

# Epidemiology and Prevention of Cardiovascular Disease in South Asian Indians

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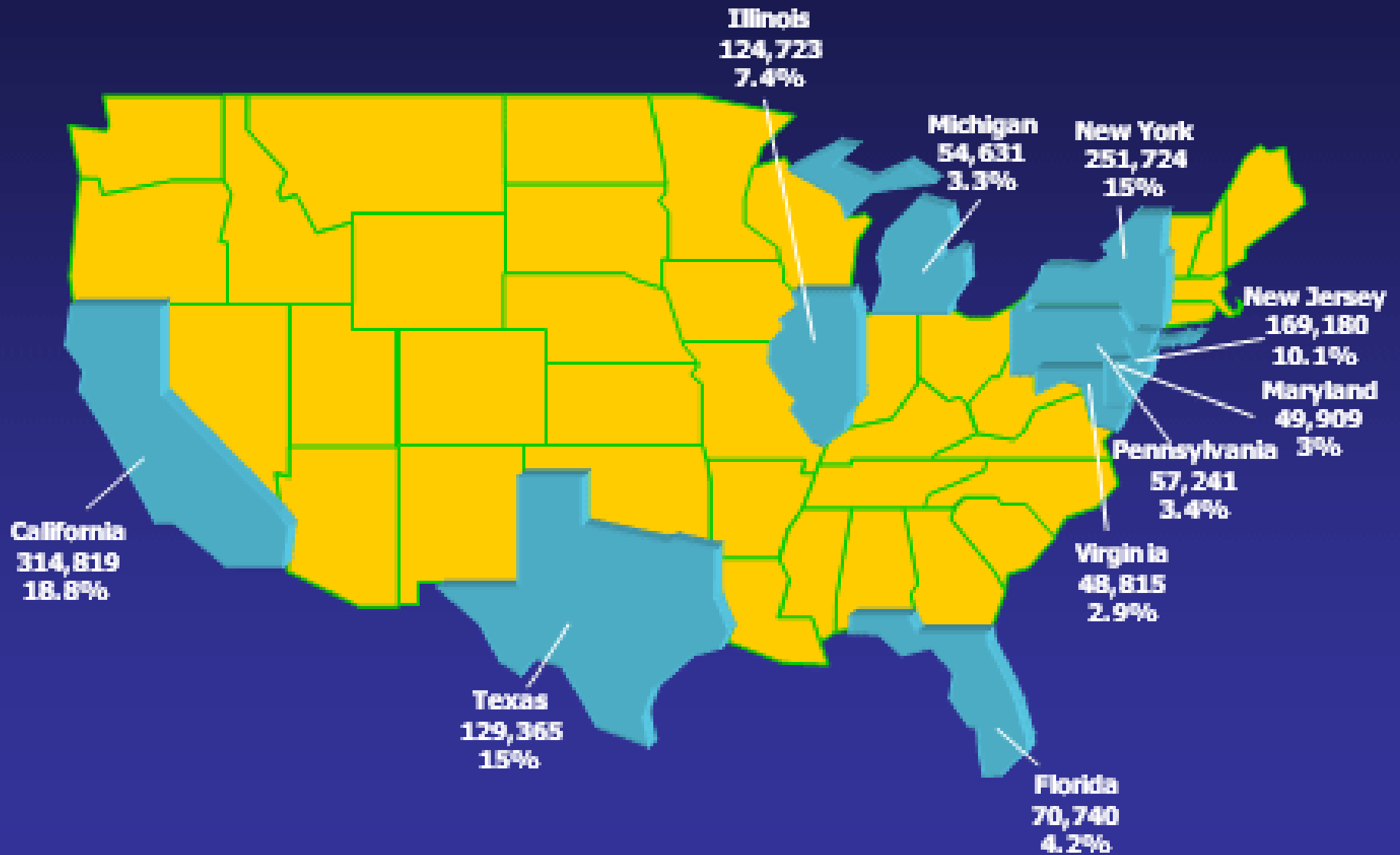
# Background

- Earliest literature from Singapore 1950s comparing ethnic Indians to ethnic Chinese and Malays
- 1970s literature in the U.K. and East Indies
- 1980s literature in the U.S.
- 1990s comparison of Indian populations to diaspora populations

# Scope

- 2010 - Asian Indians will be 60% of the world's cardiac patients
- 100 million patients predicted
- designated as an “at risk” special population in Healthy People 2010

# South Asians in the United States

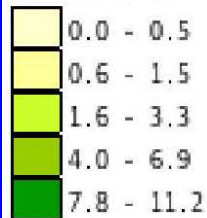


**Total US Population: 1,678,765**

# Percent of Persons Who Are Asian Indian, by County

## Data Classes

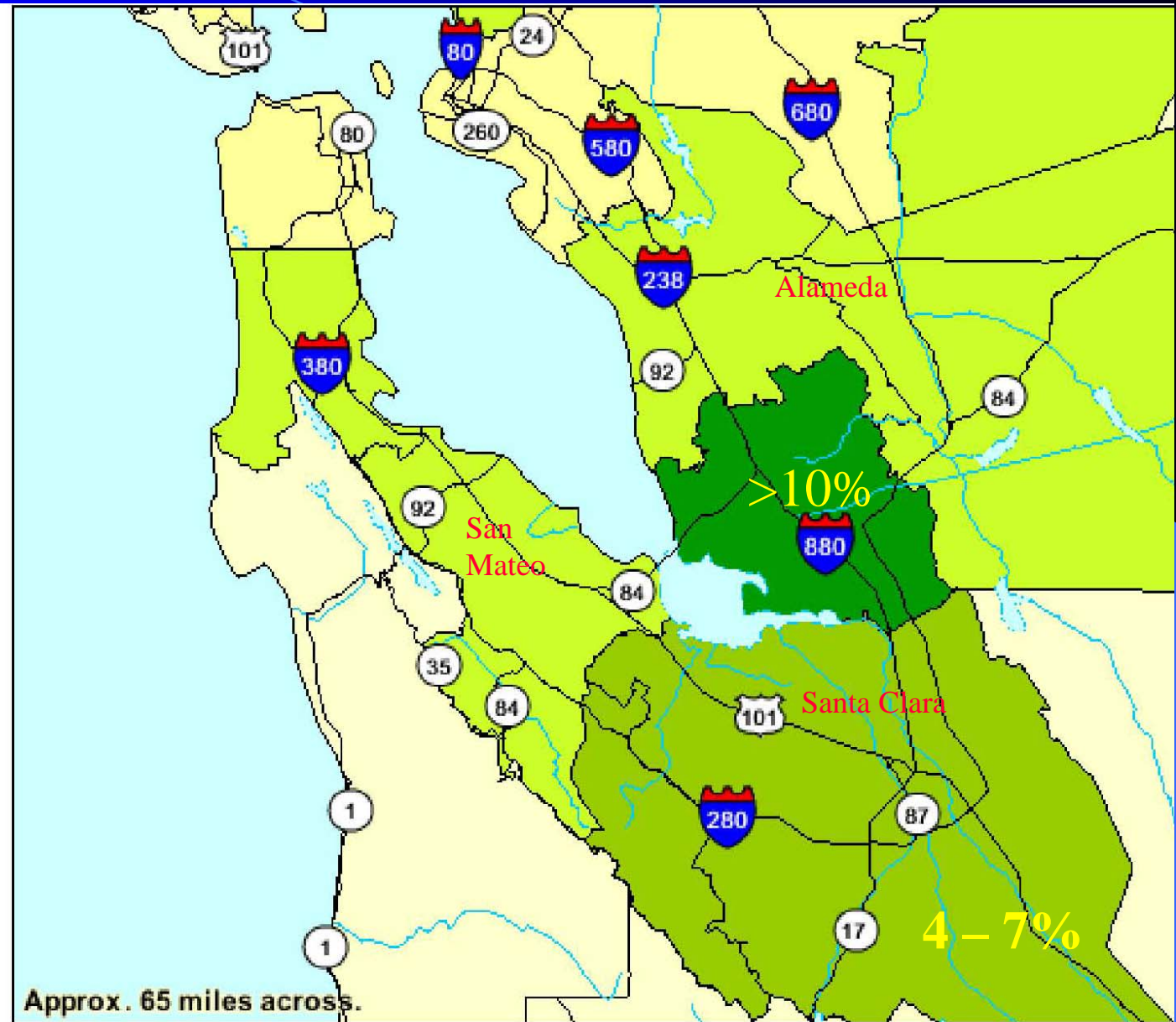
Percent



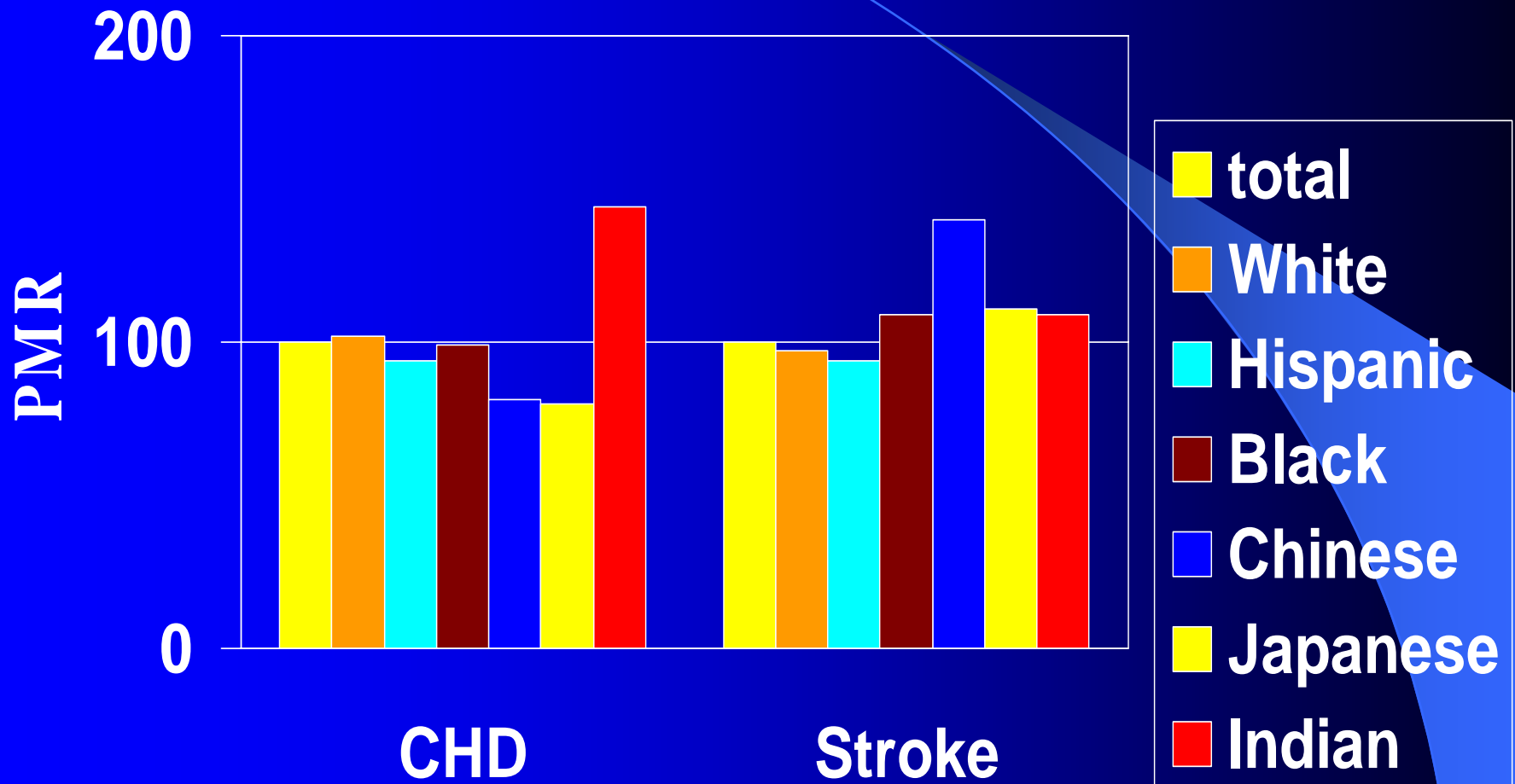
## Features

- Major Road
- Street
- Stream/Waterbody
- Stream/Waterbody

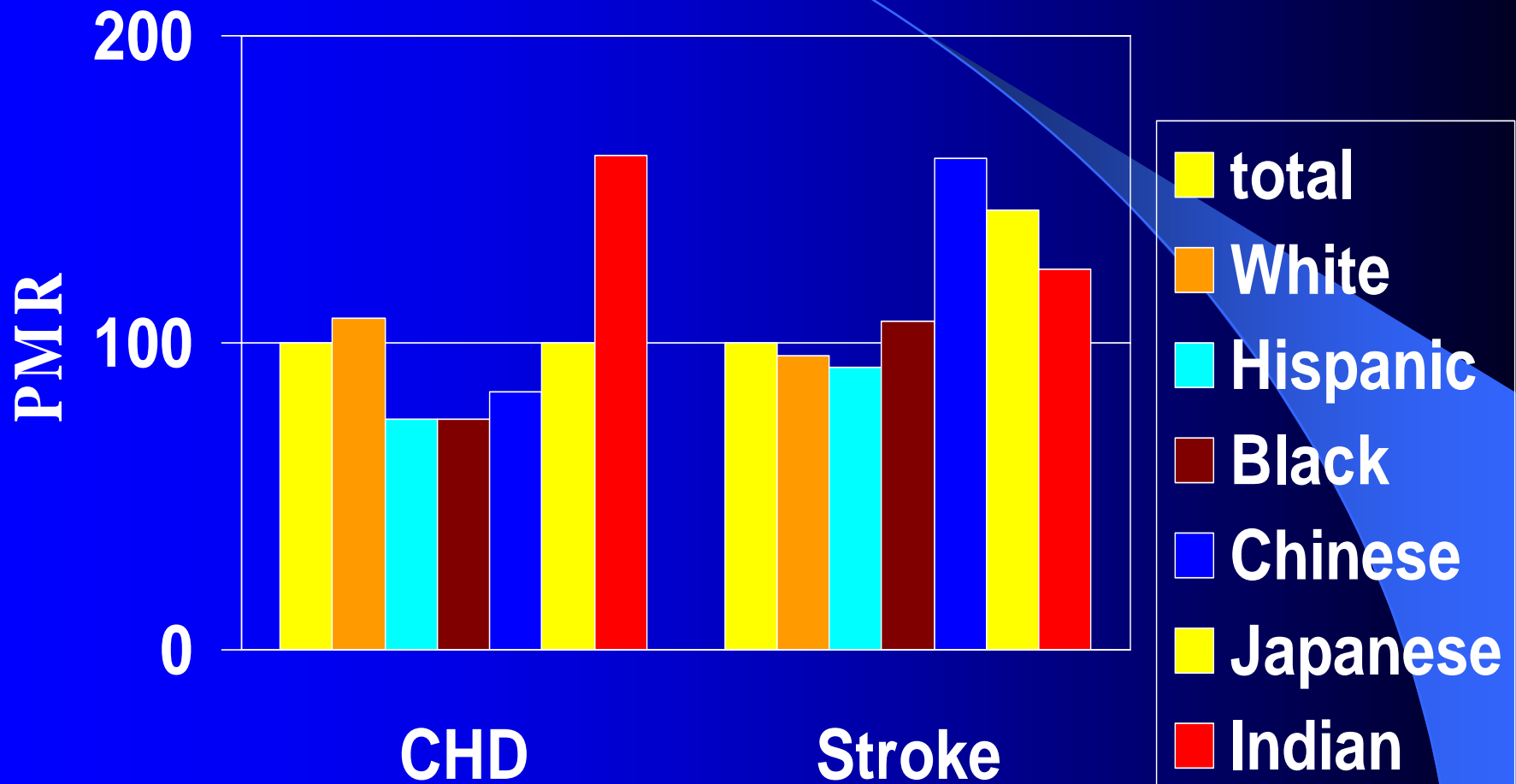
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# Women Age 25-84



# Men Age 25-84



# Risk Factors explored

- elevated serum cholesterol
- smoking
- hypertension
- Apolipoprotein B and E
- Fibrinogen
- Lp(a)
- Homocysteine



# More Potential Risk factors

- Vessel size/caliber
- endothelial function
- diet, exercise
- acculturation stress
- visceral adiposity
- low HDL, high triglycerides
- Apo A1

# Insulin Resistance?

- Barker hypothesis
- Low birth weight
- Obesity, low HDL, high triglycerides, elevated fasting glucose, HTN

# Insulin Resistance Studies

- Stanford 1994 - 22 Asian Indian Men and Women compared to whites
- Asian Indians had higher fasting plasma triglyceride and lower HDL-C
- Asian Indians had increased glucose consistent with insulin resistance.

● Laws, 1994



# Heterogeneity within the South Asian Indian Population

Who should be the referent group?

# CVD Risk Factors (SHARE Study)

Factor	South Asians (n=342)	Europeans (n=326)	Chinese (n=317)
Systolic BP (mm Hg)	119	118	119
Diastolic BP (mm Hg)	76	73	75
BMI (kg/m <sup>2</sup> )			
Men	26.0	28.4	25.1
Women	26.5	26.6	22.8
Waist-to-hip ratio			
Men	0.93	0.94	0.90
Women	0.84	0.80	0.81
LVH by ECG (%)	4.1	1.3	3.8

SHARE=Study of Health Assessment  
and Risk in Ethnic groups in Canada

# Newer Risk Factors (SHARE Study)

Factor	South Asians (n=342)	Europeans (n=326)	Chinese (n=317)
Homocysteine ( $\mu\text{mol/L}$ )	11.1	9.9	9.1
Lp(a) (mg/dL)	2.93	2.59	2.59
Glucose (mg/dL)	98.5	92.4	93.5

SHARE=Study of Health Assessment and Risk in Ethnic groups in Canada

Anand SS et al. *Lancet*. 2000;356:279-284.

## Public health

### Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies

*WHO expert consultation\**

A WHO expert consultation addressed the debate about interpretation of recommended body-mass index (BMI) cut-off points for determining overweight and obesity in Asian populations, and considered whether population-specific cut-off points for BMI are necessary. They reviewed scientific evidence that suggests that Asian populations have different associations between BMI, percentage of body fat, and health risks than do European populations. The consultation concluded that the proportion of Asian people with a high risk of type 2 diabetes and cardiovascular disease is substantial at BMIs lower than the existing WHO cut-off point for overweight ( $\geq 25$  kg/m<sup>2</sup>). However, available data do not necessarily indicate a clear BMI cut-off point for all Asians for overweight or obesity. The cut-off point for observed risk varies from 22 kg/m<sup>2</sup> to 25 kg/m<sup>2</sup> in different Asian populations; for high risk it varies from 26 kg/m<sup>2</sup> to 31 kg/m<sup>2</sup>. No attempt was made, therefore, to redefine cut-off points for each population separately. The consultation also agreed that the WHO BMI cut-off points should be retained as international classifications. The consultation identified further potential public health action points (23.0, 27.5, 32.5, and 37.5 kg/m<sup>2</sup>) along the continuum of BMI, and proposed methods by which countries could make decisions about the definitions of increased risk for their population.



# BMI: Proposed Asian Criteria

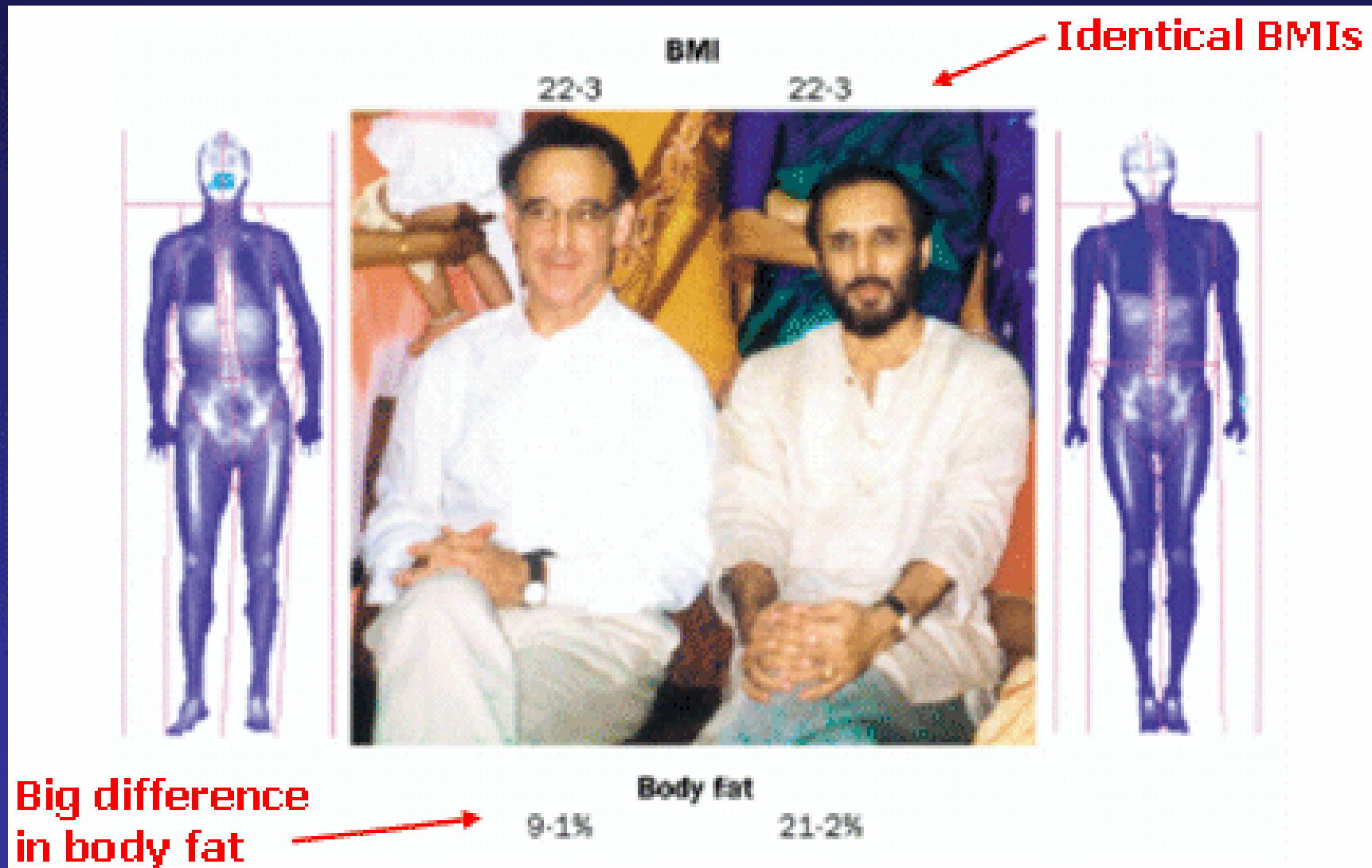
Classification  
of Obesity

BMI  
(kg/m<sup>2</sup>)

	Proposed Asian Criteria	Previous WHO Criteria
<b>Underweight</b>	<18.5	<18.5
<b>Normal Weight</b>	18.5 to <23	18.5 to <25
<b>Overweight</b>	23 to <25	25 to <30
<b>Obese</b>	>25	>30

Note: no association of waist circumference

# The Y-Y Paradox: Limitations of BMI as Measure of Adiposity Across Populations



Yajnik CS, Yudkin JS. *Lancet*. 2004;363:163.

# Future Directions

- Epidemiologic evidence in the US
- Population based surveys
- Culturally tailored instruments
- Larger studies of lipid and genetic markers
- Pairing survey information with biomarkers
- Prevention and Treatment intervention trials



**Stanford University**  
**School of Medicine**  
**General Clinical Research Center**



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■ LINKS

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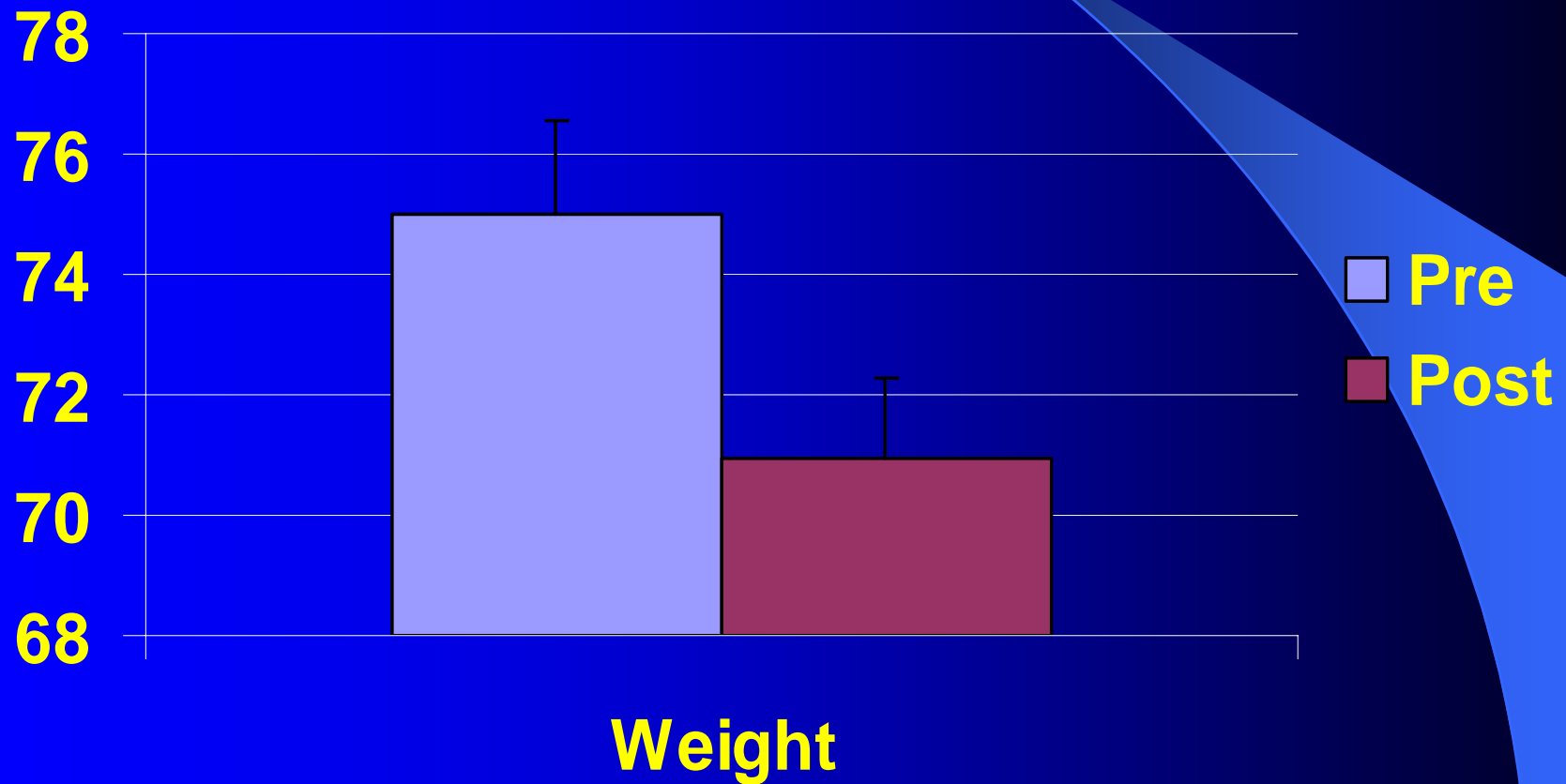
**SOUTH ASIAN INDIAN WOMEN WEIGHT**  
**LOSS STUDY**

**Quick Jumps to Areas on this Page:**

- [Overview of the Study](#)
- [Hypothesis](#)
- [Background and Significance](#)
- [Study Design and Methods](#)
- [Screening](#)
- [Insulin Sensitivity Test](#)
- [Meal Profile](#)
- [Dietary Treatment](#)
- [Time Commitment](#)
- [Benefits](#)



# Change in Weight (kg)



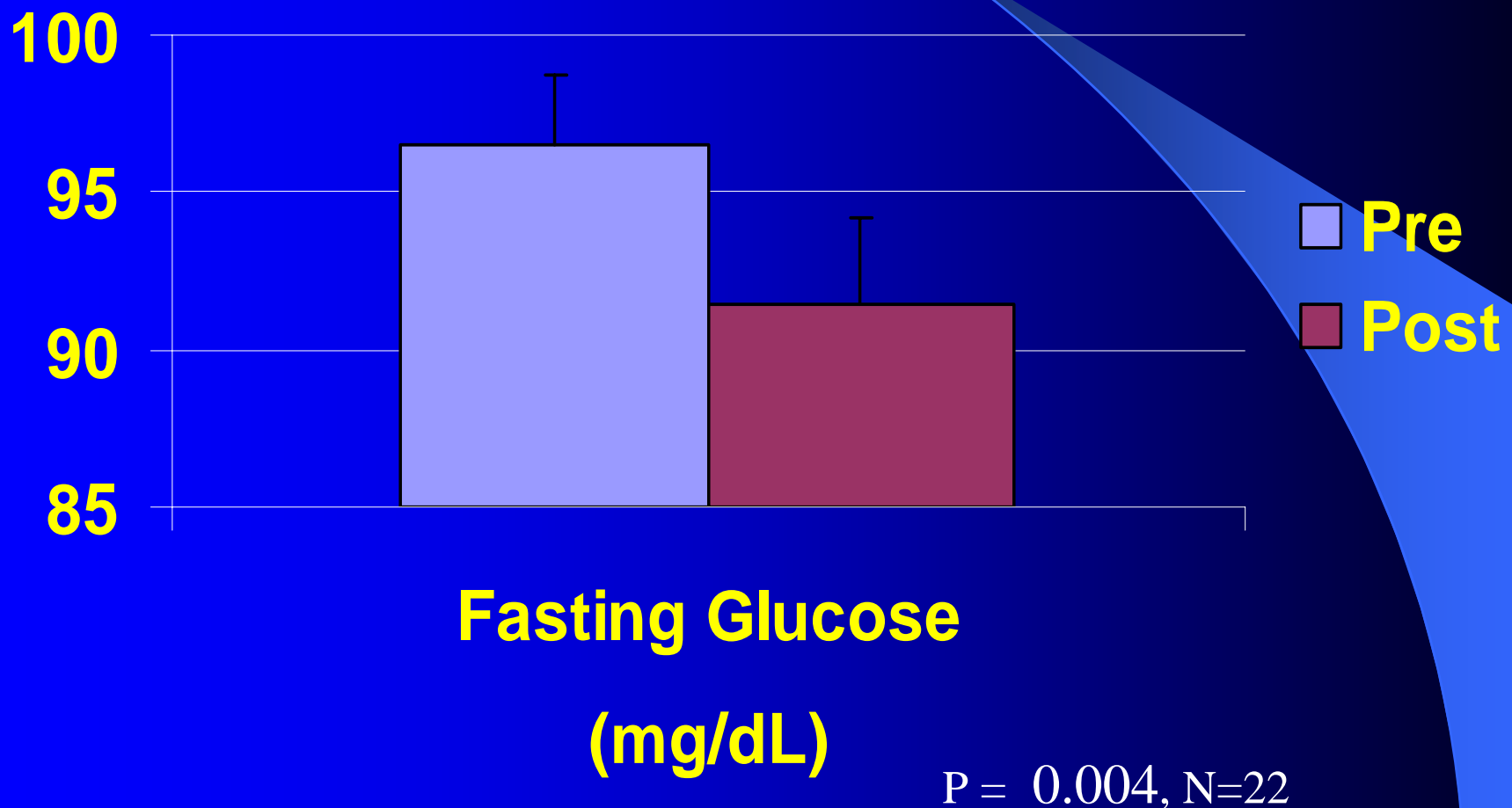
$P < 0.0001$ ,  $N=22$

# Change in SSPG (mg/dL)

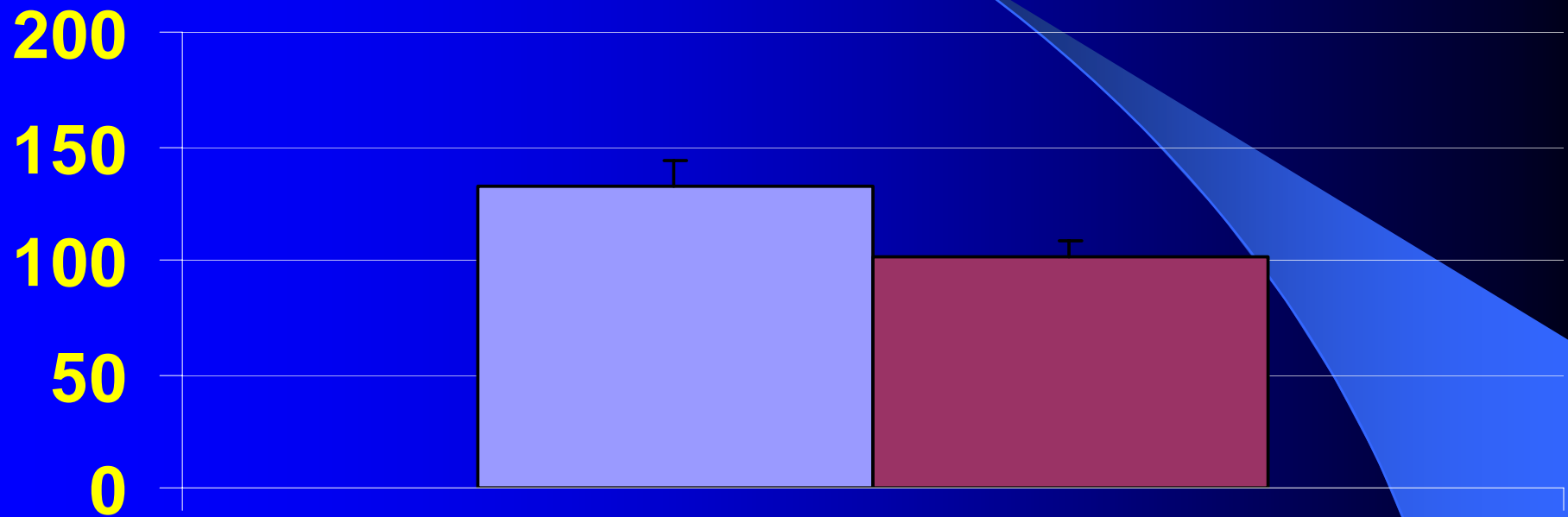


P < 0.0001, N=22

# Change in Fasting Glucose



# Change in Triglycerides



Triglycerides

mg/dl

P = 0.003, N=22



# Risk Factors for Heart Disease

## Non-modifiable

- Age
- Family history
- Gender

## Modifiable

- Physical Inactivity
- Obesity
- High fat diet
- High Blood Pressure
- Diabetes
- High Cholesterol
- Cigarette Smoking

# Key Tests for Heart Disease Risk

- Do you smoke?
- Blood pressure
- Blood cholesterol
- Fasting plasma glucose (diabetes)
- Body mass index (BMI) – ratio of height to weight (kg/m<sup>2</sup>)

# TOBACCO #1 PREVENTABLE RISK

- Second-hand smoke increases cardiac risk.
- The health benefits of quitting smoking begin immediately.
- Many people who quit smoking successfully have tried and failed many times.
- Ask about low cost or free programs to help you or someone you care about stop smoking.

# Blood Pressure

- Reduces the chance of:
  - Stroke: 35-40 %
  - Heart Attack: 20-25 %
  - Heart Failure: 50 %
- A person who has a normal blood pressure at age 55 has a 90% lifetime chance of developing hypertension.
- OPTIMAL: <120 systolic and <80 diastolic

*American Heart Association website:  
[www.americanheart.org](http://www.americanheart.org)*

## **Lifestyle Change: What Difference Does it Make ?**

- **Weight loss. (decreases SBP\*1.6 mm Hg for each kg lost)**
- **Dietary Approaches to Stop Hypertension: DASH diet:  
– (decreases systolic BP 8-14 mmHg)**
- **Reducing salt in the diet.(decreases SBP 2-8 mmHg)**
- **30-45 minutes daily aerobic exercise  
– (decreases systolic BP 4-9 mmHg)**
- **Limit alcohol. (decreases SBP 2-4 mm Hg)**
- **Avoidance of tobacco products.**

# The Lipid Profile: Know Your Numbers!

- **Total Cholesterol Goal: < 200 mg/dL**
- **Low Density Lipoprotein Cholesterol or LDL Goal: < 100 mg/dL**
- **Triglycerides Goal: < 150 mg/dL**
- **High Density Lipoprotein Cholesterol (HDL) > 40 mg/dL for men, > 50 mg/dL for women**
- **Lifestyle is the key: dietary changes, exercise, weight loss**

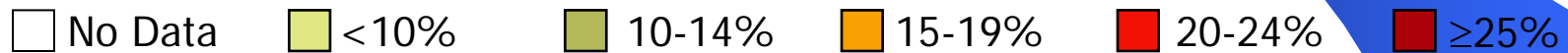
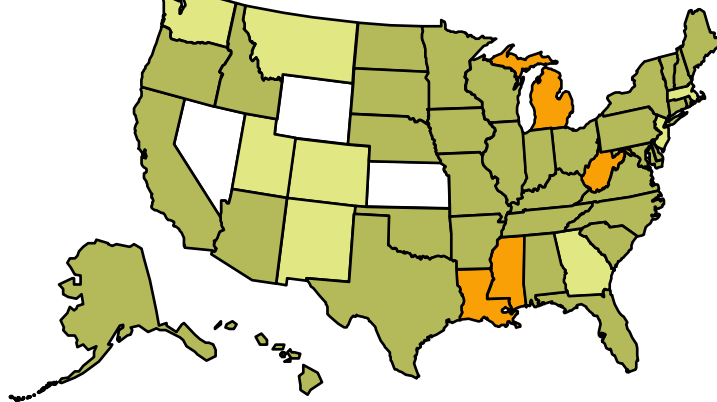
# American Diabetes Association (ADA) Guidelines

- Optimal fasting blood sugar < 100 mg/dL
- Criteria for diabetes
  - Fasting glucose 126 mg/dL or higher
  - Random glucose 200 mg/dL or higher
- Impaired fasting glucose 100 - 125 mg/dL
- People at risk for diabetes who follow a diet and exercise plan (with only a modest weight loss) can decrease their risk of developing diabetes by almost 50%.

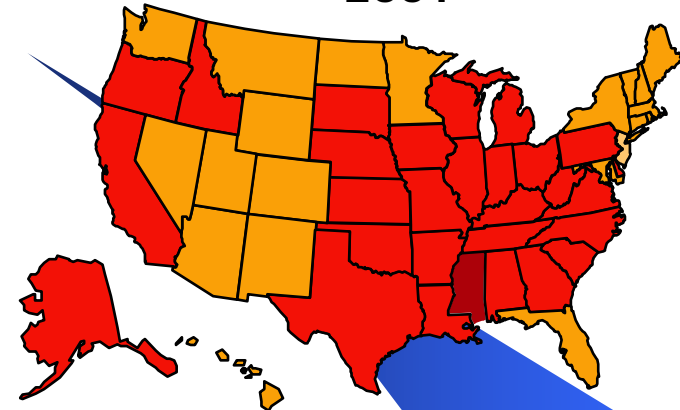
# Obesity and Diabetes Trends

## Obesity

1991

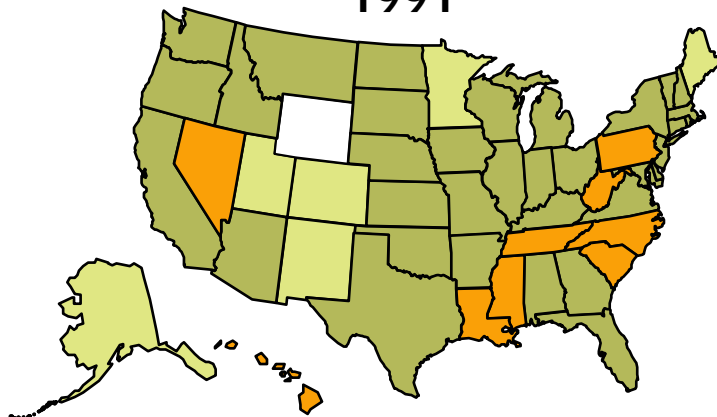


2001

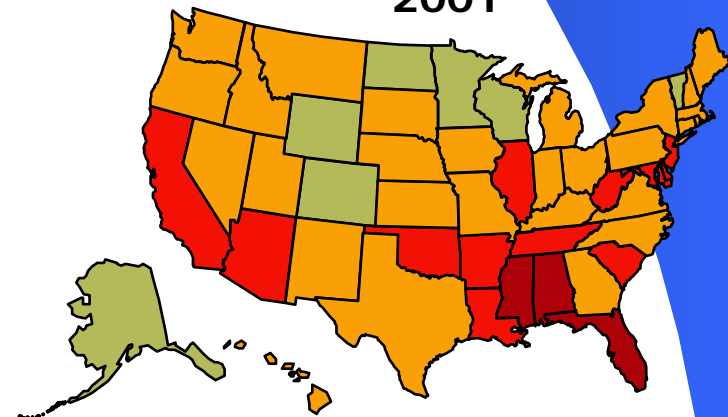


## Diabetes

1991



2001





# Health Consequences of Obesity

- High blood pressure
- High blood cholesterol
- Type 2 diabetes
- Insulin resistance
- Coronary heart disease
- Angina pectoris
- Congestive heart failure
- Stroke
- Gall bladder disease
- Gout, Osteoarthritis
- Obstructive sleep apnea and respiratory problems
- Some types of cancer
- Poor female reproductive health
- Bladder problems
- Kidney stones
- Psychological disorders

# Where Does Exercise Come In?

- **EVERYWHERE!**
- Exercise helps lower blood pressure.
- Exercise helps prevent diabetes.
- Exercise helps raise HDL (good cholesterol).
- Exercise helps weight management.
- Exercise helps manage stress.
- Exercise helps bone health.

# Portion Size

## SPAGHETTI AND MEATBALLS

20 Years Ago



**500 calories**  
1 cup spaghetti with sauce  
and 3 small meatballs

Today



**1,025 calories**  
2 cups of pasta with sauce  
and 3 large meatballs

**Calorie Difference: 525 calories**

# To Survive a Heart Attack

- Call 9-1-1 within minutes—5 minutes at most
- Emergency medical personnel will begin treatment at once
- Don't drive yourself to the hospital
- Uncertainty is normal—don't be embarrassed by a false alarm
- Plan ahead
- Learn the warning signs

# How To Lower Heart Disease Risk

- Begin today
- Be physically active—30 minutes of moderate-intensity activity on most days of the week
- Follow a healthy eating plan
  - Limit Portion Sizes
  - Count Calories (1500 for women, 1800 for men)
  - Low in saturated fat and cholesterol and moderate in total fat
  - Limit salt and sodium
  - If you drink alcoholic beverages, have no more than one a day

## **Internet Resources**

**National Heart Lung and Blood Institute**

(<http://www.nhlbi.nih.gov>)

**American Heart Association**

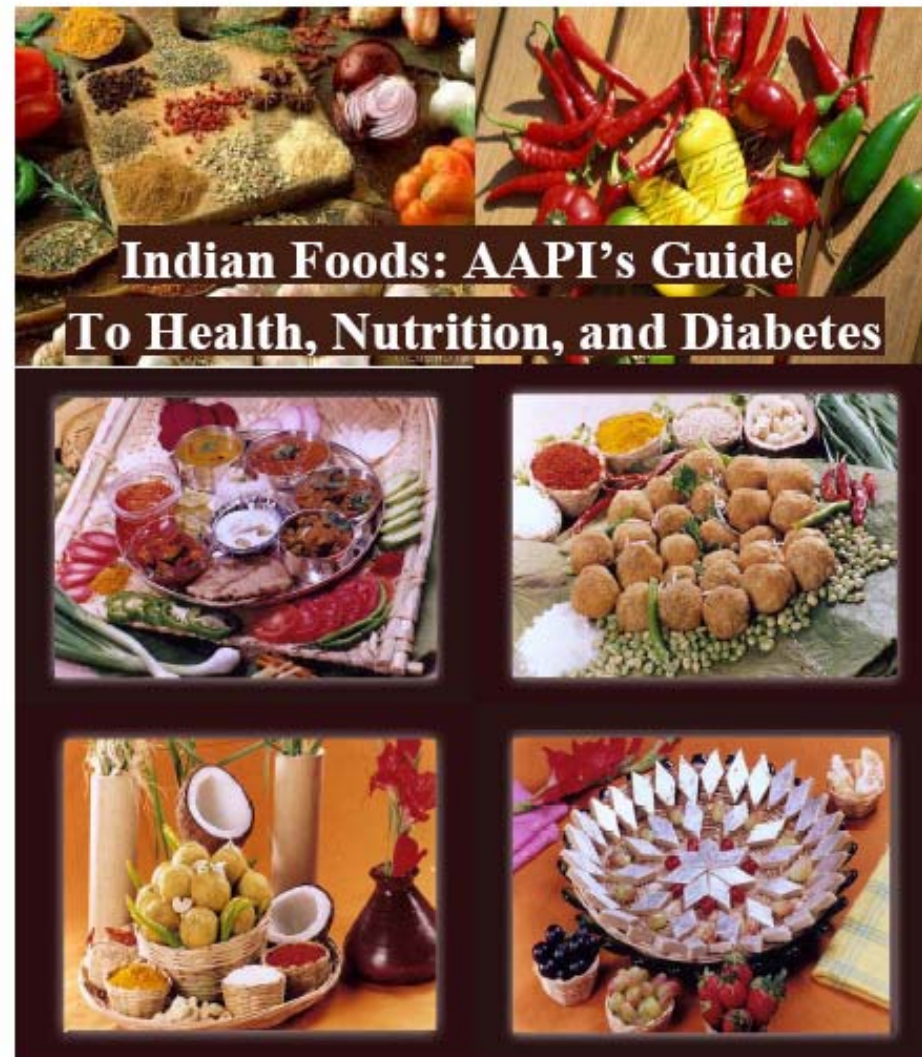
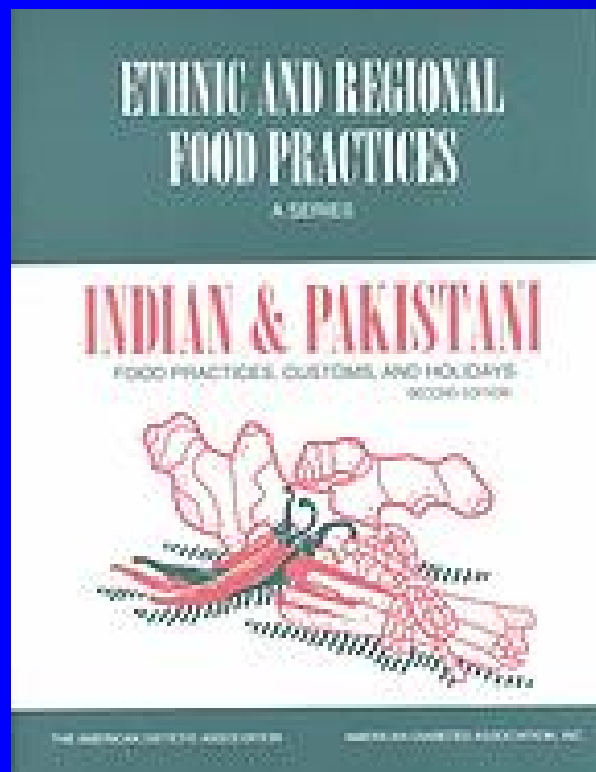
(<http://www.americanheart.org>,  
[www.goredforwomen.org](http://www.goredforwomen.org))

# In Summary

- Know the symptoms of heart disease.
- Know your risk factors for heart disease.
- Visit your healthcare provider:
  - Discuss your risk factors
  - Ask questions about your heart tests
- Maintain a healthy lifestyle.
- Heart disease is largely preventable.



Google search  
terms:  
**AAPI Nutrition**



© American Association of Physicians of Indian Origin  
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Thank You!

The background is a dark blue gradient. A thin, light blue curved line starts from the left edge and curves downwards towards the bottom right. A larger, semi-transparent blue triangular shape is positioned in the lower right quadrant, pointing towards the bottom right corner.