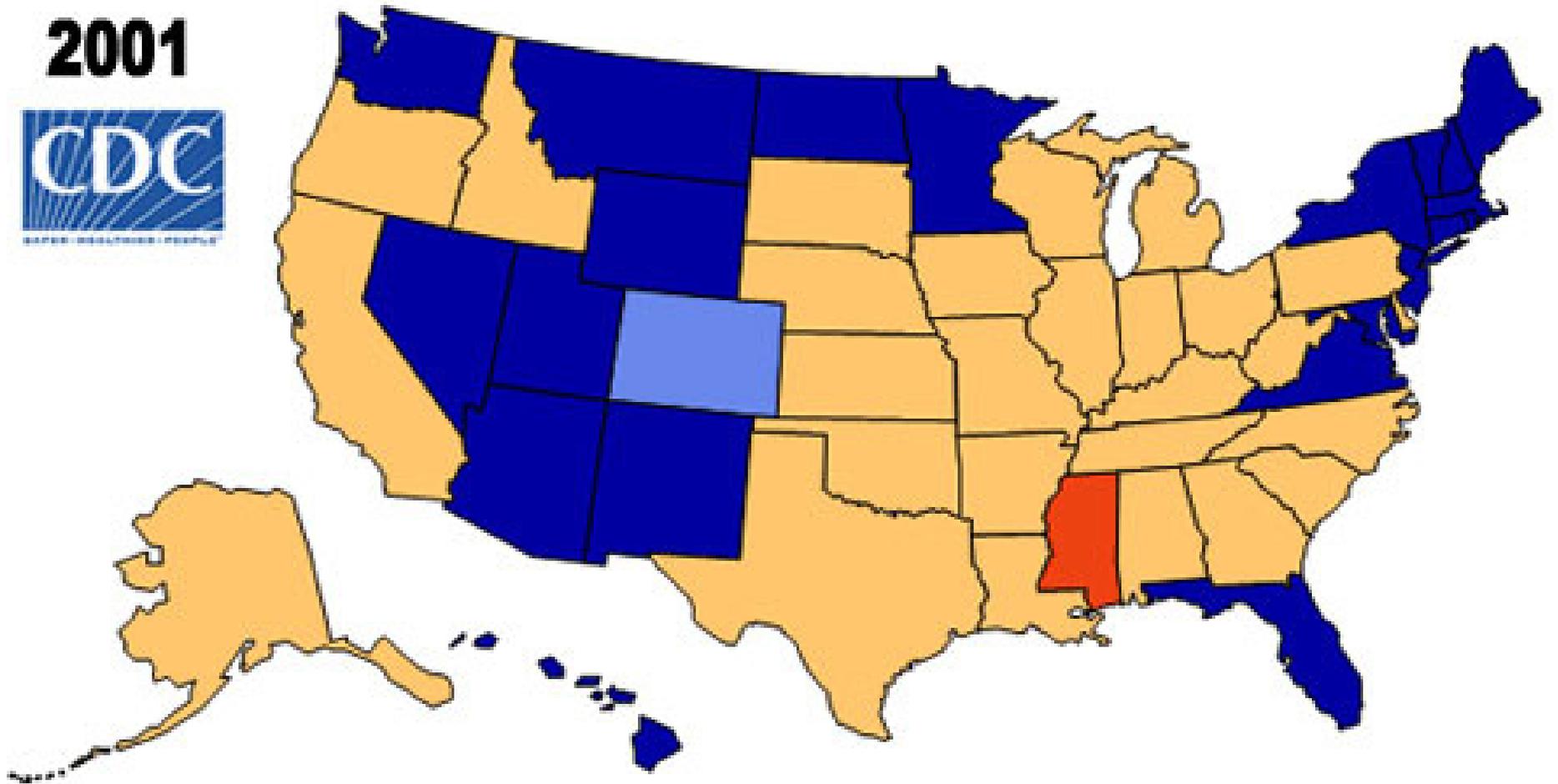


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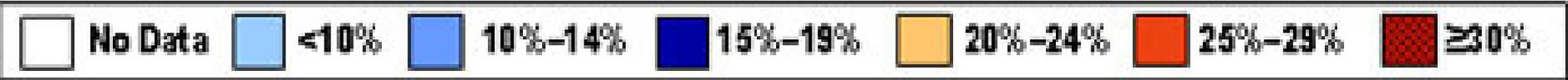
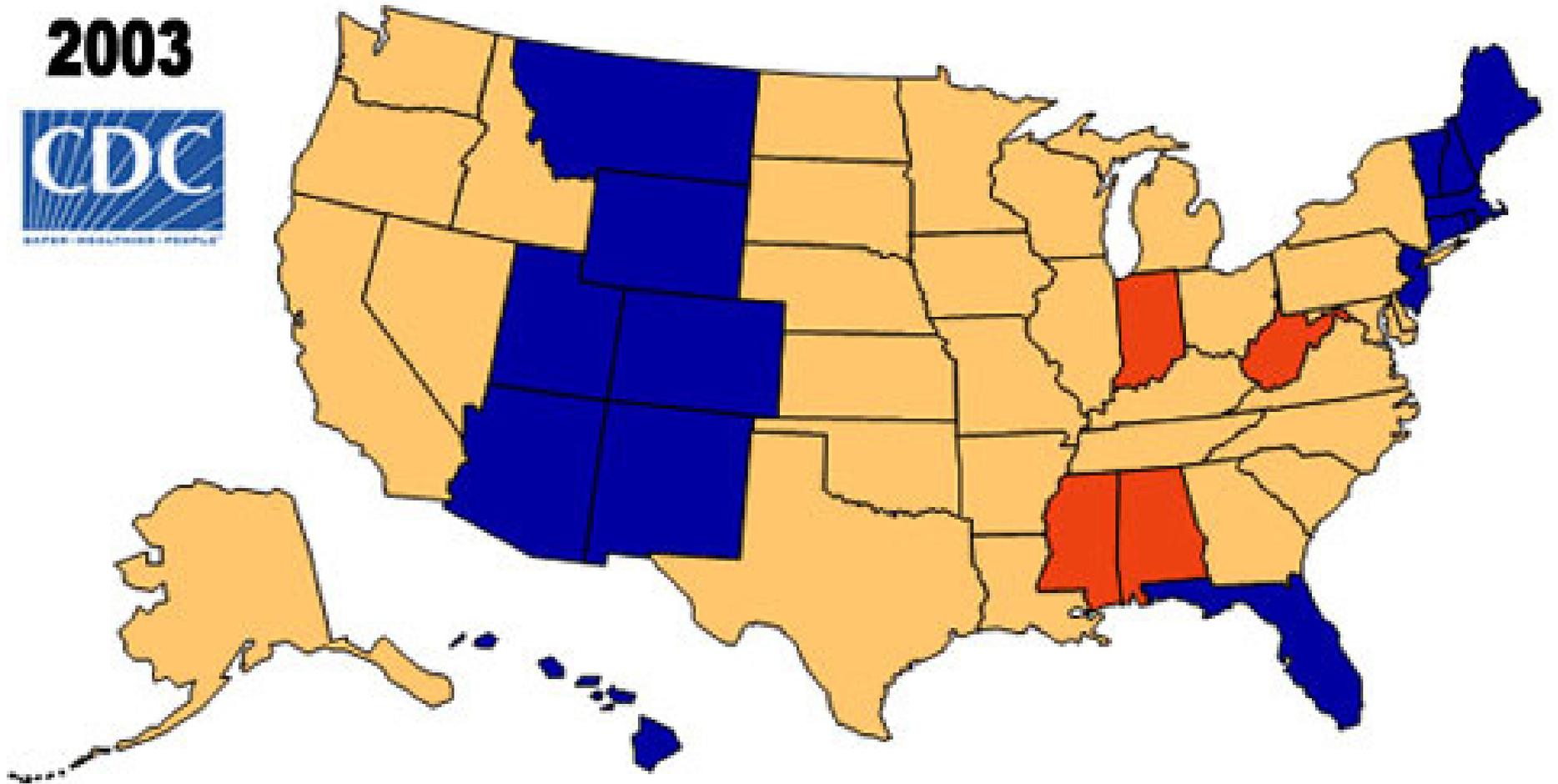


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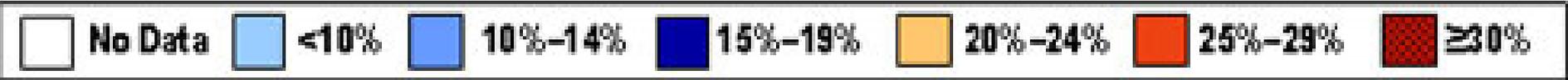
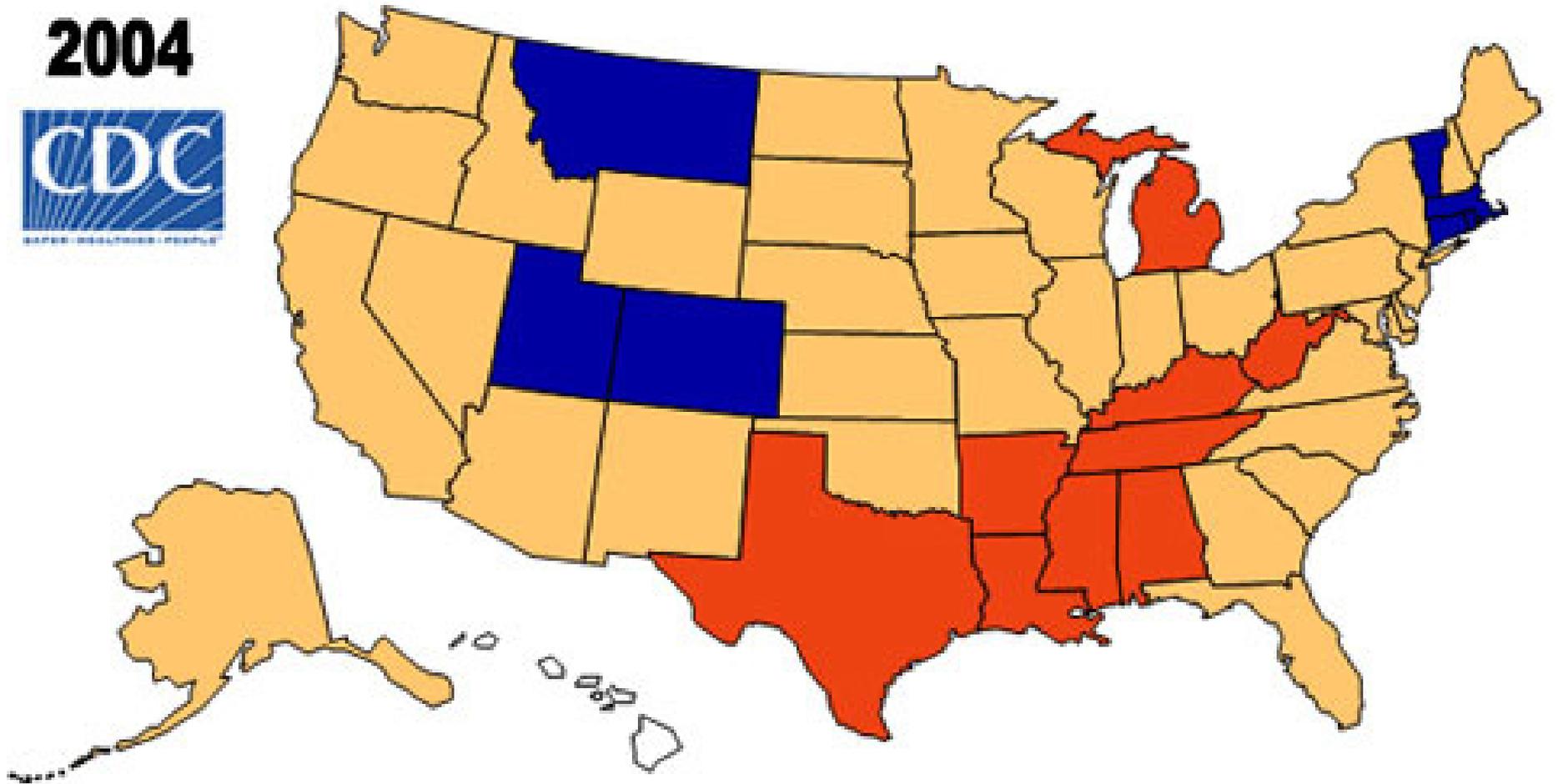




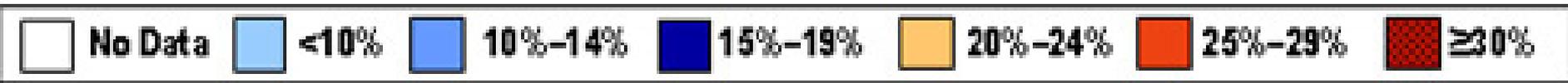
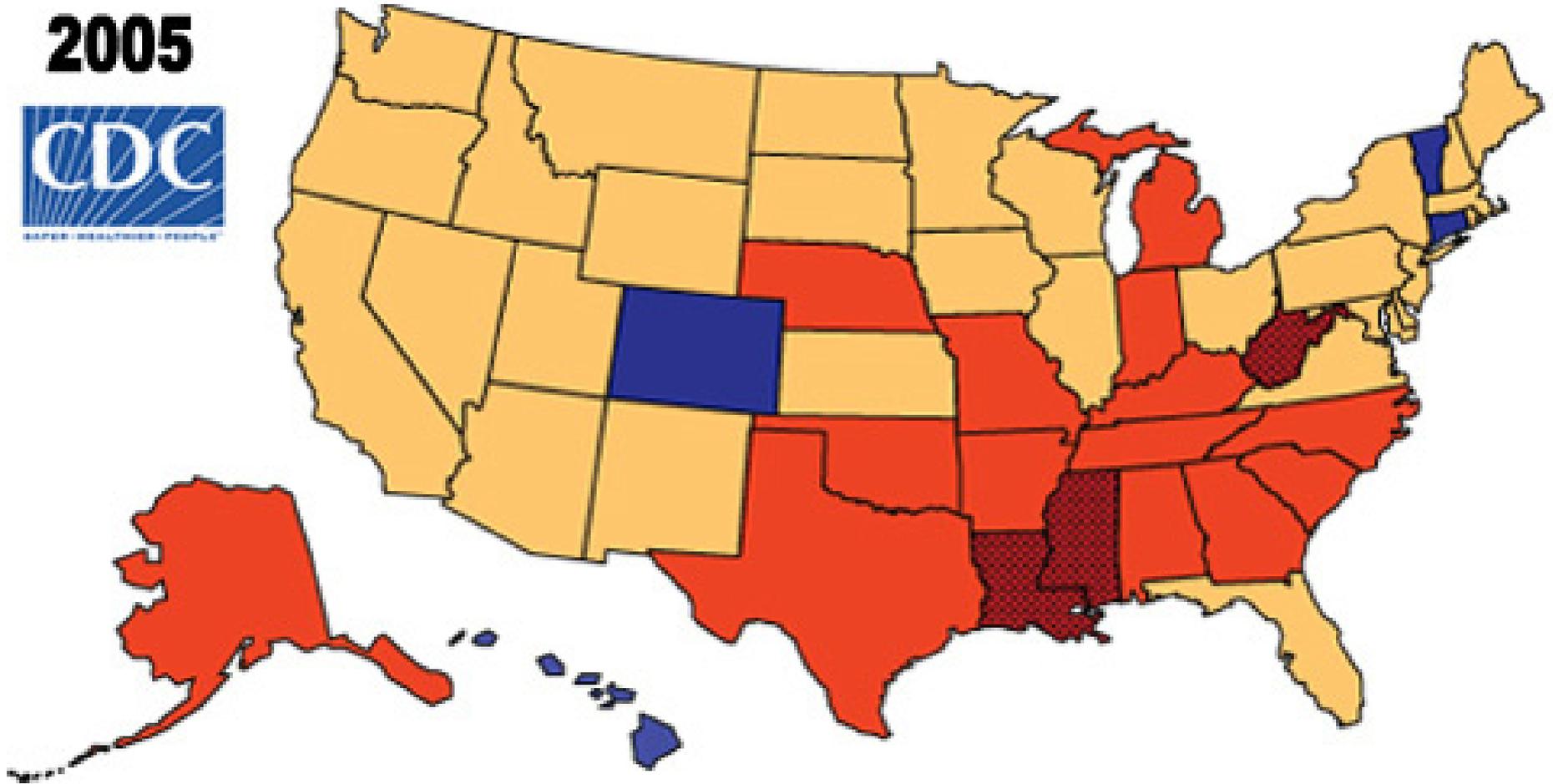
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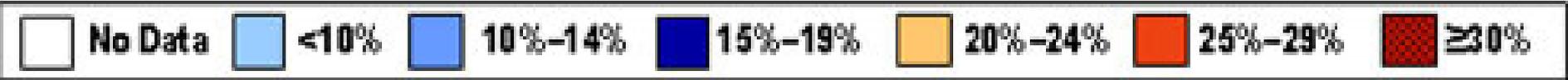
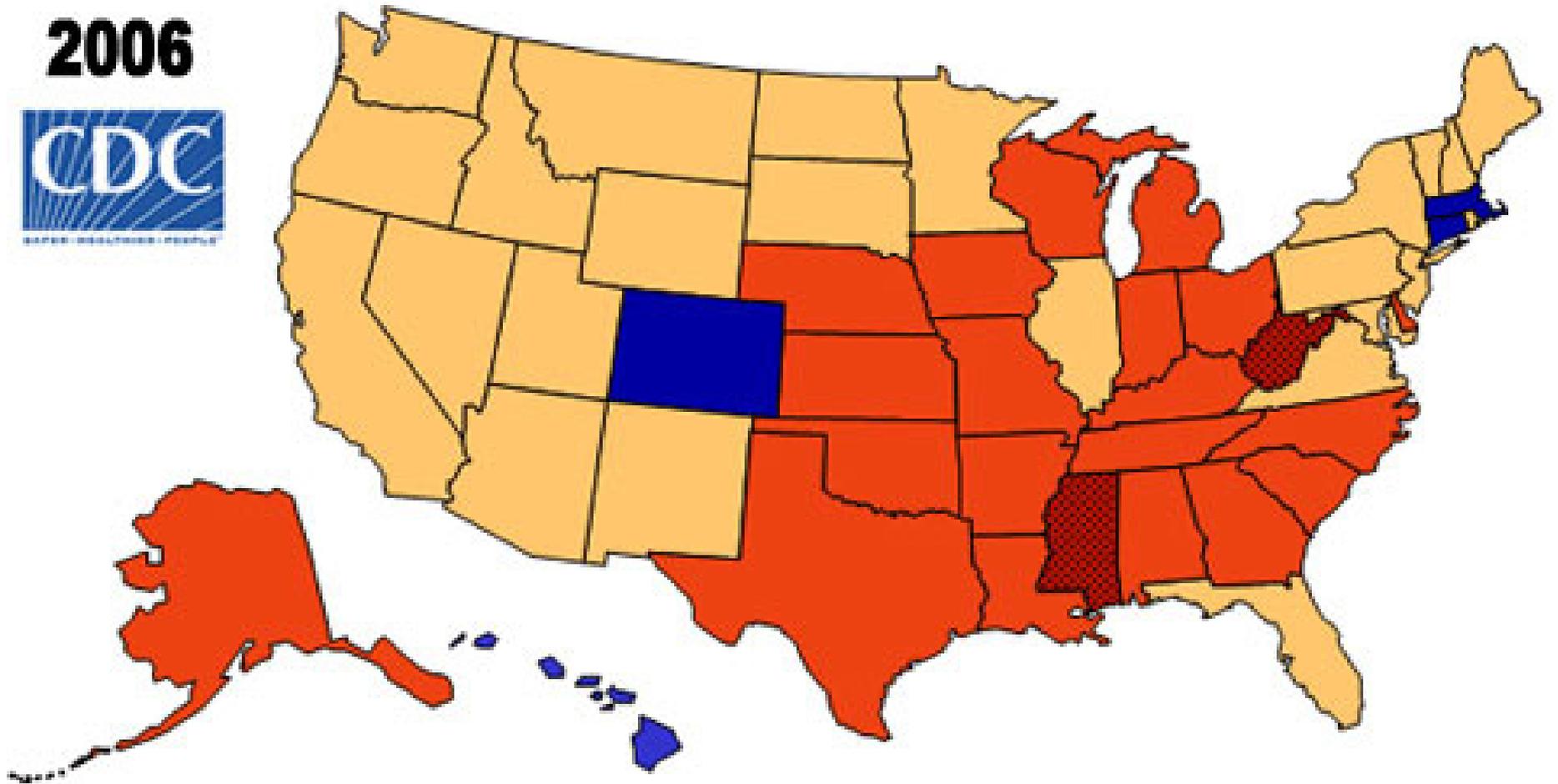
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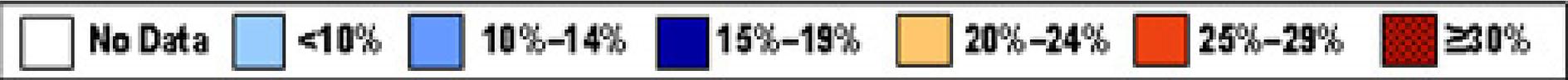
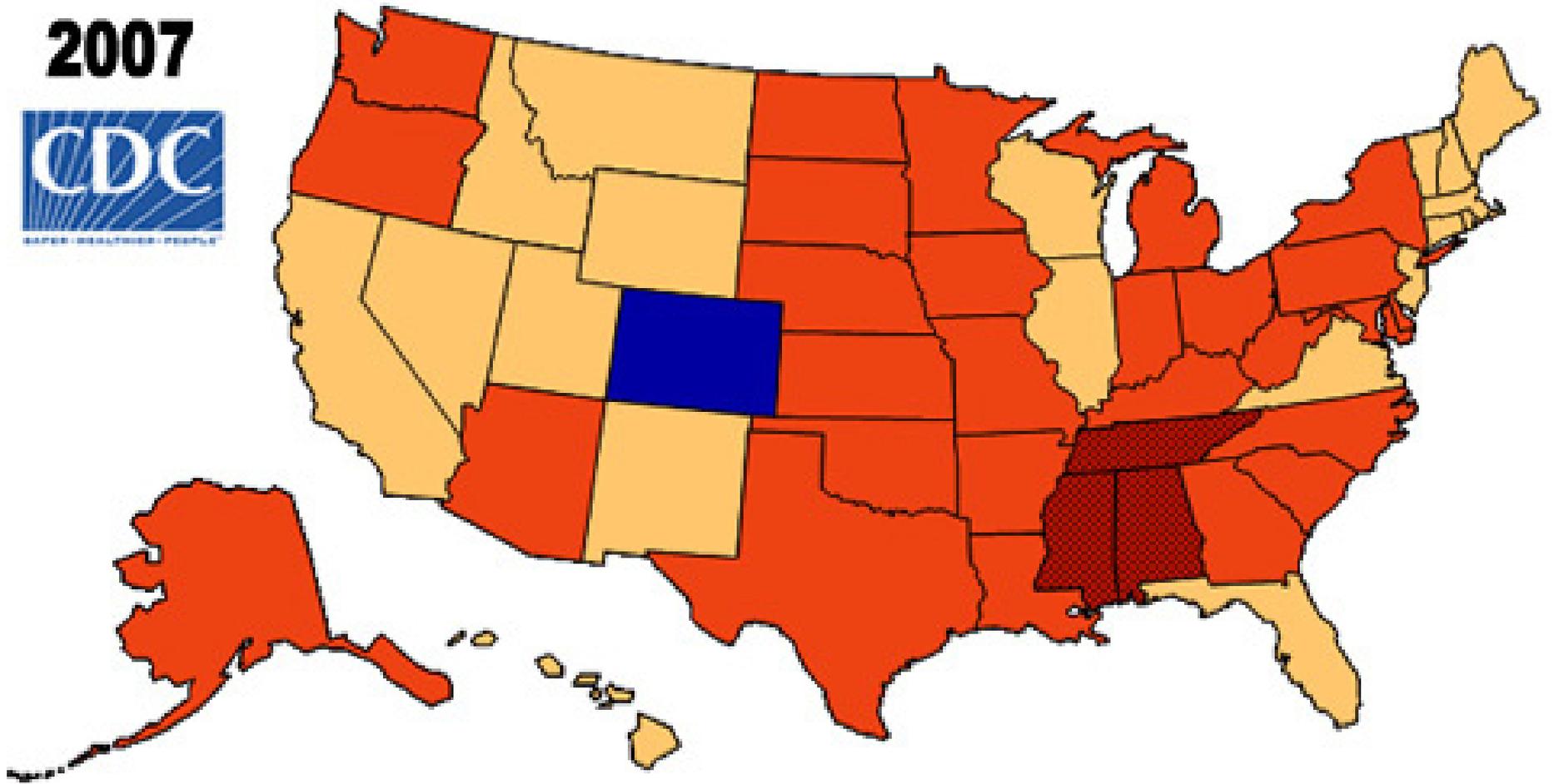
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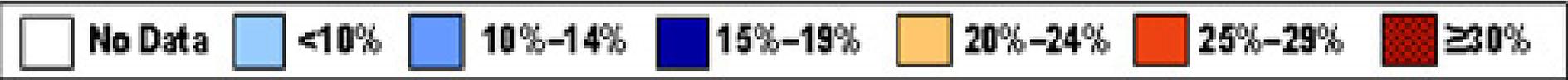
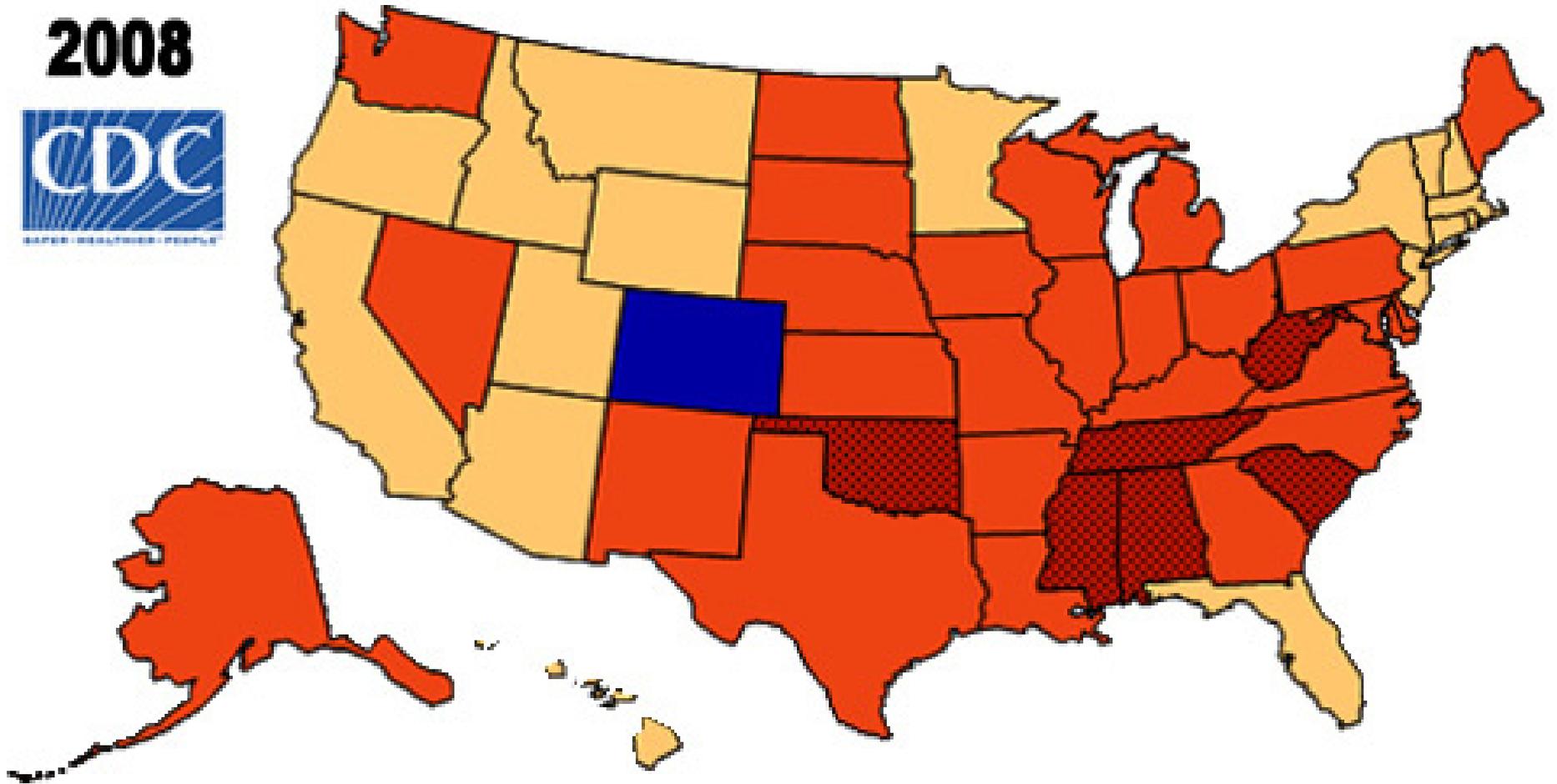
**2006**



**2007**



**2008**





# Intent: The Problem

It is important to look at obesity from an economic standpoint, because obesity even **affects people who do not have this medical condition.**

In 1998, the medical costs that attributed to obesity in the US were \$78.5 billion or 9.1% of all medical expenditures. The lifetime medical costs related to diabetes, heart disease, high cholesterol, hypertension, and stroke among the obese are **\$10,000 higher than among the non-obese.** Because medical costs are higher for the obese and premiums do not depend on weight, **lighter people in the same pool pay for the food/exercise decisions of the obese.** It is important to have obese prevention programs because they have been found to reduce the cost of obesity-related diseases.



The economic cost of obesity in the United States was about \$117 billion in 2000.

Industries are also effected by rising rates of obesity such as the **airlines with higher fuel costs** and pressure to increase seating width, and restaurants being **accused** of causing obesity.

# Intent: The Problem

Information from ARCHITECT magazine:

We're Number One: Move Faster : Sheet1	
Move Faster	
We Like Public Transportation	
131%	It's assumed that we drive because we prefer to. Yet in 2009, public transit ridership was 131% of what it was in 1995.
60%	If we love driving so much, why would 3 in 5 voters say they'd rather improve public transit and make it easier to walk and bike than build and expand roads?
73%	73% of voters currently feel they "have no choice but to drive as much as" they do, says a recent survey.
We Can Walk It Off ...	
Most walkable major U.S. city: San Francisco Least walkable major U.S. city: Jacksonville, Fla.	
44%	Overweight and obesity rate, san francisco
62%	Overweight and obesity rate, Jacksonville/Duval County, Fla.
If There's Mixed Use	
12.2%	According to a study of the Atlanta region, the odds of obesity declined by 12.2% for each quartile increase in mixed use.
4.8%	The odds of obesity went down by 4.8% for each kilometer walked, according to the same study.
6%	But for each hour spent in a car per day, the odds increased by 6%.
And Not Just TV To Entertain Us	
8h 11min	The average American household watches more than 8 hours of television per day, a full-time job.
Use Your Commute	
25.5min	The average commuting time in the u.s. (each way) is 25.5 minutes.
	Spend those minutes in a car, and you'll burn a mere 64 calories. walking or biking to work will get you fitter, and slimmer.
Steps Of Our Lives	
5062	Total steps taken in an average day by a lawyer
9646	Total steps taken in an average day by a construction worker
18904	Total steps taken in an average day by a mail carrier

A **sedentary** lifestyle plays a **significant** role in obesity. Worldwide there has been a large shift towards less physically demanding work, and currently at least 60% of the world's population gets **insufficient exercise**. This is primarily due to increasing use of mechanized transportation and a greater prevalence of labor-saving technology in the home. In children, there appears to be declines in levels of physical activity due to less walking and physical education. The World Health Organization indicates people worldwide are taking up **less active recreational pursuits**.

ARCHITECT magazine says “Even if we’re careful about eating healthfully, the best diet in the world can’t make up for a **sedentary** lifestyle. And boy, are Americans sedentary. We commute—usually by car—to our jobs, which are mostly at desks. But as these graphics show, a surprising amount of activity can be slotted into the **average workday**. Commuting by foot or bicycle can translate into an hour of calorie-burning, mood-lifting exercise. Moving more while on the job can help, too.”

# Problem Statement

How is a person's **behavior** affected by architecture?

And furthermore, how does architecture impact a person's **wellness**?

# Intent: Project Justification

Our society **makes behavioral decisions** every day that may or may not lead to better health. Choosing **poor** behavioral decisions may eventually lead to **obesity, stress, diabetes, depression**, and America's number one killer, **heart disease**. According to CDC (Centers for Disease Control and Prevention), America's obesity problem has been increasing in the last 20 years. About every 25 seconds, an American will have a coronary event, and about one American every minute will die from one. **Well-designed architecture** may benefit our society's behavior and help our **habits to change unconsciously**, because healthy habits **conserve** sustainable human development.

# Intent: Abstract

The mere sight of architecture can create a behavioral response. This thesis **seeks** to develop a better **understanding** of **architecture's impact on health and wellness**. Architecture can create sensory responses with color, odor, illumination, vibration, etc. This Lifestyle Center doesn't just provide a program to **promote healthy behavior** but its architecture **influences healthy decisions**.

# Intent: User/Client

Obesity is the last socially acceptable form of **discrimination**. Obese people claim to experience invisibility; people do not look them in the eye the same way they would with a thin person, and professional colleagues, in most instances, do not take them as **seriously**. This in turn becomes an **emotional battle**. Food indulgence is perpetual and becomes uncontrollable as life confronts them with daily conflict. Slowly, the weight will gain and the **disorder often becomes invisible** to the over eater.

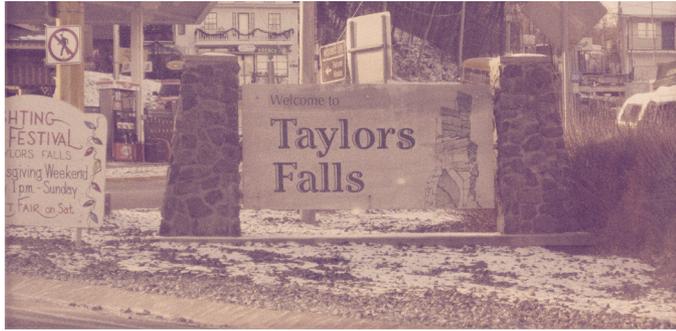
It is important to recognize this because obese parents are more likely to have obese children. **Children are very responsive to the lifestyles and habits of their parents**. Children will follow the same dietary and exercise habits of their parents and if they make **poor lifestyle choices** it encourages their **children to follow the same attitudes and behaviors**. These behaviors lead to obesity as children that will stay with them into adulthood and will eventually run another vicious cycle.

It is important to address obesity as **family matters** so that both the adult and child are not devaluing the importance of a healthy, **active lifestyle**.

Why is this problem important to me?

Dance Instructor and Choreographer at Red River Dance and Performing Company  
Research Project in the Fall Semester of 2010

# Site:



## Why Taylors Falls?

Taylors falls carries a certain **character** and spirit. It has a **rich history**. It was an important transportation route for Native Americans and became a route for European Fur Traders. The region of Taylors Falls was also significant for boat building and logging. During the logging era (1837-1893) there were major logging jams due to the narrow gorge. To prevent further catastrophic jams and control water flow, the **Nevers Dam** was built.

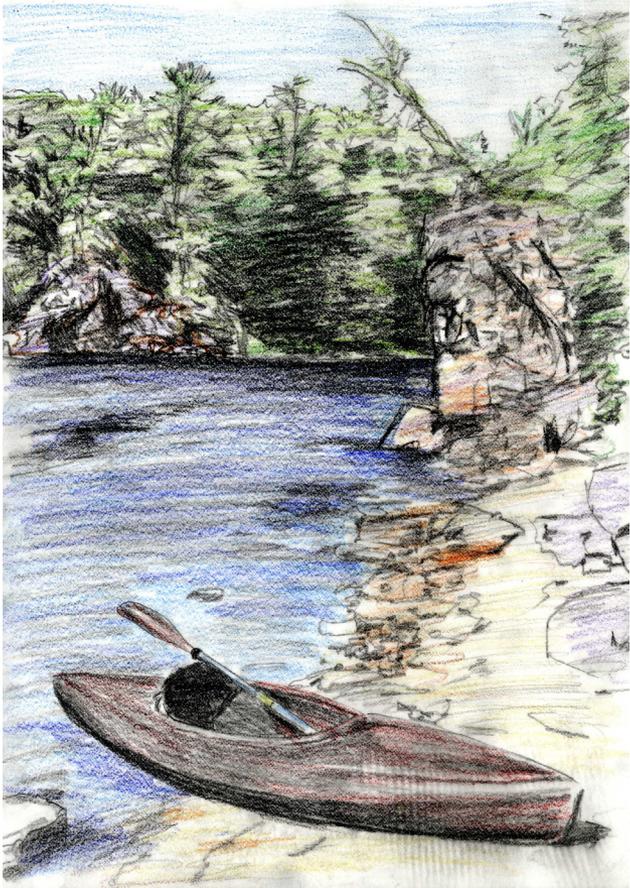


Taylors Falls is a place for passer-byes, those in the area for **scenic or active reasons**, and those who pass by because of transportation, both by travel and for a job. Taylors Falls has a **culture of hard working people** and the beauty of the area helps give it an **uplifting spirit**.



# Site:Taylors Falls, MN

Taylors Falls is located near many state park and recreation areas which include **scenic boat tours, paths, rock climbing, campgrounds, and canoe & Kayak rentals**. The site is located in the middle of each activity and will also be owned by the state. This will also attract and provide activity for the inhabitants of the program.



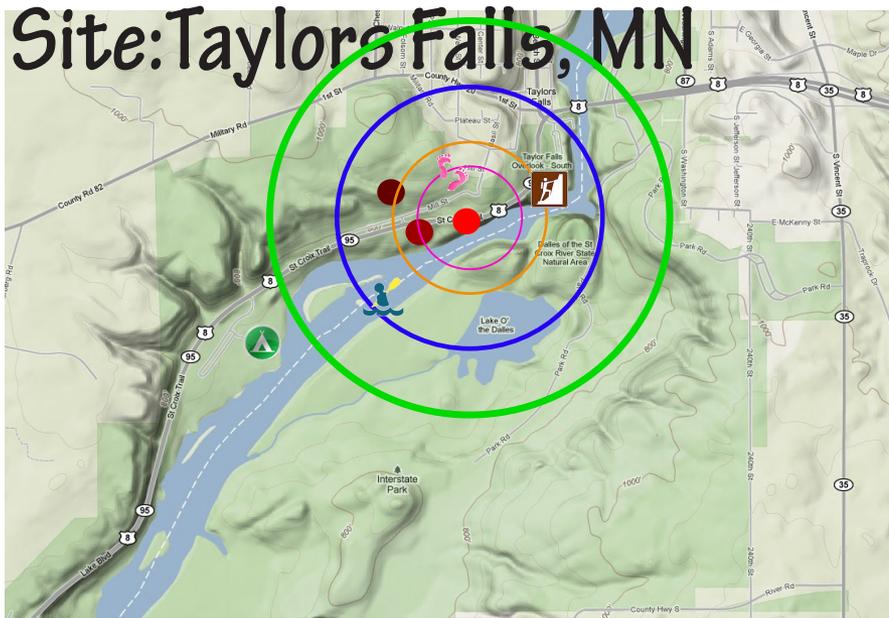
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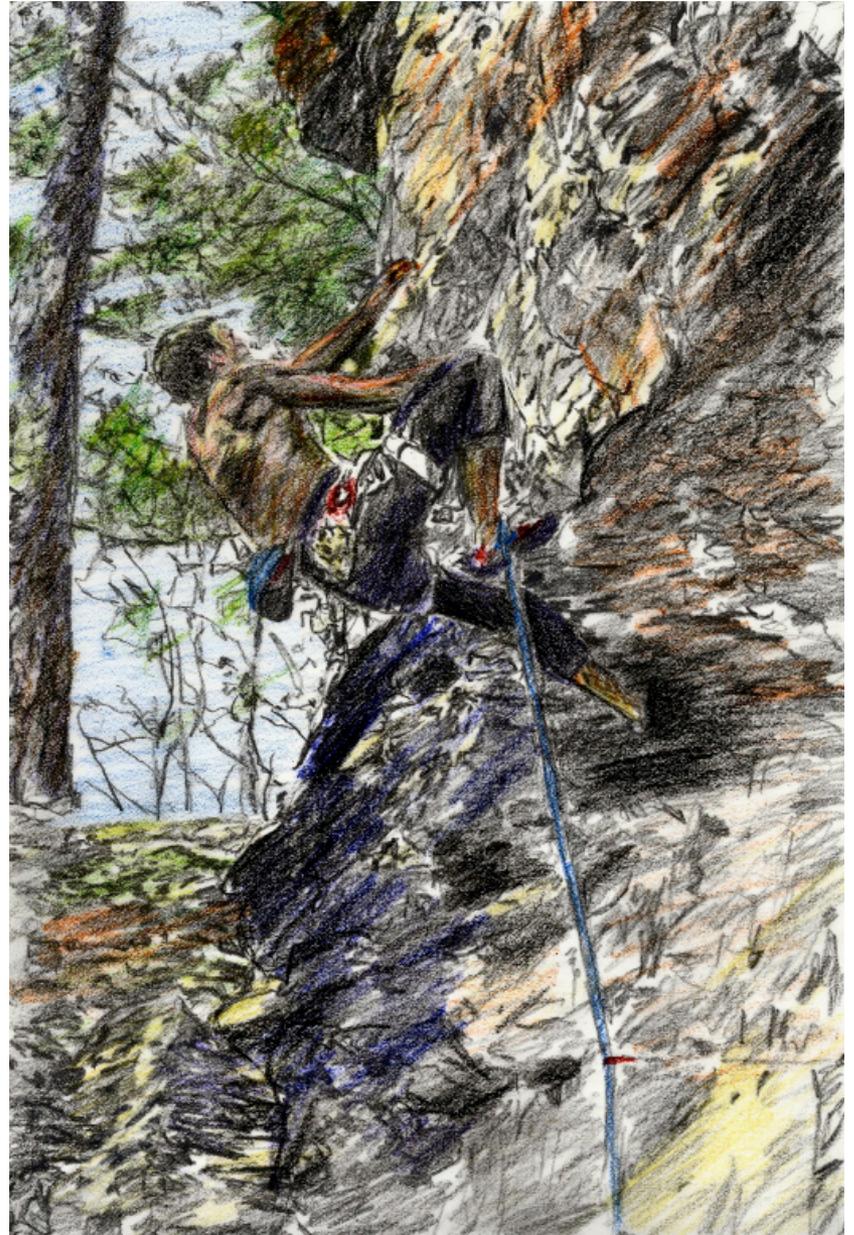


<http://www.flickr.com/photos/melodyeve/2912197247/in/set-72157607730190676/>



# Ideas & Inspiration

**The Rock Climber** offers a **robust** representation incorporated into the design. Not only is this suitable for the **typology** but it is appropriate for the **site**.



# Ideas & Inspiration: Case Studies



Khyber Ridge Residence  
Location: Whistler, British  
Columbia, Canada



This contemporary residence is enclosed in walls of windows, placing it inconspicuously among the **trees** and **mountains**.

**Rock walls** really make you feel as though you're a part of something truly majestic.



Architects: KLab

Location: Lefkada, Greece

This project is a small **convention center** in the winter months, and switches to become a **summer camp for children** during the second half of the year.



Architects: Antonio Sofan

Location: Medellin,

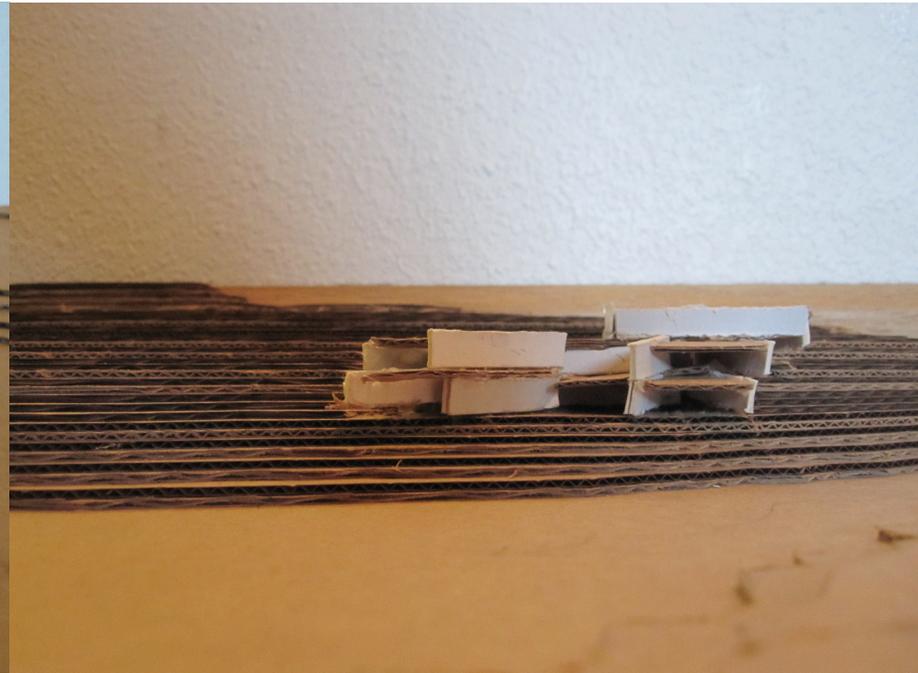
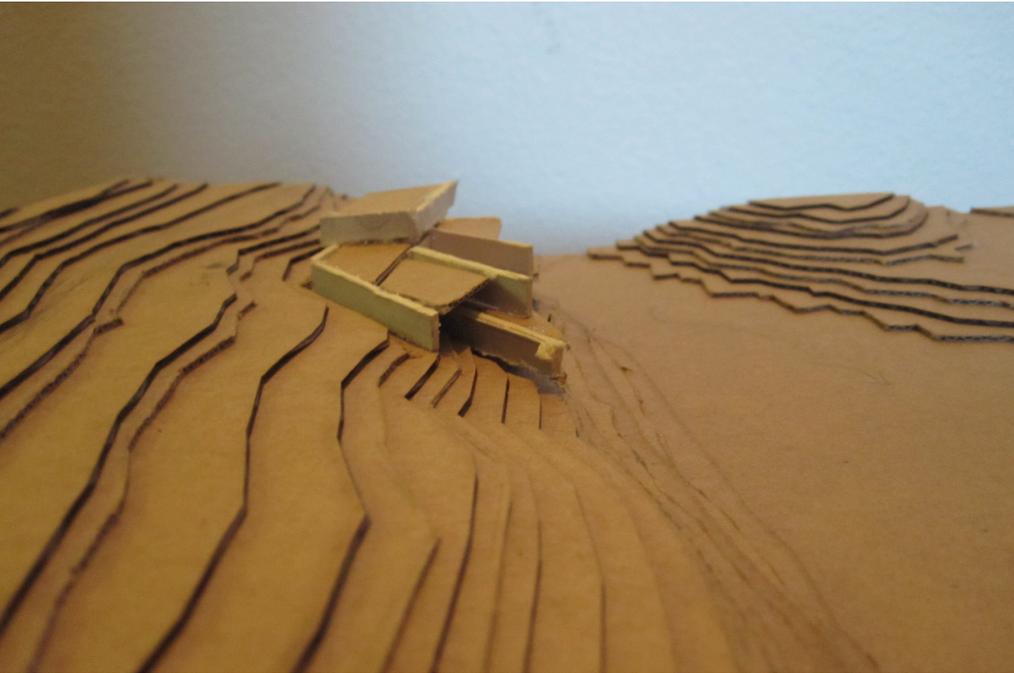
This case study is owned by the state, and is set in a location near **state parks**.

# Ideas & Inspiration: Process



This model was built to experiment with the layers of a context, the same as the different **sedimentary layers** of the land.

# Ideas & Inspiration: Process



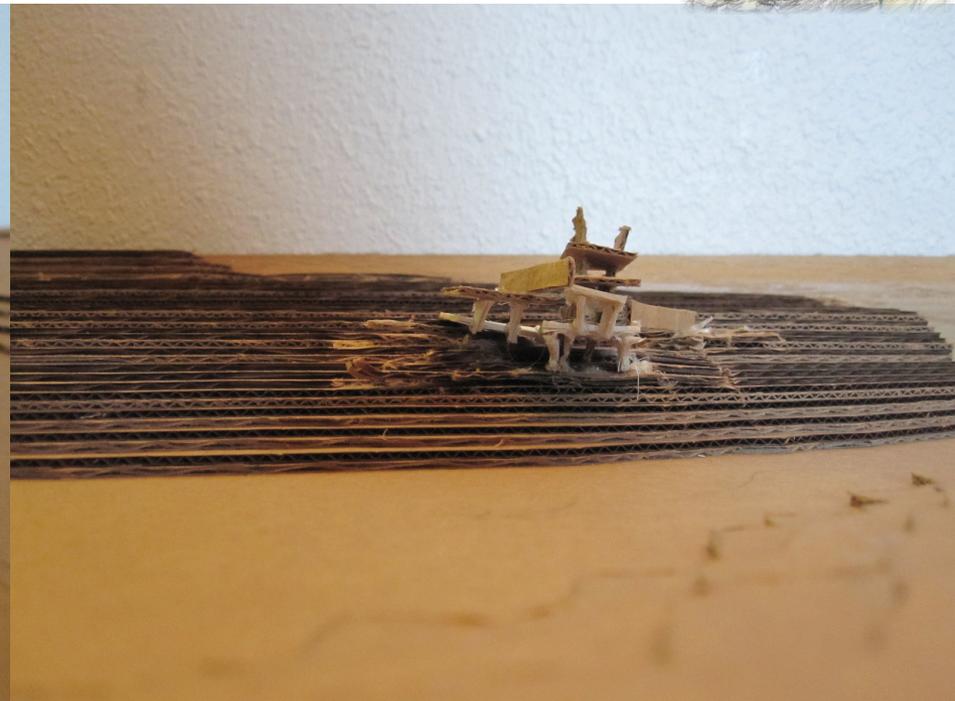
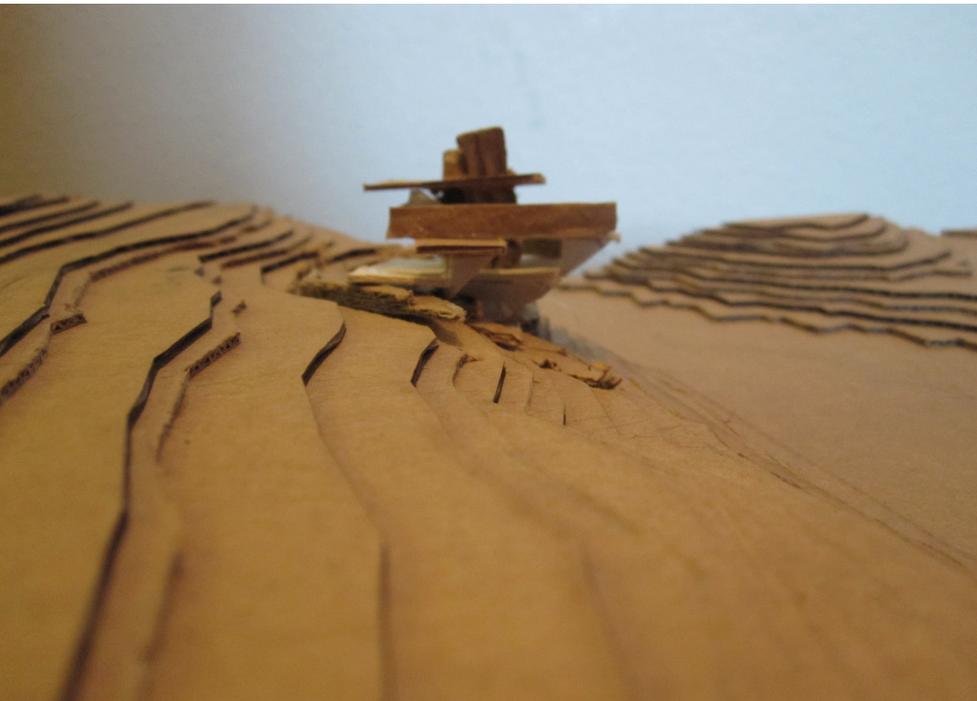
The **form** of this building was intended to be elongated with the contours of the land.

# Ideas & Inspiration: Process



Taking the form to the next level I introduced more **vertical elements**.

# Ideas & Inspiration: Process



The vertical form was pulled from the body, but I was missing the **action** of “clinging on” like the **rock climber**.

# Ideas & Inspiration: Process



At midterm this was my idea of a clinging rock climber with possible **structural elements** that represent the assistance the rock climber gets from his tools. **Spatial organization** needed to be **developed further** however.

# Ideas & Inspiration: Process



After moving **further into the cliff**, this became the final conceptual design.

# Final Design

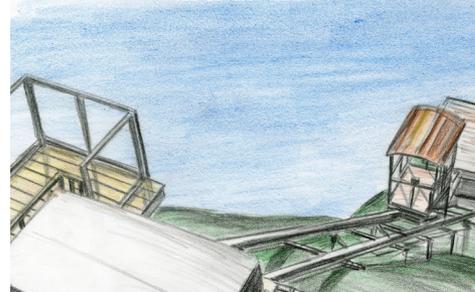


# Final Design: Entry Experience

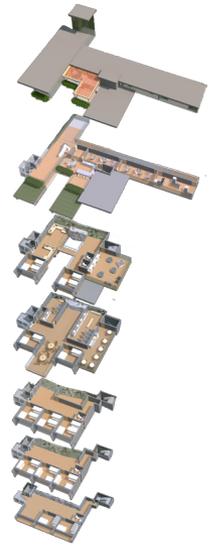
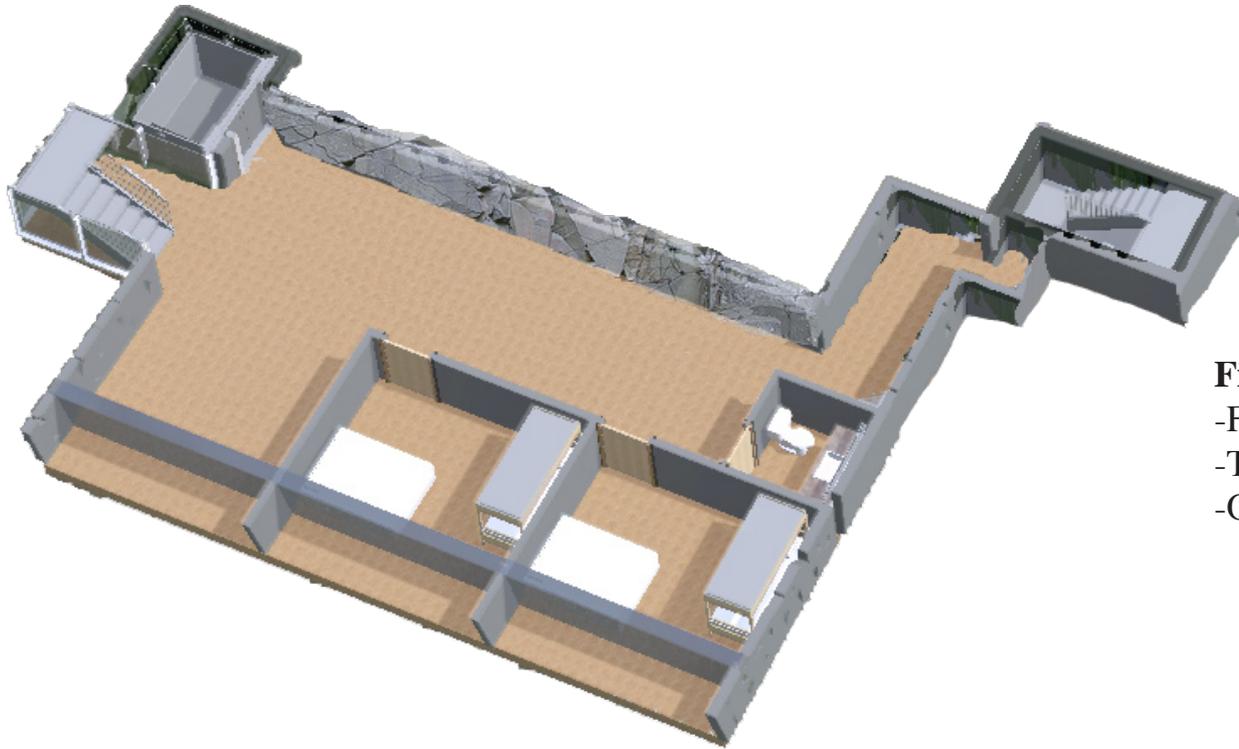
Zig Zag Trail



Funicular Elevator

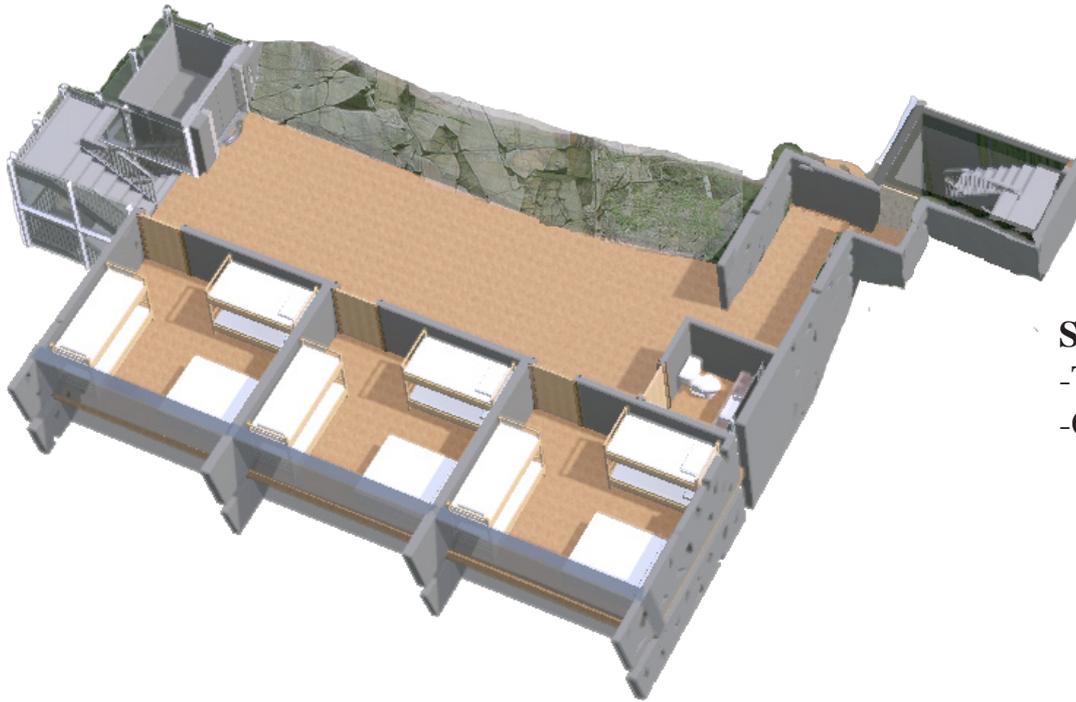


# Final Design: Floor Plans



- First Floor**
- Funicular Landing
  - Two Cabins
  - One Bathroom

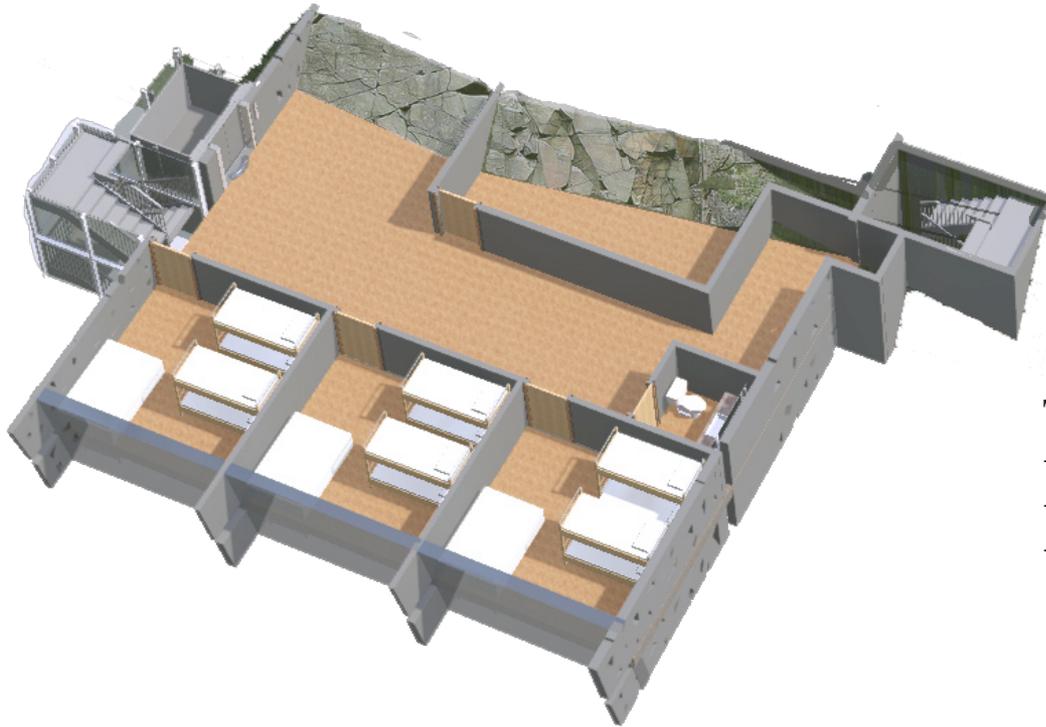
# Final Design: Floor Plans



**Second Floor**  
-Three Cabins  
-One Bathroom



# Final Design: Floor Plans

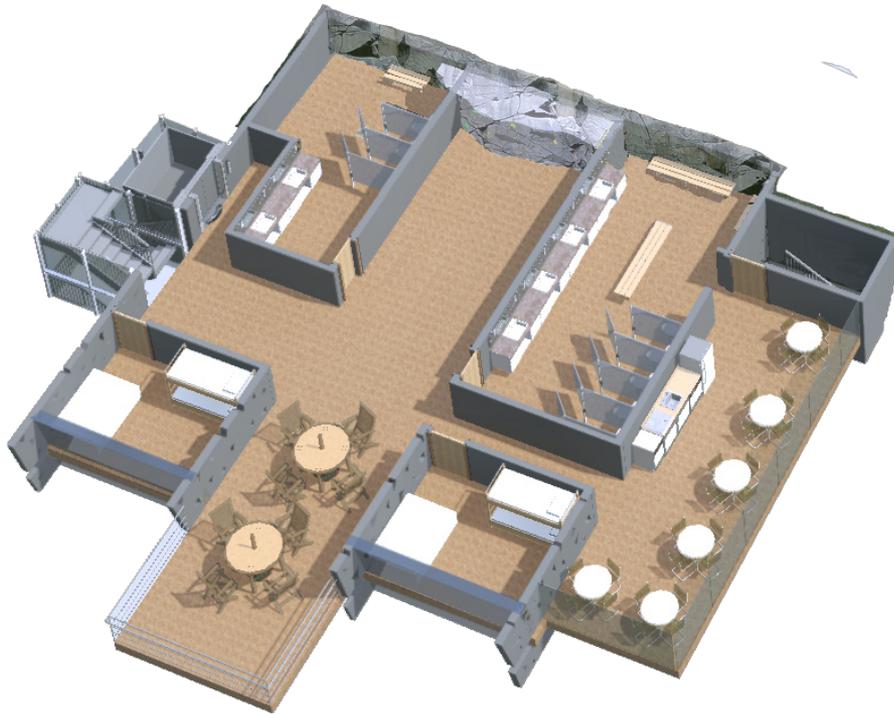


## **Third Floor**

- Three Cabins
- Mechanical/Storage
- One Bathroom



# Final Design: Floor Plans

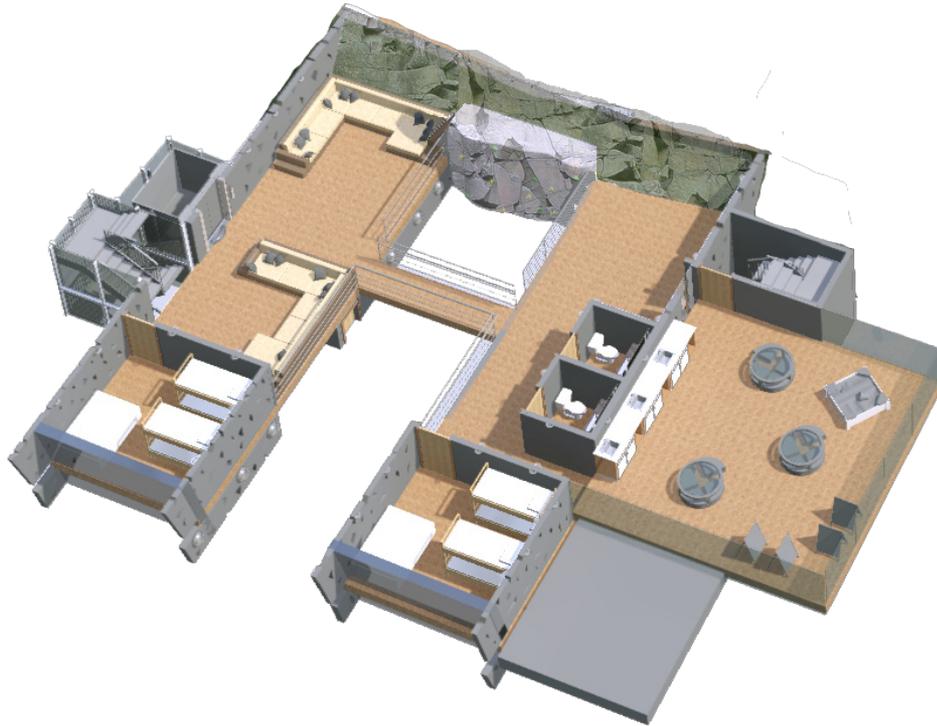


## **Fourth Floor**

- Two Cabins
- Men's Washroom
- Women's Washroom
- Dining Area
- Rock Wall Training
- Cantilevered Balcony



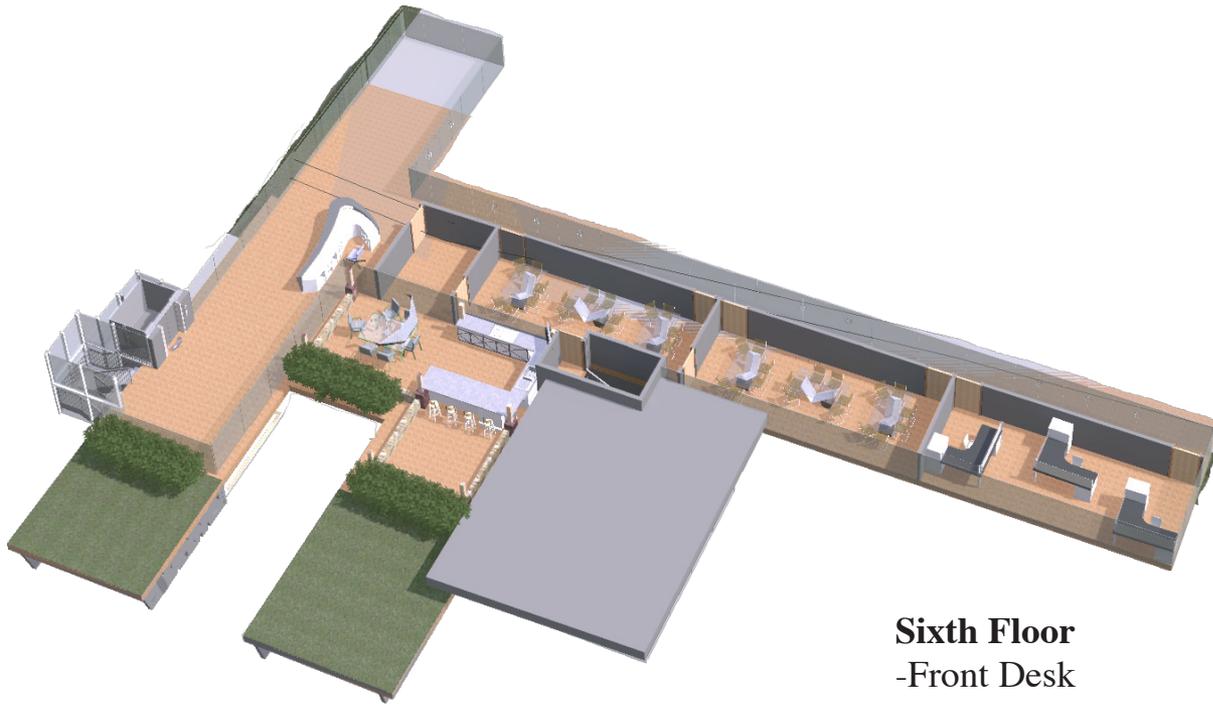
# Final Design: Floor Plans



## **Fifth Floor**

- Two Cabins
- Gathering Space
- Studio Workout Space
- Two Bathrooms
- Exploratory
- Rock Wall Viewing

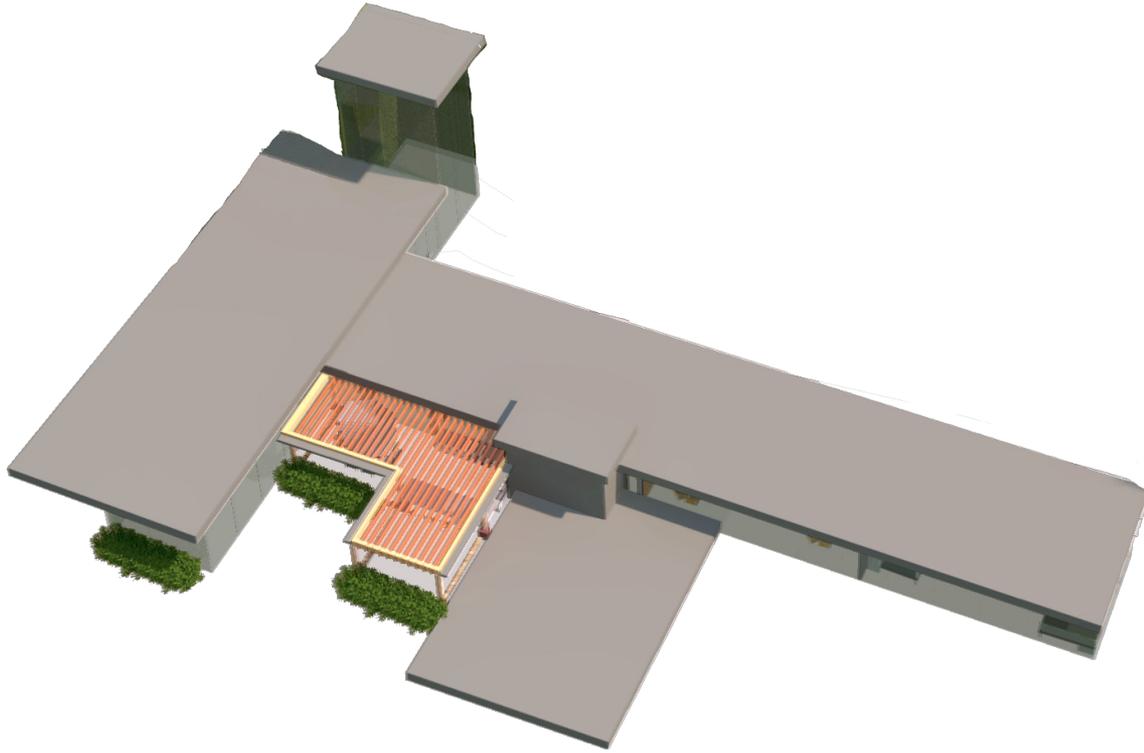
# Final Design: Floor Plans



## **Sixth Floor**

- Front Desk
- Health Office
- Two Conference Room
- Faculty Office
- Adult Outdoor Area

# Final Design: Floor Plans



Roof Plan



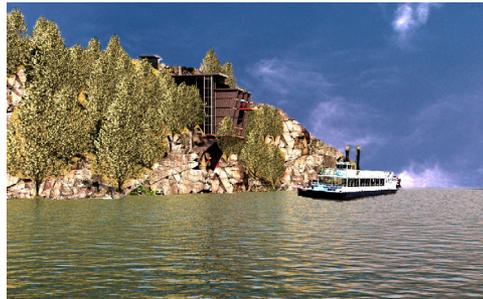
# Final Design: Section Analysis

At the Caltrans District 7 Building in Los Angeles, a study found that the open **staircase** next to a **skip-stop** elevator is used 3,300% more than the enclosed stairs next to traditional elevators.

By designing a **courtyard and viewing deck**, sun and air are able to circulate into the center of the building.



The glass stair case provides **views** to the river.



# Final Design: Section & Cantilever Structure



# Final Design: Materials

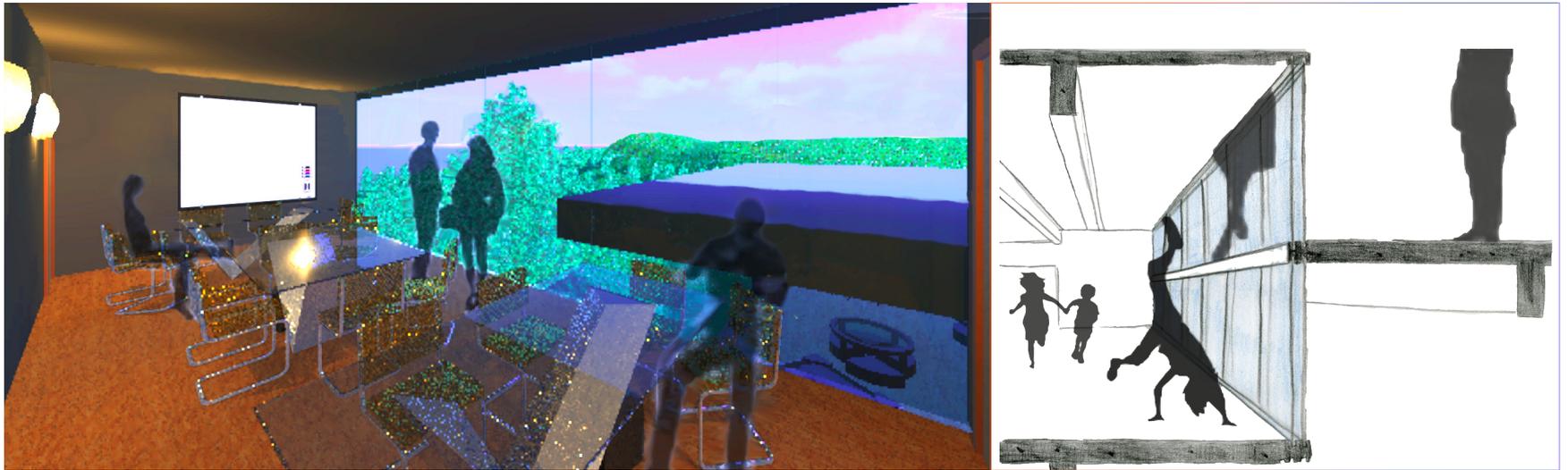
This lifestyle center was designed to fit into the landscape and into the nearby city. Neighboring buildings are made of **stone, wood, and concrete.**



# Final Design: Check In



# Final Design: Adult Conference Room



# Final Design: Exploratory



# Final Design: Viewing Deck

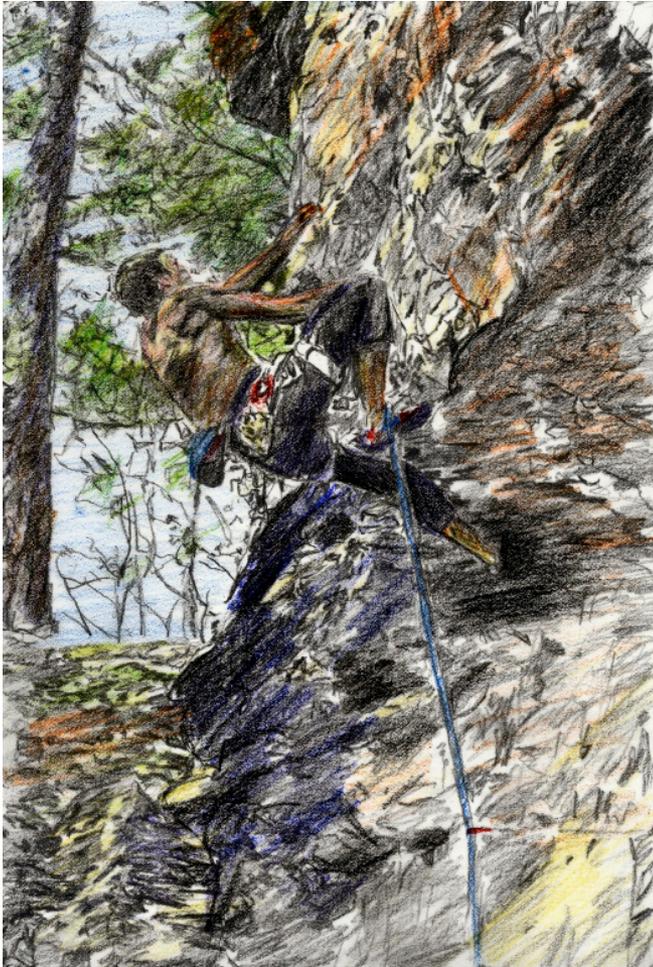


# Final Design: Rock Wall Viewing & Gathering Area



# Thank you for taking your time to come!

## Questions & Comments?



“Architecture can get **people talking**. It can calm children in the classroom, **make passive people more active**, and **shape corporate culture**. It can also encourage people to find new paths and discover new aspects of their city—and of **themselves**.”  
~ Kim Herforth Nielsen