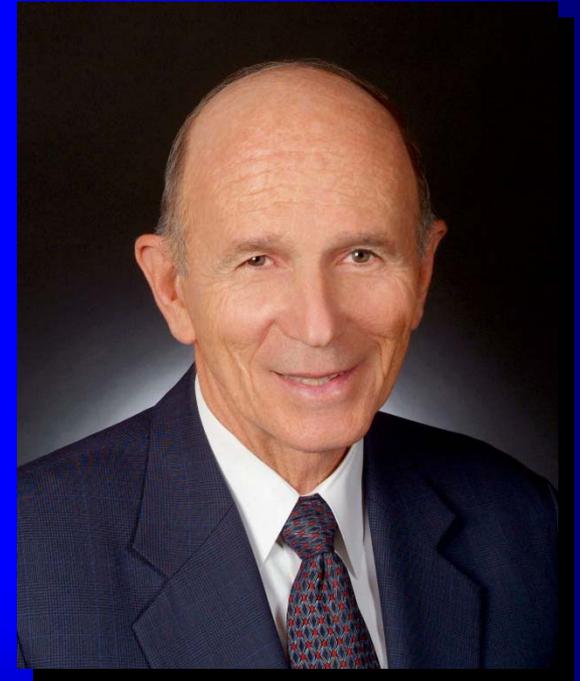
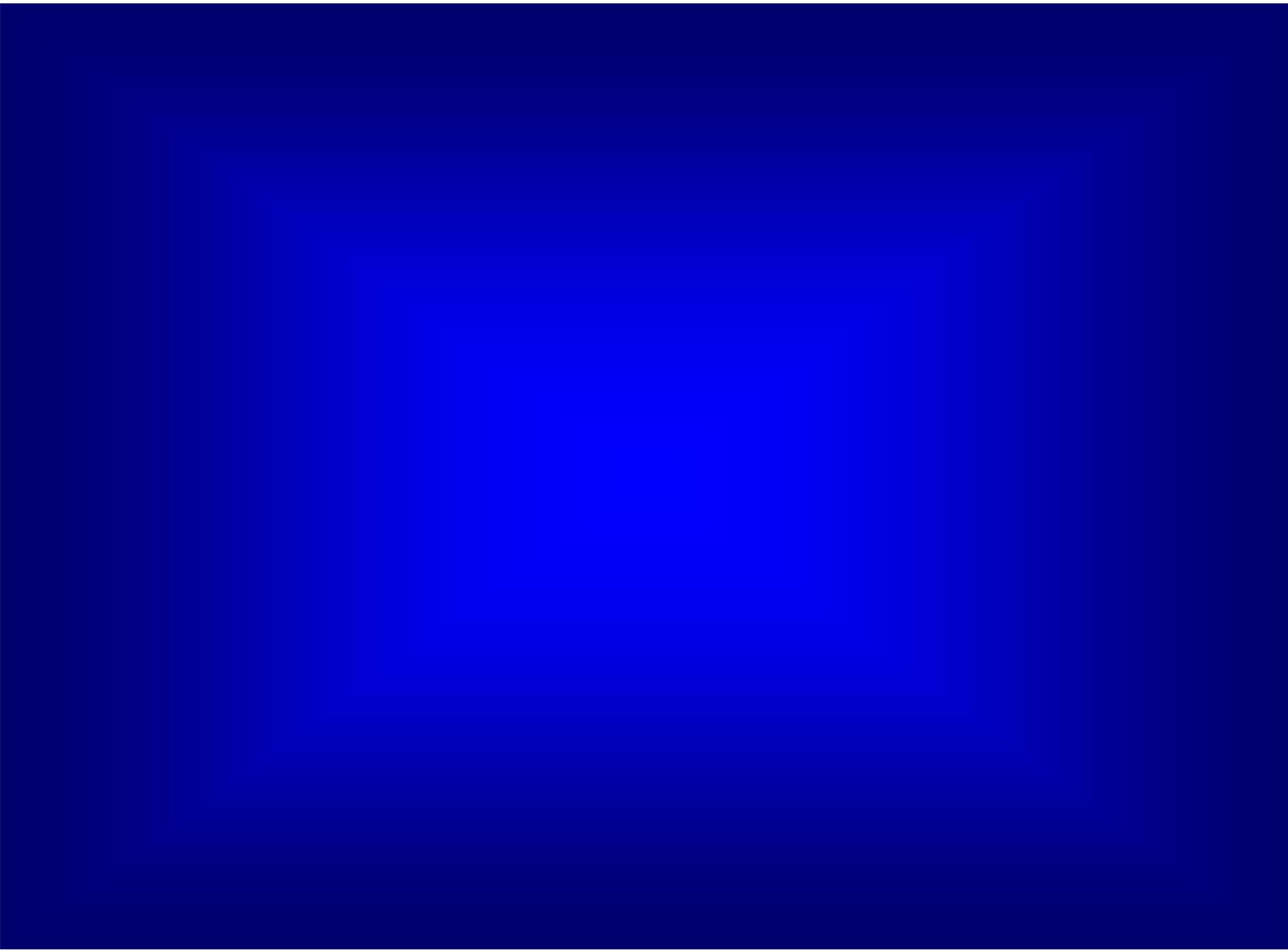
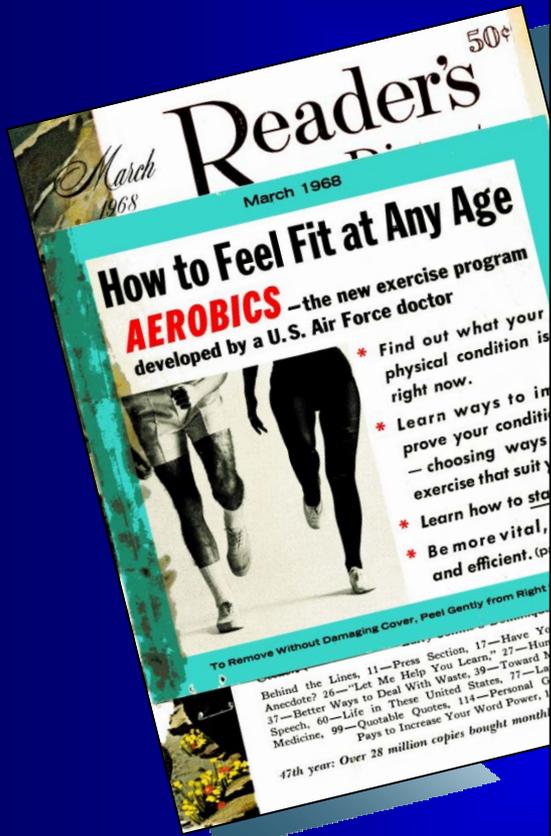


***21<sup>st</sup> Century Medicine:  
Preventive Medicine and Wellness***

***Kenneth H. Cooper, M.D., M.P.H.  
Founder & Chairman  
The Cooper Aerobics Center  
12200 Preston Road  
Dallas, Texas***







Only after you've measured exercise in terms of essential benefits to your body -- and that is what this book is all about -- will you understand why some of the most popular forms of exercise are almost worthless and why others, more neglected, score very high. Until now, not even the best exercise book -- not even your own physician -- could answer the question: "What form of exercise and how much will improve my health and protect my life?" Here, at last, is the answer.

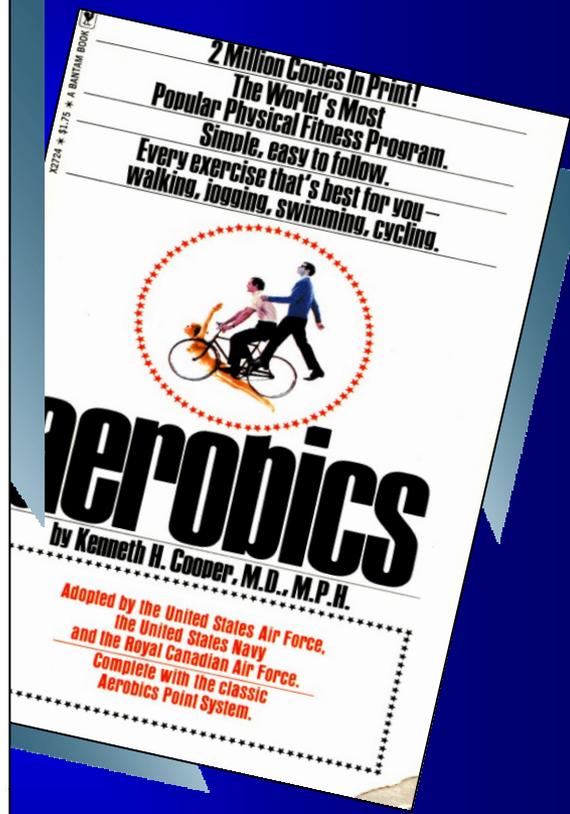
# Aerobics

a scientific program of exercise aimed at the overall fitness and health of your body with a unique point system for measuring your progress towards maximal health

by Kenneth H. Cooper, M.D., M.P.H.

Introduction by Richard L. Bohannon, SURGEON GENERAL U.S.A.F. (Ret.)

Preface by Senator William Proxmire



# American Adult Exercise Habits 1968-1990

Exercising	<u>1968</u> < 24 %	<u>1984</u> 59 %	<u>1990</u> 40 %
Jogging	< 100,000	34 million	30 million

← 48 % ↓ CVD →

Russia: ↑ 31 %

Poland: ↑ 36 %

Hungary: ↑ 40 %

Romania: ↑ 60 %

# ***American Adult Exercise Habits 1968-1990***

1968 - 1990

**Medical Treatment**  
33 %

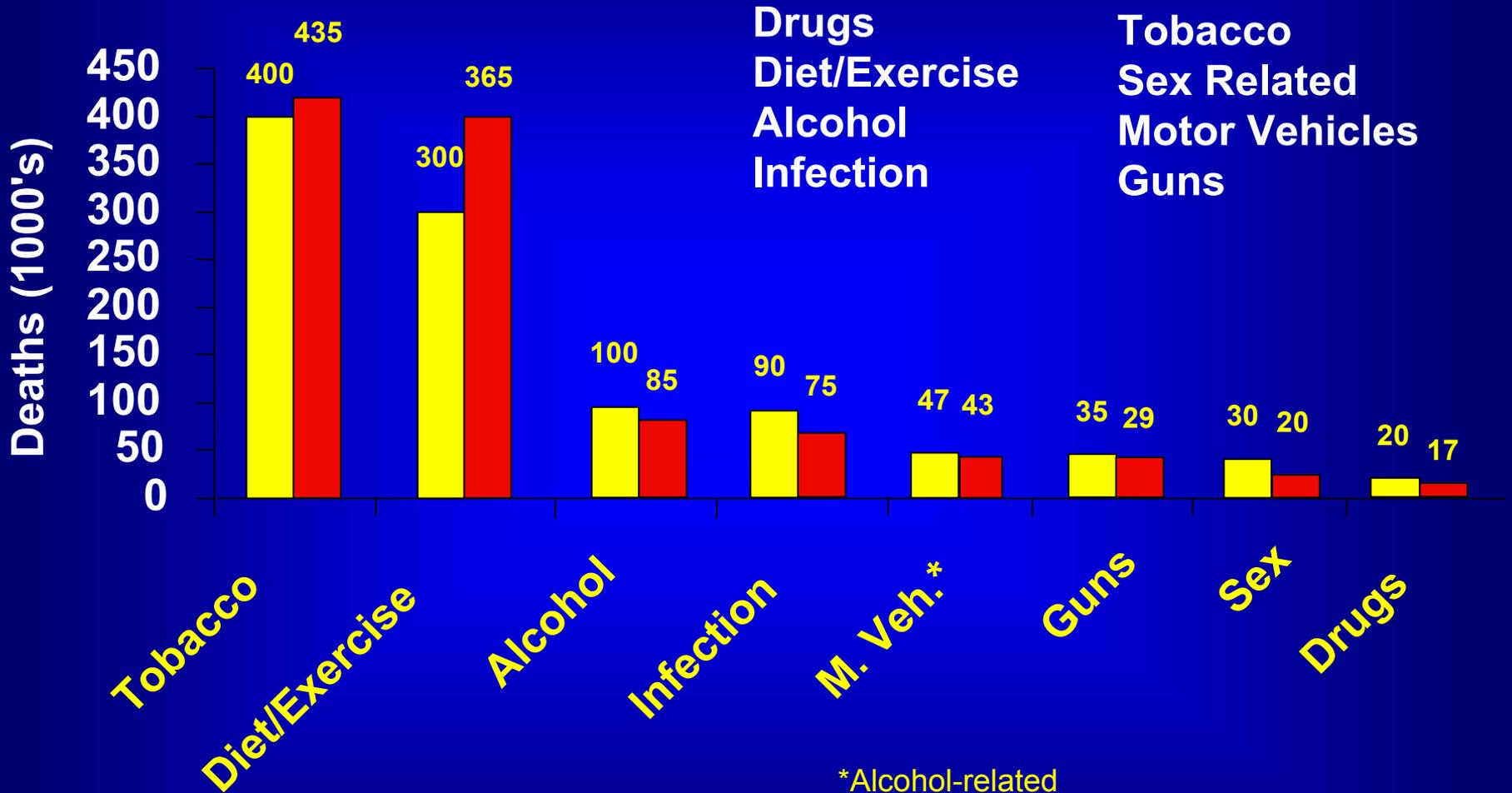
**Lifestyle Change**  
67 %

**CV Deaths**  
↓ 48 %



- Cigarette Smoking**
- Blood Pressure Control**
- Cholesterol Reduction**
- Stress Management**
- Increased Activity**

# Actual Causes of Death 1990 / 2000



\*Alcohol-related  
deaths:  
1990 – 22,084  
2000 – 16,653

# Body Mass Index

<b>BMI =</b>	$\frac{\text{(Weight in pounds)}}{\text{(Height in inches) x (Height in inches)}} \times 703$
--------------	---

Examples

$$\frac{130}{65 \div 65} \times 703 = 21.7 \text{ BMI}$$

$$\frac{165}{65 \div 65} \times 703 = 27.5 \text{ BMI}$$

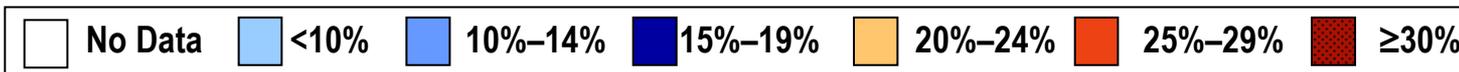
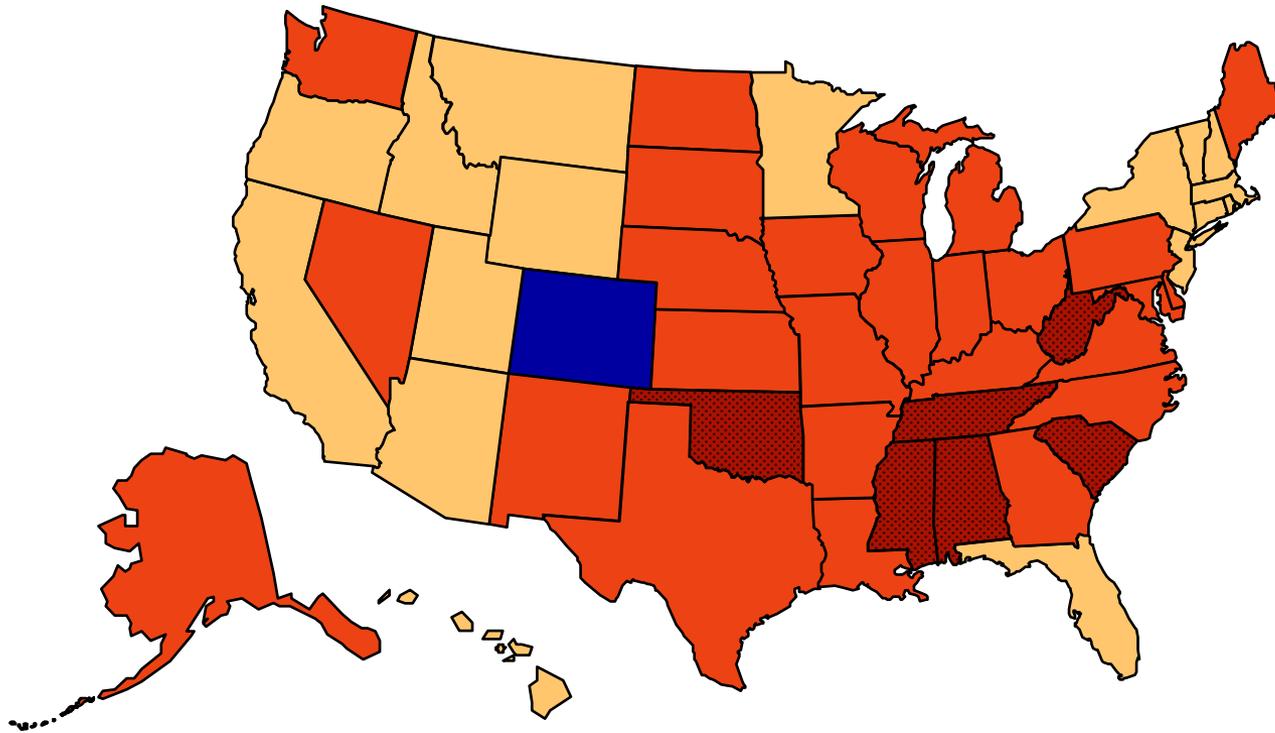
Range BMI

< 25	Normal
25 – 30	Overweight (66 %)
> 30	Obese (34 %)



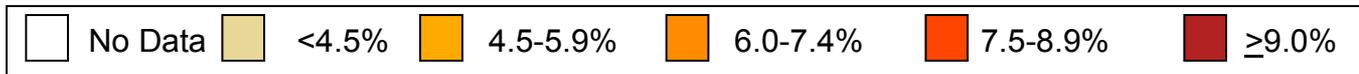
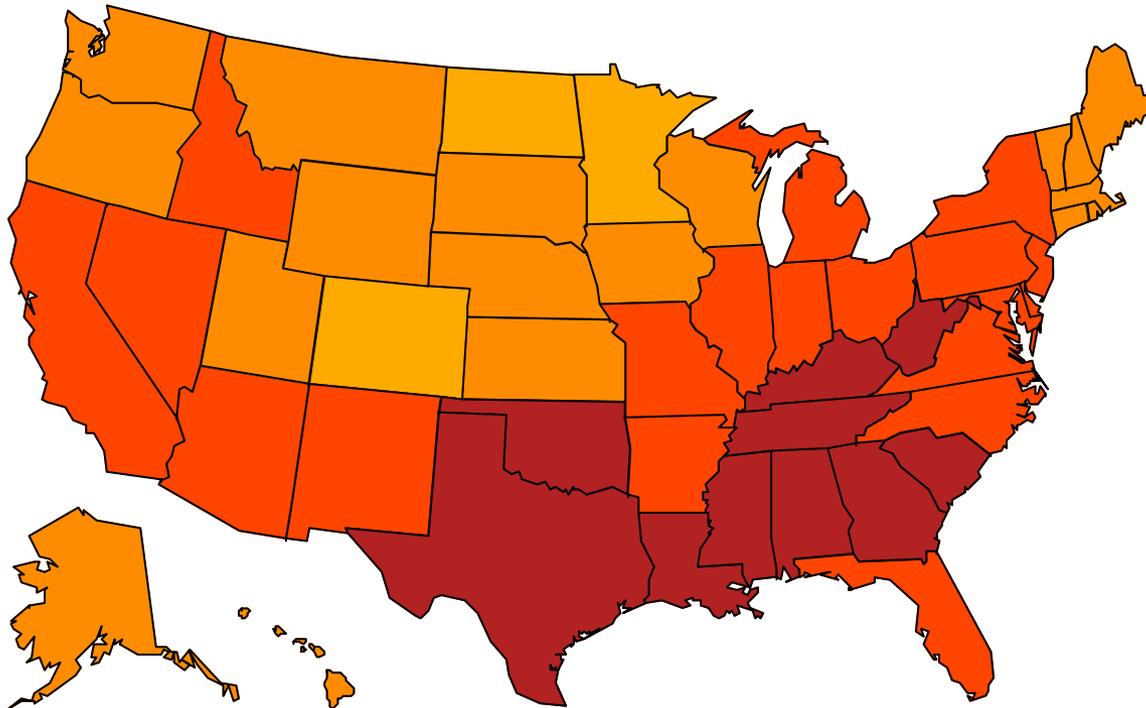
# Obesity Trends\* Among U.S. Adults *BRFSS, 2008*

(\*BMI  $\geq 30$ , or  $\sim 30$  lbs. overweight for 5' 4" person)



Source: Behavioral Risk Factor Surveillance System, CDC.

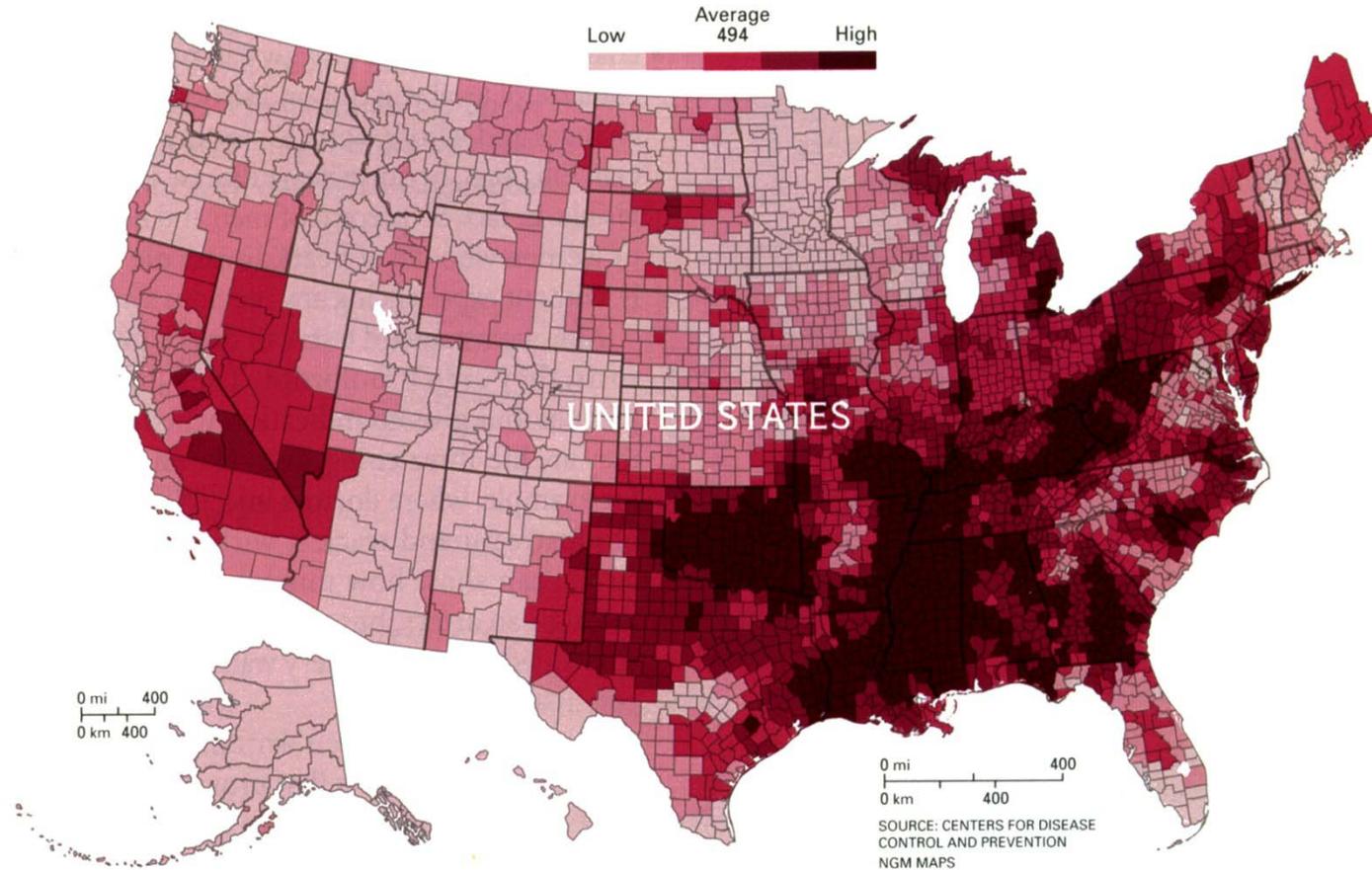
# Diabetes Trends\* Among Adults in the U.S., (Includes Gestational Diabetes) 2007



Source: CDC's Division of Diabetes Translation. National Diabetes Surveillance System available at <http://www.cdc.gov/diabetes/statistics>

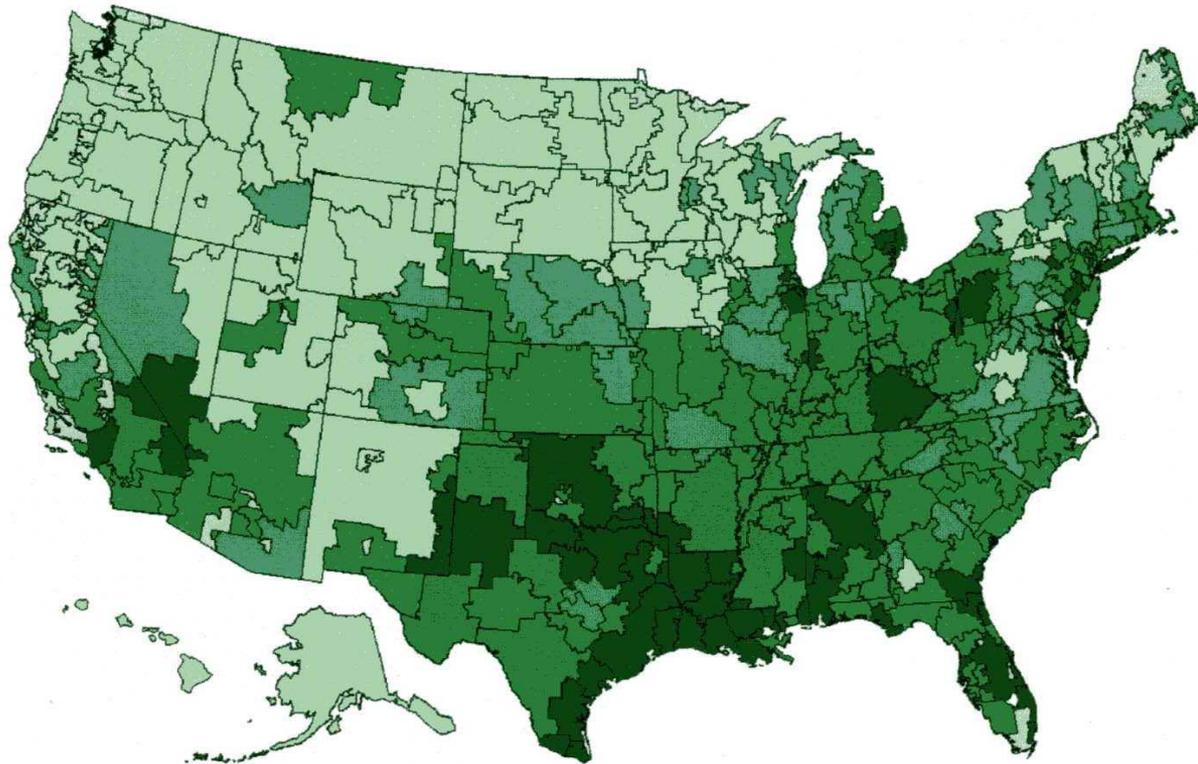
## HEART DISEASE DEATH RATES, 1999-2003

Average annual deaths per 100,000 adults 35 years and older, by county



Source: "Mending Broken Hearts," National Geographic, Feb. 2007

# Price-Adjusted Per-Capita Medicare Spending

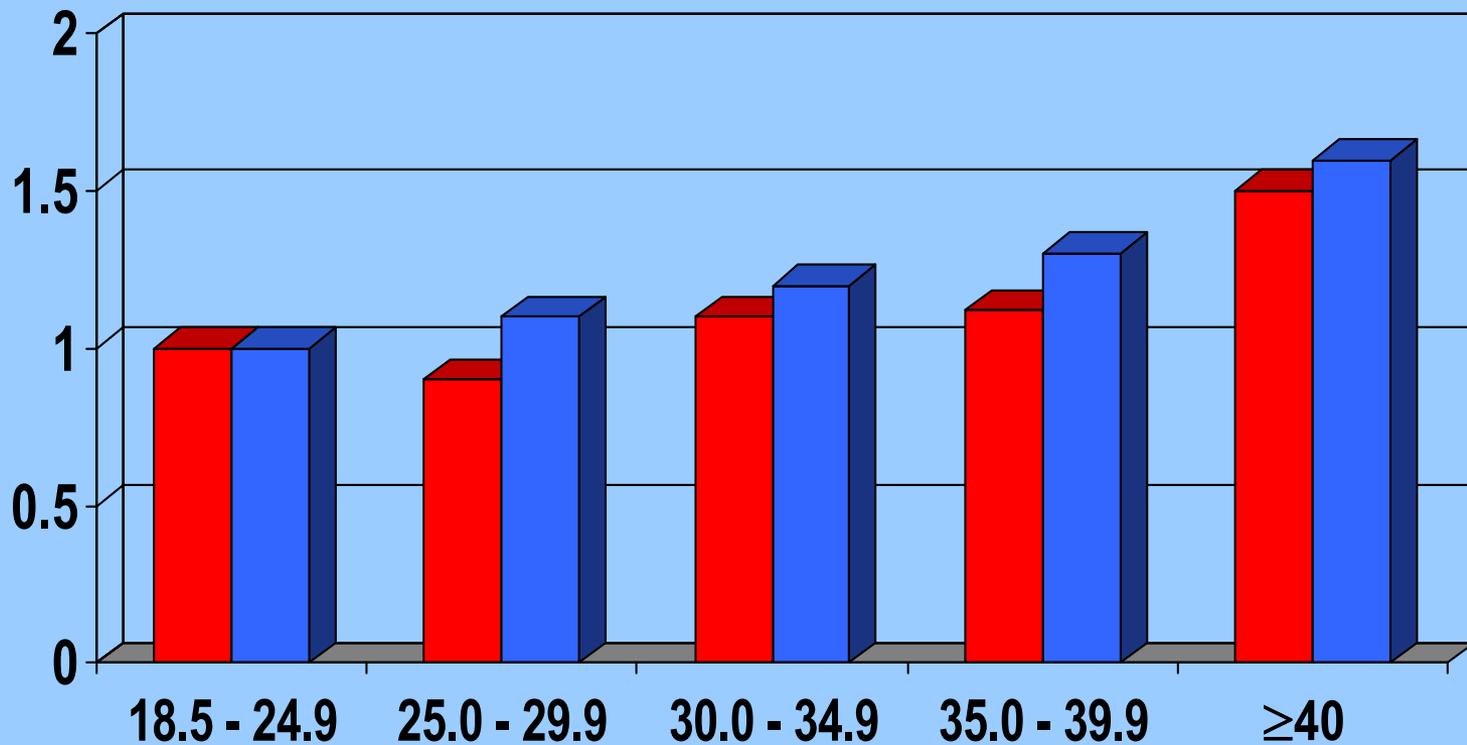


■	\$10,250	to	17,184	(55)
■	9,500	to <	10,250	(69)
■	8,750	to <	9,500	(64)
■	8,000	to <	8,750	(53)
■	6,039	to <	8,000	(65)
■	Not Populated			



# Contribution of Overweight and Obesity to Mortality from Cancer in the United States

Relative Risk of Death from Cancer



Body-Mass Index

Men



Women







***After a two-year visit to the United States ,  
Michelangelo's David is returning to Italy ...***

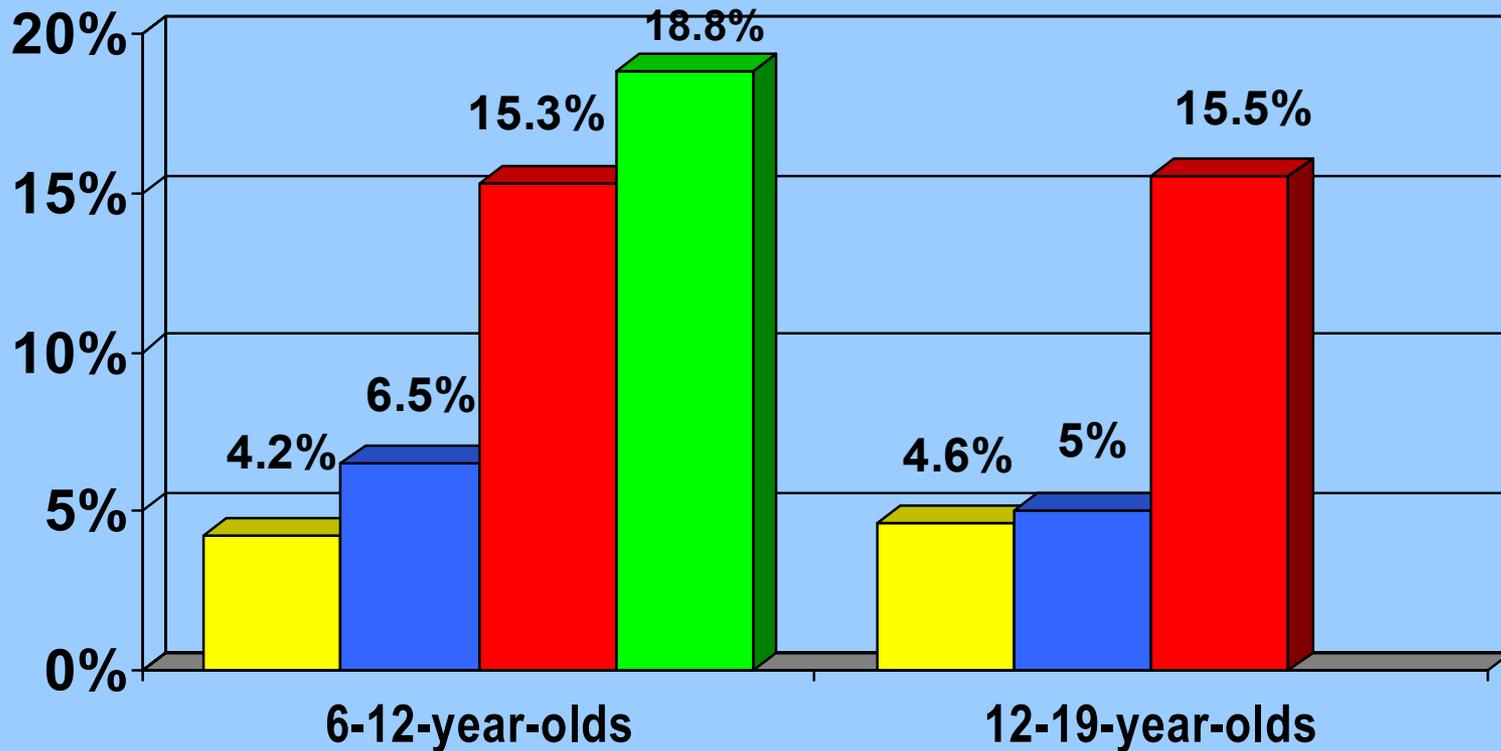


*His proud sponsors were:*



# *Proportion of Overweight Children in the United States*

■ 1963-1970   ■ 1976-1980   ■ 1999-2000   ■ 2000-2004



***Stanford Achievement Test  
Ninth Edition  
(SAT-9)  
2004***

# ***FITNESSGRAM® Tests***

## **AEROBIC CAPACITY**

### ***#1 PACER (Progressive Aerobic Cardiovascular Endurance Run)***

**Set to music, a paced, 20-meter shuttle run increasing in intensity as time progresses.**

***Or:***

- ***One-Mile Run***  
**Students run (or walk if needed) one mile as fast as they can.**
- ***Walk Test***  
**Students walk one mile as fast as they can (for ages 13 or above since the test has only been validated for this age group).**

# ***FITNESSGRAM<sup>®</sup> Tests***

## **BODY COMPOSITION**

### ***#2 Skin Fold Test***

**Measuring percent body fat by testing the triceps and calf areas.**

***Or:***

- Body Mass Index (BMI)***  
**Calculated from height and weight**



# ***FITNESSGRAM® Tests***

## **MUSCULAR STRENGTH AND ENDURANCE**

### ***#3 Curl-Up***

Measuring abdominal strength and endurance, students lie down with knees bent and feet unanchored.

Set to a specified pace, students complete as many repetitions as possible to a maximum of 75.



# ***FITNESSGRAM® Tests***

## **MUSCULAR STRENGTH AND ENDURANCE**

### ***#4 Trunk Lift***

Measuring trunk extensor strength, students lie face down and slowly raise their upper body long enough for the tester to measure the distance between the floor and the student's chin.



# **FITNESSGRAM<sup>®</sup> Tests**

## **MUSCULAR STRENGTH AND ENDURANCE**

### **#5 Push-Up**

Measuring upper body strength and endurance, students lower body to a 90-degree elbow angle and push up. Set to a specific pace, students complete as many repetitions as possible.

*Or:*

- *Modified Pull-Up (proper equipment required)*  
*With hands on a low bar, legs straight and feet touching the ground, students pull up as many repetitions as possible.*
- *Flexed Arm Hang*  
*Students hang their chin above a bar as long as possible.*



# ***FITNESSGRAM<sup>®</sup> Tests***

## **FLEXIBILITY**

### ***#6 Back-Saver Sit and Reach***

Testing one leg at a time, students sit with one knee bent and one leg straight against a box and reach forward.



*Or:*

- ***Shoulder Stretch***  
With one arm over the shoulder and one arm tucked under behind the back, students try to touch their fingers and then alternate arms.



## Report for Parents

People come in all shapes and sizes, but everyone can benefit from regular physical activity and a healthy level of physical fitness. The FITNESSGRAM fitness test battery evaluates five different parts of health-related fitness, including aerobic capacity, muscular strength, muscular endurance, flexibility, and body composition. Parents play an important role in shaping children's physical activity and dietary habits. This report will help you evaluate your child's current level of health-related fitness and help you identify ways to promote healthy lifestyles in your family.

### AEROBIC CAPACITY

Aerobic capacity is a measure of the ability of the heart, lungs, and muscles to perform sustained physical activity. In general, the more your child exercises, the higher his or her aerobic capacity level will be. Aerobic capacity is measured with the PACER test, the one-mile run, or the walk test.

*Importance:* Good aerobic capacity can reduce risks of heart disease, stroke, and diabetes. Although generally not present in children, these diseases can begin during childhood and adolescence.

Healthy Fitness Zone for 12 year-old boys = 32 - 72 laps

### MUSCLE STRENGTH, ENDURANCE, & FLEXIBILITY

These components of health-related fitness measure the overall fitness of the musculoskeletal system. A variety of tests are used to assess these different components.

*Importance:* The fitness level of muscles is important for injury prevention and overall body function. Strength, endurance, and flexibility are important for maintaining good posture, low back health, and total body function.

Healthy Fitness Zone for 12 year-old boys

Curl-Up = 18 - 36 repetitions  
Trunk Lift = 9 - 12 inches  
Push-Up = 10 - 20 repetitions  
Back-Saver Sit and Reach =  
At least 8 inches on R & L

### BODY COMPOSITION

The body composition measure refers to the relative proportion of fat and lean tissue in the body. Body fat percentage can be estimated by skinfold calipers or other measuring devices. The Body mass index (BMI) is another indicator that determines if a person is at a healthy weight for his or her height.

*Importance:* Overweight youth are at high risk for being overweight adults. Adult obesity is associated with a number of chronic health problems. Many of these health problems can begin early in life. It is important to begin healthy eating and regular activity early.

Healthy Fitness Zone for 12 year-old boys = 14.80 - 22.00

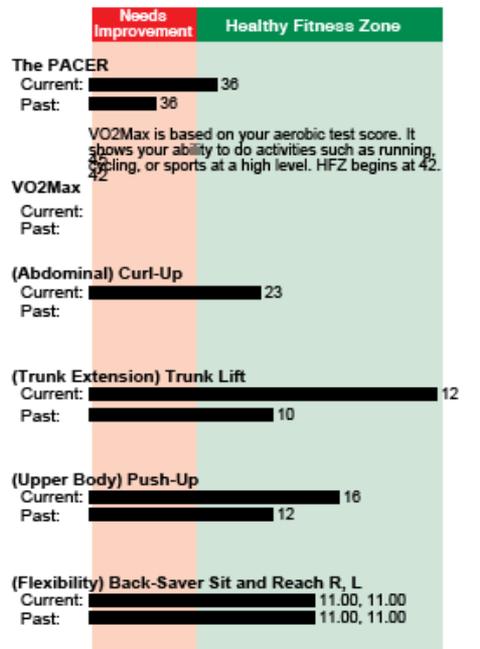
### INTERPRETING THE FITNESSGRAM REPORT

Health-related fitness includes a variety of factors. With regular physical activity most children will be able to score in the Healthy Fitness Zone for most of the tests. It is important for all children to be physically active every day (a total of 60 minutes is recommended) even if they are already fit. If your child is in the Needs Improvement area on a particular test, it is important to provide additional opportunities to be active so they can improve their levels of fitness. See back of page for more information.

Joe Jogger  
Grade: 5 Age: 12  
Cooper Institute Elementary School

Instructor(s): Bostick, Sue

	Date	Height	Weight
Current:	01/15/2010	5' 1"	115 lbs
Past:	05/05/2009	4' 9"	120 lbs



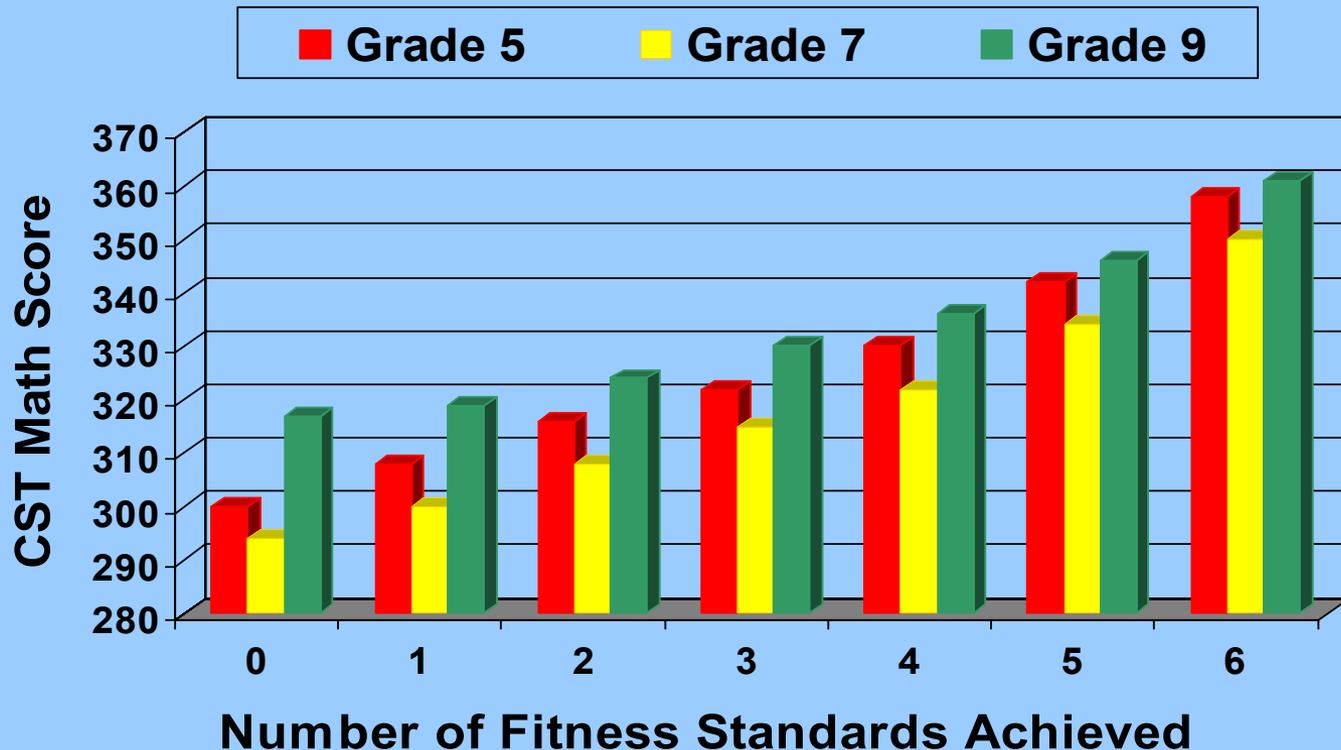
### Body Mass Index



Being too lean or too heavy may be a sign of (or lead to) health problems. However, not all people who are outside the Healthy Fitness Zone are at risk for health problems. For example, a person with a lot of muscle may have a high BMI without excess fat.

# 2004 CST\* Scores in Math by Number of Fitness Standards

Grade 5 – 371,198 Students  
Grade 7 – 366,278 Students  
Grade 9 – 63,028 Students\*\*



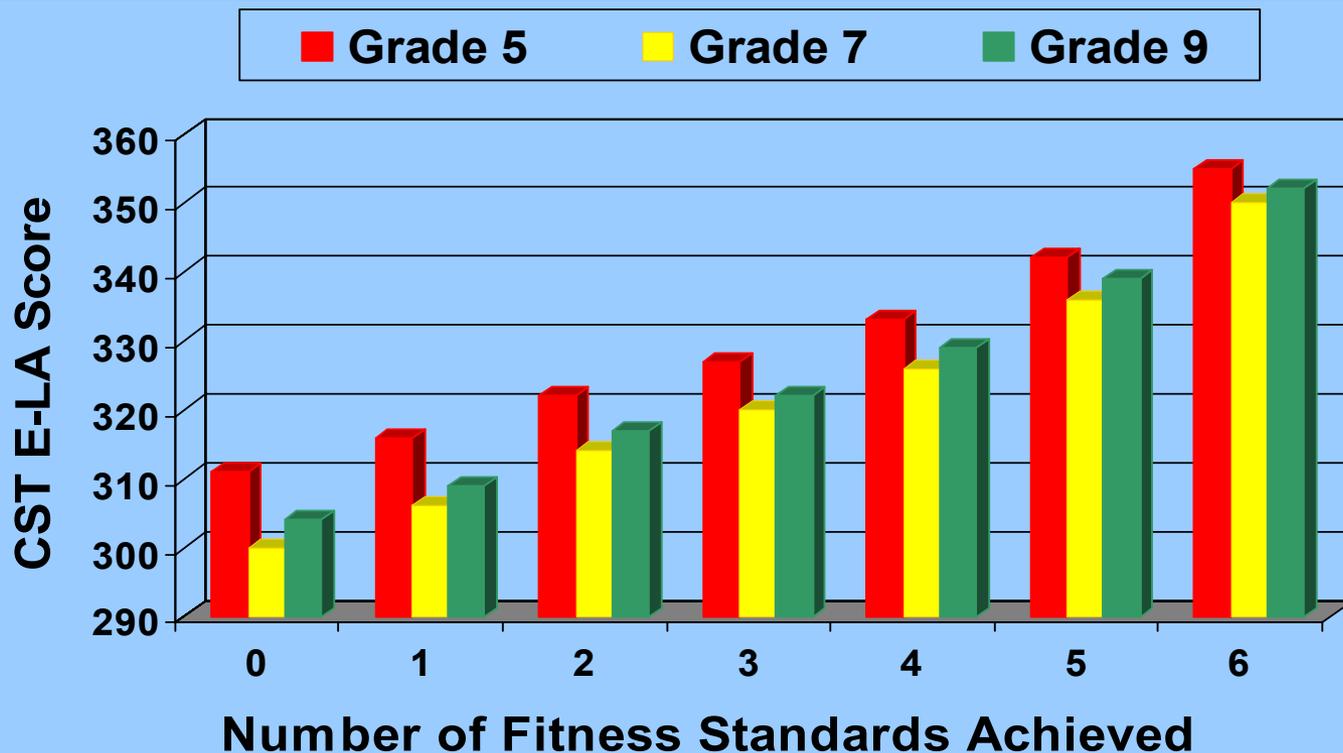
\*California Standards Test

\*\* Grade 9 Students who took CST geometry

Source: California Physical Fitness Test, 2004 Results, Calif. Dept. of Ed., April 2005

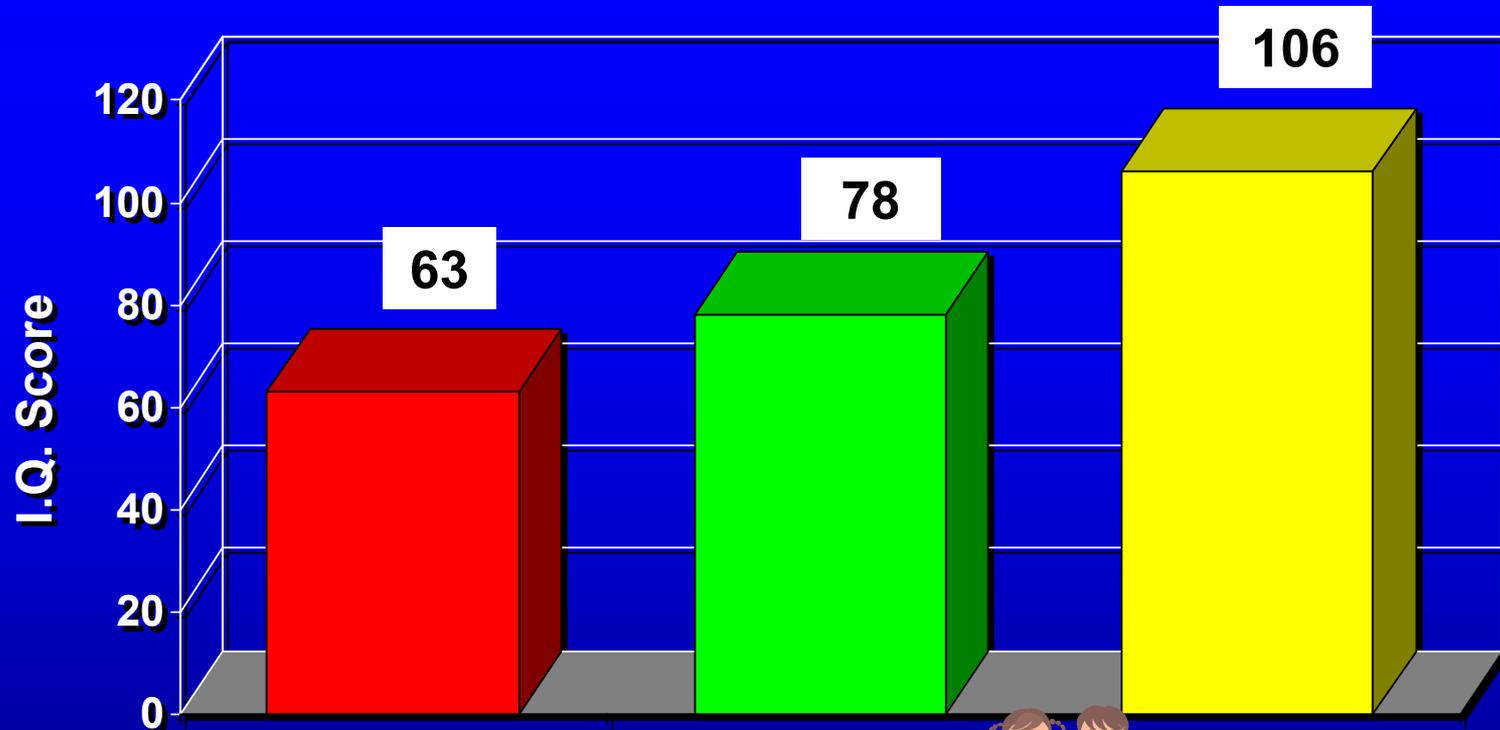
# 2004 CST\* Scores in English-Language Arts by Number of Fitness Standards

Grade 5 – 371,198 Students  
Grade 7 – 366,278 Students  
Grade 9 – 298,910 Students



\*California Standards Test

# Early-Onset Obesity and Its Effect on I.Q.



**Prader-Willi Syndrome\***  
(19 children & 5 adults)

*\*Prader-Willi Syndrome is a genetic deficiency which causes marked obesity before age 6.*



**Siblings:**  
150% Ideal Weight  
before age 6  
(18 children & adults)

**Siblings:**  
Normal Weight  
(24 children & adults)

***“... discovered a link between marked obesity in toddlers and lower IQ scores, cognitive delays, and brain lesions similar to those seen in Alzheimer’s disease patients.”***

***" ... emerging research showing that physical activity sparks biological changes that encourage brain cells to bind to one another. For the brain to learn, these connections must be made."***

***" ... exercise provides an unparalleled stimulus, creating an environment in which the brain is ready, willing, and able to learn."***

***"Exercise is fertilizer for the brain."***



## ***Senate Bill 530***

***Passed by Texas State  
House of Representatives and  
Senate on May 27, 2007***

***Signed into Law by  
Governor Rick Perry  
on June 13, 2007***

***Fitnessgram<sup>®</sup> approved as official testing  
vehicle by the Texas Education Agency  
on September 27, 2007***

# Texas Youth Evaluation Project 2008

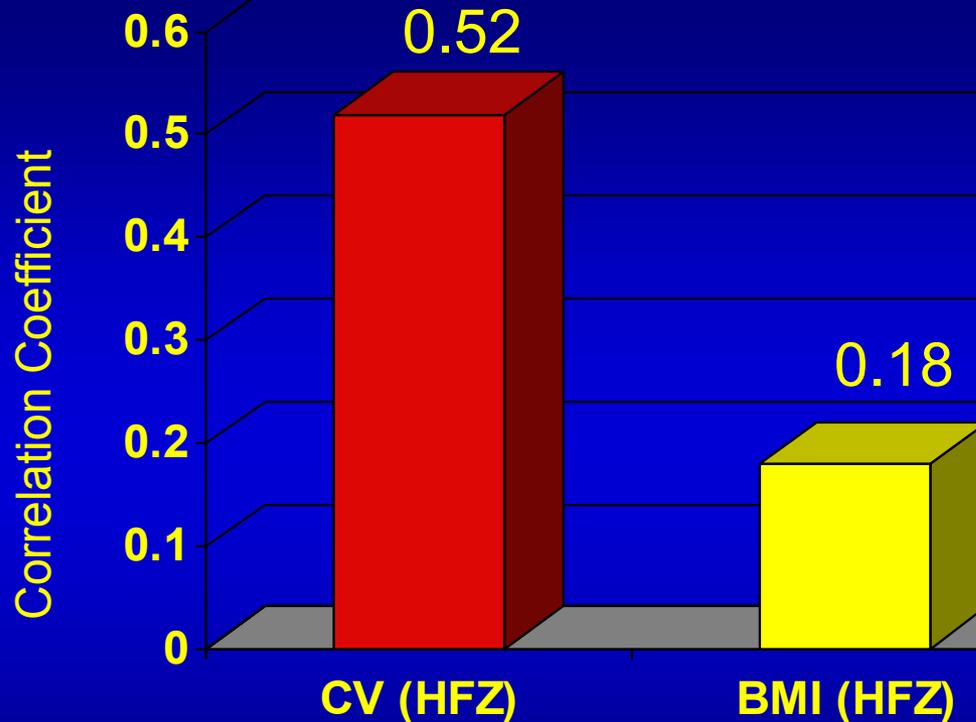
Total # of Students Grades 3-12: 2,658,665

Grade	FITNESSGRAM® Test % Achieving Healthy Fitness Zone on all 6 tests		
	Total # Students	Girls	Boys
3	102,342	33.25	28.60
4	80,539	28.50	21.14
5	66,798	23.82	17.89
6	60,663	23.08	17.60
7	55,441	21.32	17.26
8	48,971	18.99	17.88
9	39,456	13.90	15.04
10	28,650	12.42	13.70
11	21,152	10.68	12.24
12	13,040	8.18	8.96

6,532 campuses out of 9,212 (70.91%)

1,074 districts out of 1,267 (84.77%)

# Association Between Fitness and School Attendance Rates

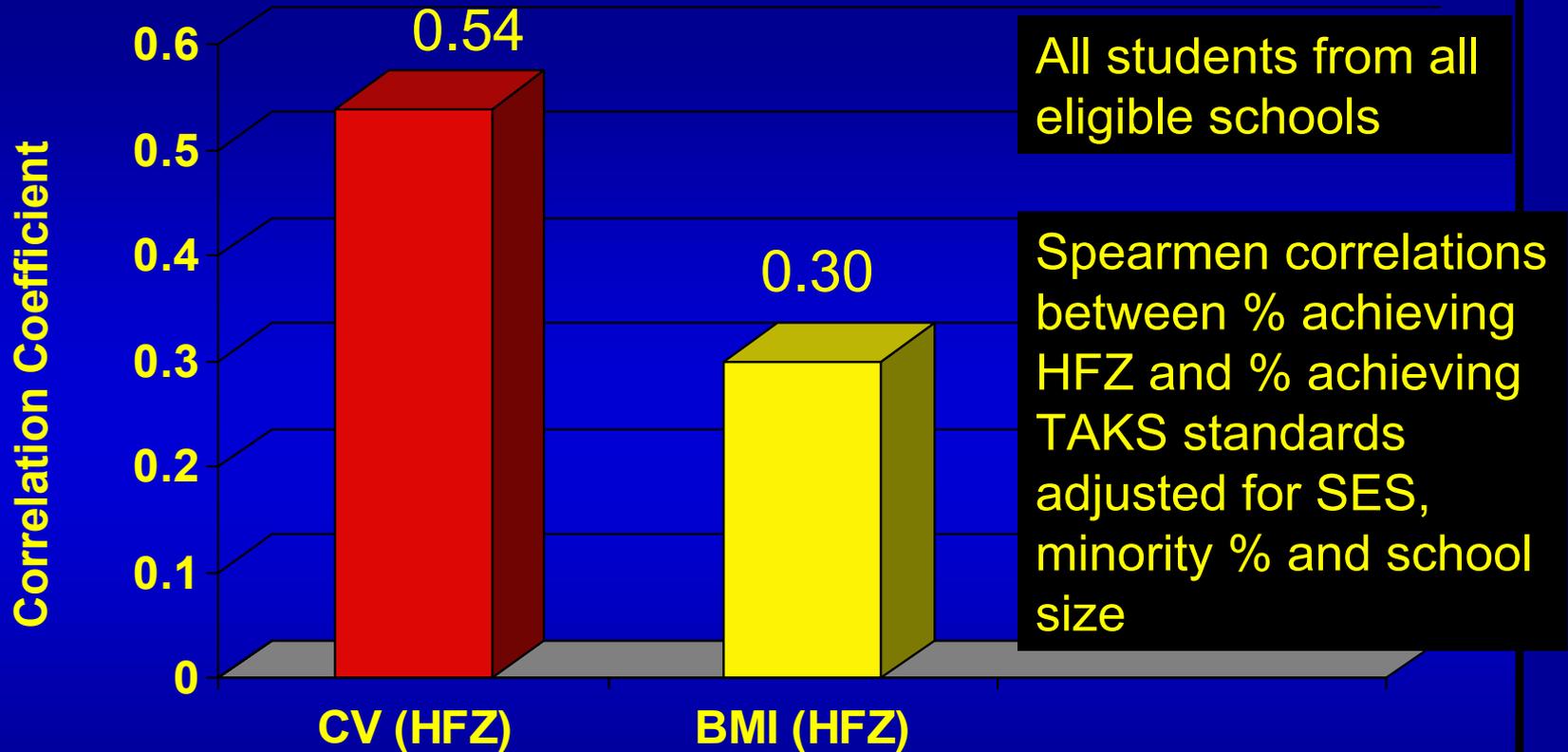


All students from all eligible schools

Spearman correlations between % achieving HFZ and % attendance (PEIMS data) adjusted for SES, minority % and school size

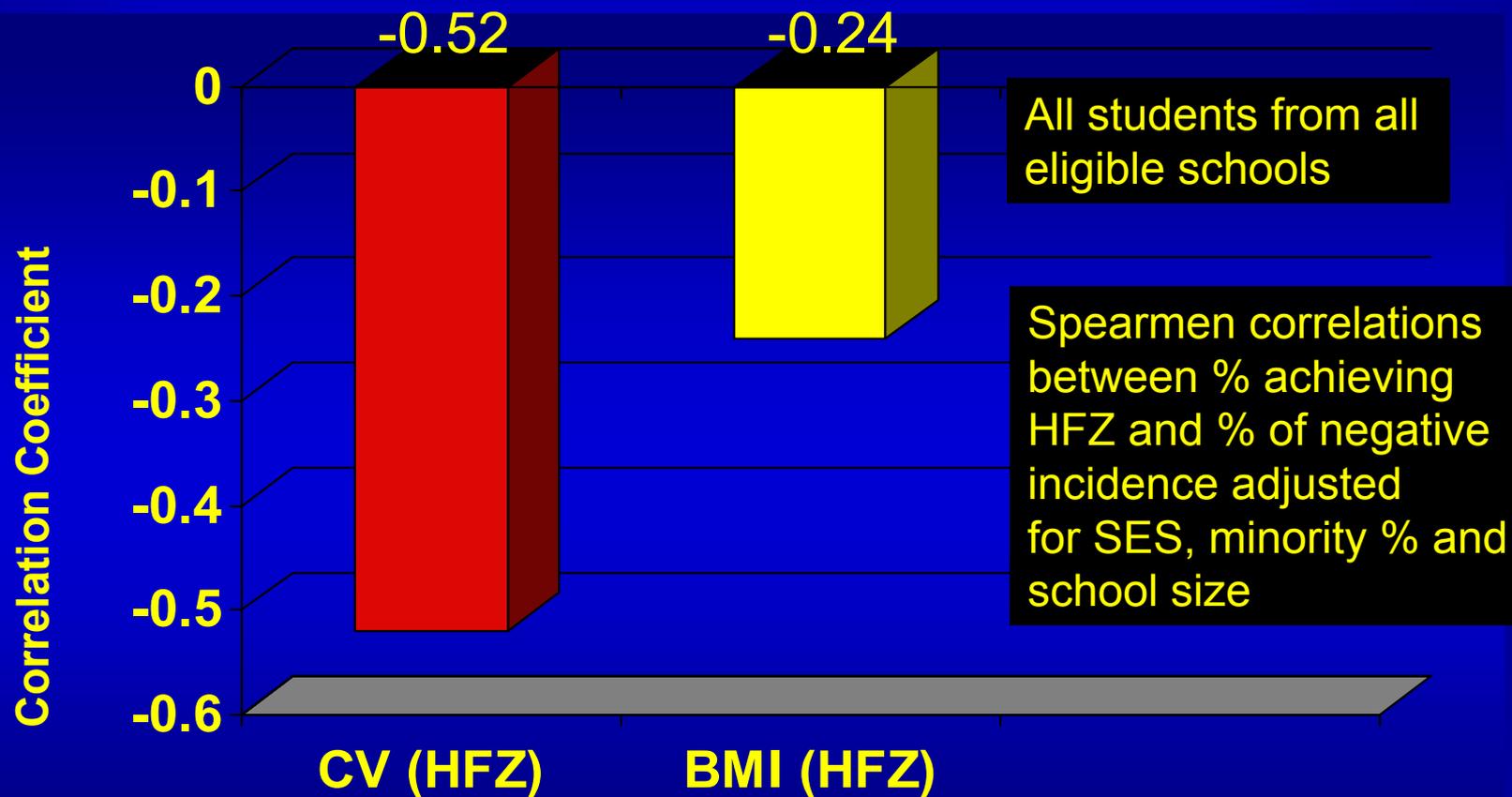
Higher Levels of Fitness Associated with Better School Attendance

# Association Between Fitness and Academic Performance (TAKS)



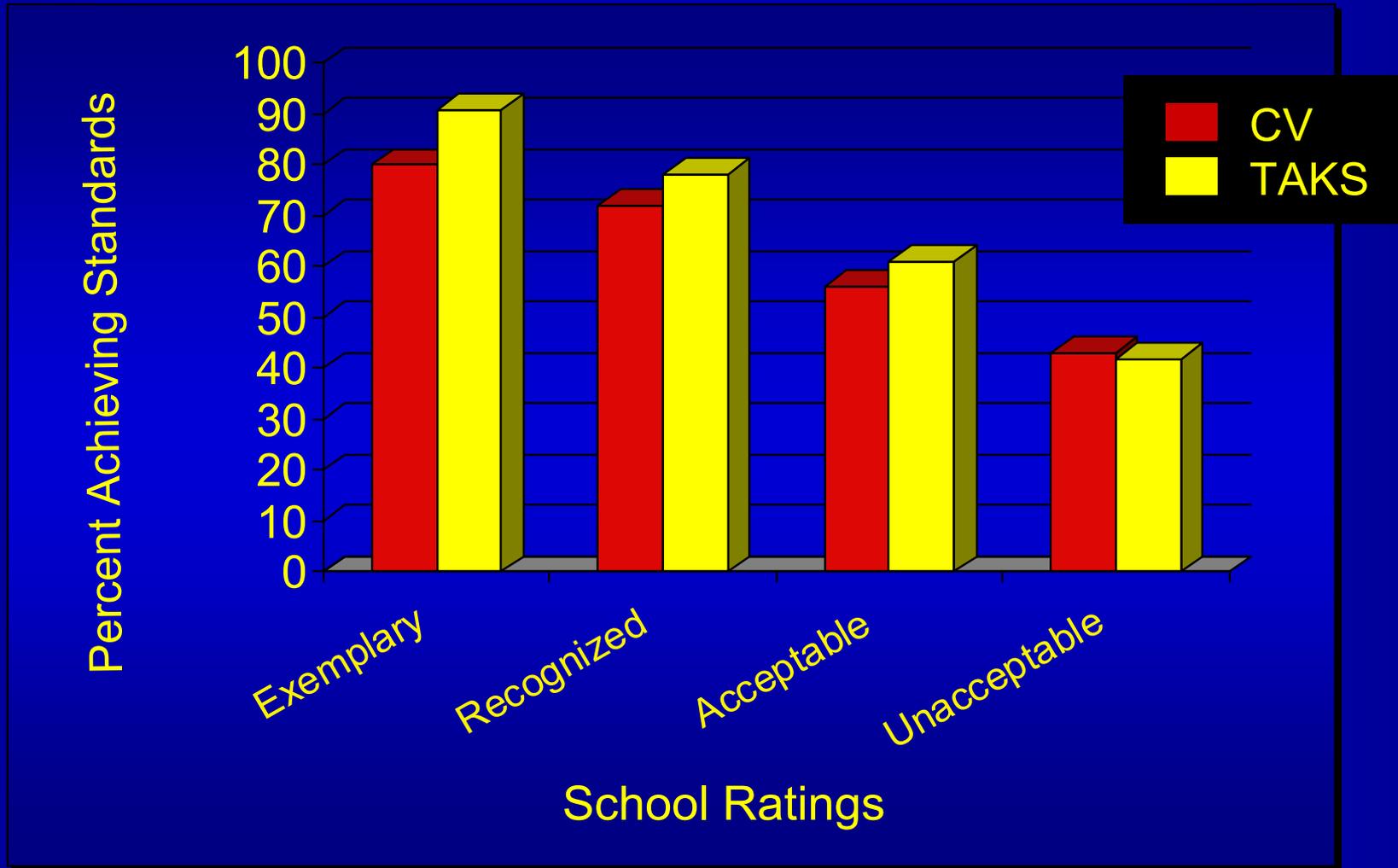
Higher Levels of Fitness Associated with Better Academic Performance

# Association Between Fitness and School Incidence Rates

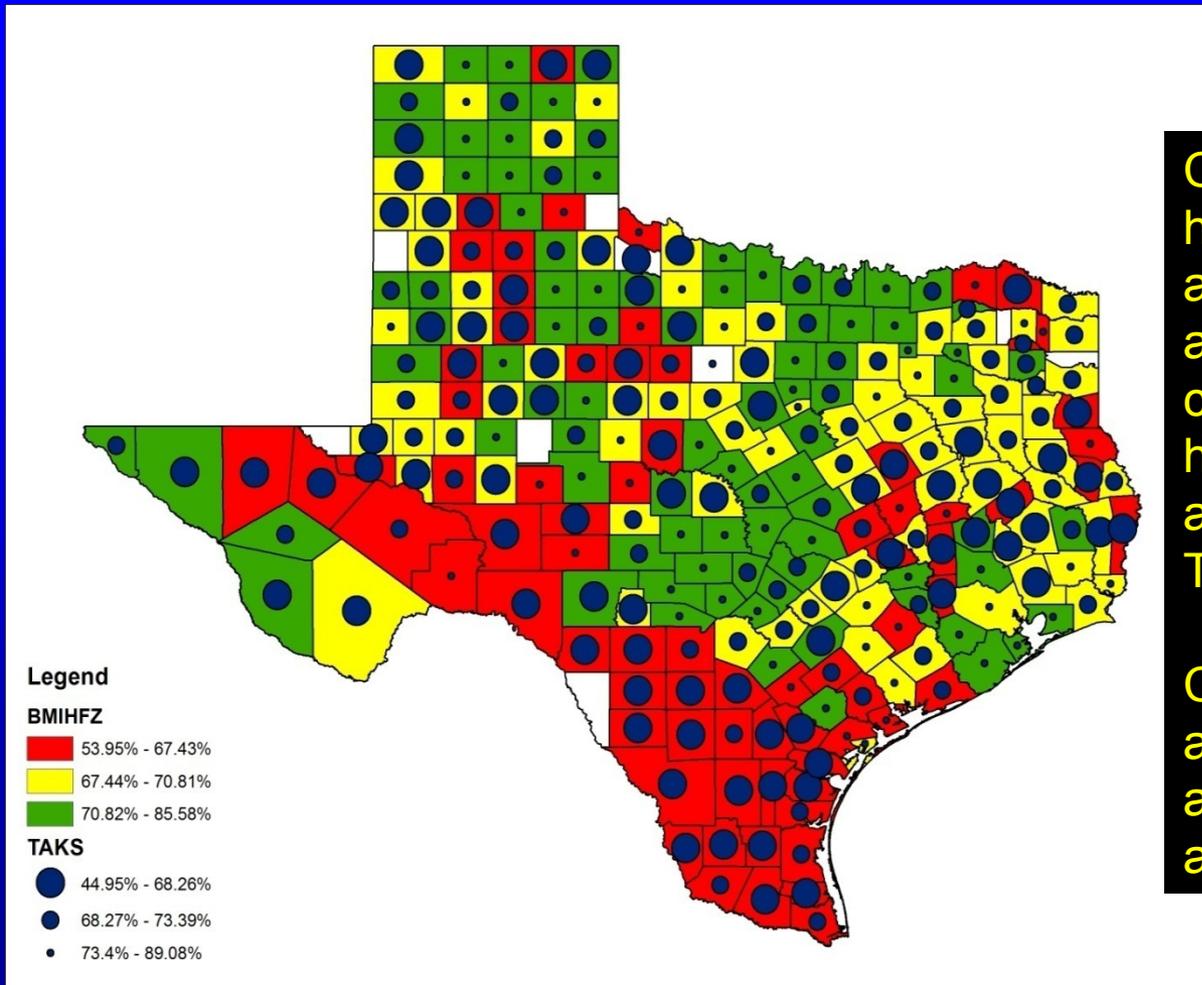


Higher Levels of Fitness Associated with Fewer Negative School Incidents

# *CV Fitness Corresponds with Academic Performance when Schools Stratified by State Rating System*

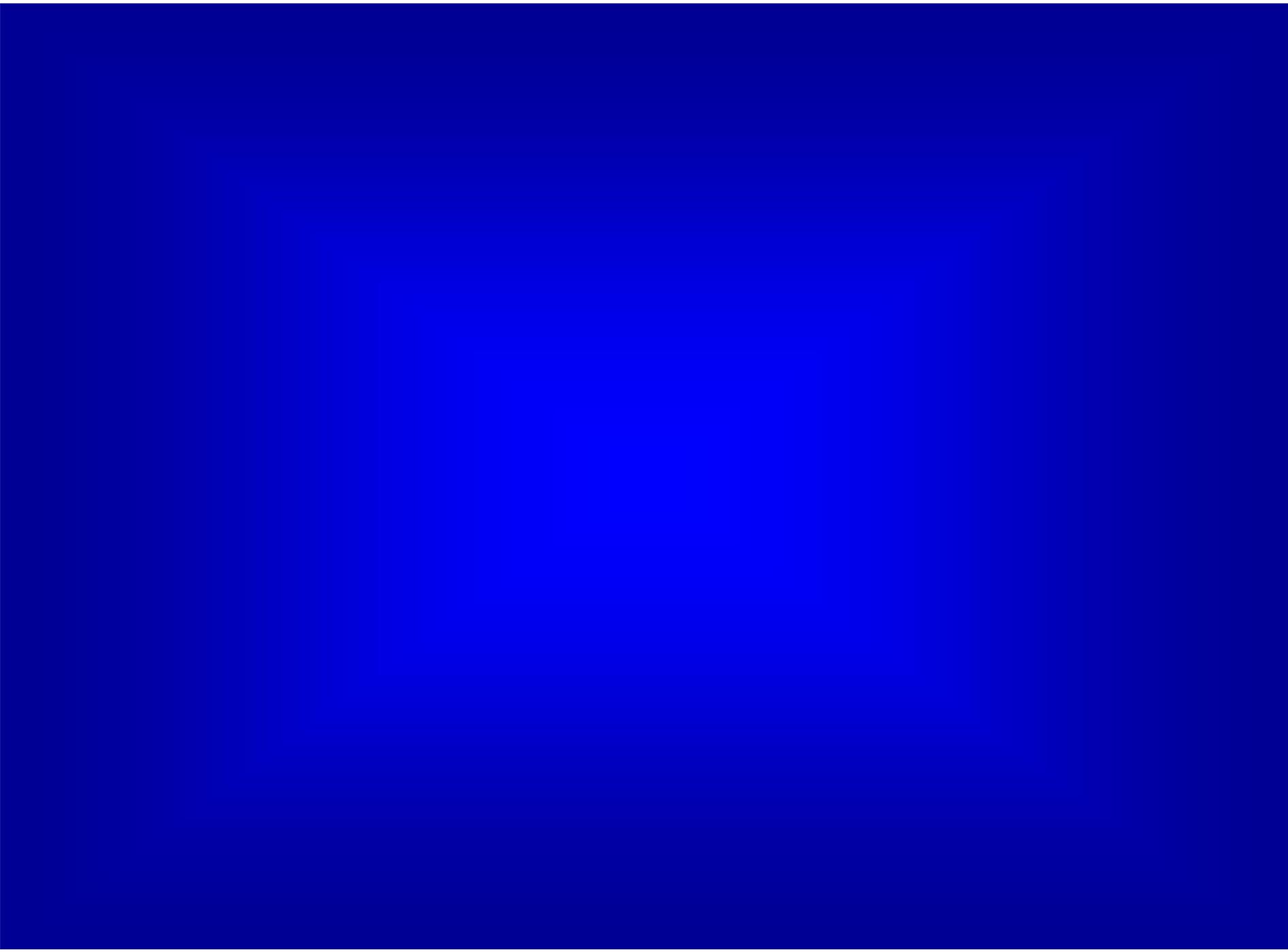


# *Distribution of BMI Achievement AND TAKS Achievement by County*



Counties with low or high levels of achievement in BMI also tended to have corresponding low or high levels of achievement on TAKS.

Causality can't be assumed but associations are apparent.



# ***Rember™***

## ***Rember™ Phase 2 Clinical Trial***

### **Rember™**

- **Small molecule Tau Aggregation Inhibitor**
- **Good safety profile, low cost of goods, robust patents**

### **Clinical trial**

- **321 patients**
- **Mild or moderate disease**
- **Three doses 30mg, 60mg, 100mg**  
**(Encapsulation problems with 100mg dose)**
- **Measured disease progression at 24, 50 and 102 weeks**
- **Brain scans**

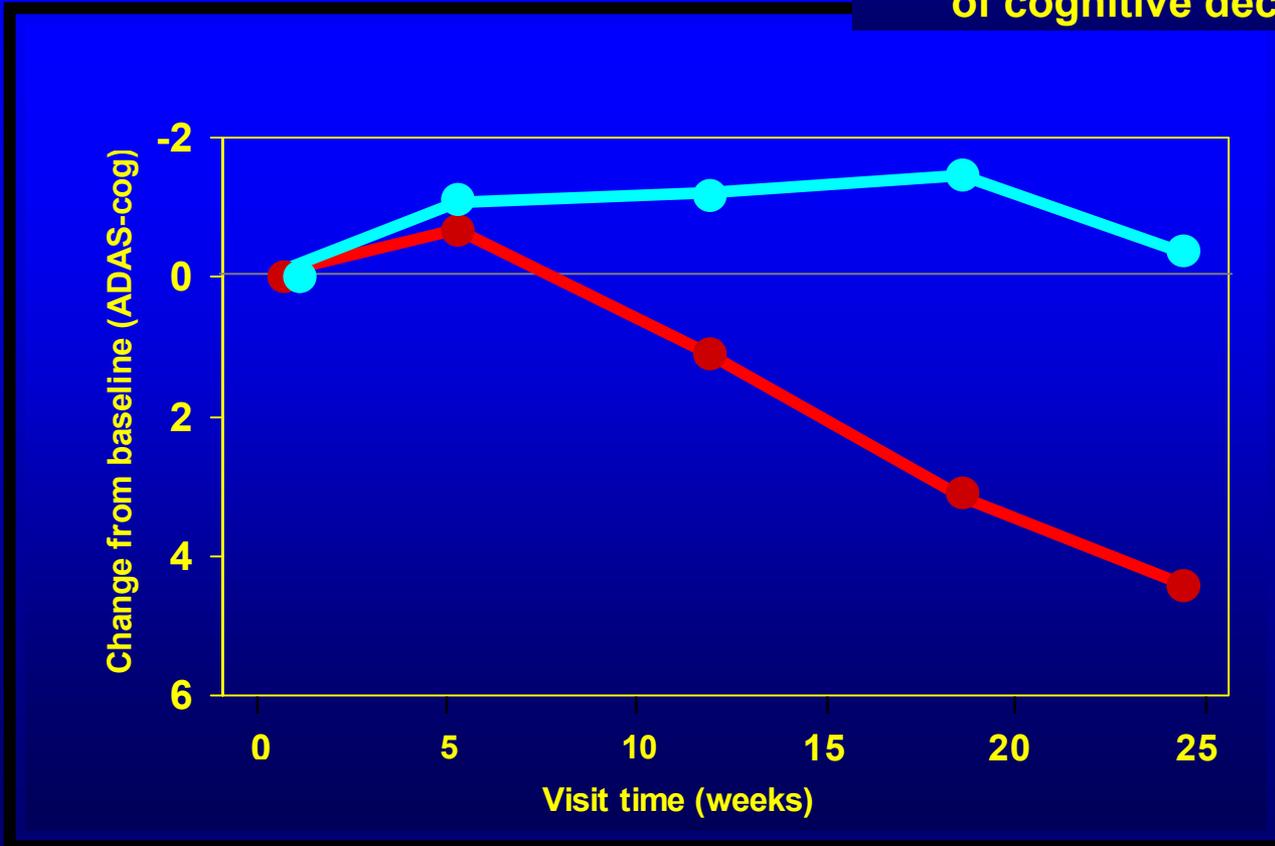
# Rember™

## 24-Week Data, Effect Seen in Moderate AD First

Dose: Control —●—  
60mg —●—

Moderate Severity Disease

109% reduction in rate of cognitive decline



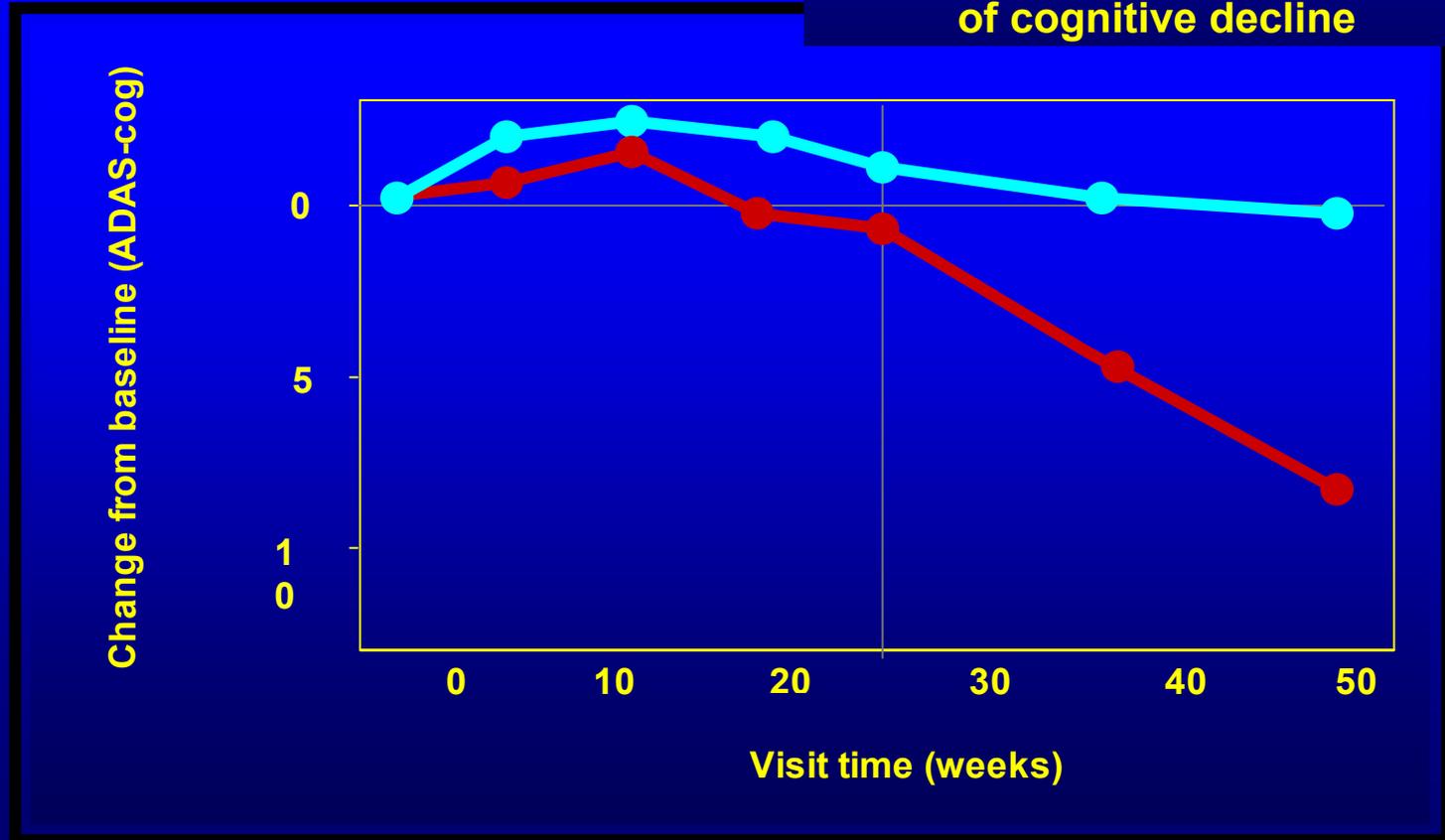
# Rember™

## 50-Week Data, Effect Seen in Mild & Moderate Cases

Dose: Control —●—  
60mg —●—

Pooled Mild & Moderate Disease

84% reduction in rate  
of cognitive decline



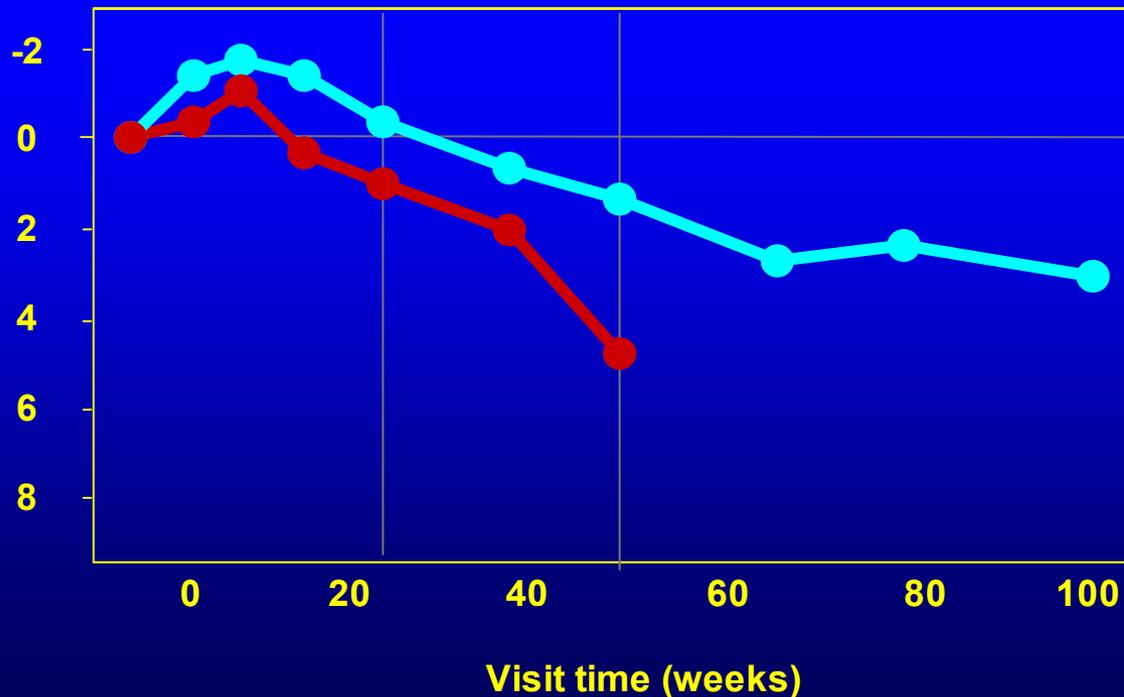
# Rember™

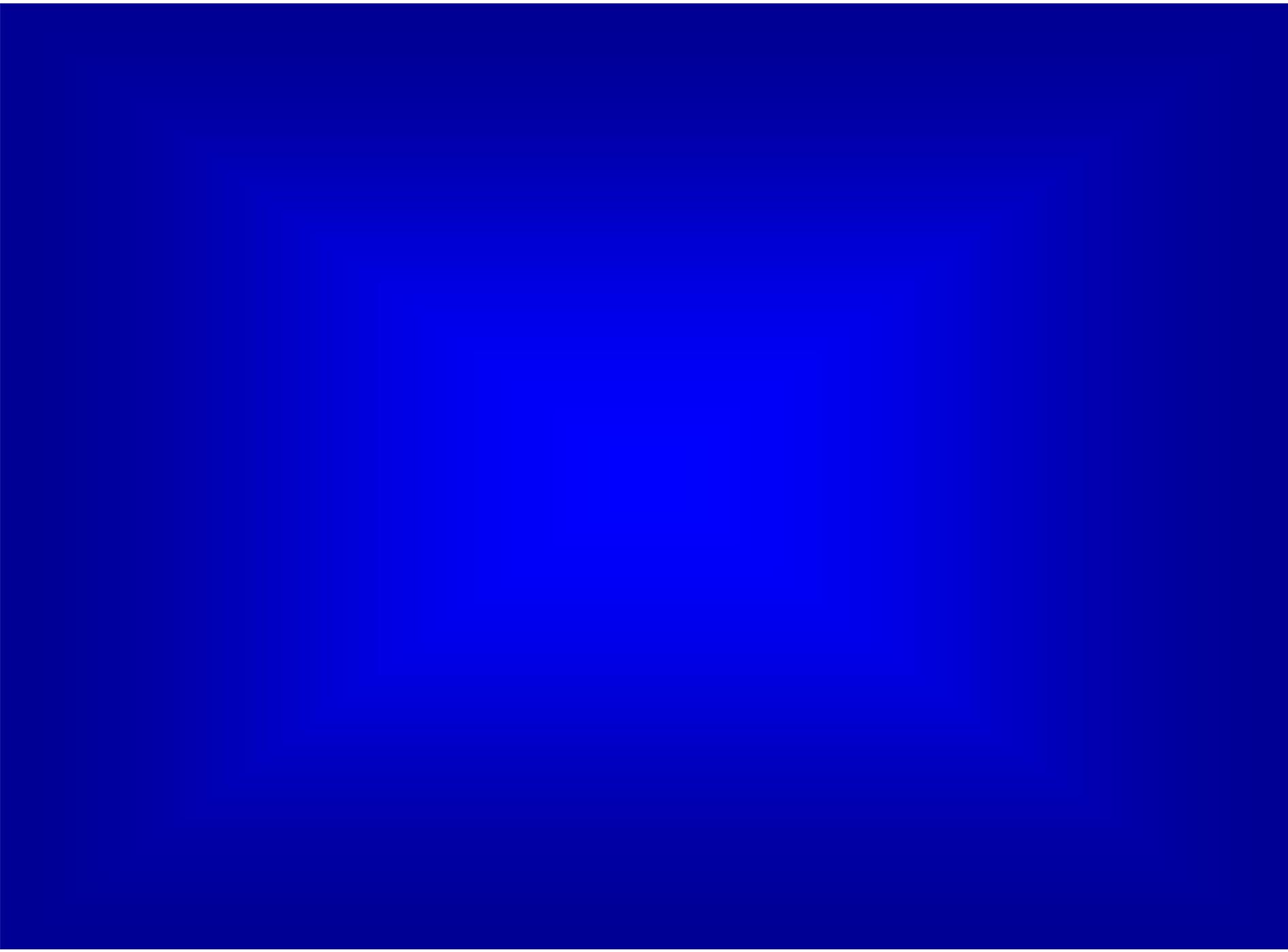
## 102-Week Data, Effect Seen in Mild & Moderate Cases

Dose: Control —●—  
60mg —●—

Pooled Mild & Moderate Disease  
102 Weeks  
80% reduction in rate  
of cognitive decline

Change from baseline (ADAS-cog)





**The Cooper Institute**

**Cooper Clinic**  
*Dallas & Craig Ranch*

**Cooper Ventures**

**Cooper Fitness  
Center & Spa**  
*Dallas &  
Craig Ranch*

**CooperLife**

**Cooper  
Benefits**

**The Guest Lodge**

**Cooper Concepts**

**Cooper Wellness Program**

**Cooper Weight Loss**

