

Temptation and Self Control

Behavioral Economics Fall 2022

G6943: Columbia University

Mark Dean

Temptation and Self Control

- One of the most successful and influential areas in behavioral economics
- Lots of classic (and influential) papers:
 - Theoretical: Gul, F. and W. Pesendorfer (2001) "Temptation and Self-Control." *Econometrica* 69, 6 1403-1435.
 - Empirical: Ashraf, N., D. Karlan, and W. Yin (2006). Tying odysseus to the mast: Evidence- from a commitment savings product in the Philippines. *Quarterly Journal of Economics* 121 (2), 635.
 - Policy: Richard H. Thaler & Shlomo Benartzi, 2004. "Save More Tomorrow (TM): Using Behavioral Economics to Increase Employee Saving," *Journal of Political Economy*, vol. 112(S1)
- Popular for (at least) 3 reasons

Temptation and Self Control

1. Problems of temptation and self control seem to be ubiquitous
2. Correlated with socioeconomic outcomes
3. Something the standard model cannot capture

Temptation and Self Control

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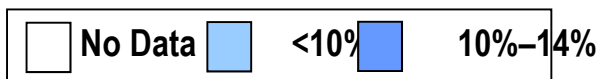
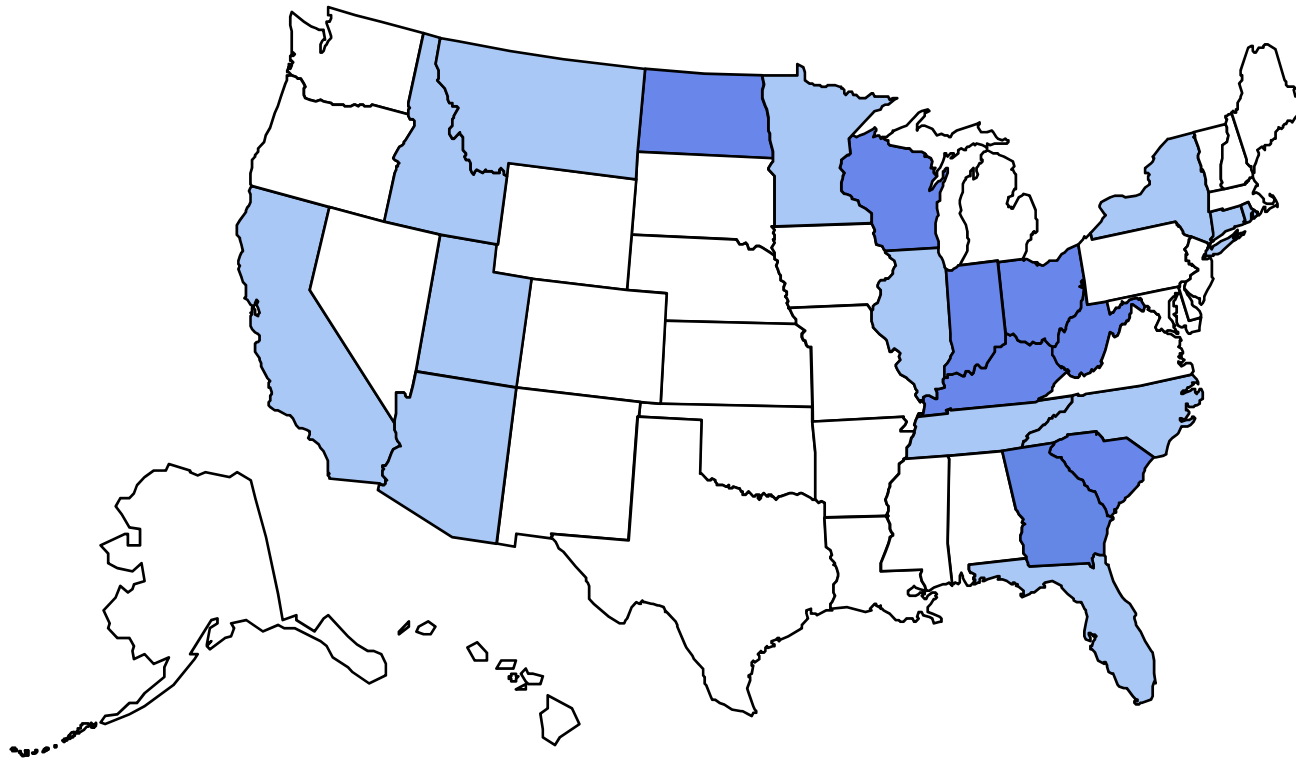
(1) Temptation and Self Control Problems Seem to Be Ubiquitous

- America has an 'obesity problem'

Obesity Trends* Among U.S. Adults

BRFSS, 1985

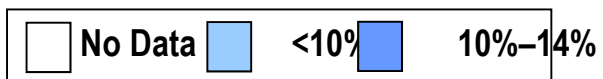
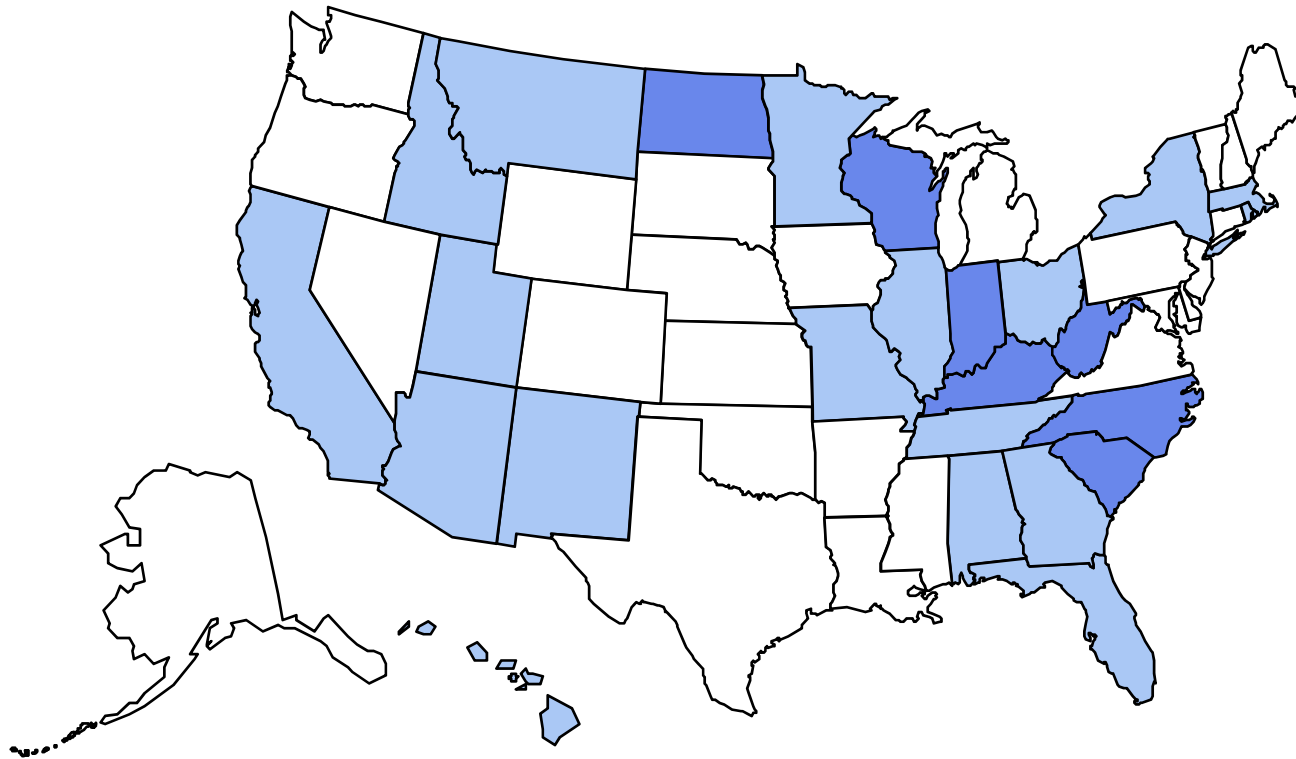
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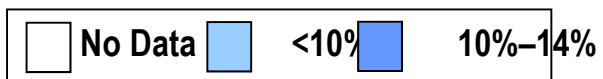
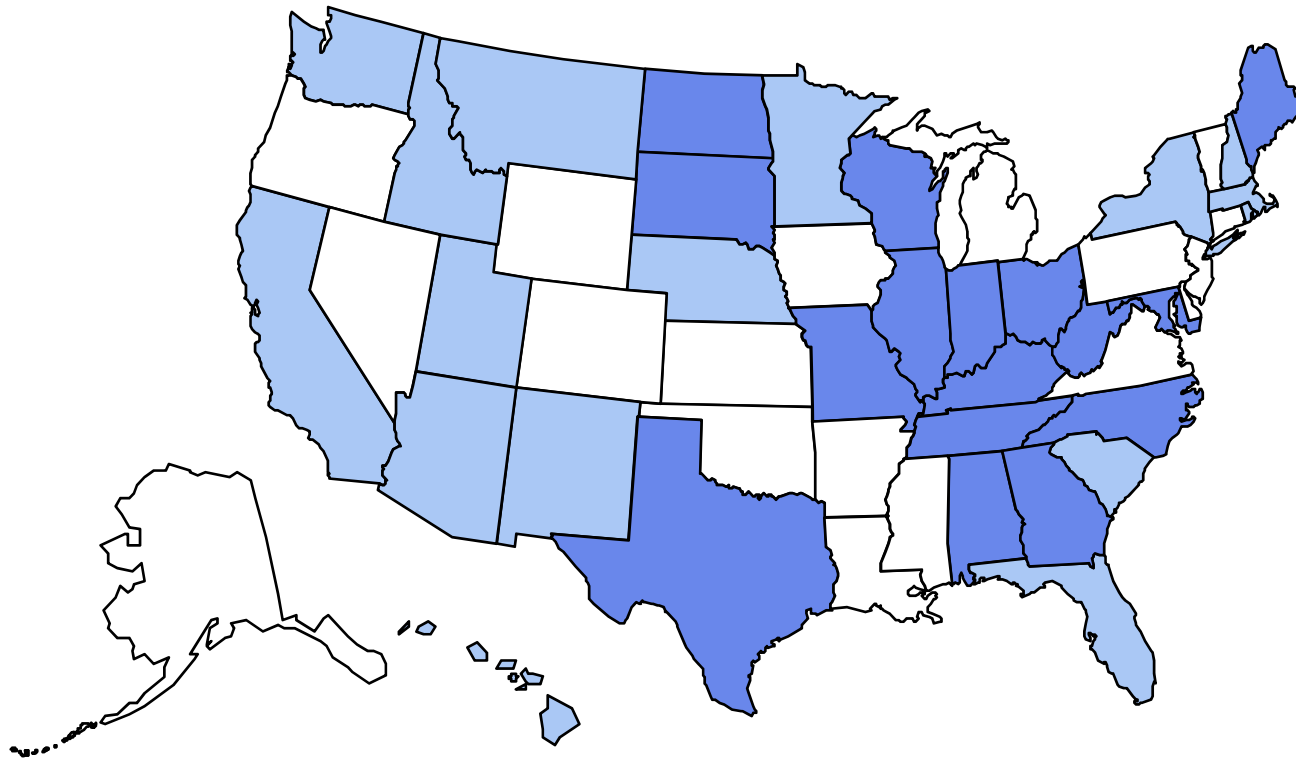
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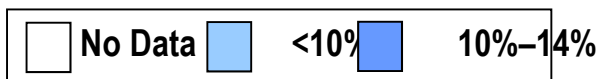
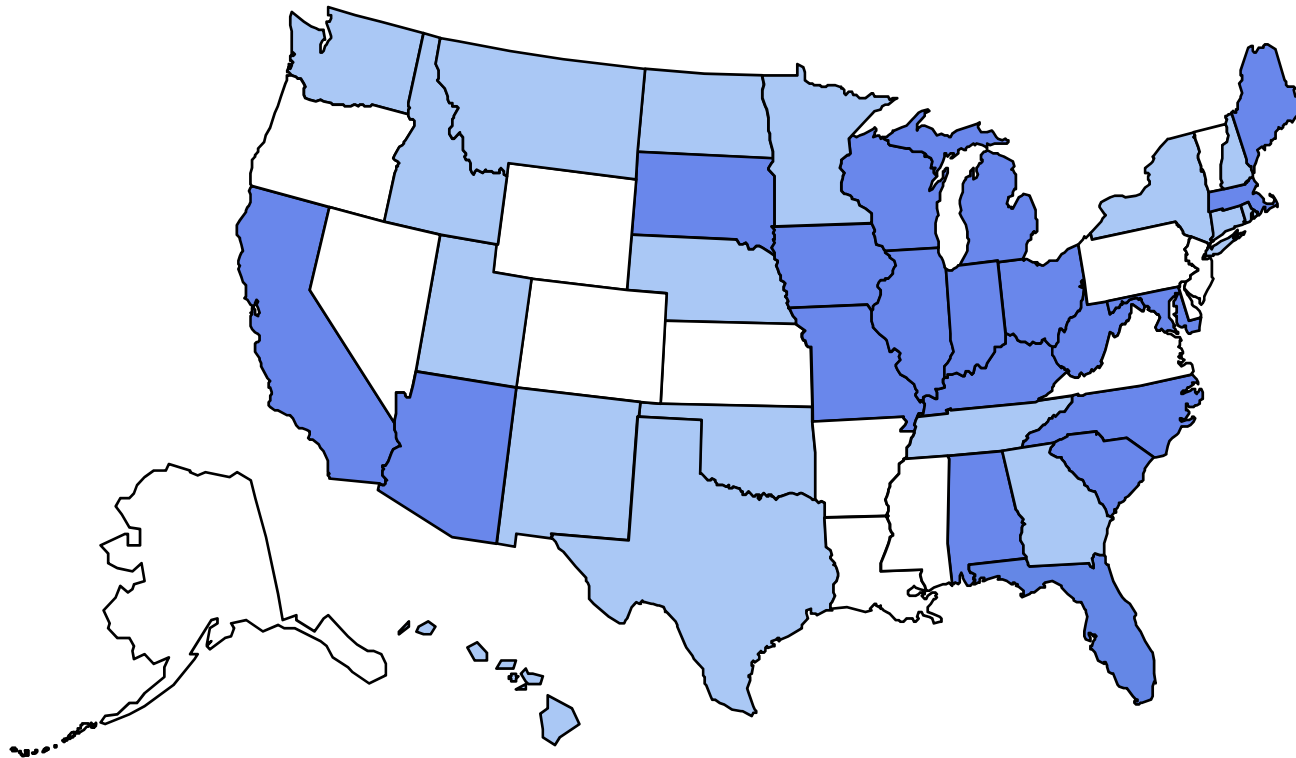
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Obesity Trends* Among U.S. Adults

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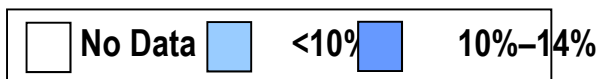
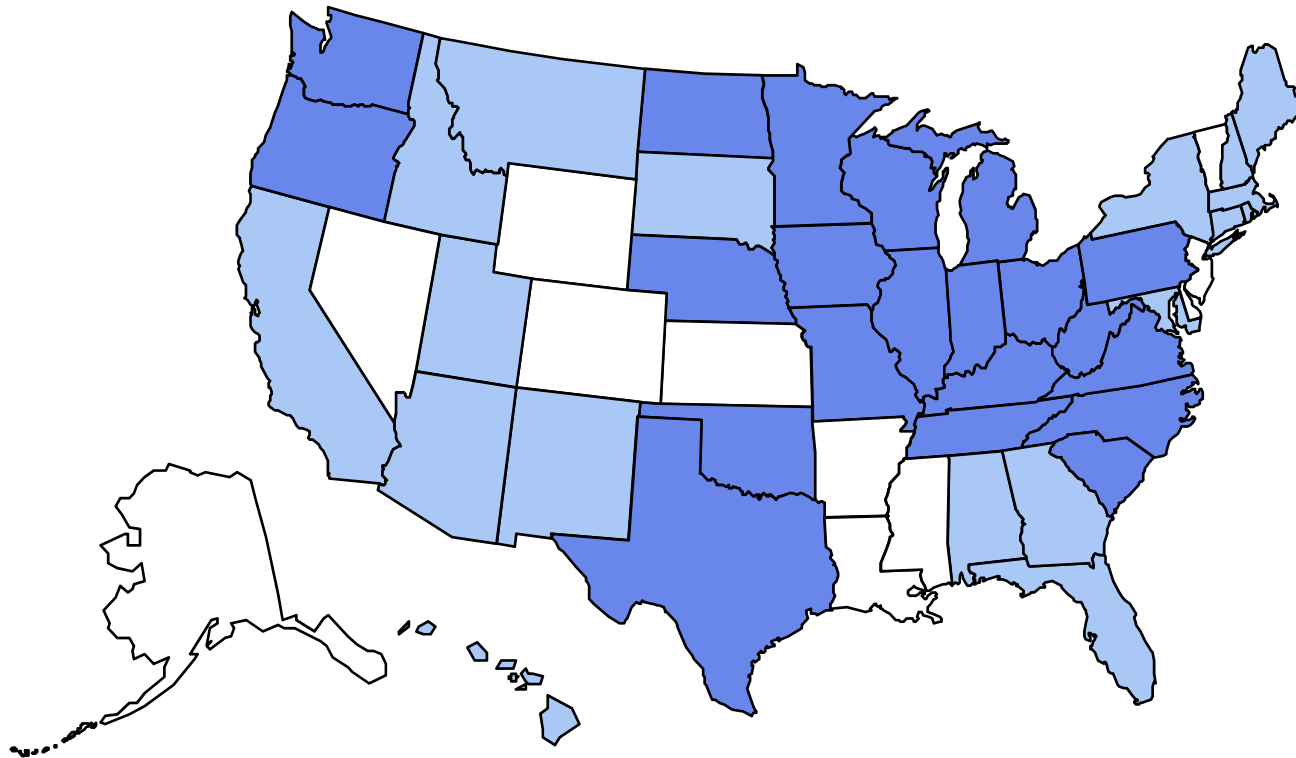
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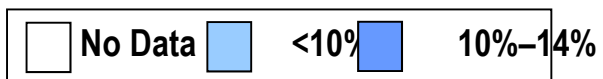
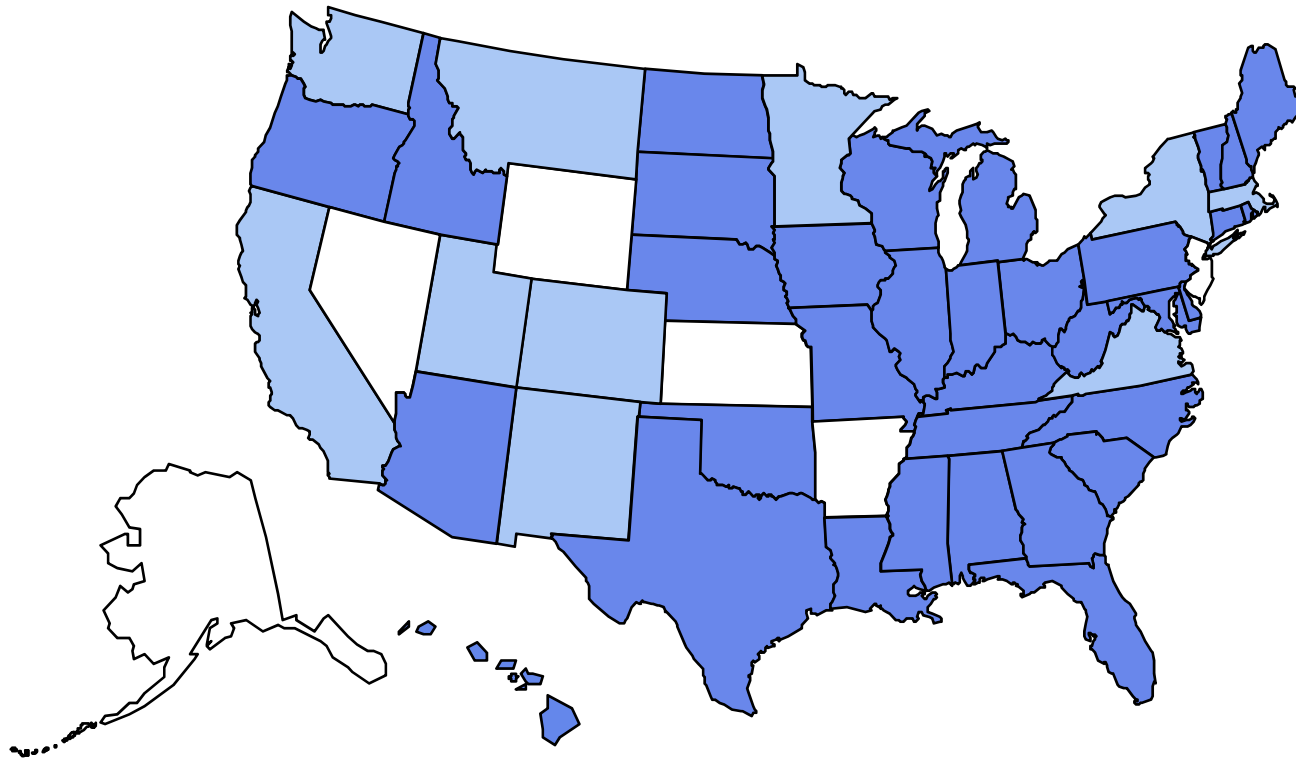
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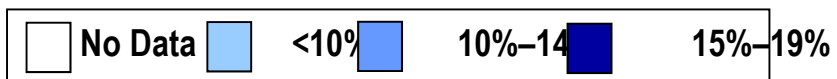
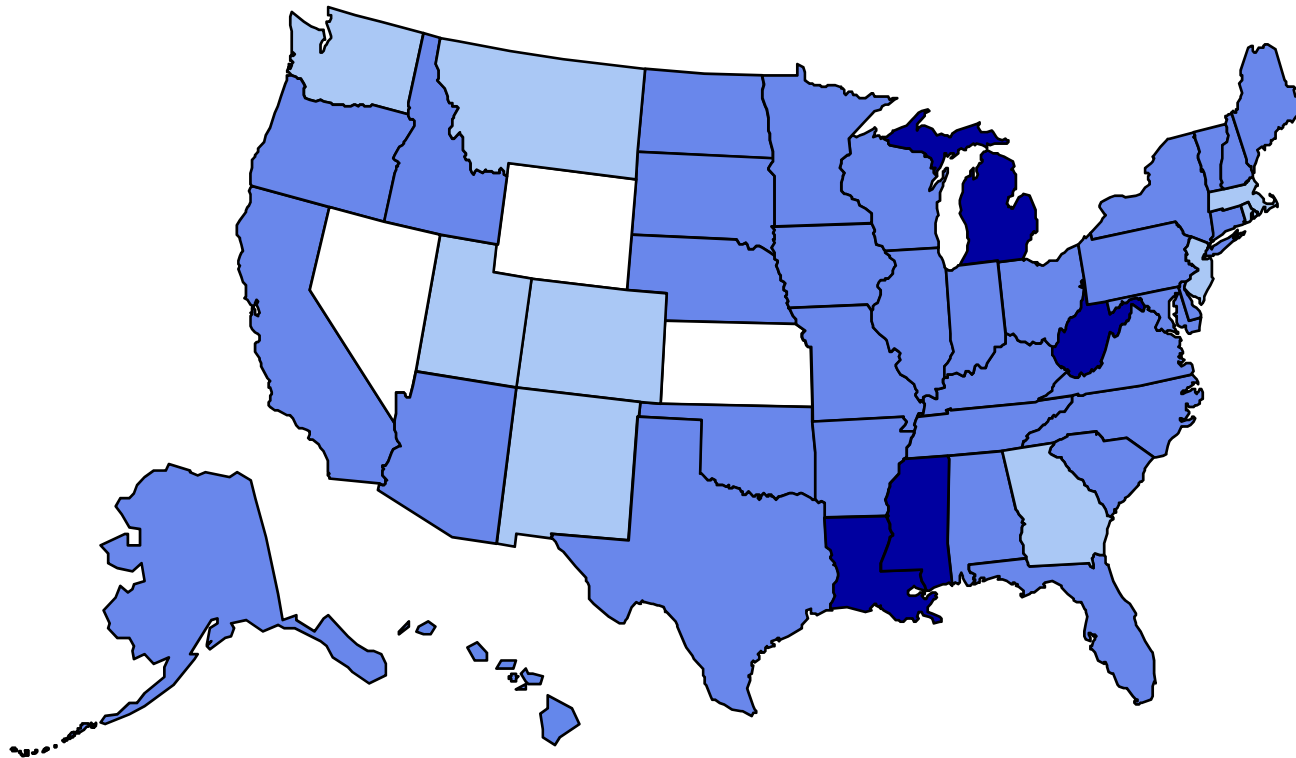
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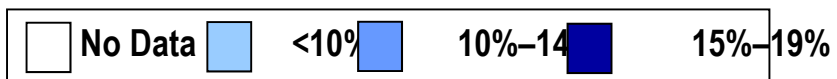
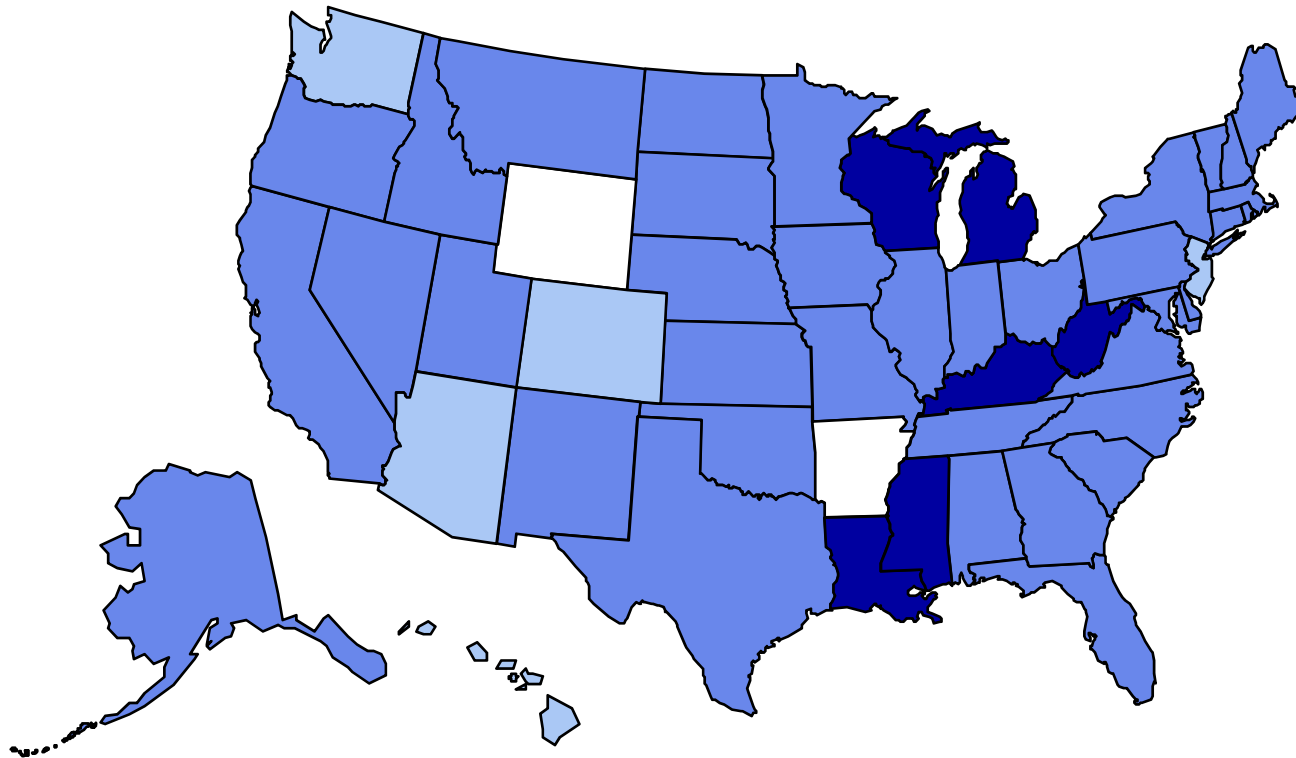
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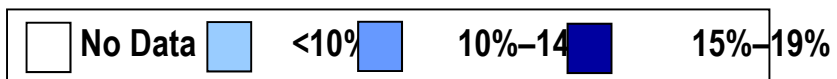
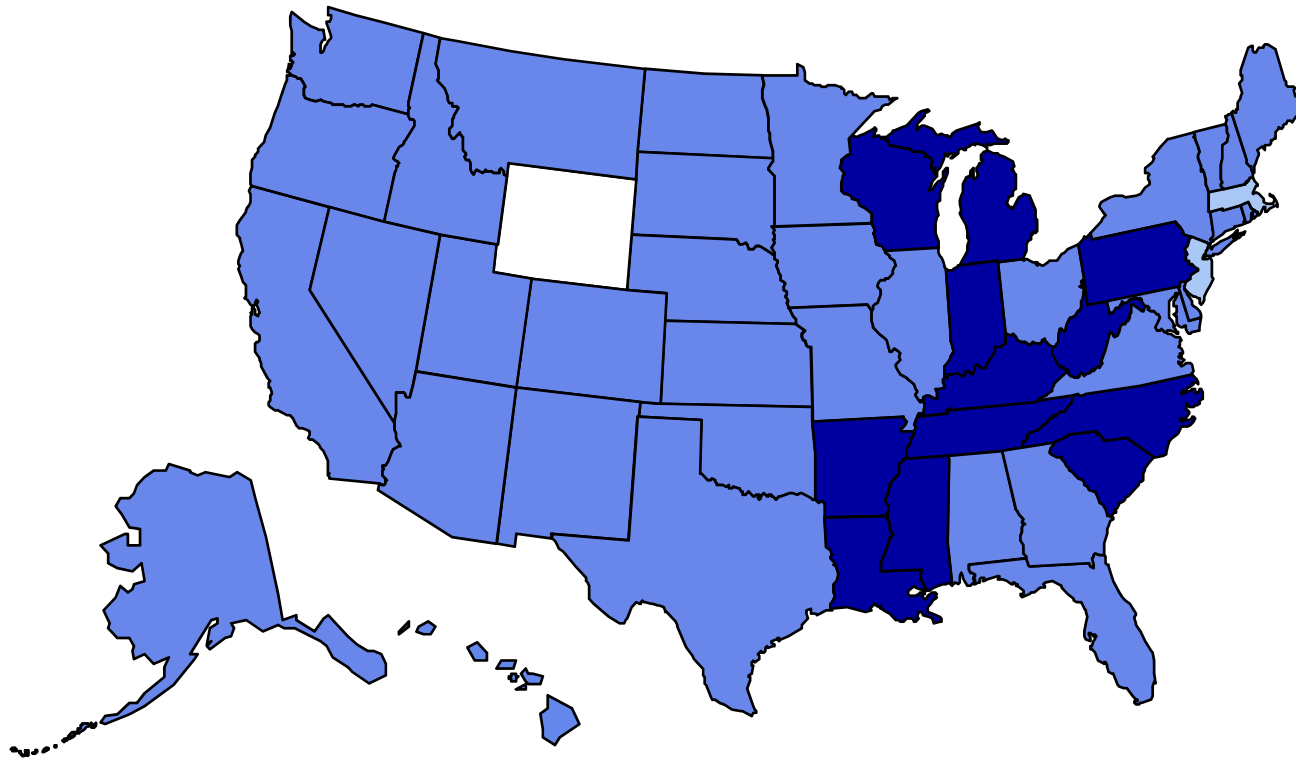
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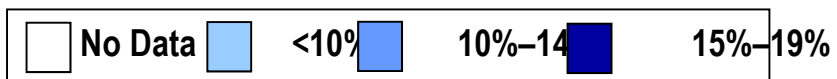
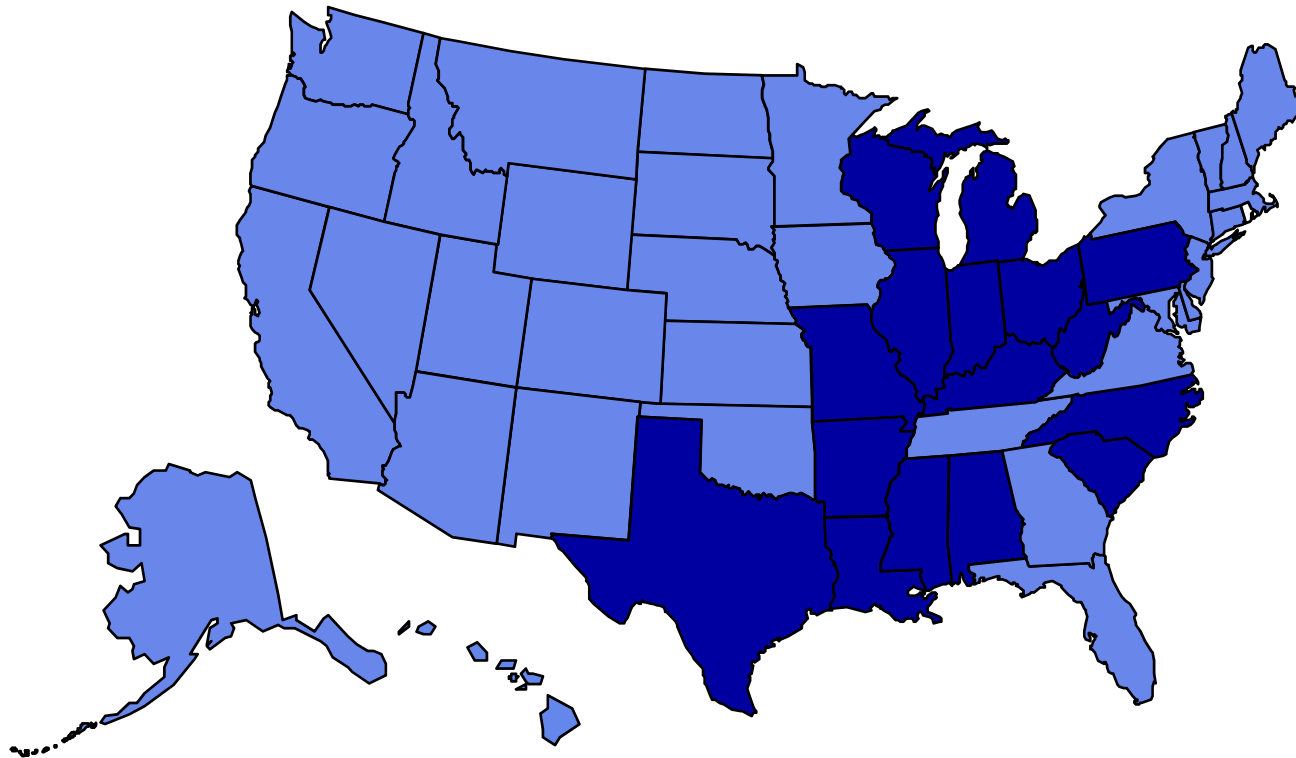
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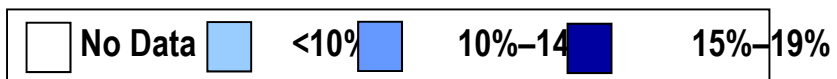
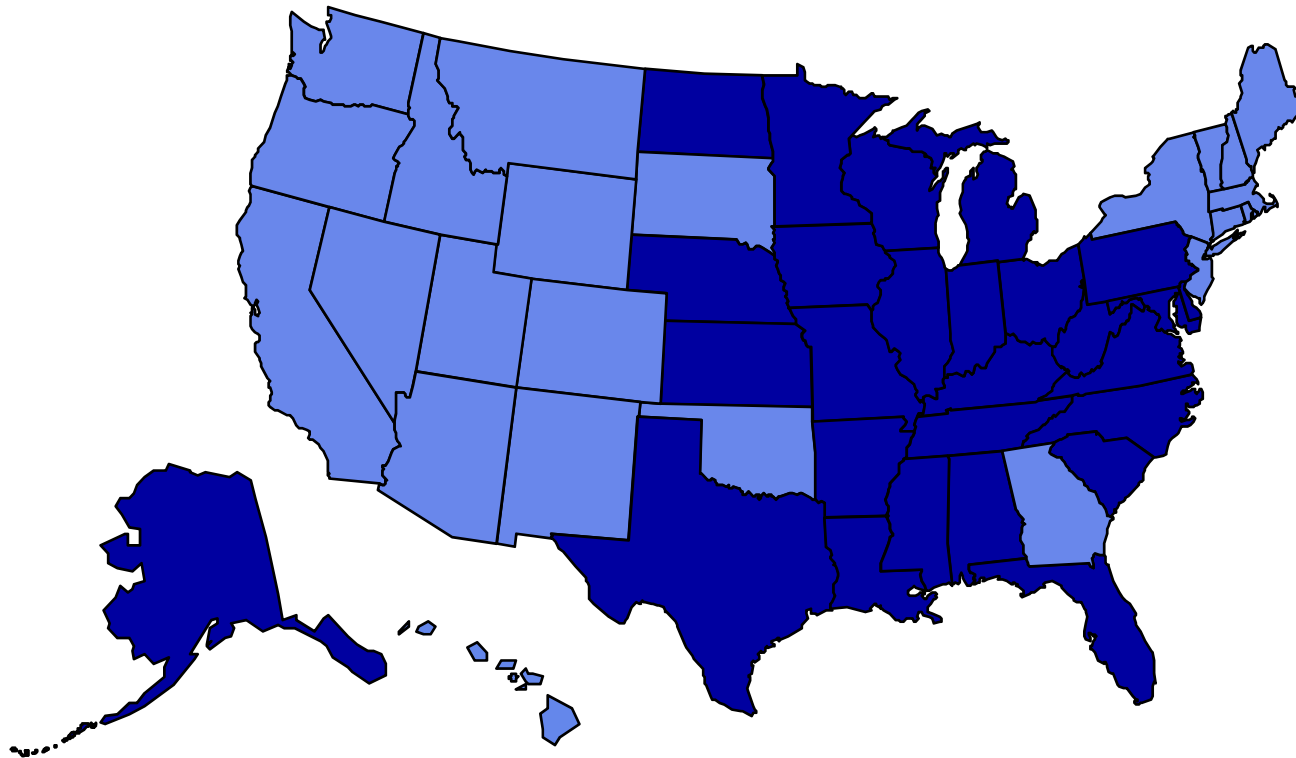
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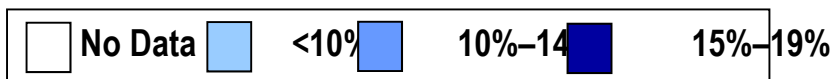
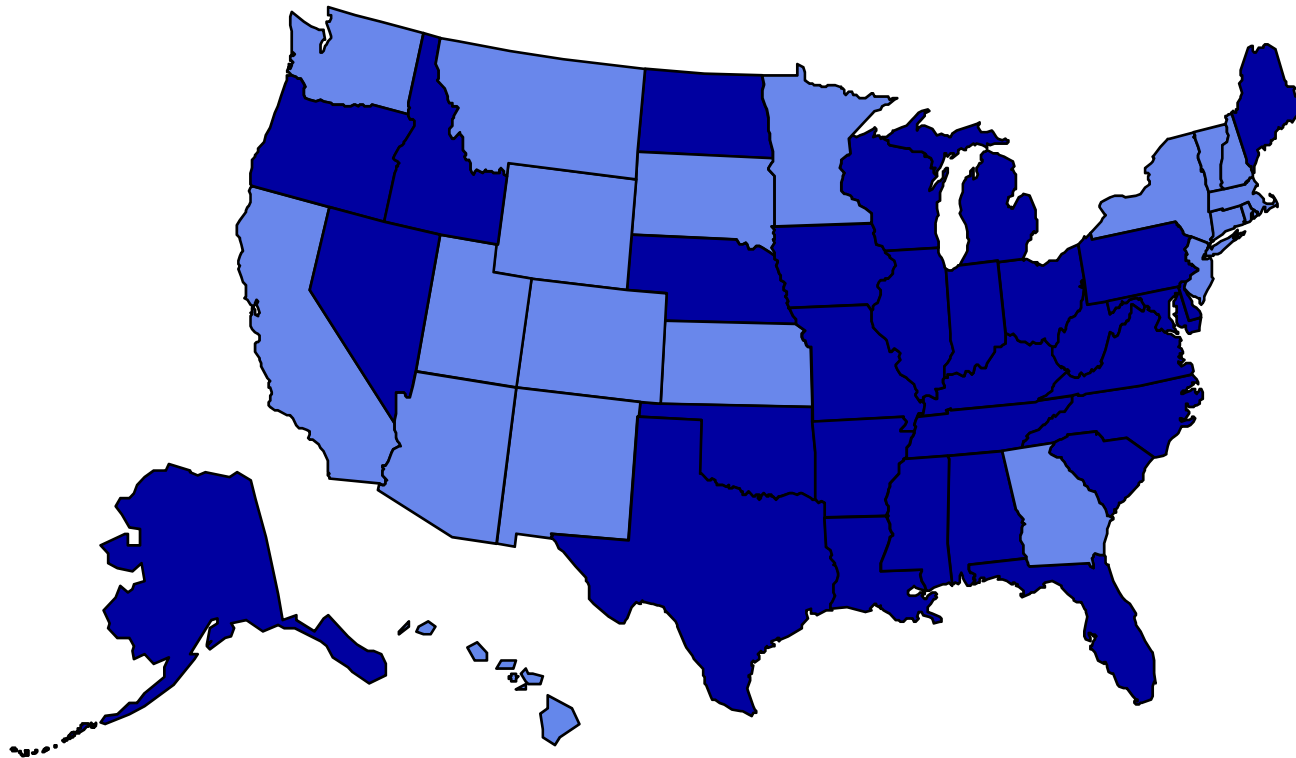
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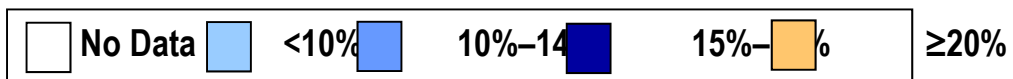
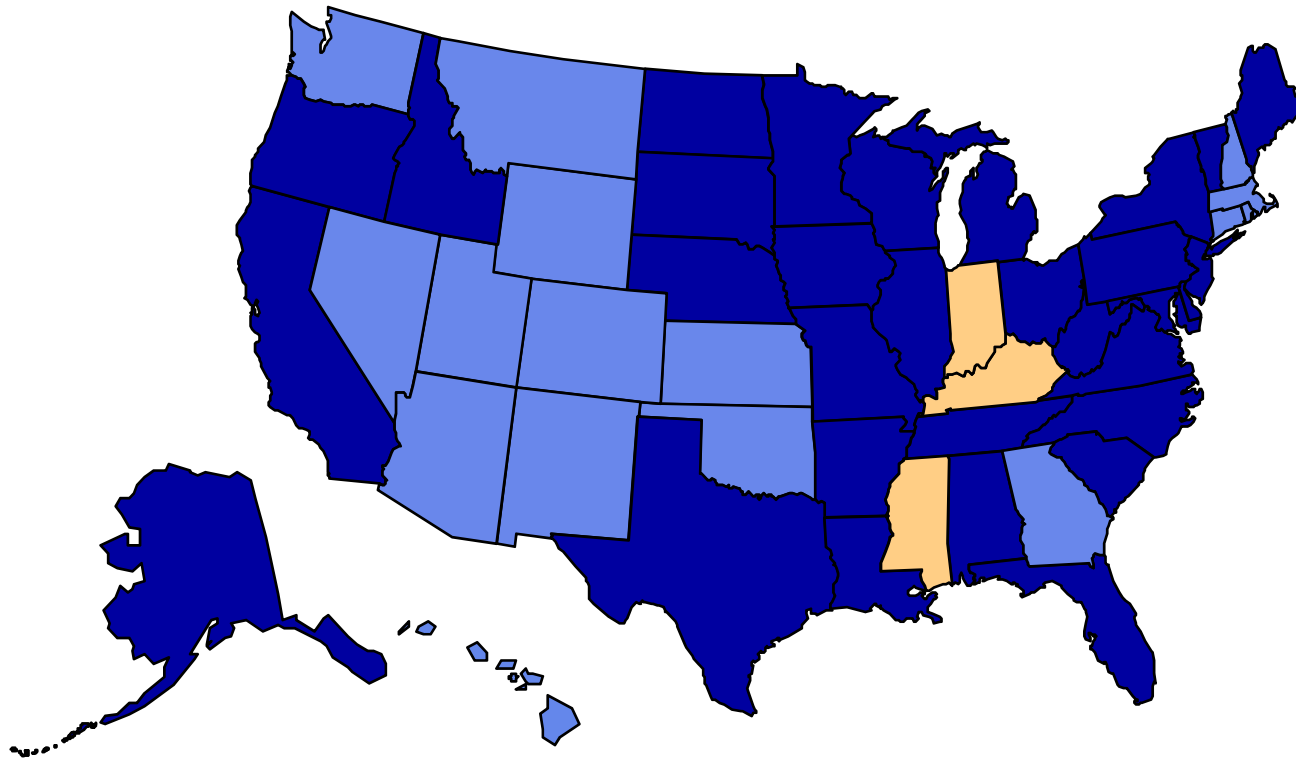
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BRFSS, 1997

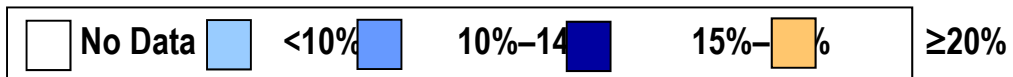
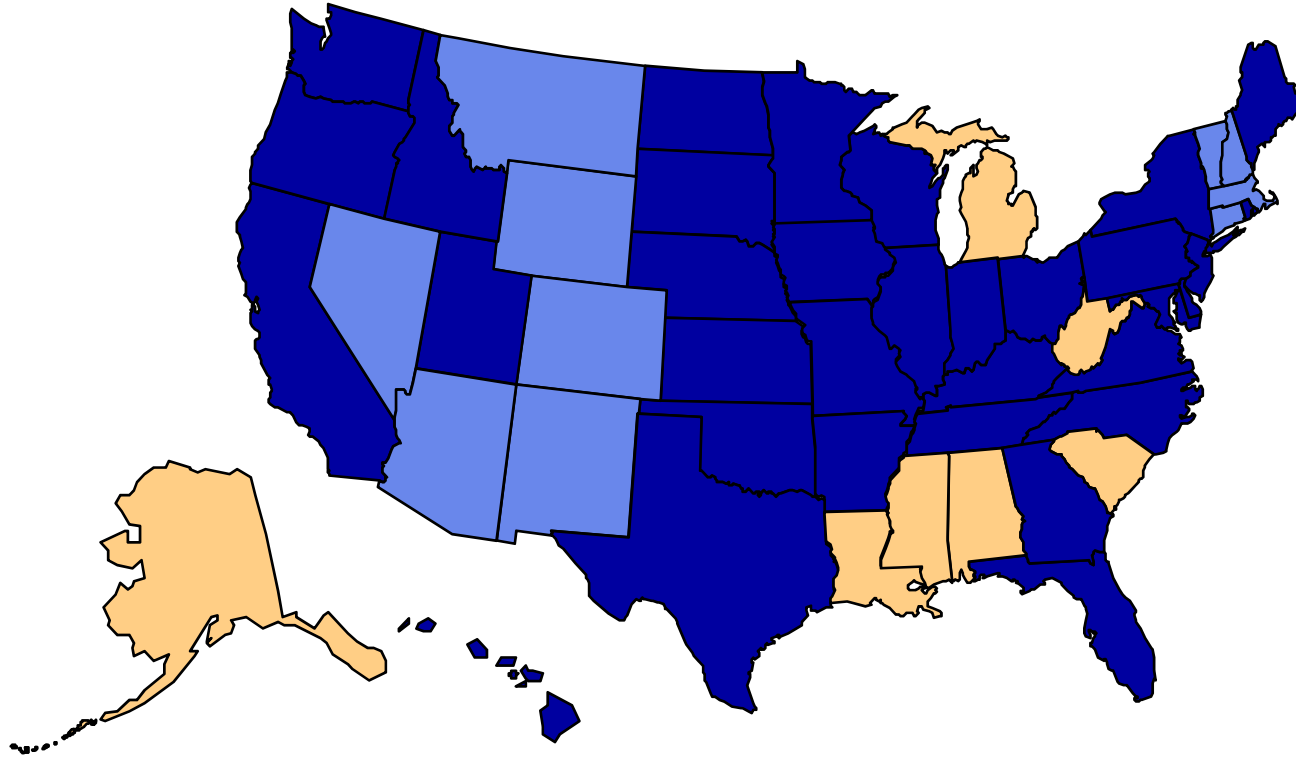
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BRFSS, 1998

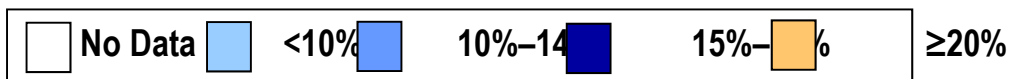
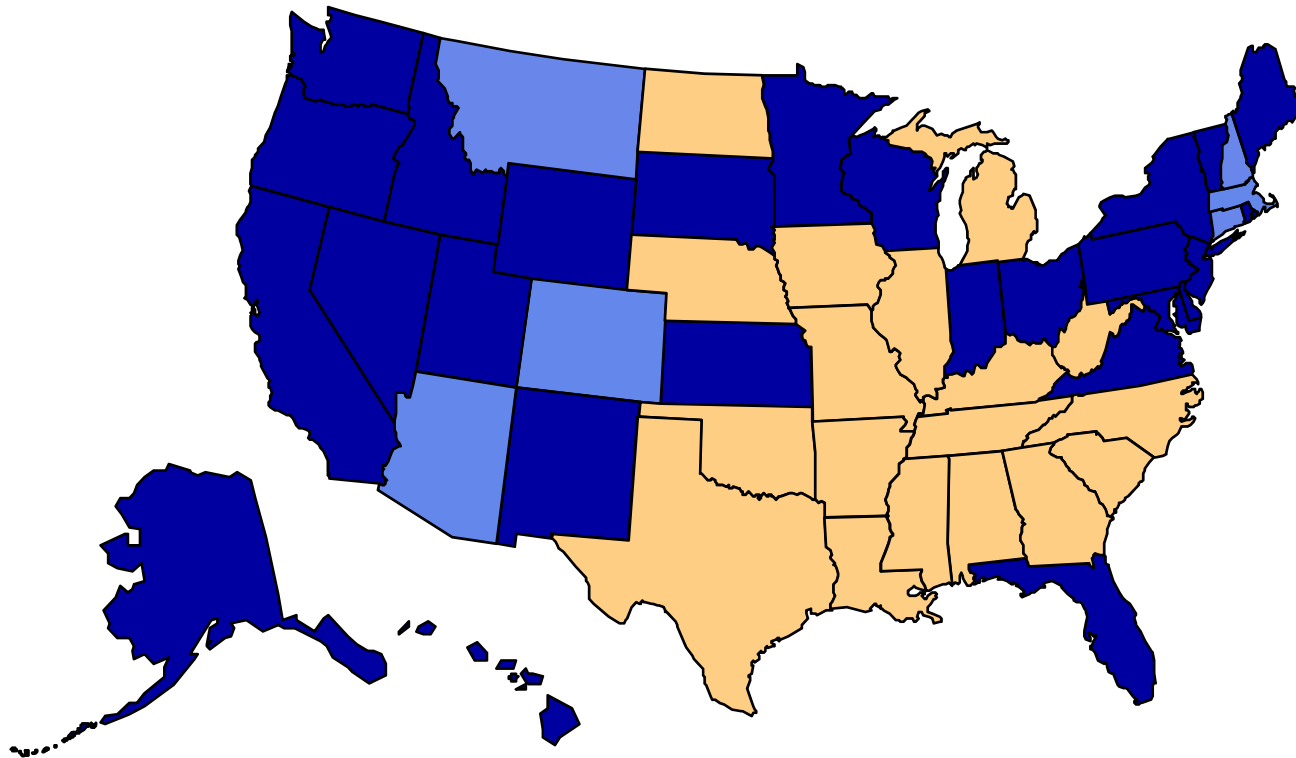
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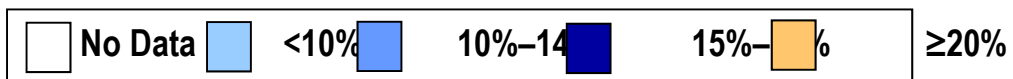
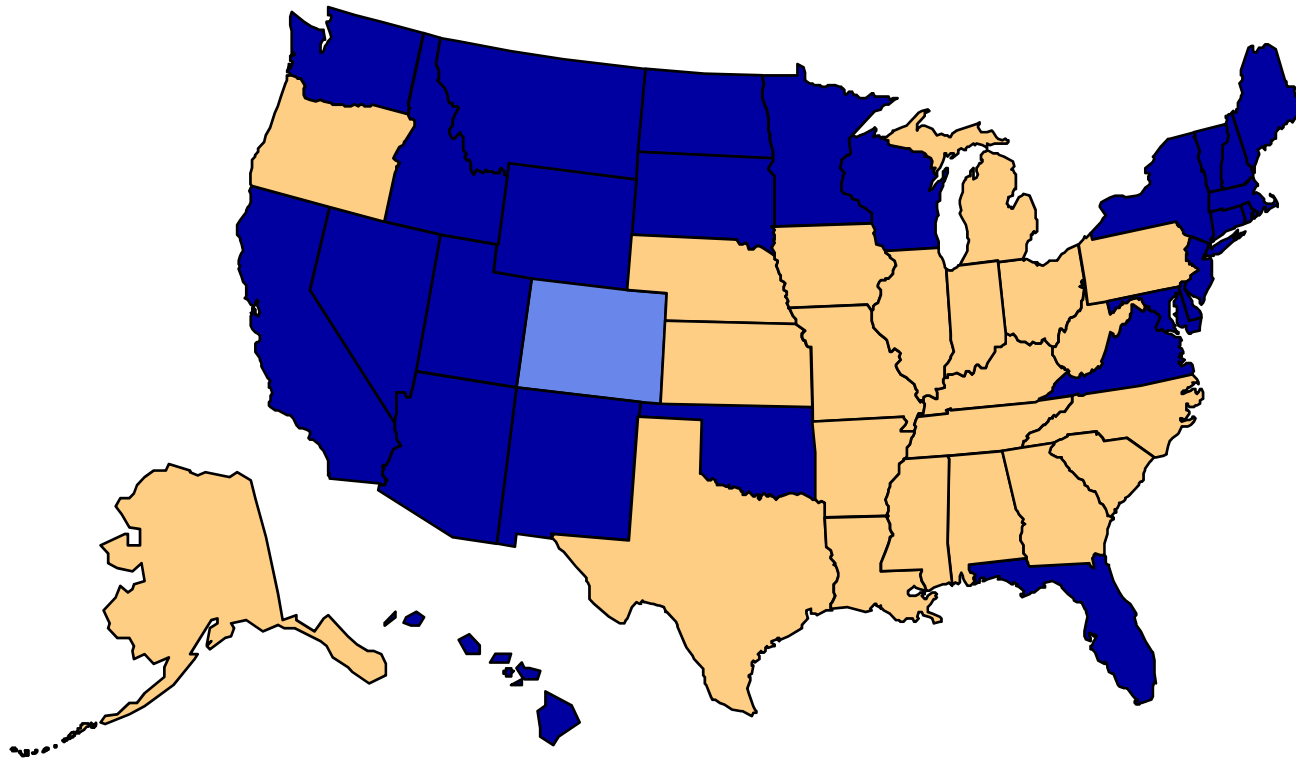
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Obesity Trends* Among U.S. Adults

BRFSS, 2000

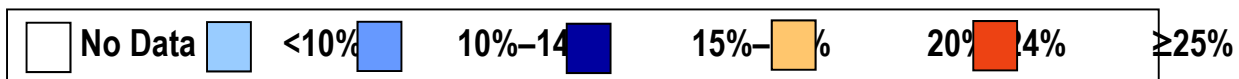
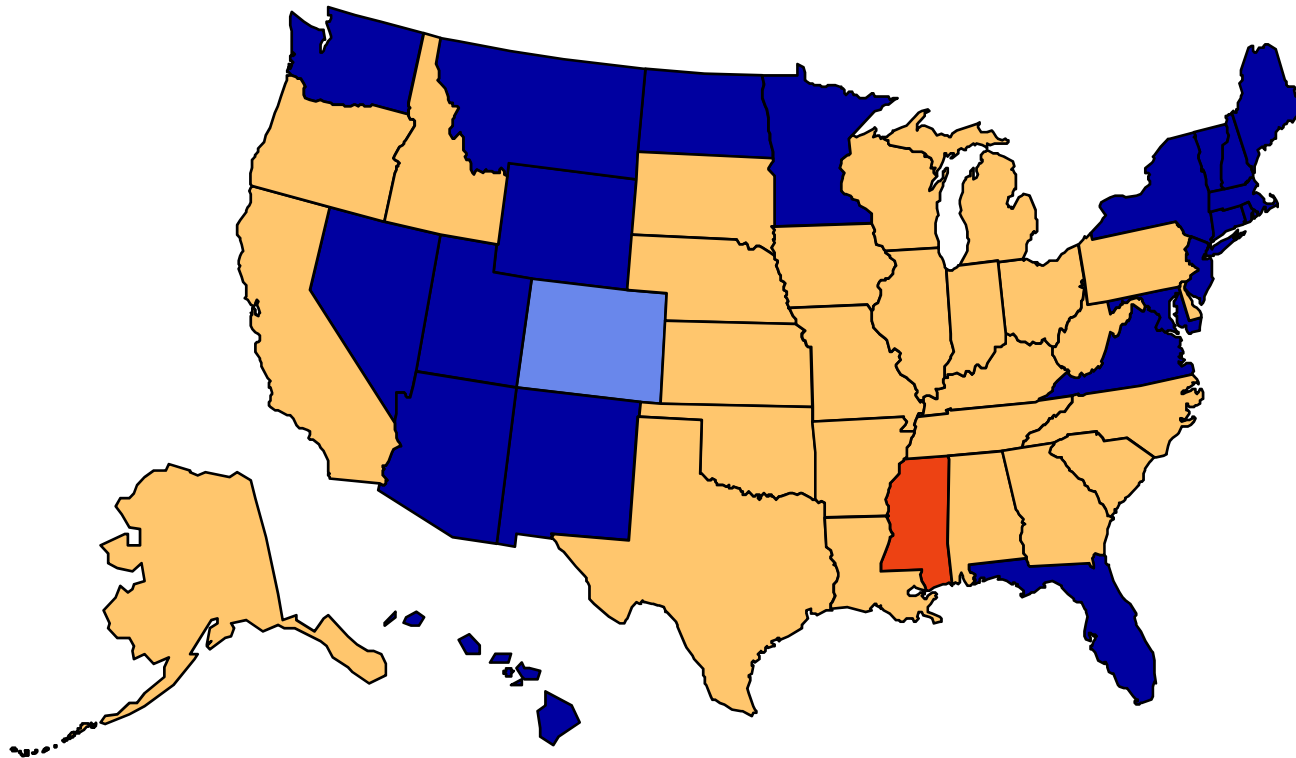
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Obesity Trends* Among U.S. Adults

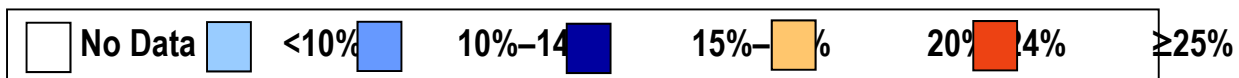
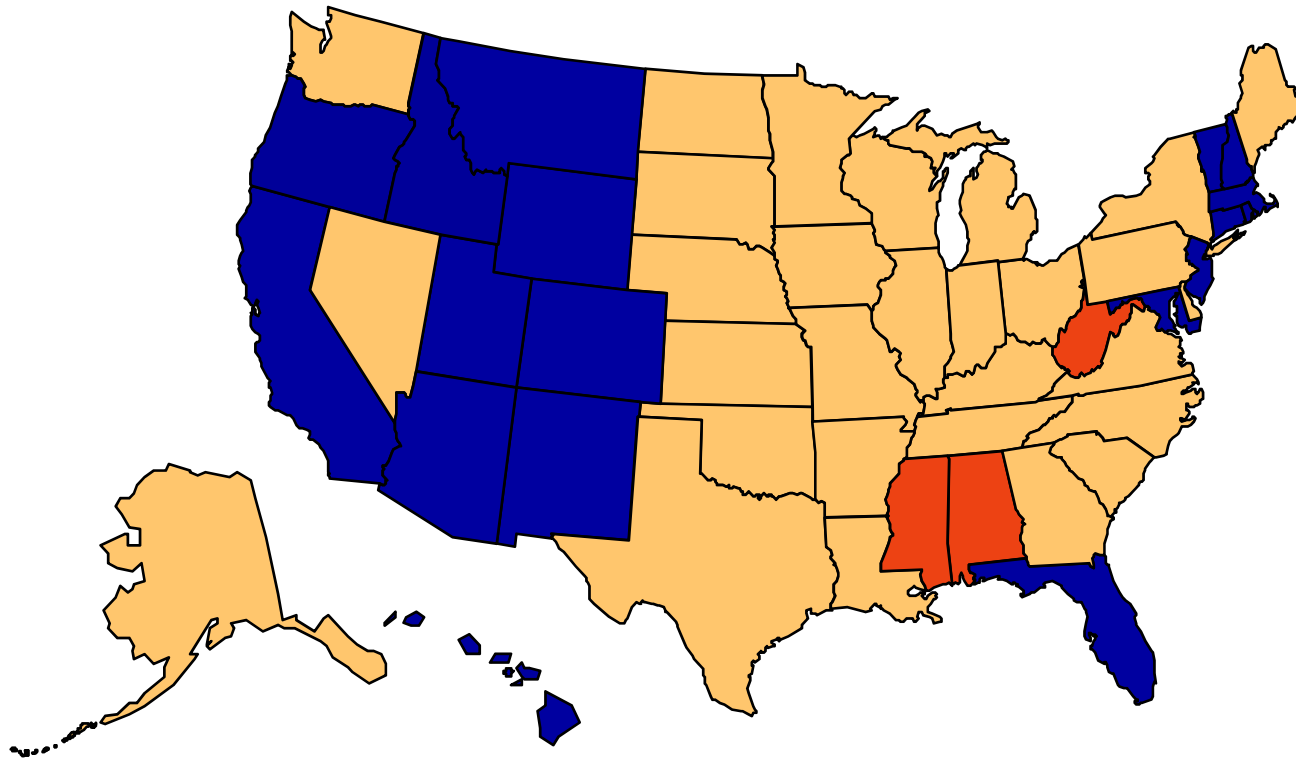
BRFSS, 2001

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Obesity Trends* Among U.S. Adults BRFSS, 2002

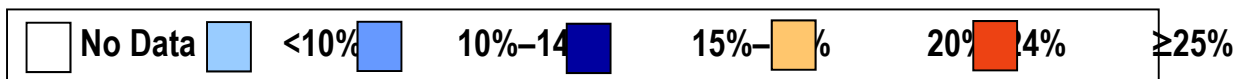
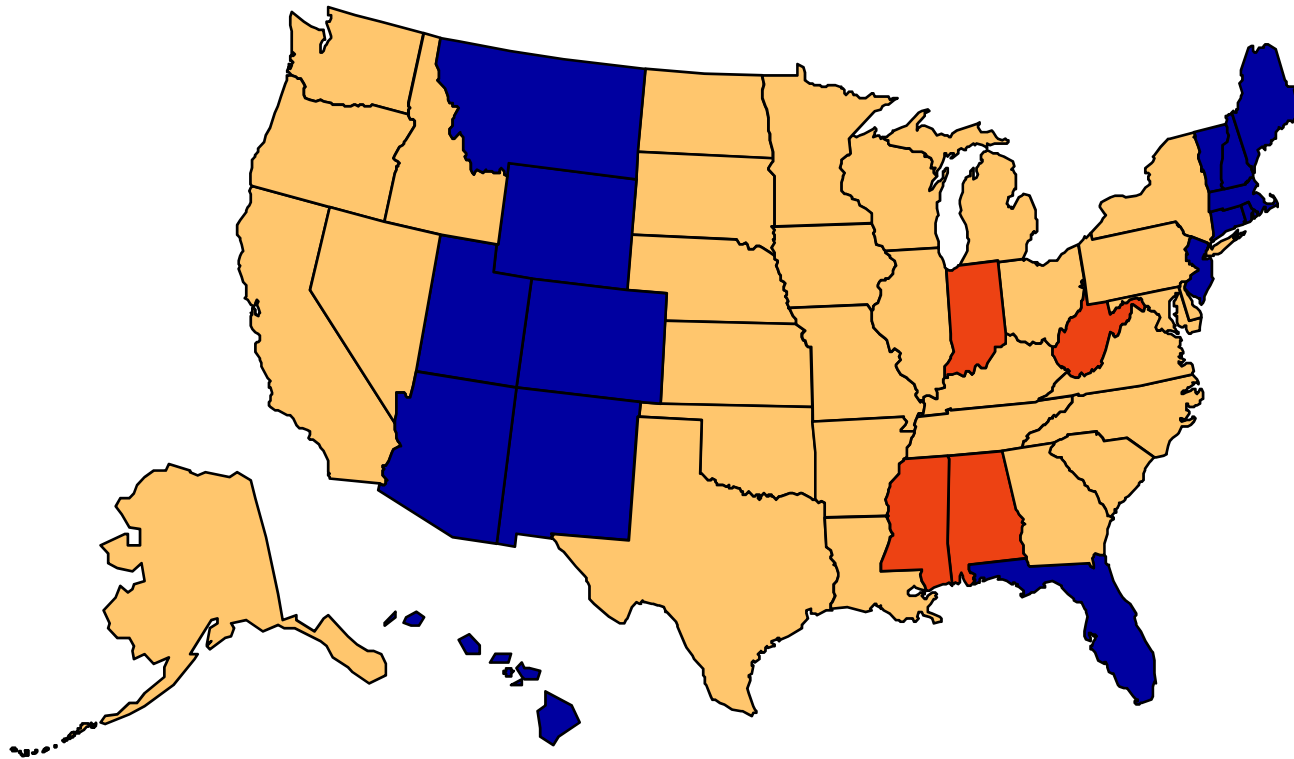
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Obesity Trends* Among U.S. Adults

BRFSS, 2003

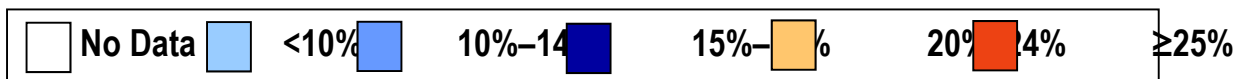
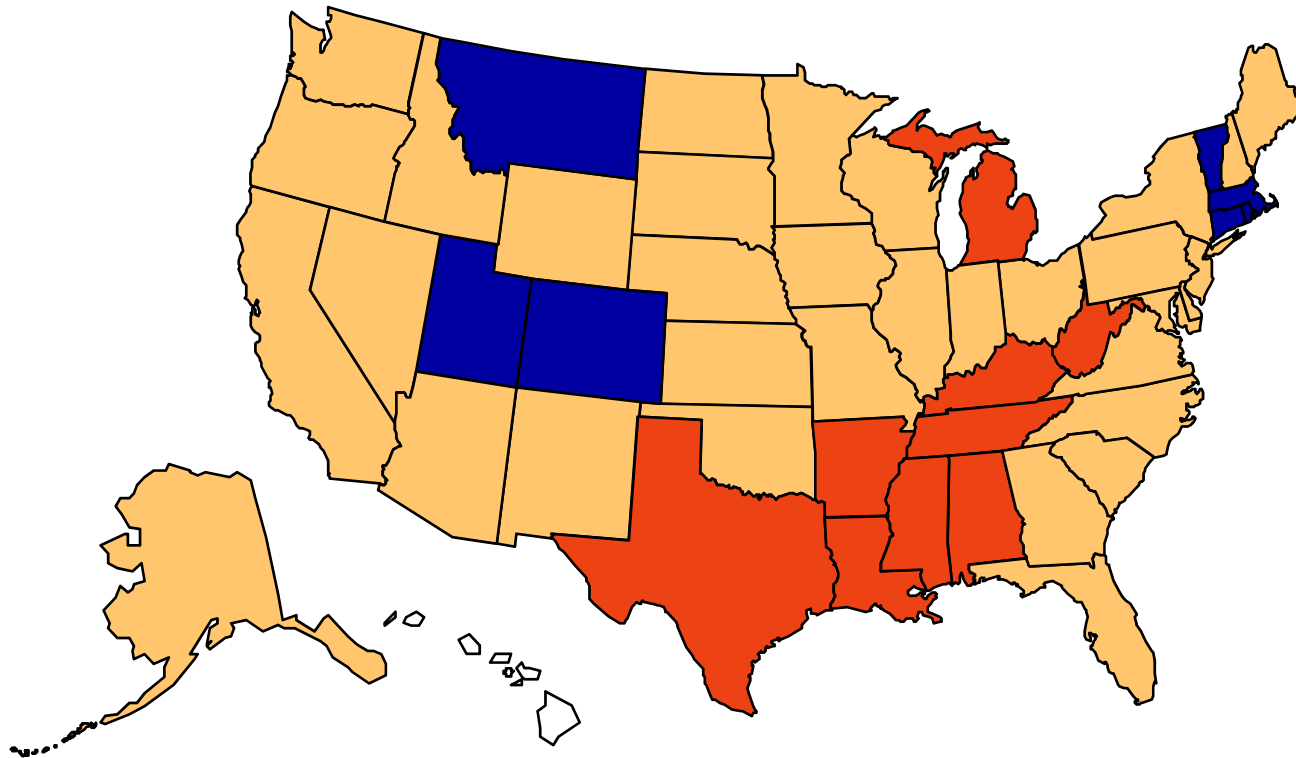
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BRFSS, 2004

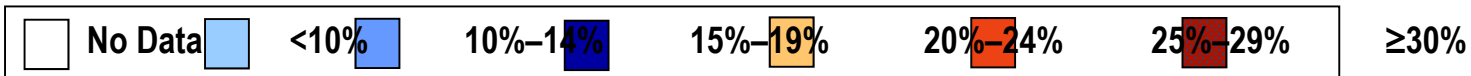
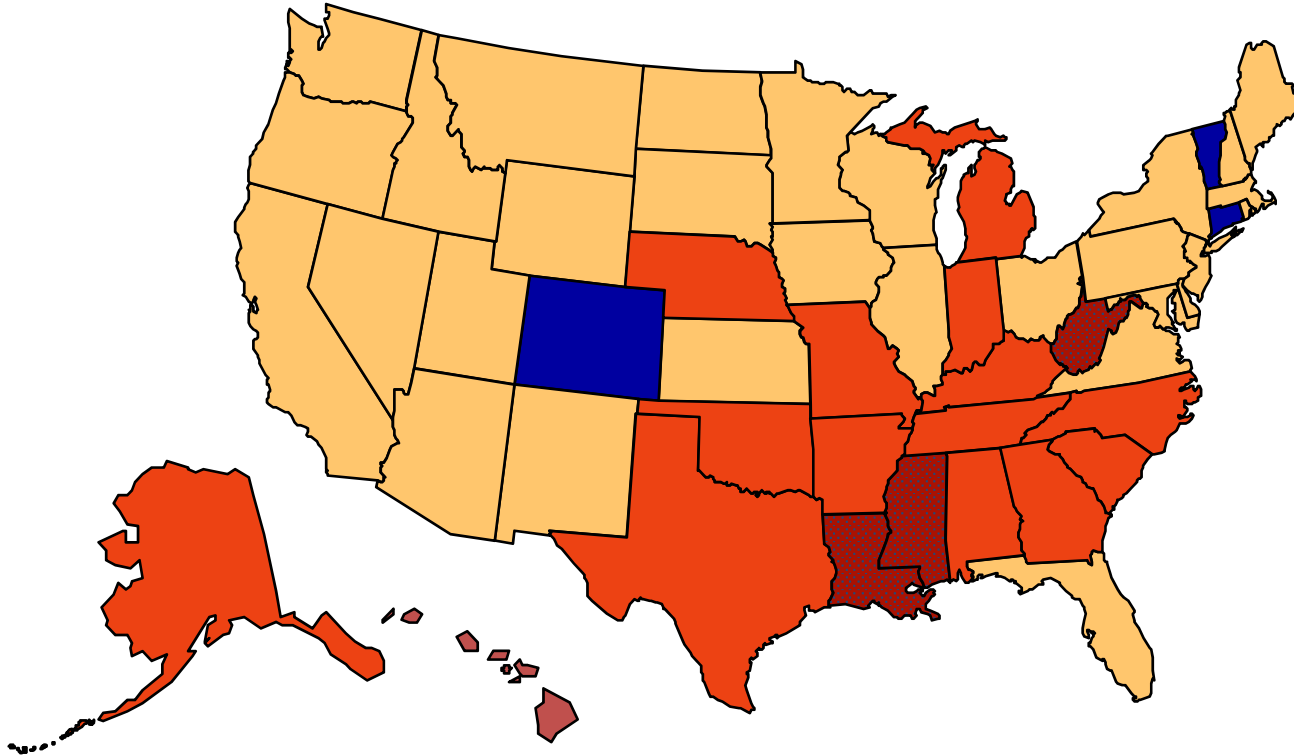
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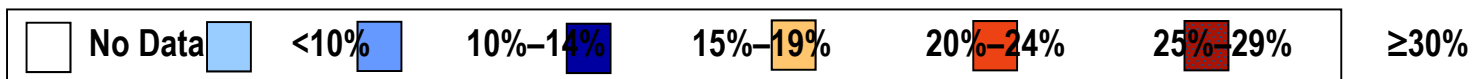
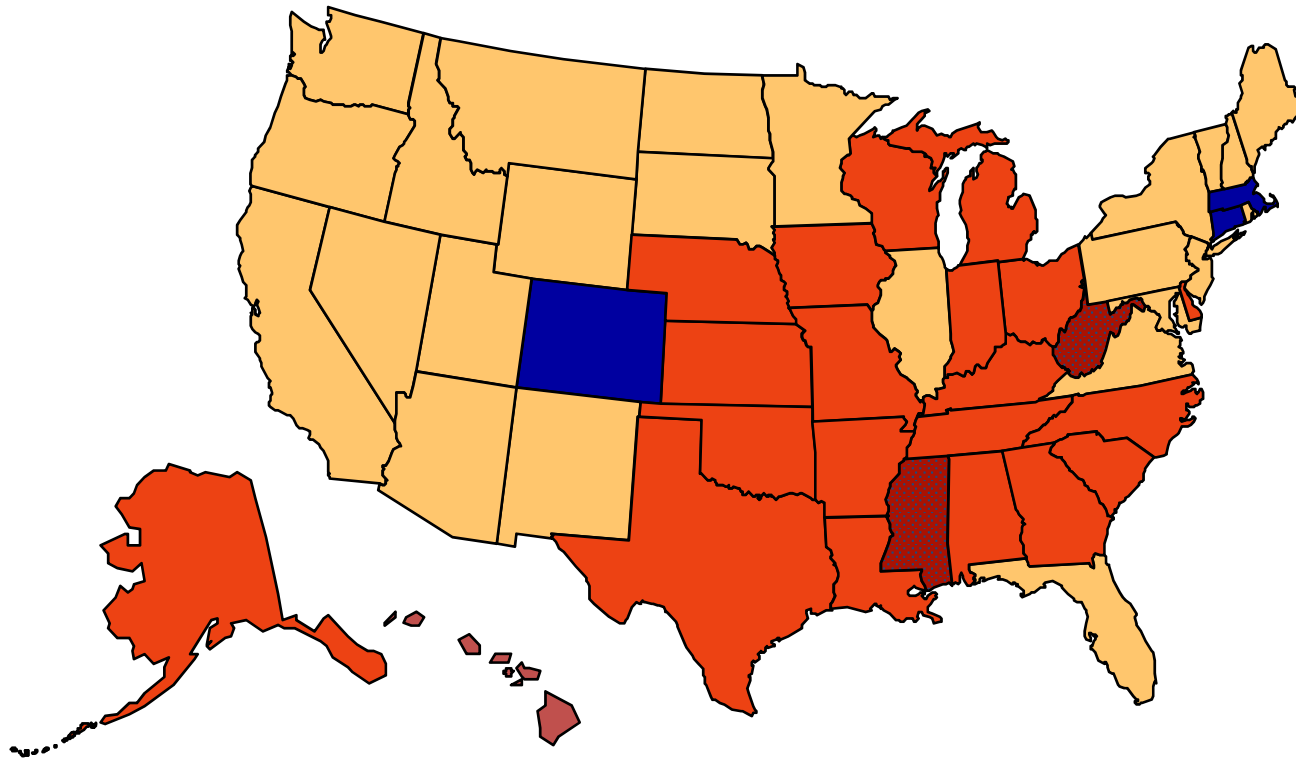
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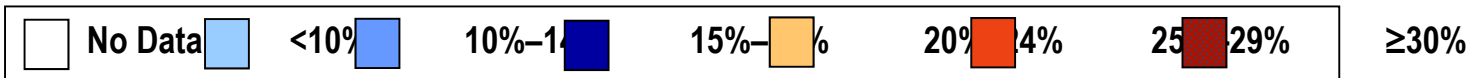
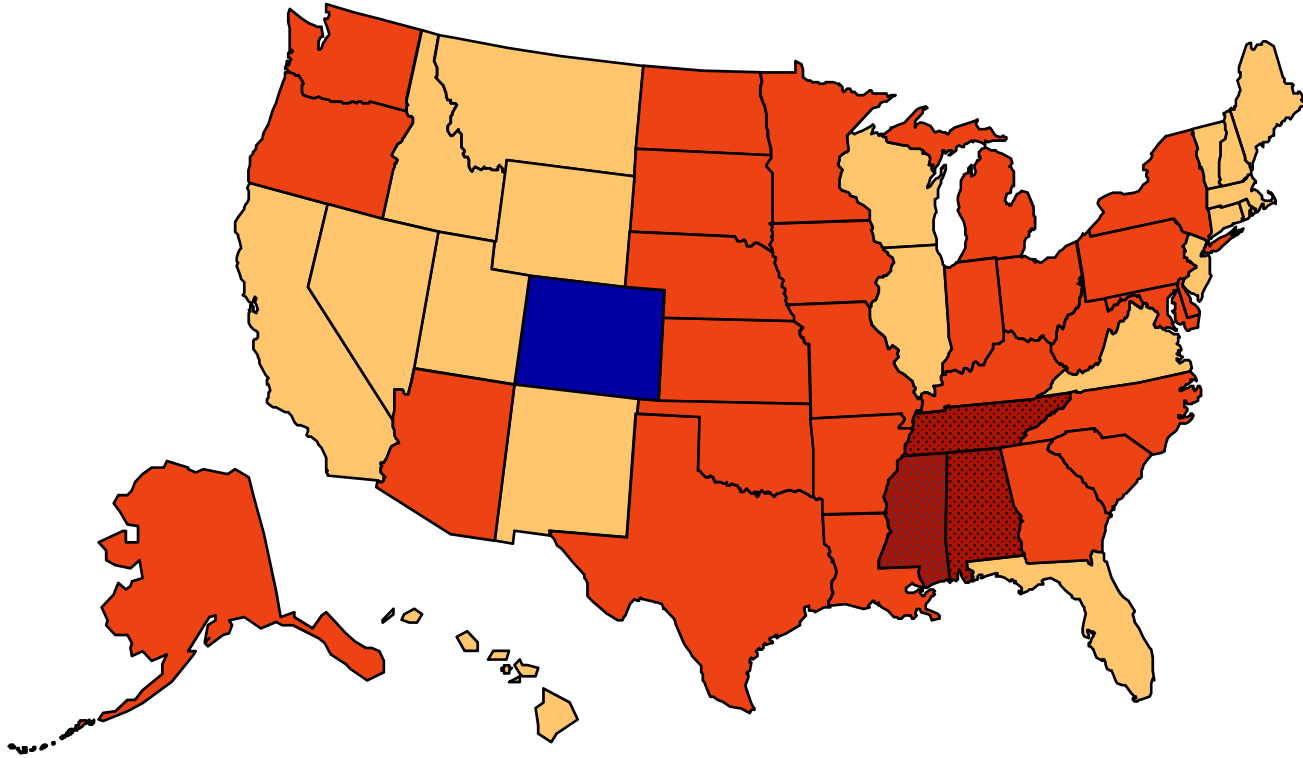
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BRFSS, 2007

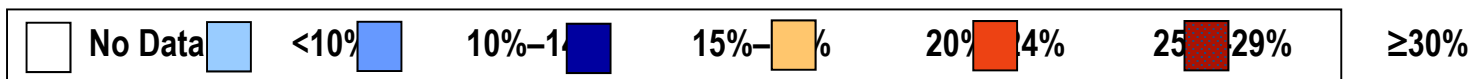
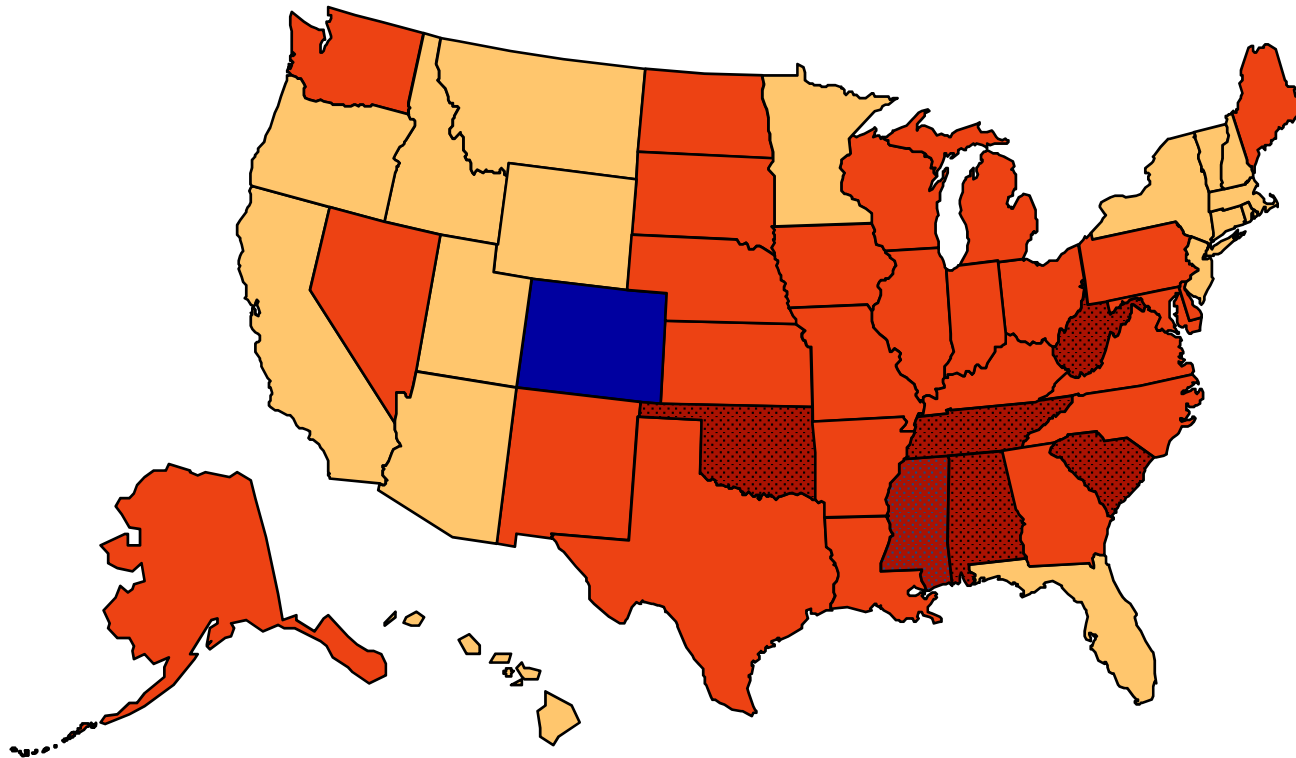
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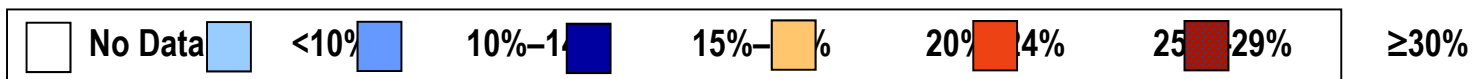
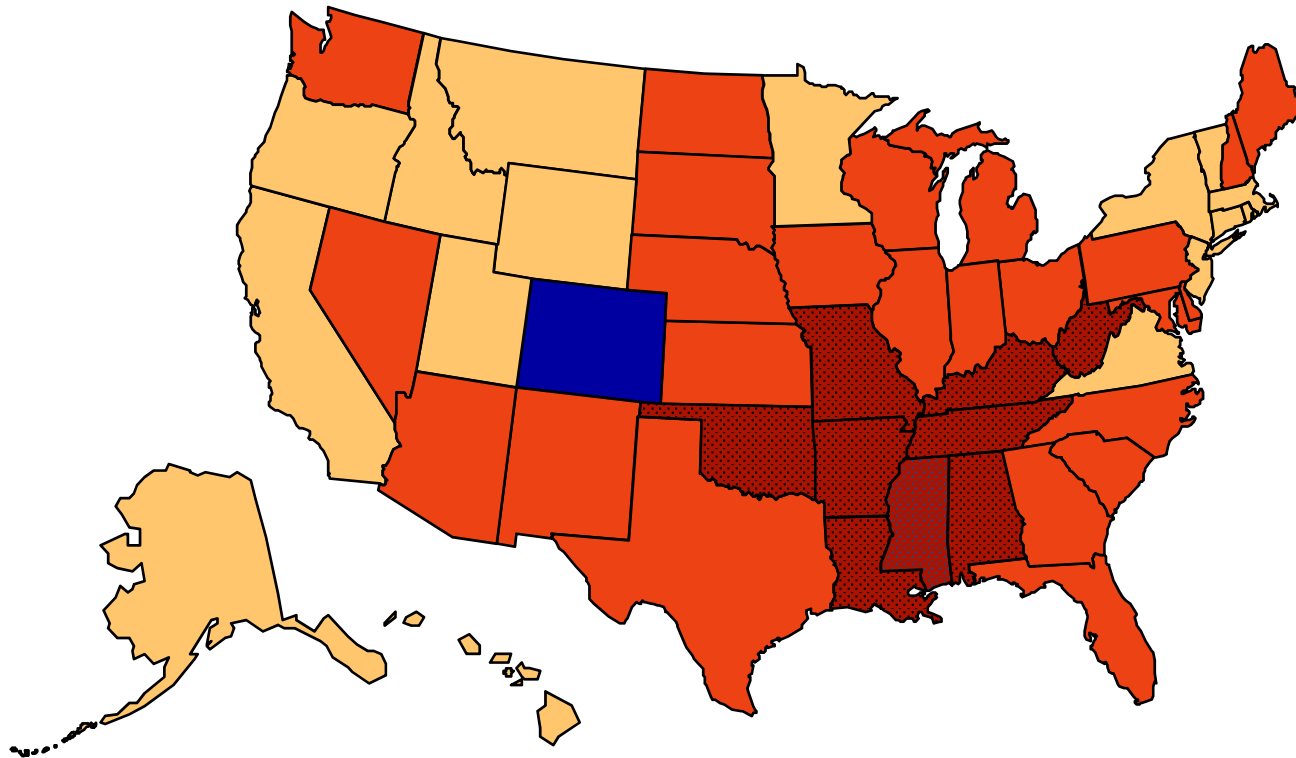
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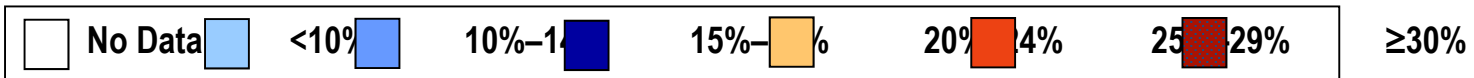
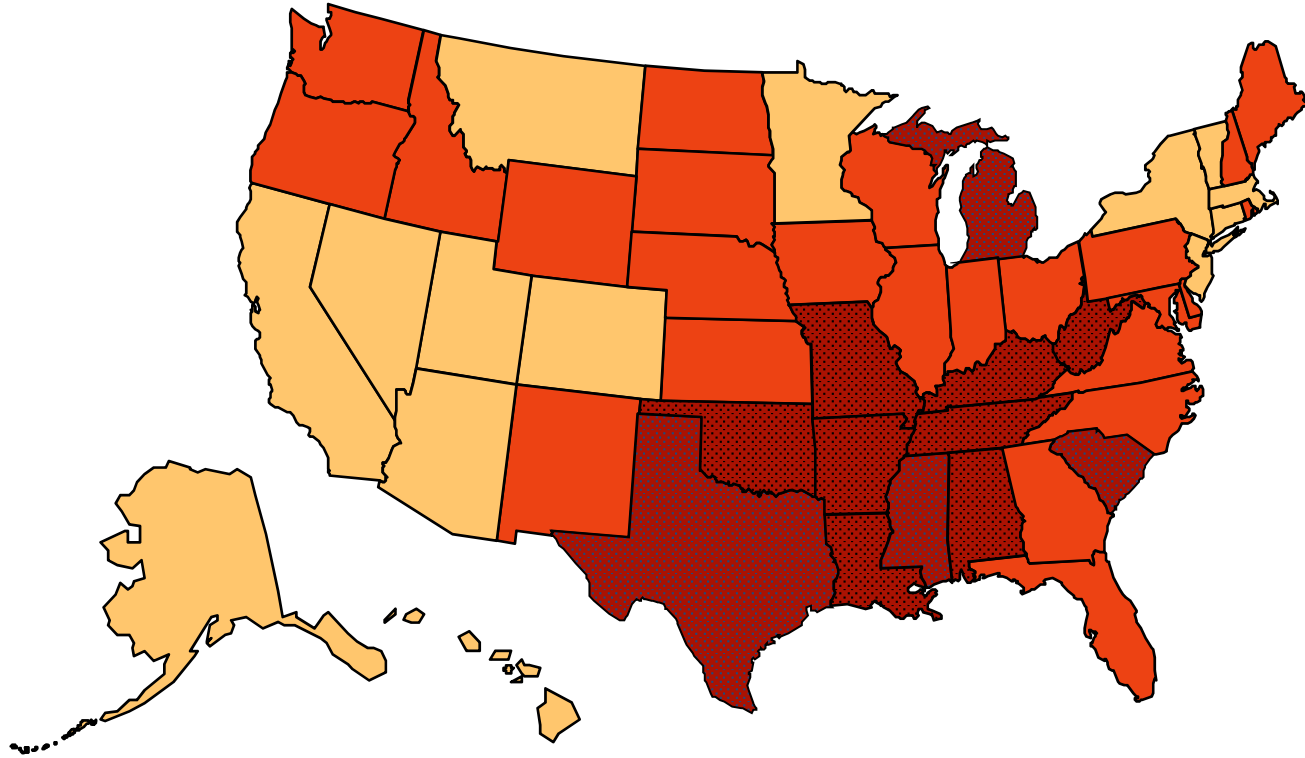
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BRFSS, 2010

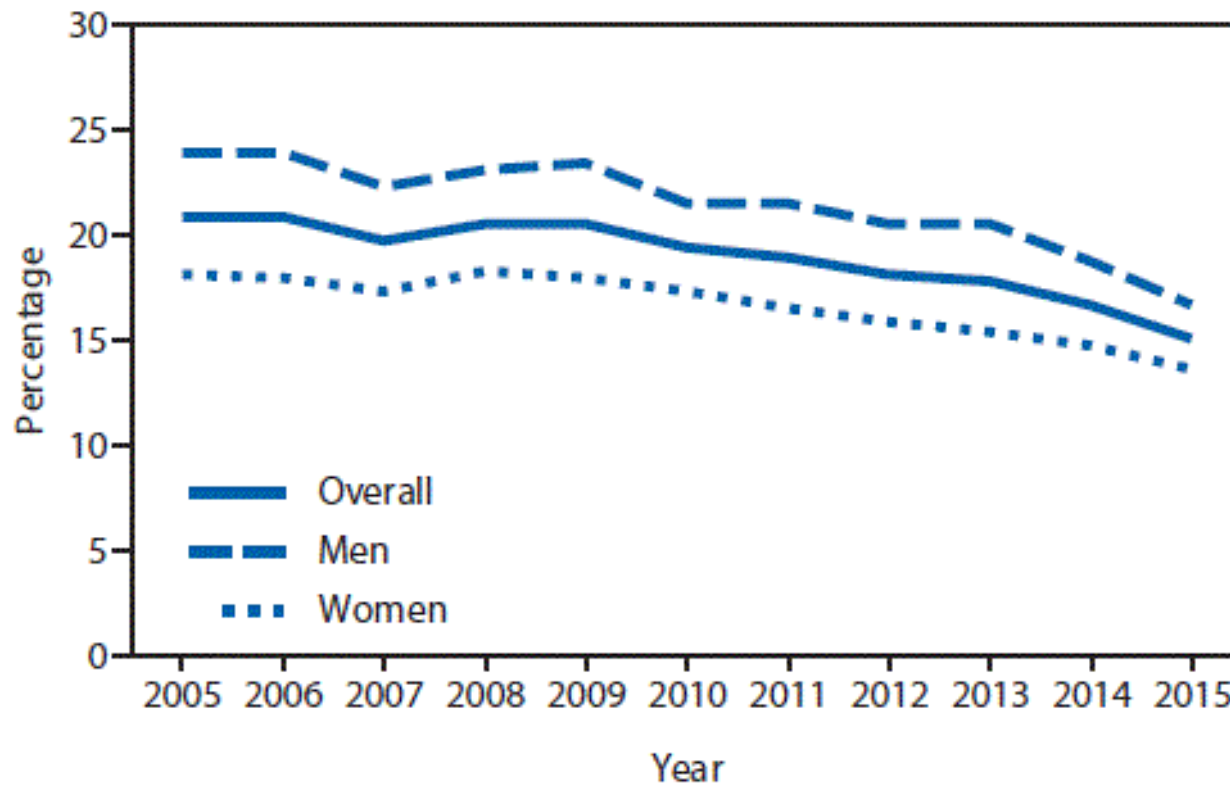
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(1) Temptation and Self Control Problems Seem to Be Ubiquitous

- America has an 'obesity problem'
- Americans smoke

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(1) Temptation and Self Control Problems Seem to Be Ubiquitous

- America has an 'obesity problem'
- Americans smoke (but less than they did)
- Americans take drugs

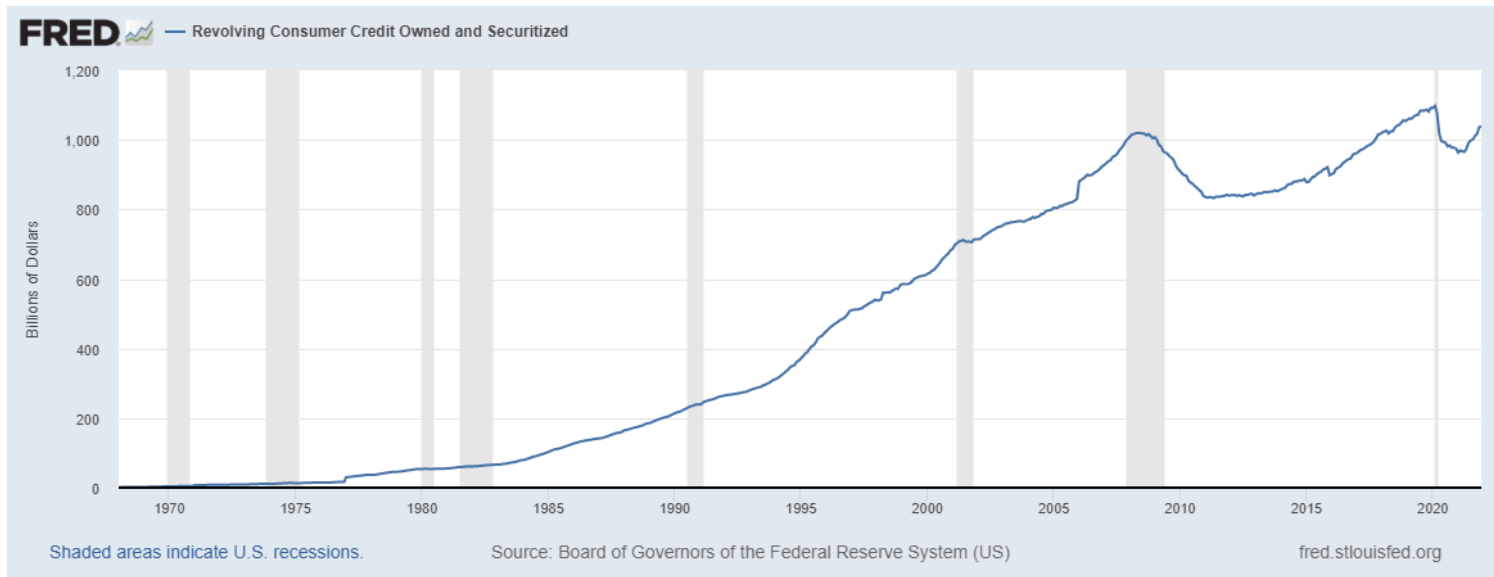
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Substance	2013	2014	2015	2016	2017	2018
ILLICIT DRUGS	nc	nc	10.1* (0.17)	10.6* (0.18)	11.2 (0.19)	11.7 (0.21)
Marijuana	7.5* (0.17)	8.4* (0.16)	8.3* (0.15)	8.9* (0.16)	9.6* (0.18)	10.1 (0.20)
Cocaine	0.6 (0.05)	0.6* (0.04)	0.7 (0.05)	0.7 (0.04)	0.8 (0.05)	0.7 (0.05)
Crack	0.1 (0.02)	0.1 (0.02)	0.1 (0.02)	0.2 (0.02)	0.2 (0.03)	0.2 (0.03)
Heroin	0.1 (0.02)	0.2 (0.02)	0.1 (0.02)	0.2 (0.02)	0.2 (0.02)	0.1 (0.02)
Hallucinogens	nc	nc	0.5* (0.03)	0.5 (0.03)	0.5 (0.03)	0.6 (0.04)
LSD	0.1* (0.01)	0.1* (0.02)	0.1 (0.01)	0.1 (0.02)	0.2 (0.02)	0.2 (0.02)
PCP	0.0 (0.01)	** (***)	0.0 (0.00)	0.0 (0.00)	0.0 (0.01)	0.0 (0.00)
Ecstasy	nc	nc	0.2 (0.02)	0.2 (0.02)	0.2 (0.02)	0.3 (0.02)
Inhalants	nc	nc	0.2 (0.02)	0.2 (0.02)	0.2 (0.02)	0.2 (0.02)
Methamphetamine	nc	nc	0.3 (0.03)	0.2* (0.03)	0.3 (0.03)	0.4 (0.04)
Misuse of Psychotherapeutics	nc	nc	2.4* (0.08)	2.3* (0.08)	2.2 (0.08)	2.0 (0.08)
Pain Relievers	nc	nc	1.4* (0.06)	1.2* (0.06)	1.2 (0.06)	1.0 (0.06)
Stimulants	nc	nc	0.6 (0.04)	0.6 (0.04)	0.7 (0.04)	0.6 (0.04)
Tranquilizers or Sedatives	nc	nc	0.8* (0.05)	0.9* (0.05)	0.7 (0.04)	0.7 (0.05)
Tranquilizers	nc	nc	0.7 (0.04)	0.7* (0.04)	0.6 (0.04)	0.6 (0.04)
Sedatives	nc	nc	0.2* (0.02)	0.2* (0.03)	0.1 (0.02)	0.1 (0.02)
Benzodiazepines	--	--	--	--	--	--
Opioids	nc	nc	1.5* (0.06)	1.4* (0.06)	1.3* (0.06)	1.1 (0.06)
Illicit Drugs Other Than Marijuana	nc	nc	3.5 (0.10)	3.4 (0.10)	3.4 (0.10)	3.2 (0.10)
TOBACCO PRODUCTS	25.5* (0.32)	25.2* (0.28)	23.9* (0.26)	23.5* (0.27)	22.4* (0.26)	21.5 (0.27)
Cigarettes	21.3* (0.30)	20.8* (0.26)	19.4* (0.25)	19.1* (0.25)	17.9* (0.25)	17.2 (0.25)
Smokeless Tobacco	nc	nc	3.4* (0.11)	3.3* (0.10)	3.2* (0.09)	2.9 (0.09)
Cigars	4.7 (0.14)	4.5 (0.11)	4.7 (0.12)	4.6 (0.11)	4.6 (0.11)	4.5 (0.12)
Pipe Tobacco	0.9 (0.06)	0.8 (0.05)	0.8 (0.05)	0.8 (0.05)	0.9 (0.05)	0.8 (0.04)
ALCOHOL	52.2* (0.41)	52.7* (0.33)	51.7 (0.32)	50.7 (0.31)	51.7 (0.33)	51.1 (0.37)
Binge Alcohol Use	nc	nc	24.9 (0.27)	24.2 (0.26)	24.5 (0.27)	24.5 (0.26)
Heavy Alcohol Use	nc	nc	6.5* (0.14)	6.0 (0.14)	6.1 (0.13)	6.1 (0.14)
SUBSTANCE USE						
Illicit Drugs, Tobacco Products, or Alcohol	nc	nc	60.9 (0.30)	60.2 (0.30)	60.7 (0.32)	60.2 (0.35)
Illicit Drugs or Alcohol	nc	nc	54.1 (0.31)	53.4 (0.32)	54.3 (0.33)	53.9 (0.36)
Tobacco Products or Alcohol	60.6* (0.39)	61.0* (0.31)	59.8* (0.30)	58.9 (0.30)	59.4 (0.32)	58.8 (0.35)

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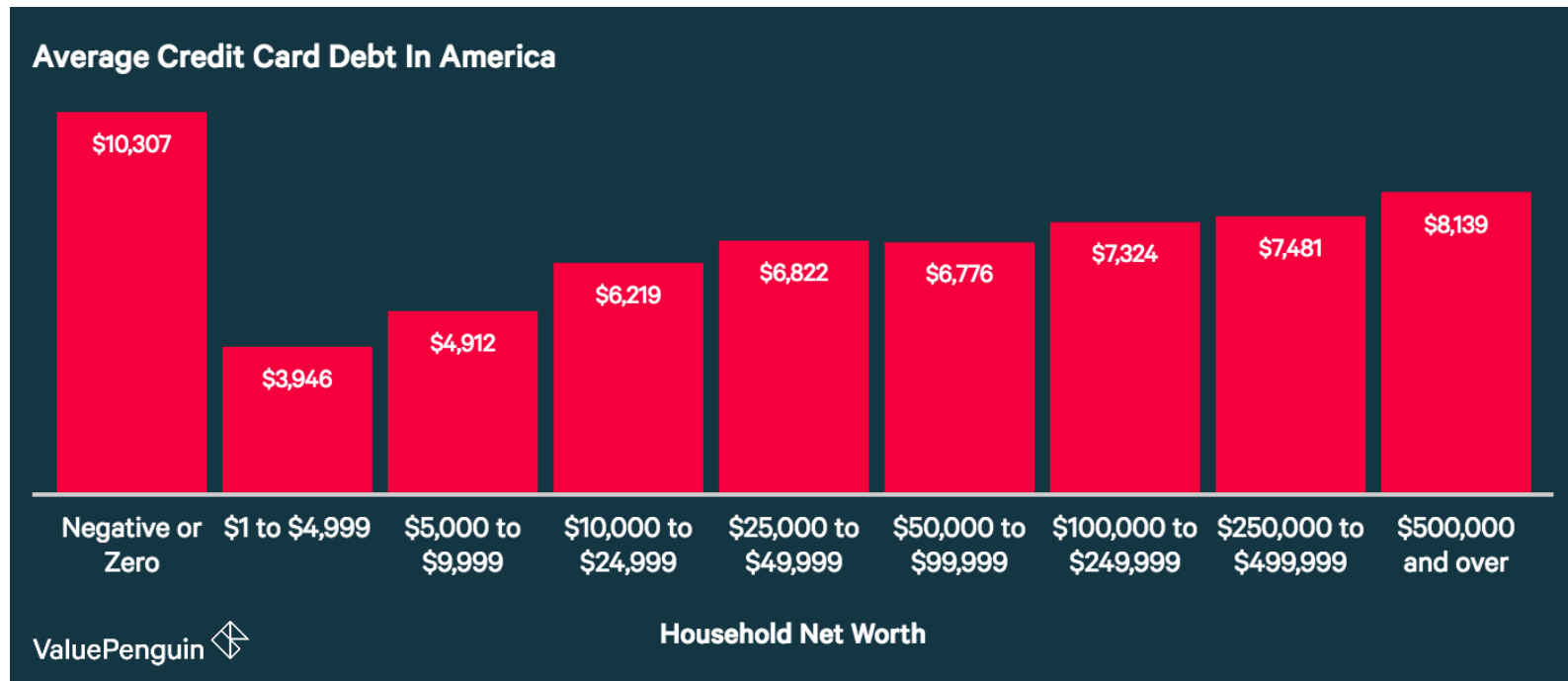
- America has an 'obesity problem'
- Americans smoke (but less than they did)
- Americans take drugs
- Americans have a lot of credit card debt

(1) Temptation and Self Control Problems Seem to Be Ubiquitous



- Graph shows outstanding US credit card debt
- \$8595 per household in 2022

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Year: 2018

(1) Temptation and Self Control Problems Seem to Be Ubiquitous

Age of family head and family income ¹	Percent having a general-purpose credit card	Percent having a balance after last month's bills	Median balance ²
1992 total	62.4%	52.6%	\$1,200
1995 total	66.5	52.6	1,700
1998 total	67.5	54.7	2,000
2001 total	72.7	53.7	1,800
2004 total	71.5	56.2	2,100

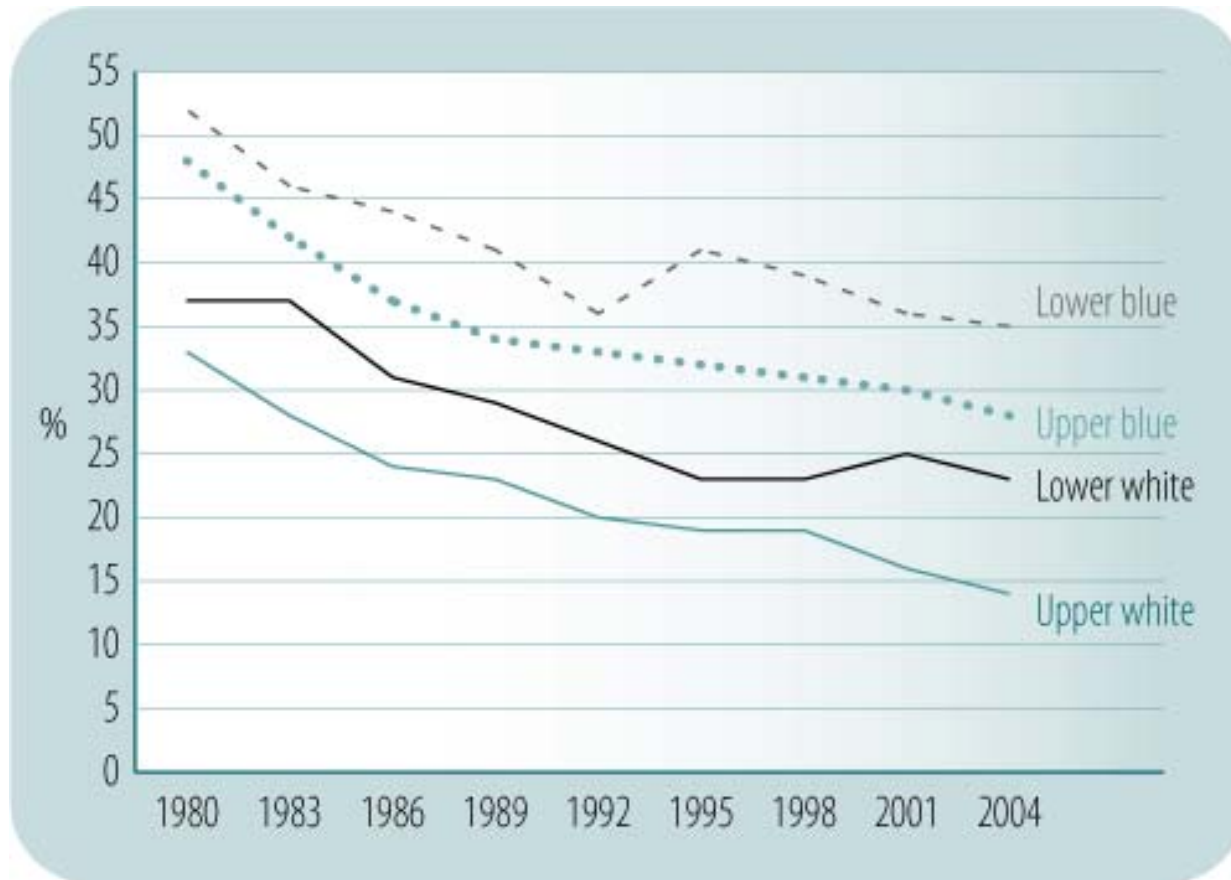
(1) Temptation and Self Control Problems Seem to Be Ubiquitous

- America has an ‘obesity problem’
- Americans smoke (but less than they did)
- Americans take drugs (but slightly less than they used to)
- Americans have a lot of credit card debt (more than they used to AND have a balance at the end of the month)
- Americans wished they saved more
 - 76% of Americans wish that they

Temptation and Self Control

1. Problems of temptation and self control seem to be ubiquitous
2. Correlated with socioeconomic outcomes
3. Something the standard model cannot capture

(2) Temptation and Self Control Linked to Socioeconomic Outcomes



(2) Temptation and Self Control Linked to Socioeconomic Outcomes

	Smoking Rate USA 2015
Below poverty level	26.1
Above poverty level	13.9

(2) Temptation and Self Control Linked to Socioeconomic Outcomes

- “Delay of Gratification in Children” by Mischel et al. (Science 1989)
 - ‘Self control’ measured in 35 young (4 years old) children
 - Children shown a worse and better reward (e.g. 1 marshmallow or 2 marshmallows)
 - Told that they could wait until the experimenter comes back, and get the better reward
 - Or press the bell and get the worse reward
 - Self control measured as length of time before bell is pressed

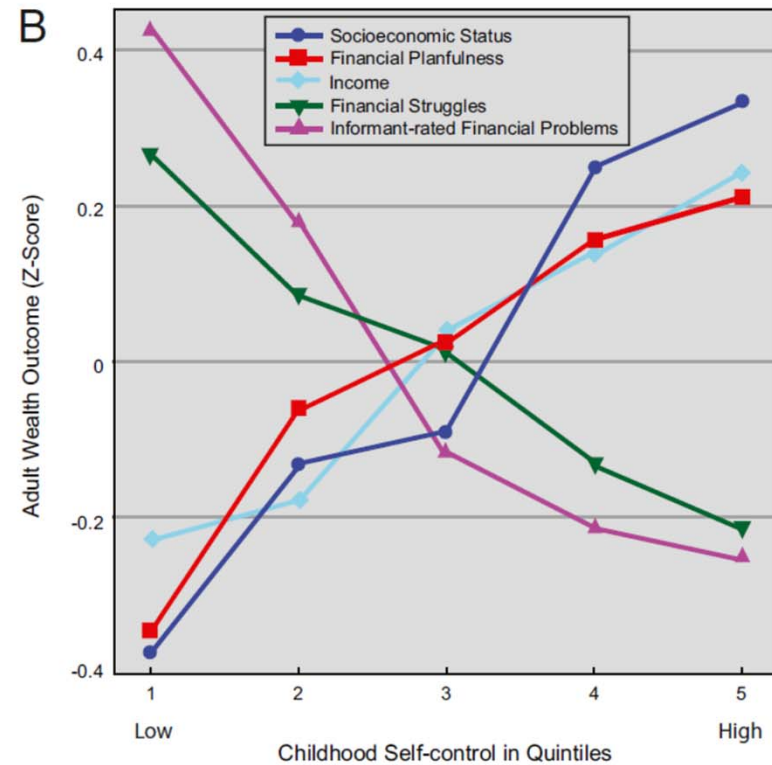
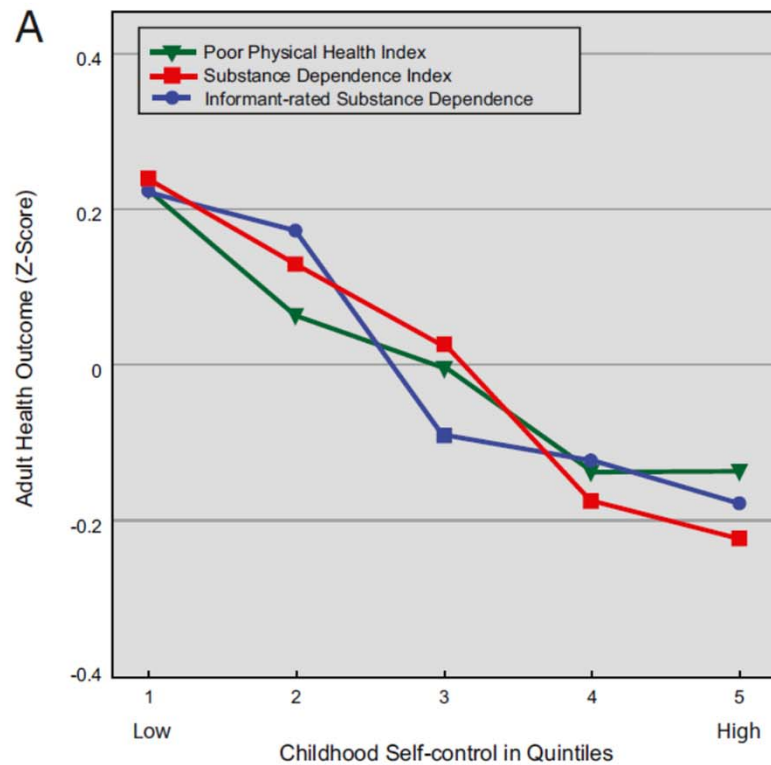
(2) Temptation and Self Control Linked to Socioeconomic Outcomes

- Self Control at age of 4 correlated with later life outcomes
 - SAT verbal and quantitative
 - Parental ratings of coping ability as adolescents
- Only true for treatments in which rewards were exposed, not obscured
- See also Shoda, Mischel and Peake (1990)

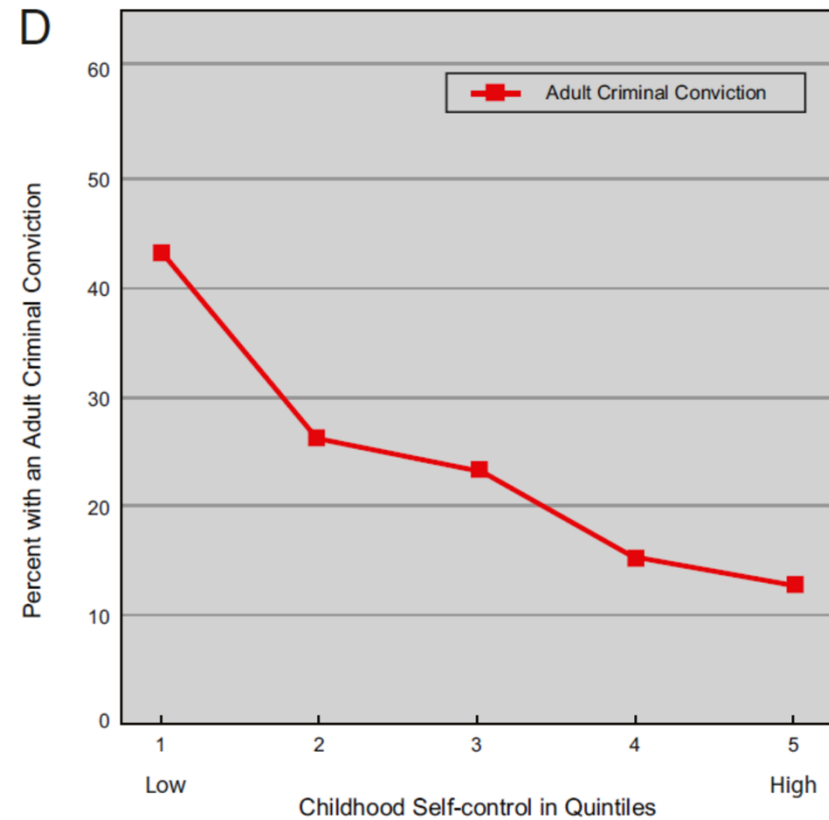
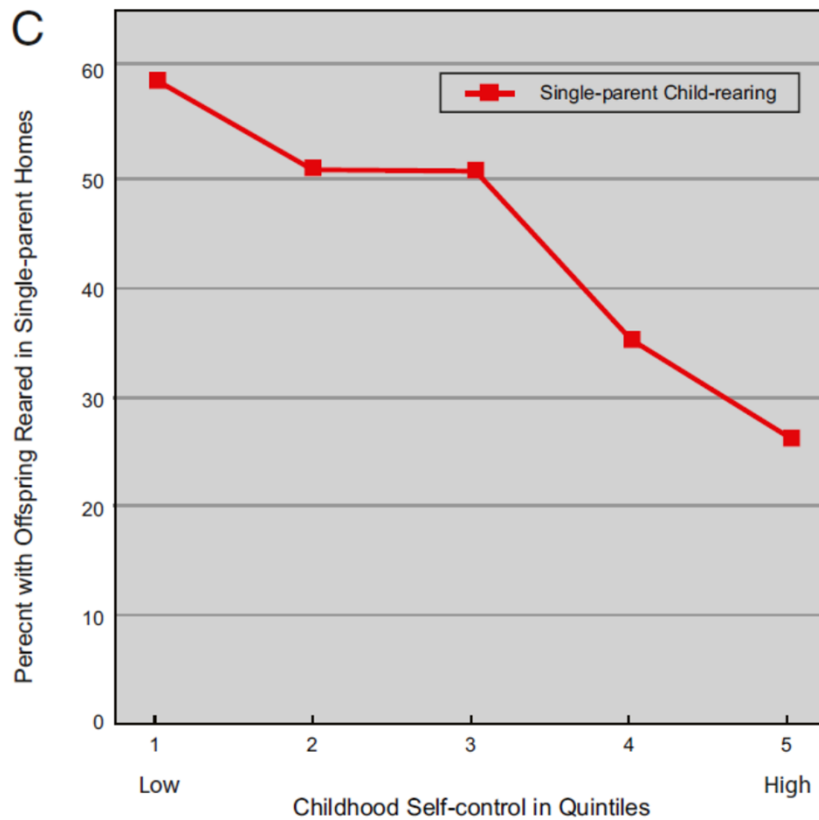
(2) Temptation and Self Control Linked to Socioeconomic Outcomes

- “A gradient of Childhood self control predicts health, wealth and public safety” Moffitt et al [2011] PNAS
 - 1037 children in New Zealand
 - Self control measured via
 - Self reports
 - Observations by researchers
 - Reports by teachers and parents
 - Combined in a single factor

(2) Temptation and Self Control Linked to Socioeconomic Outcomes



(2) Temptation and Self Control Linked to Socioeconomic Outcomes



(2) Temptation and Self Control Linked to Socioeconomic Outcomes

- Results remain when intelligence controlled for
- In sibling study, significant results for
 - Smoking as a 12 year old
 - School performance
 - Antisocial behavior

(2) Temptation and Self Control Linked to Socioeconomic Outcomes

- Other evidence:
 - Differences remain into (much) later life (Mischel et al 2011)
 - Meta studies show robust correlation between psychologically measured self control measures and a wide variety of behaviors (de Ridder et al. 2012)
 - Contemporaneously measured ability to delay gratification related with many behaviors
 - Obesity (Caleza et al. 2016)
 - Health related behavior, savings decisions and conduct in school for adolescents (Sutter et al. 2013)
- Replication Issue Claxon!
 - But Watts, Duncan and Quan [2018] report much smaller effects
 - Though see Falk, Kosse and Pinger [2019] and Michaelson and Munakata [2020]

(2) Temptation and Self Control Linked to Socioeconomic Outcomes

- Note however that these do NOT imply a causal link
 - It could be a third factor drives both measured self control and socioeconomic outcomes
 - See Kidd, Palmeri and Aslin [2013] and Michaelson and Munakata [2020]
 - Performance in Marshmallow type tasks related to how much you trust people in your environment
- Even if link is causal, which way does causation run?
 - Do self control problems lead to worse outcomes?
 - Or do worse outcomes make it harder to exert self control?
- A recent literature has concentrated on the second possibility
 - Link between poverty and cognitive resources
 - Link between cognitive resources and self control

(2) Temptation and Self Control Linked to Socioeconomic Outcomes

Poverty to limited cognitive resources

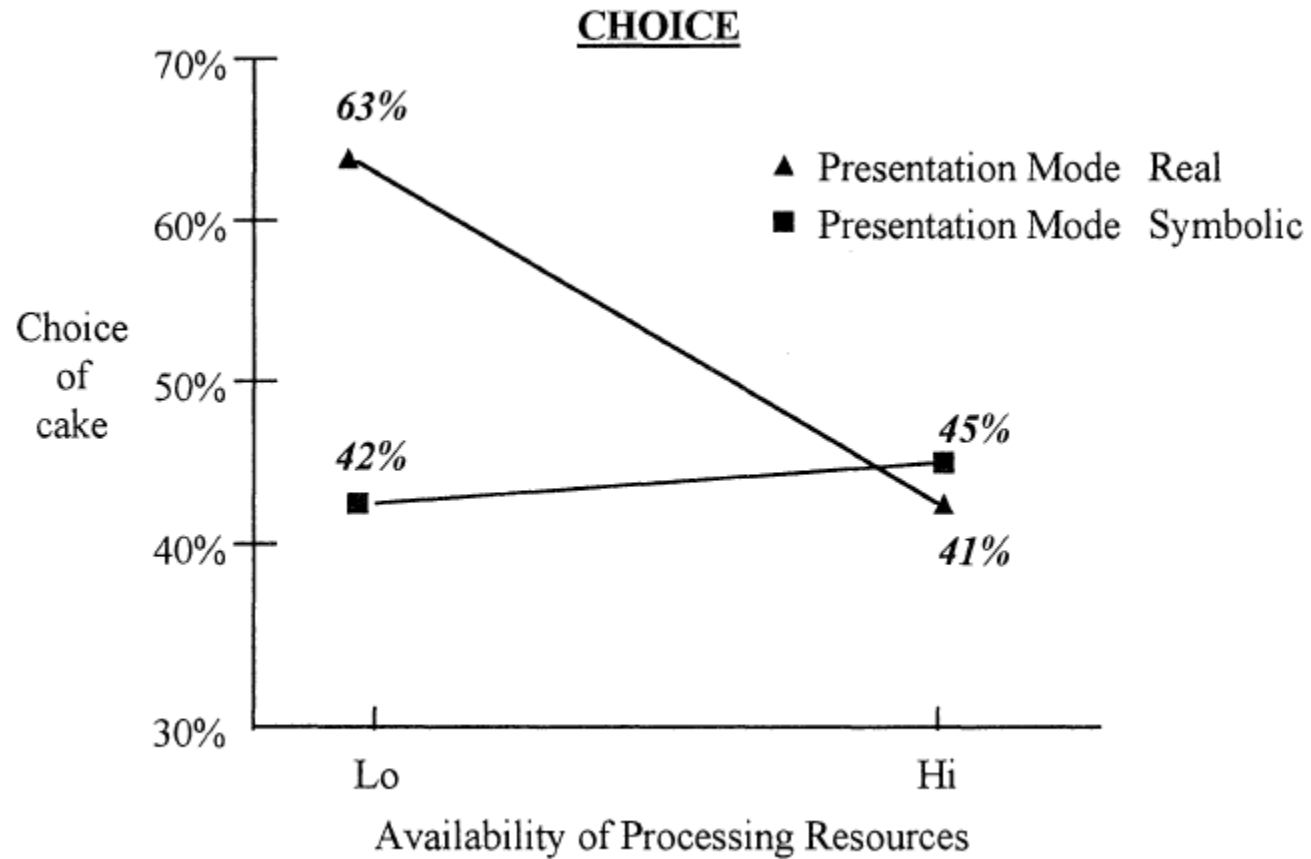
- Mani et al. [2013] – link between poverty and cognitive resources
- Provide laboratory and field evidence that poverty affects decision making
- Hypothesize that the cognitive effort required to manage day to day activities when poor limit cognitive resources for other things
- Study how well Indian farmers perform on cognitive control and intelligence tasks before and after they are paid for the annual harvest
 - Pre payment farmers do worse
 - Seems not to be related to
 - Time available
 - Work effort
 - Stress
 - Nutrition
- But see
 - Carvalho et al [2015] – only impact on present bias for money
 - Recent replication study of economic experiments [Camerer et al. 2018]
 - Fehr et al [2019] – *smaller* endowment effect when more resource constrained

(2) Temptation and Self Control Linked to Socioeconomic Outcomes

Depleted cognitive resources to self control

- Shiv and Fedorikhin [1999]
 - Subject enters room 1
 - Asked to remember a number to be repeated in room 2
 - Walks to room 2 via a tray of snacks
 - Containing 2 types of snack
 - Chocolate Cake
 - Fruit
 - Four treatments:
 - Available processing capacity
 - High (2 digit number)
 - Low (7 digit number)
 - Presentation mode
 - Real
 - Symbolic

Shiv and Fedorikhin [1999]



Temptation and Self Control

1. Problems of temptation and self control seem to be ubiquitous
2. Correlated with socioeconomic outcomes
3. Something the standard model cannot capture

(3) Something that the Standard Model Cannot Capture

- In the standard economic model of decision making, there is a single utility function that people maximize
- No room for 'temptation' or 'self control'
 - No sense in which the DM might choose option x, but wished they had chosen option y
 - No sense in which they exerted self control in order to choose x over the tempting alternative y
 - In choices over time, decision maker is assumed to be **time consistent**
 - Decision maker at time t agrees with themselves at time t+1
 - Even if tastes change
 - This is true even in 'rational addiction' models in which utility function is history dependent
- Standard model has no way of starting to address problems of temptation and self control

How Do We Spot Someone Having a Temptation/Self Control Problem?

- Loosely speaking “Doing something in the moment that is against your long run interests”

How Do We Spot Someone Having a Temptation/Self Control Problem?

1. We see them doing something naughty
 - i.e. we identify self control problems with certain activities
 - Smoking
 - Drug taking
 - Undersaving
 - There is no ‘rational’ reason to take drugs, so anyone who takes drugs must be in the grip of a self control problem
 - This goes against standard economic methodology
 - Very proscriptive – maybe benefit of cigarette smoking is higher than long term costs for some people
 - Should someone with a week to live really not take heroin?

How Do We Spot Someone Having a Temptation/Self Control Problem?

2. People tell us that they want to do one thing, then do another
 - For example, tell us that they want to quit smoking, but then carry on smoking
 - Hard to interpret this data – why do we treat what they say as more important than what they do?
 - In general, we may feel that we don't know how to deal with 'self reports', but know how to deal with choice
 - If someone says they want to do a, but actually does b, we would generally consider this evidence that they prefer b over a
 - Talk is cheap

How Do We Spot Someone Having a Temptation/Self Control Problem?

3. They change their mind

- For example:
 - People repeatedly quit smoking, then restart
 - People take drugs when they are younger but not when they are older
 - People smoke when drunk, but not when sober
- Hard to distinguish between temptation and changing tastes
 - Maybe drinking and cigarette smoking are compliments?

Two Approaches to Spotting Temptation and Self Control Problems

1. Preference for Commitment
2. Time Inconsistency

Preference For Commitment

- Imagine we saw the following behaviors:
 - A gambler asks to be banned from a casino
 - A drinker asks to be given a drug that makes them violently ill if they drink
 - A dieter refuses to have chocolate in their house
- In other words, **choosing to reduce their choice set in the future**
- (all of these happen in real life)

Preference For Commitment

- I would argue that these are plausibly signs of temptation/self control problems
 - Time t self is worried that time $t+1$ self will do something that they do not like
 - Therefore restricts options available to their $t+1$ self
- E.g. at time t , removes the option to drink at time $t+1$
- Such behavior would not be exhibited by someone who
 - Was perfectly happy with the amount they drank
 - Had changing preferences over drinking, but were happy to make a game-time decision
- Stops talk being cheap
- Though requires decision maker to be *sophisticated*

Time Inconsistency

- Imagine we saw the following behaviors:
 - A (very thirsty) decision maker chooses juice now over twice the amount of juice in 5 mins
 - Also chooses juice in 20 minutes over twice the amount of juice in 25 minutes.
- This is 'present biased preference reversal'
- Arguably, this is also an example of a self control problem
 - Presumably, in 20 minutes, you would choose juice today over 2 times juice in 5 minutes
 - So your preferences now disagree with preferences in 20 minutes time
 - Assumes that now is the same as 20 minutes time in all other respects