

Promoting Brain Health: Diabetes, U.S. POINTER, and the Public Health Imperative

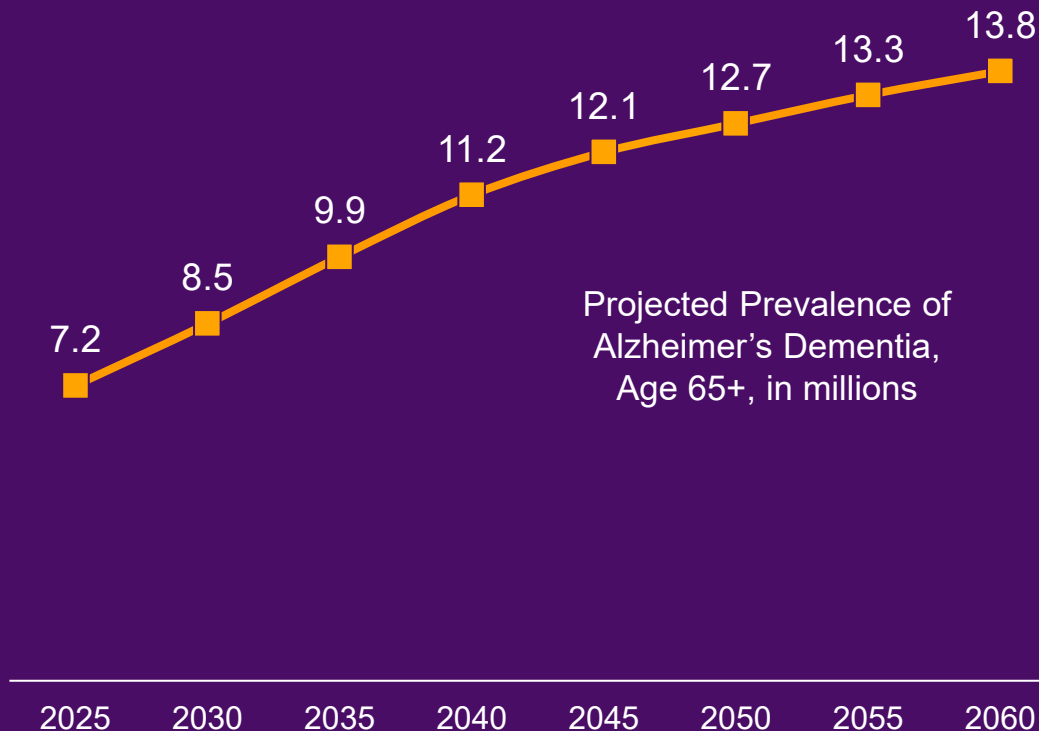
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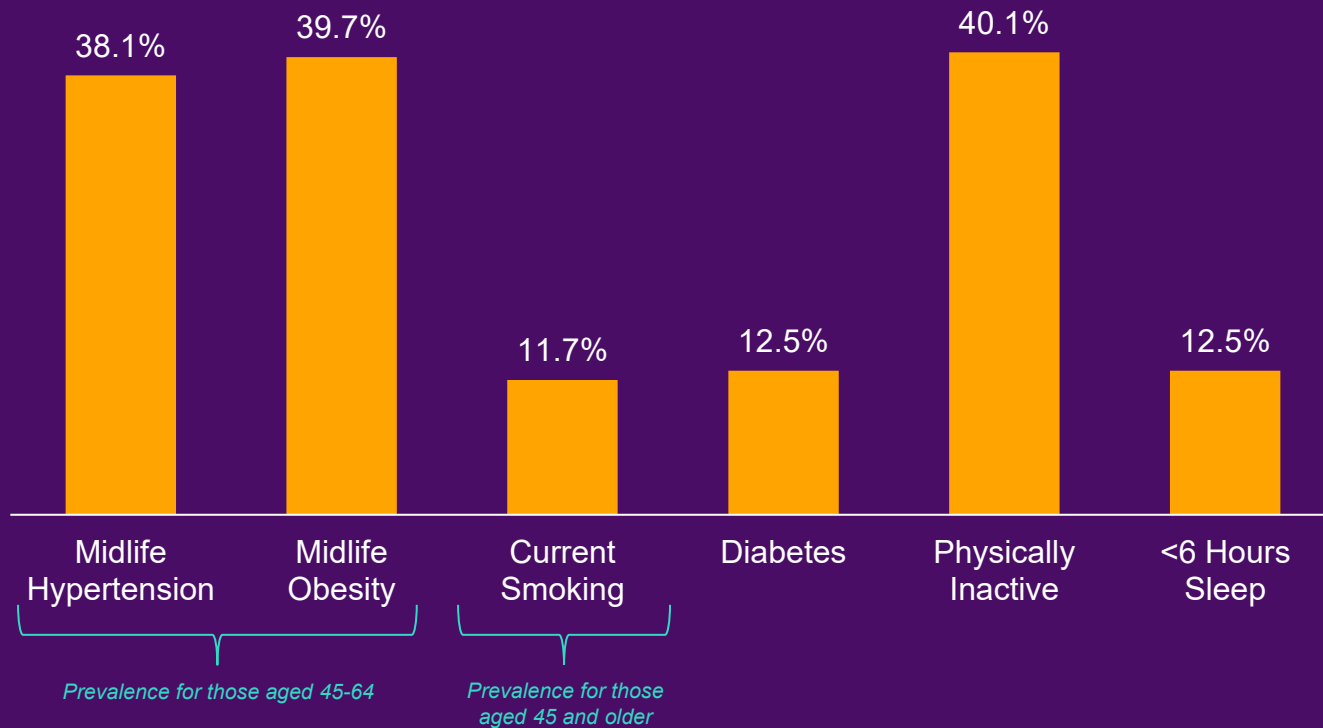
The Importance of Risk Reduction

Projected Alzheimer's Prevalence

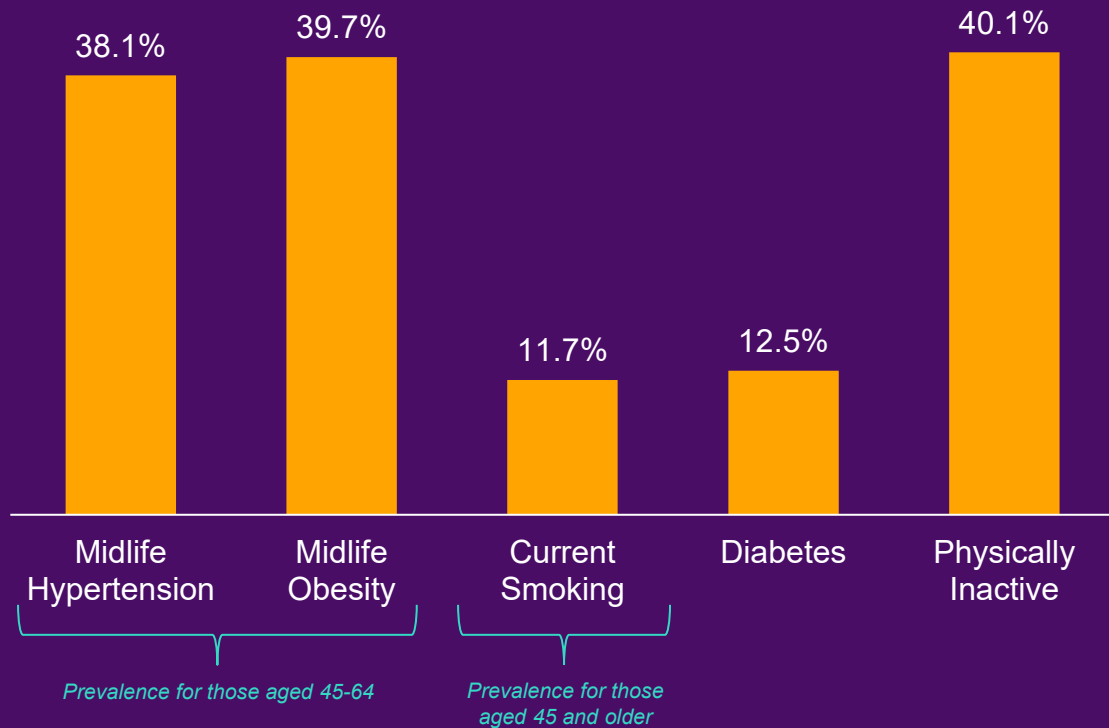
- More than 7 million older Americans currently living with Alzheimer's
- In 2060, nearly 14 million living with Alzheimer's



Risk Factor Prevalence



Risk Factor Prevalence



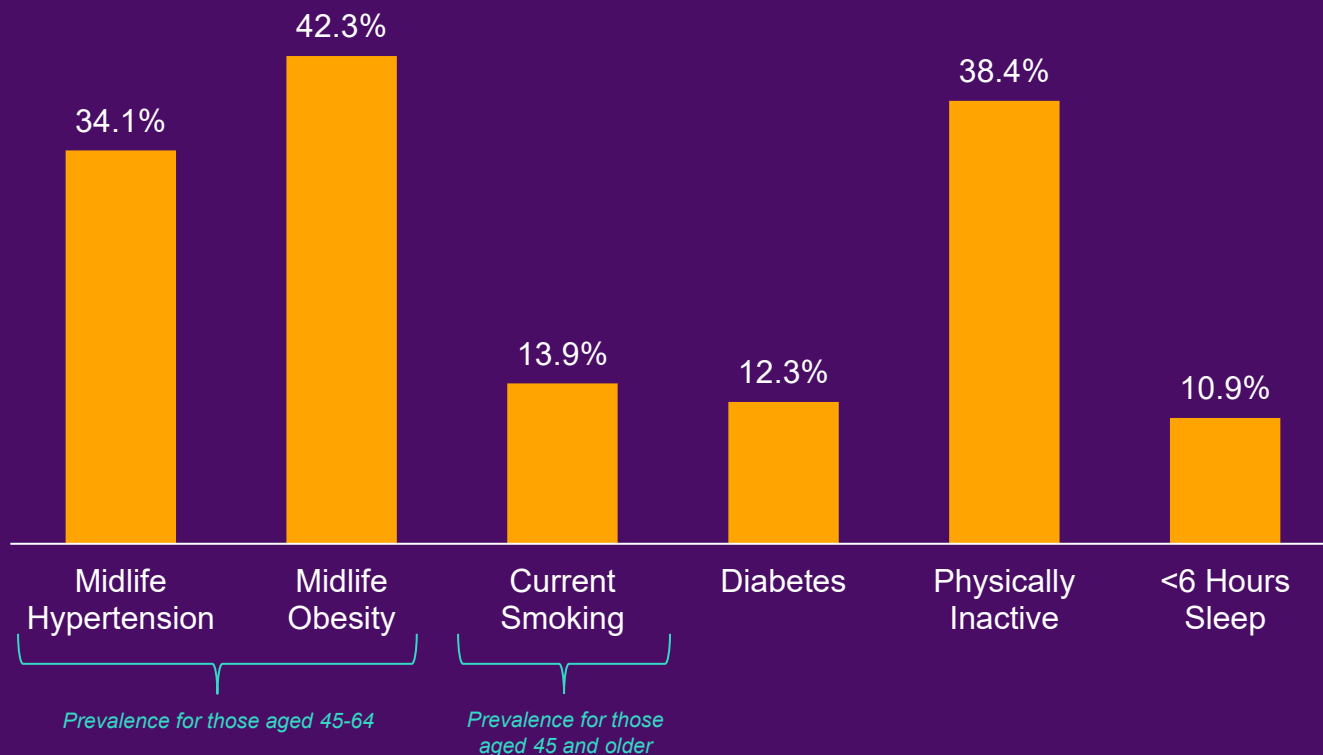
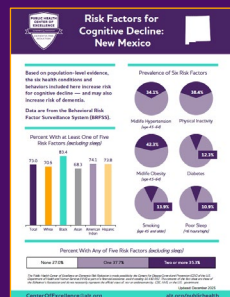
% with at least one

70%

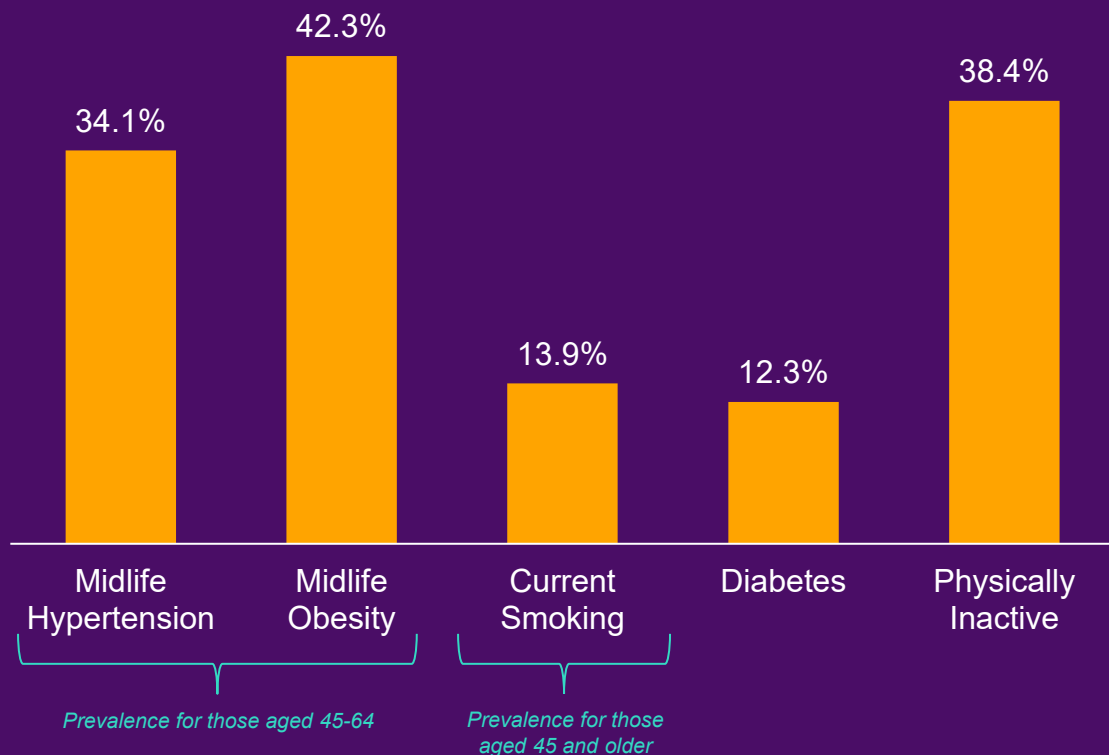
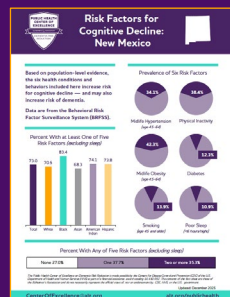
of all adults

78% of Black adults

Risk Factor Prevalence, New Mexico



Risk Factor Prevalence, New Mexico



% with at least one

73%

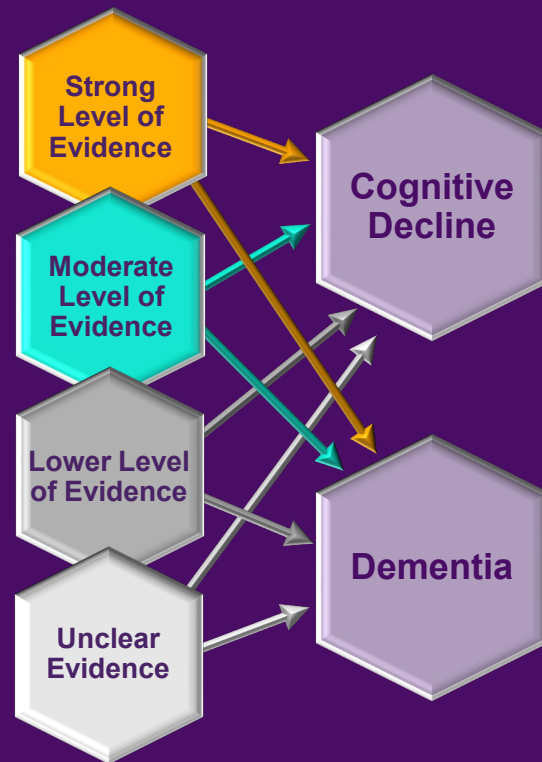
of all adults

83% of Black adults

The State of the Science on Risk Factors

Categorizing the Evidence

- Examined 18 risk factors most often included in reviews and syntheses of the evidence
- Largely, a review of the reviews
- Categorization was done separately for cognitive decline and dementia



EVIDENCE LEVELS

STRONG

Consistent evidence of a causal relationship, including intervention studies suggesting modification of risk

MODERATE

Some evidence (reproducible in multiple studies) of either a causal relationship or positive effect of interventions

LOWER

Some relationship, but studies are limited in number, scope and/or strength - and/or have some contradictory findings

UNCLEAR

Emerging areas of research and/or areas with currently unclear relationships

The Conclusions

10
factors with the
STRONGEST
EVIDENCE

Risk Factors	Evidence Level for:	
	Cognitive Decline	Dementia
Formal Education (+)	STRONG	STRONG
Traumatic Brain Injury		
Midlife Hypertension		
Midlife Obesity		
Diabetes		
Physical Activity (+)		
Smoking		
Sleep Disorders/Poor Sleep		
Balanced Nutrition (+)		
Cognitive Engagement (+)		

Risk Factors	Evidence Level for:	
	Cognitive Decline	Dementia
Air Pollution	MODERATE	MODERATE
Social Isolation		
Depression		
Hearing Loss		
Moderate Alcohol Use (+)		
Hyperlipidemia		
Alcohol Abuse		
Substance Abuse		

(+) Indicates protective factor

EVIDENCE LEVELS

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UNCLEAR

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10 Healthy Habits for Your Brain



Stay in
School



Get
Moving



Maintain a
Healthy
Weight



Eat
Right



Protect
Your Head

10 HEALTHY HABITS FOR YOUR BRAIN



Challenge
Your Mind



Control Your
Blood
Pressure



Be Smoke
Free



Manage
Diabetes



Sleep
Well

alz.org/healthyhabits

State of the Science



Formal Education

- Some of the most consistent and strongest evidence
- “Cognitive reserve” theory
- Is it quality not (or not just) quantity?



TBI

- Moderate and severe TBI
- Repeated head injuries increases risk more
- Possibly brain development, not just physical injury



Poor Sleep

- Sleep cleans out the “junk”
- Duration, disruption, or overall quality?
- Ongoing trials on effect of sleep interventions



Cognitive Engagement

- Challenge the mind – learn new things
- Exact “recipe” unknown
- Long-term effect on dementia?



Smoking

- Heavy mid-life smoking may double risk
- Quitting smoking reduces risk back to non-smokers



Mid-life Hypertension

- 80% of people with AD have significant vascular changes
- Increasingly strong evidence of link
- Not just prevention – RCTs on treatment

Diabetes as a Risk Factor

Shared Risk Factors



Mid-life Obesity

- Possible mechanisms for why obesity may increase risk include:
 - Insulin resistance and elevated blood glucose associated with obesity
 - Increased inflammation and impairments in metabolism
- Less compelling evidence that weight loss has an effect on incidence of MCI or dementia
- Some studies indicate relationship is less clear with late-life obesity:
 - Obesity in later life may be protective
 - Weight loss among older obese individuals may have a negative implication for cognition



Diet and Nutrition

- Healthy dietary factors are associated with better cognitive function – and may reduce the risk of cognitive decline
- Evidence supports balanced nutrition through a healthy dietary pattern over time:
 - Fruits and vegetables
 - Lean meats/proteins
 - Lower fat foods
 - Less processed foods
- MIND Diet (used in U.S. POINTER), Mediterranean Diet, and DASH share common themes and include important aspects of a balanced diet

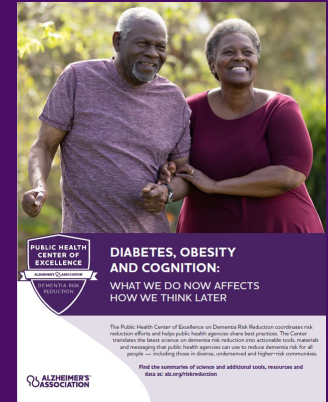


Physical Inactivity

- Evidence supports aerobic exercise as a means of preserving cognition – and possibly reducing risk for dementia
- Studies consistently show the exercise must be regular and more vigorous, but the exact “prescription” is unclear
- The “POINTER” prescription:
 - 30-35 minutes of aerobic exercise four times per week
 - 15-20 minutes of strength training twice a week
 - 10-15 minutes of stretching/balance exercises twice a week

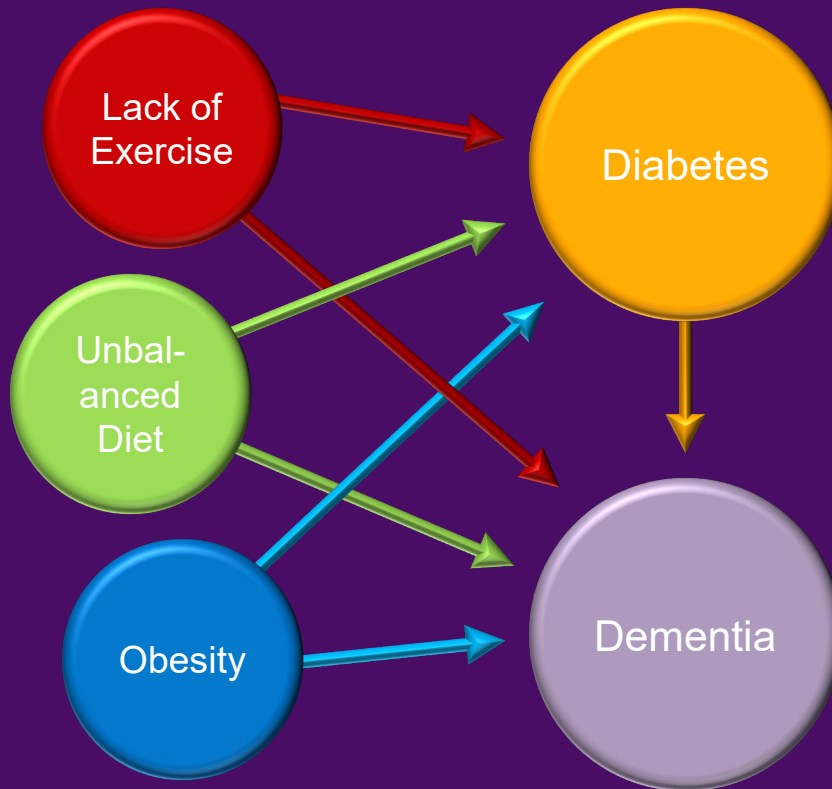
Diabetes as a Risk Factor

- Compelling evidence that Type 2 diabetes increases risk for cognitive decline and possibly dementia; relative risk estimated at 1.7 (70% higher risk)
- Possible reasons for elevated risk:
 - Vascular damage (e.g., damage to blood vessels)
 - Biological mechanisms related to diabetes itself, including insulin resistance in the brain
- Less compelling evidence that treating diabetes subsequently reduces risk – so prevention is key



alz.org/riskreduction

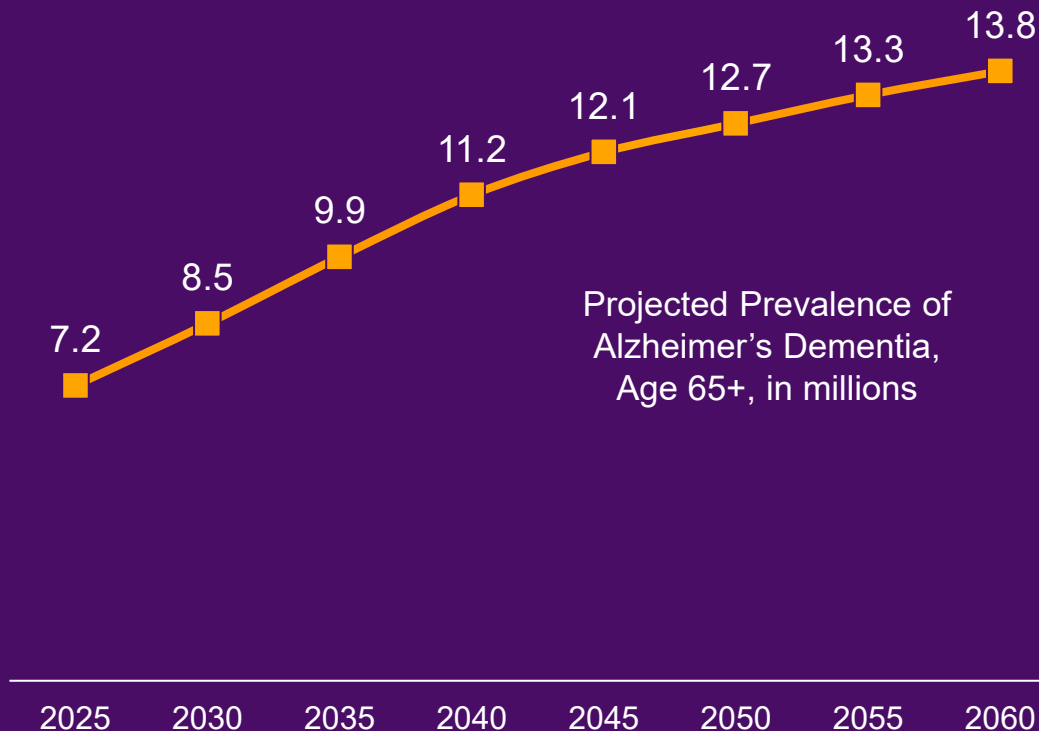
The Way to Think About It



Is This a Ticking Time Bomb?

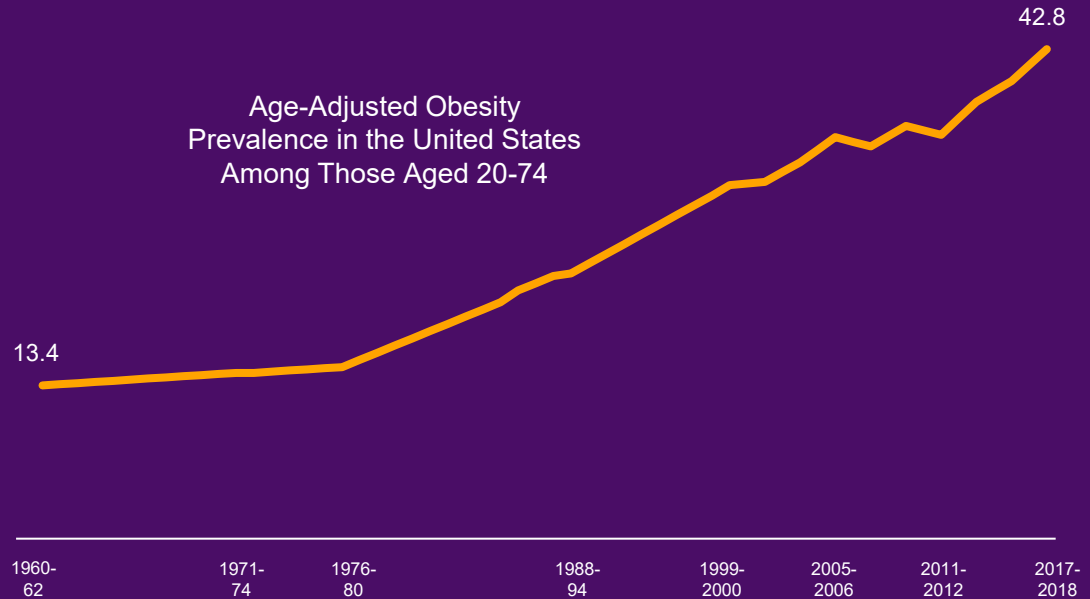
Projected Alzheimer's Prevalence

- Projections based on studies of recent older Americans – a group that had lower rates of obesity and diabetes
- What happens if future cohort has higher rates?



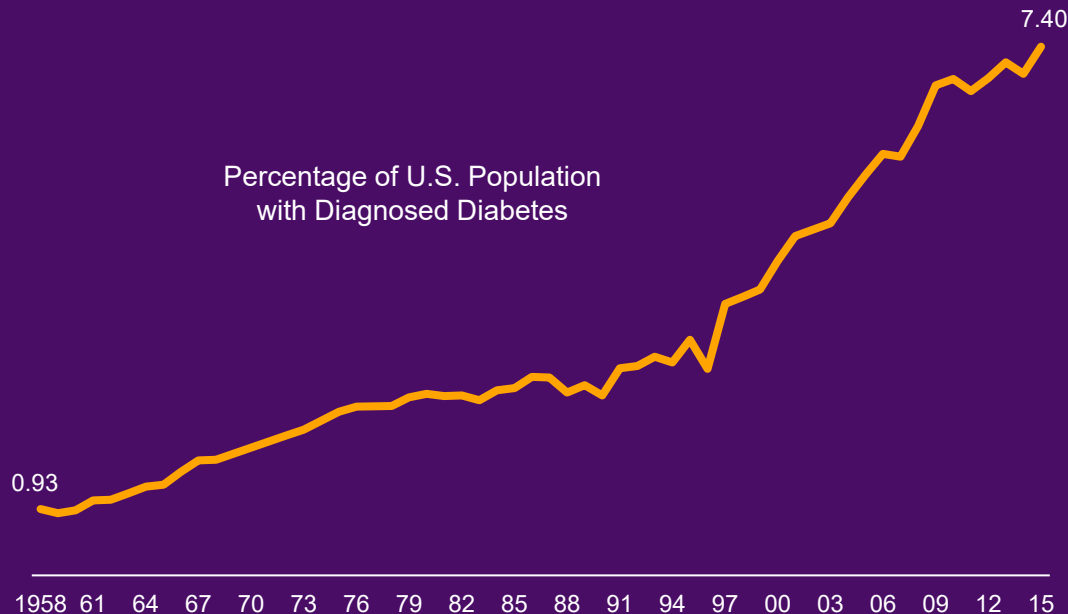
Projected Alzheimer's Prevalence

- What happens if future cohort has higher rates?
- Obesity prevalence has more than tripled



Projected Alzheimer's Prevalence

- What happens if future cohort has higher rates?
- Obesity prevalence has more than tripled
- An 8-fold increase in those with diagnosed diabetes



U.S. POINTER

U.S. POINTER Clinical Trial

Sites
5
Participants
2000
Years
2

U.S. POINTER
ALZHEIMER'S ASSOCIATION®



STRUCTURED GROUP

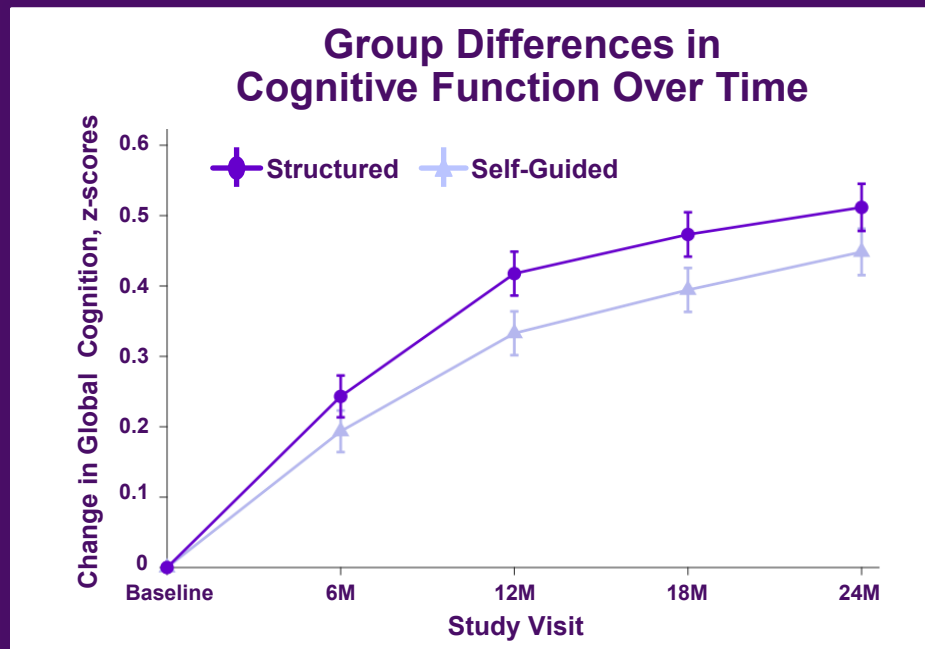
- Participants provided with a structured lifestyle intervention program to follow
- Receive education on healthy lifestyles/brain health
- Frequent health monitoring



SELF-GUIDED GROUP

- Participants design their own lifestyle intervention program
- Receive education on healthy lifestyles/brain health
- Annual health monitoring

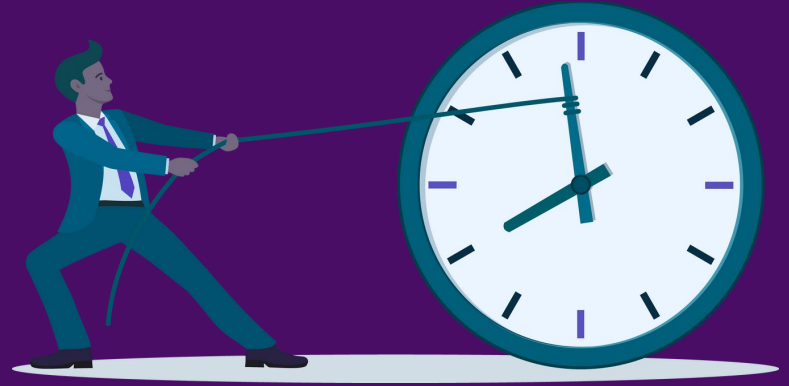
U.S. POINTER Results



- Cognitive function improved over time for both groups
- The Structured group had a significantly greater benefit on cognitive function
- The extra benefit was the same regardless of sex, age, race/ethnicity, and heart health

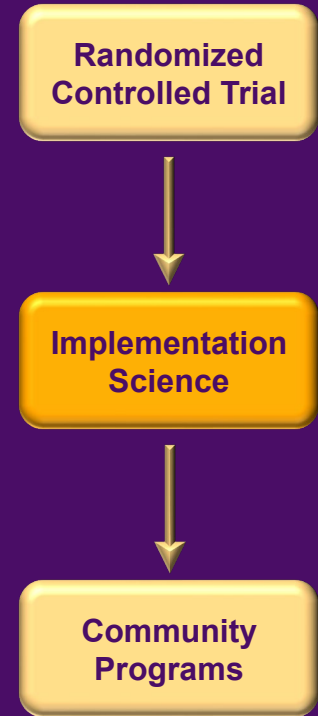
What It Means

- The Structured group obtained scores that were similar to adults who are 1 to 2 years younger
- That is, the Structured Intervention may slow the cognitive aging clock by an extra 1 to 2 years compared with the Self-Guided Intervention
- This difference may provide additional protection against cognitive decline in the future



What Next?

- Need to move from the clinical trial to community-based programs, and diabetes is our model
- The Alzheimer's Association:
 - Is providing more than \$1 million to 10 teams to plan implementation projects
 - Will issue an RFP (~ \$15 million) to fund implementation studies
- Call on Congress to fund U.S. POINTER implementation studies



What You Can Do

Action Steps

- Incorporate brain health messages into your diabetes work
 - Preventing diabetes also promotes brain health – and may lessen the chances of getting dementia
 - Managing diabetes is good for your heart and your brain
- Encourage people to develop a brain health action plan, which may also help prevent diabetes; [alz.org/habitbuilder](https://www.alz.org/habitbuilder)
- Press for addressing barriers to diabetes prevention and better brain health
 - Improving diet and nutrition is hard in neighborhoods that are food deserts, or if the suggested dietary pattern is not culturally relevant
 - Physical activity is difficult if there aren't safe streets or parks in the neighborhood, or among those who cannot afford a gym membership



Sources and References

Data and Statistics

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Risk Factors State of the Science

The conclusions presented here on the state of the science on modifiable risk factors for cognitive decline and dementia are not from a single source but are the Alzheimer's Association conclusions based on our analysis of various reviews and syntheses of the evidence. Some resources for reviews of the evidence include:

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- Livingston G, Huntley J, Liu KY, et al. Dementia prevention, intervention, and care: 2024 report of the Lancet standing commission. *Lancet* 2024;404(10452):572-628.

Information Specific to Diabetes

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U.S. POINTER Trial

Baker LD, Espeland MA, Whitmer RA, et al. Structured vs self-guided multidomain lifestyle interventions for global cognitive function: The US POINTER randomized clinical trial. *JAMA* 2025;334(8):681-691.

Thank You

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alz.org

alz.org/brainhealth

alz.org/healthyhabits

alz.org/habitbuilder