

Measuring and Addressing Disparities in Stroke Prevention

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UNLABELED/UNAPPROVED USES DISCLOSURE: None

Stroke Epidemiology Gaps in our Knowledge

- **African Americans have nearly twice the mortality from stroke according to US health statistics**
- **Little is known about Hispanics, the fastest growing population in the US**
- **Prior stroke epidemiology studies have been performed in predominantly white populations**

260,000 people

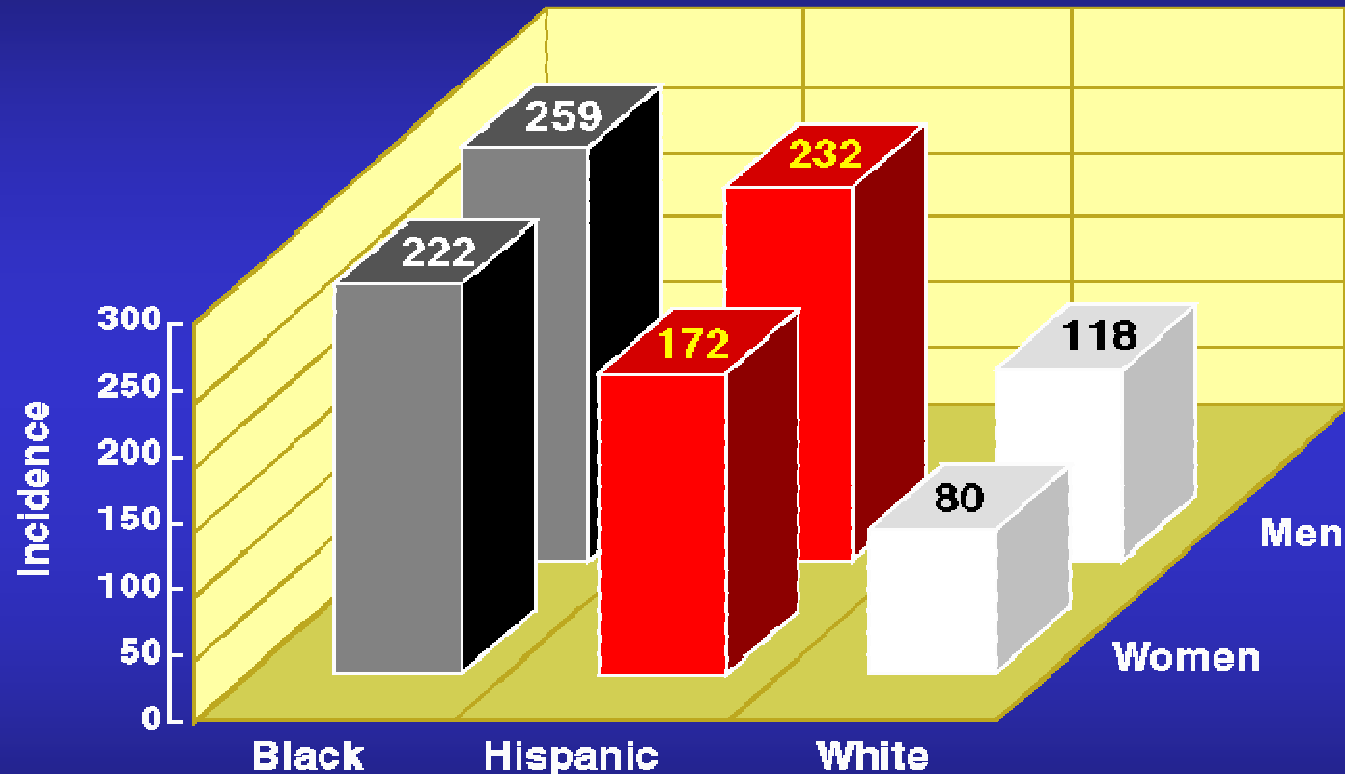
15% White

20% Black

**63% Hispanic
(Dominican 60%)**



Annual Stroke Incidence Northern Manhattan Stroke Study

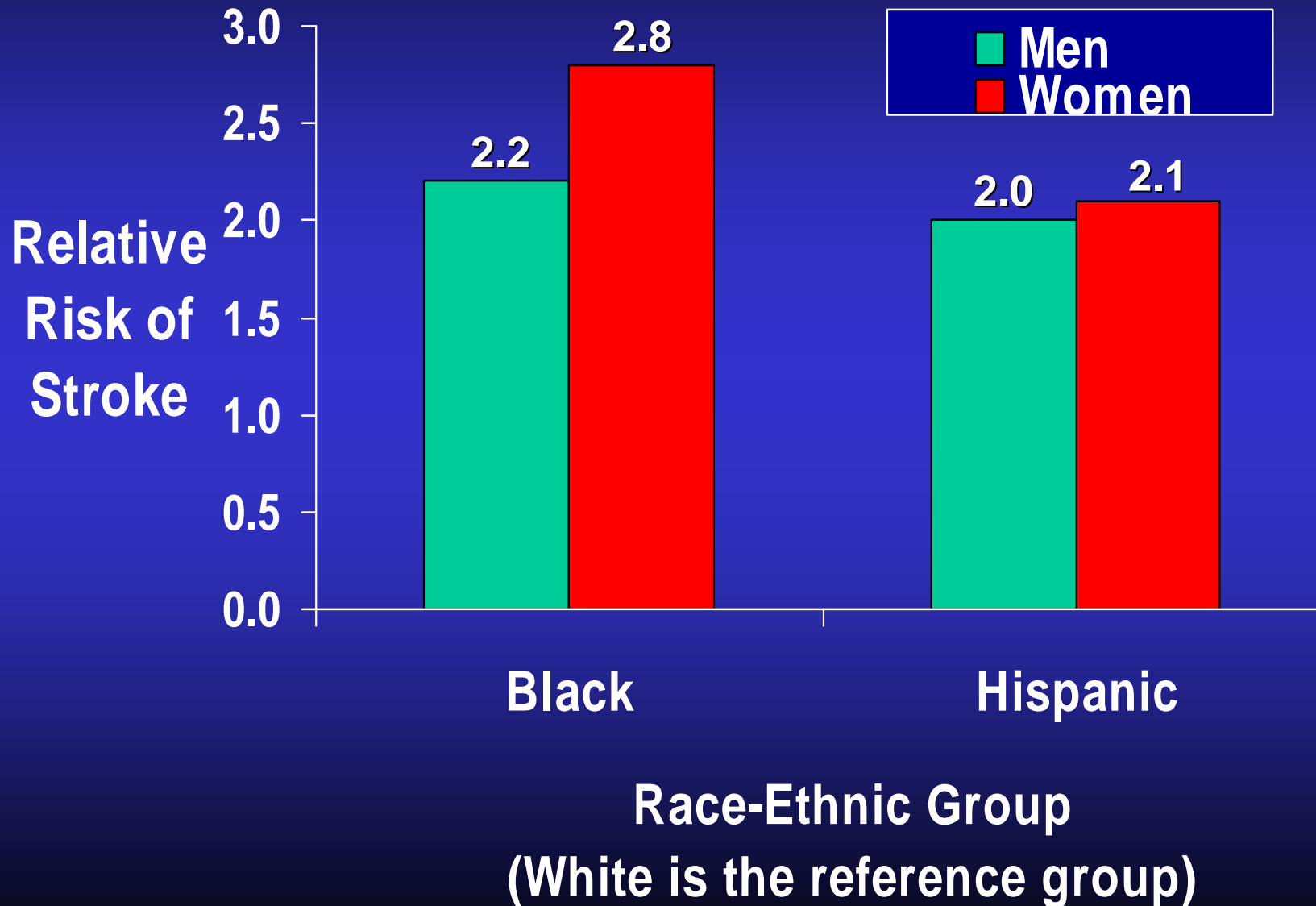


Age-adjusted stroke incidence for white, black, and Hispanic northern Manhattan residents over age 20

Source: Sacco et al., *Am J Epidemiol* 1998;147

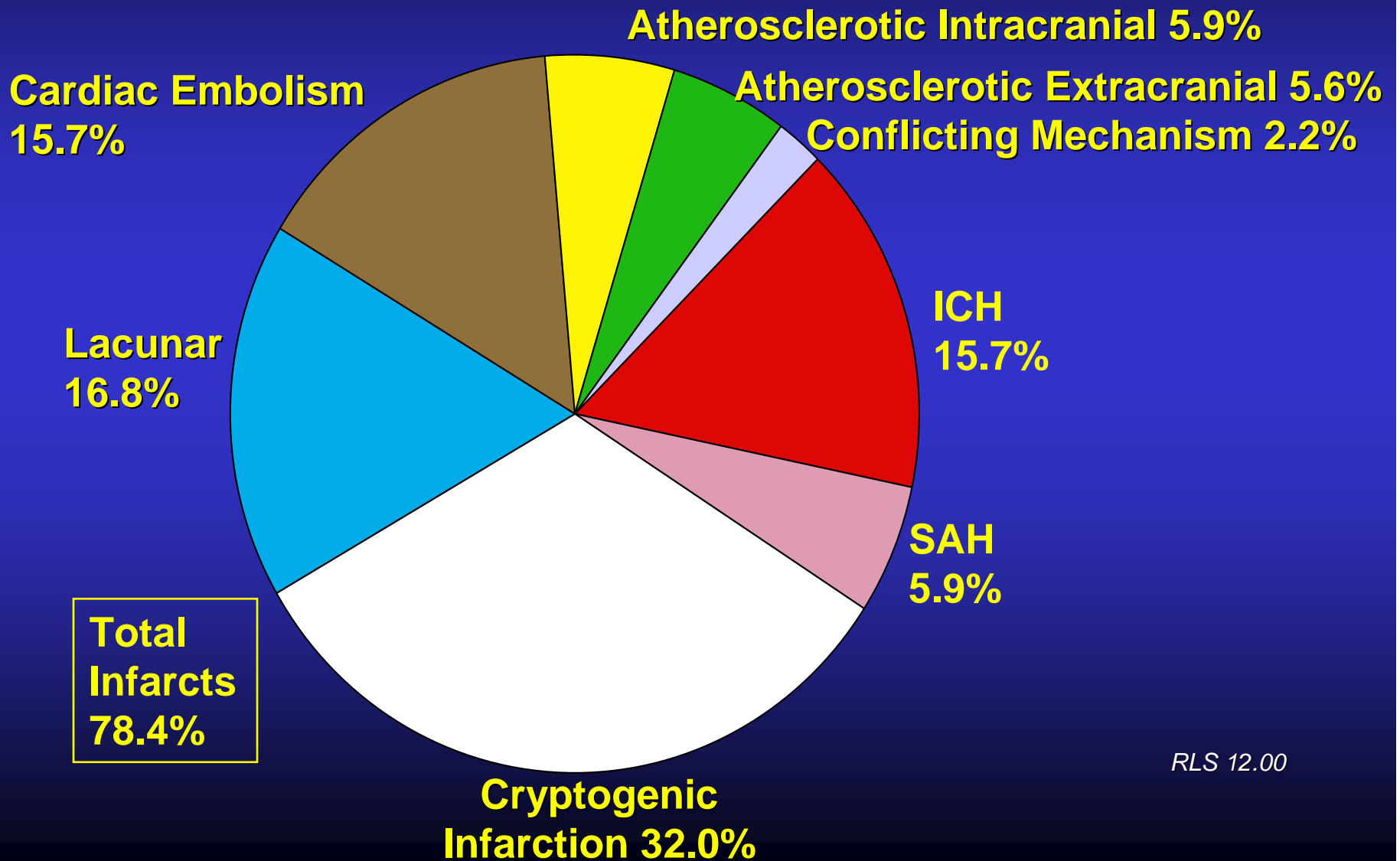
Relative Risk of Stroke by Race

Northern Manhattan Stroke Study



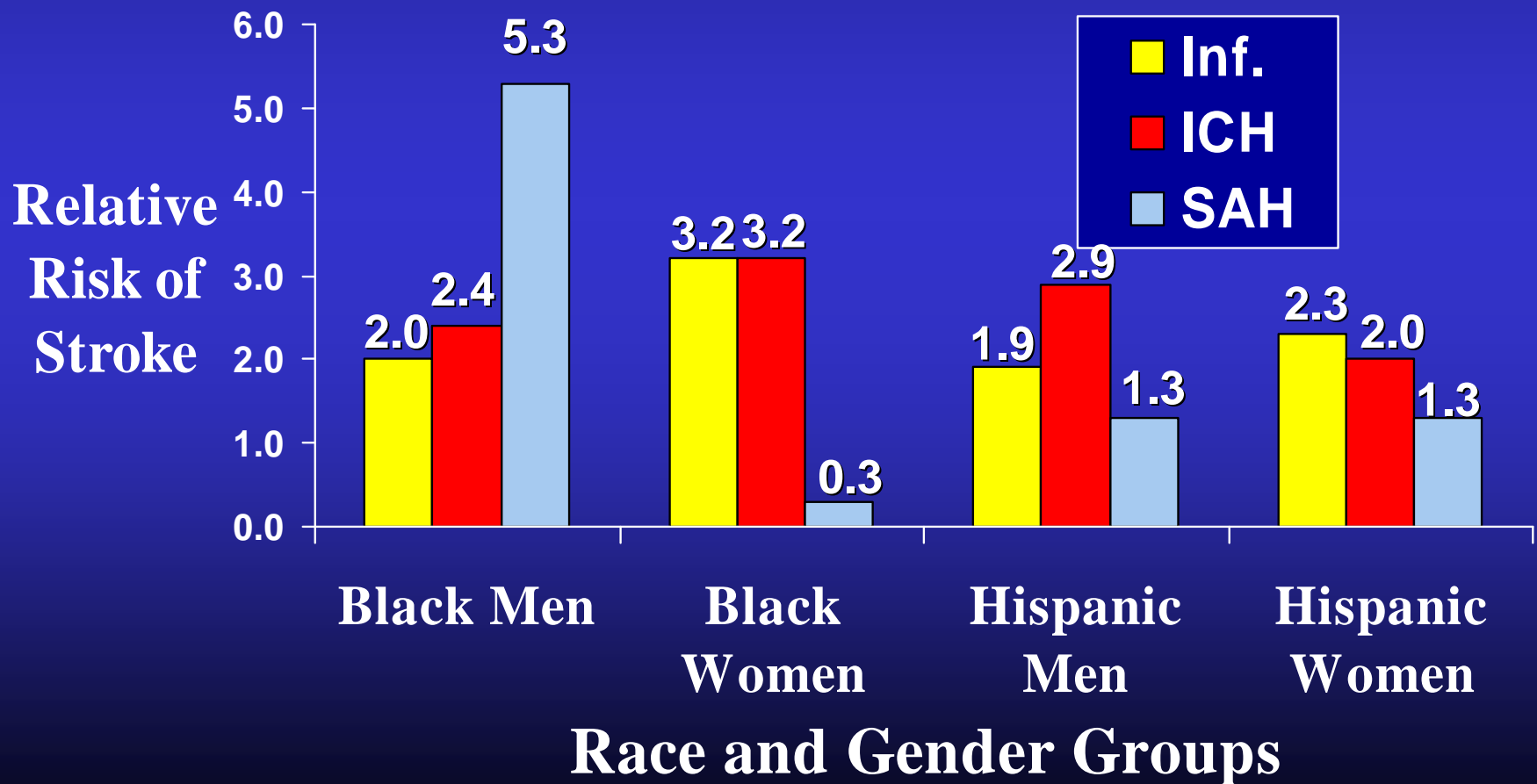
Northern Manhattan Stroke Study

Frequency of first choice diagnosis

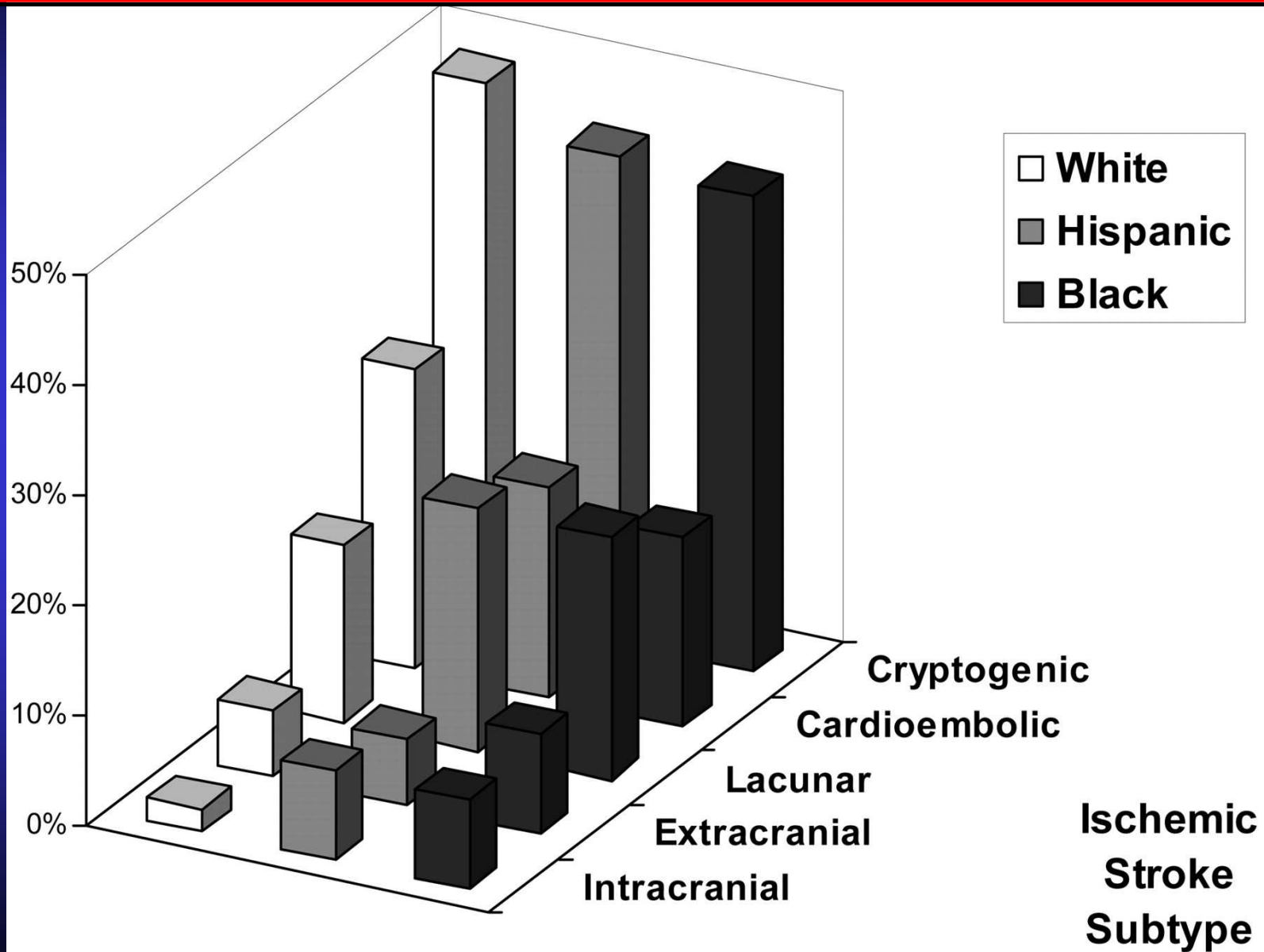


Relative Risk of Stroke by Subtype

Northern Manhattan Stroke Study



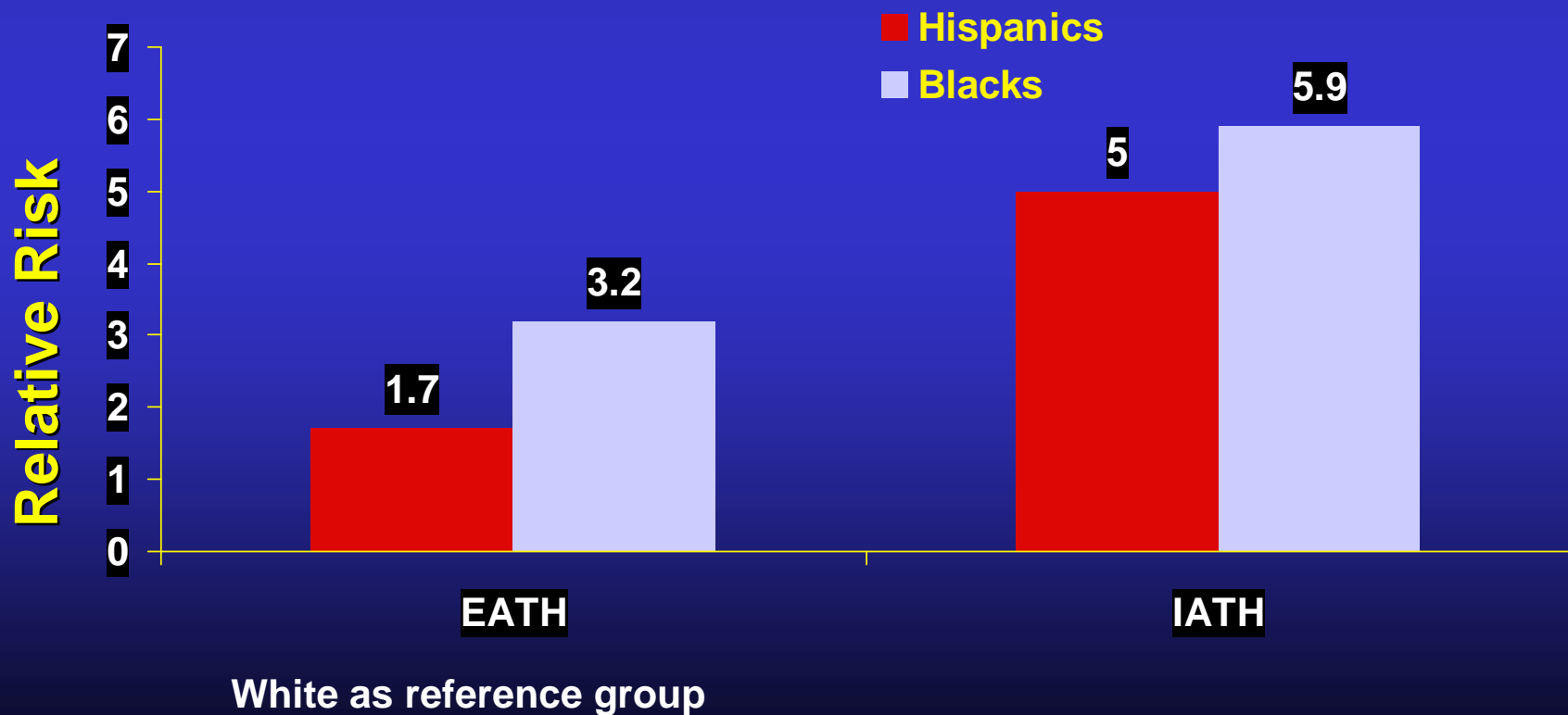
Ischemic Stroke Subtypes for Whites, Blacks, and Hispanics The Northern Manhattan Study



Northern Manhattan Stroke Study

Age Adjusted Relative Incidence Rates

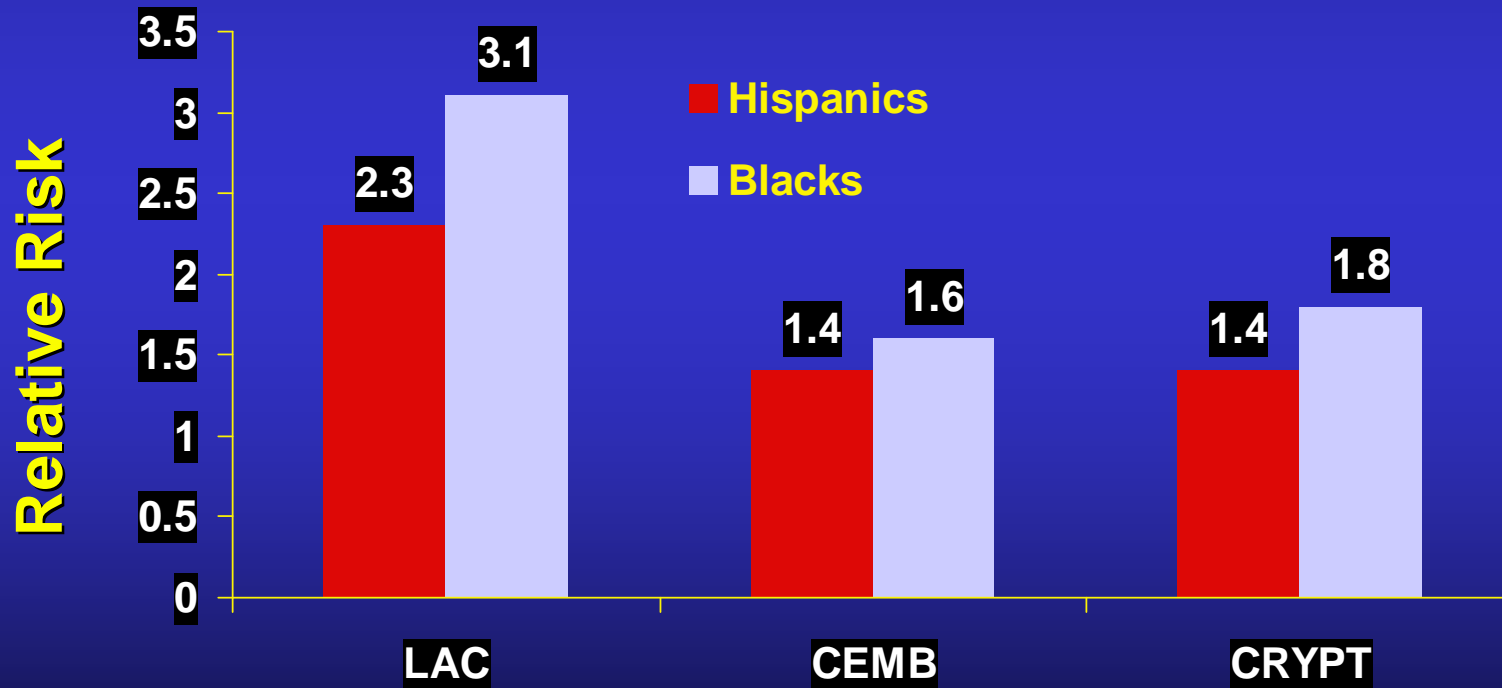
Atherosclerotic Subtype



Northern Manhattan Stroke Study

Age-Adjusted Relative Incidence Rates

Non-Atherosclerotic Subtype



White as reference group

Stroke Risk Factors

Modifiable

Behavioral

- Smoking
- Alcohol use
- Physical Inactivity
- Obesity and Waist-Hip Ratio

Medical

- Hypertension
- Diabetes
- Coronary Artery Disease
- Atrial Fibrillation
- Lipids

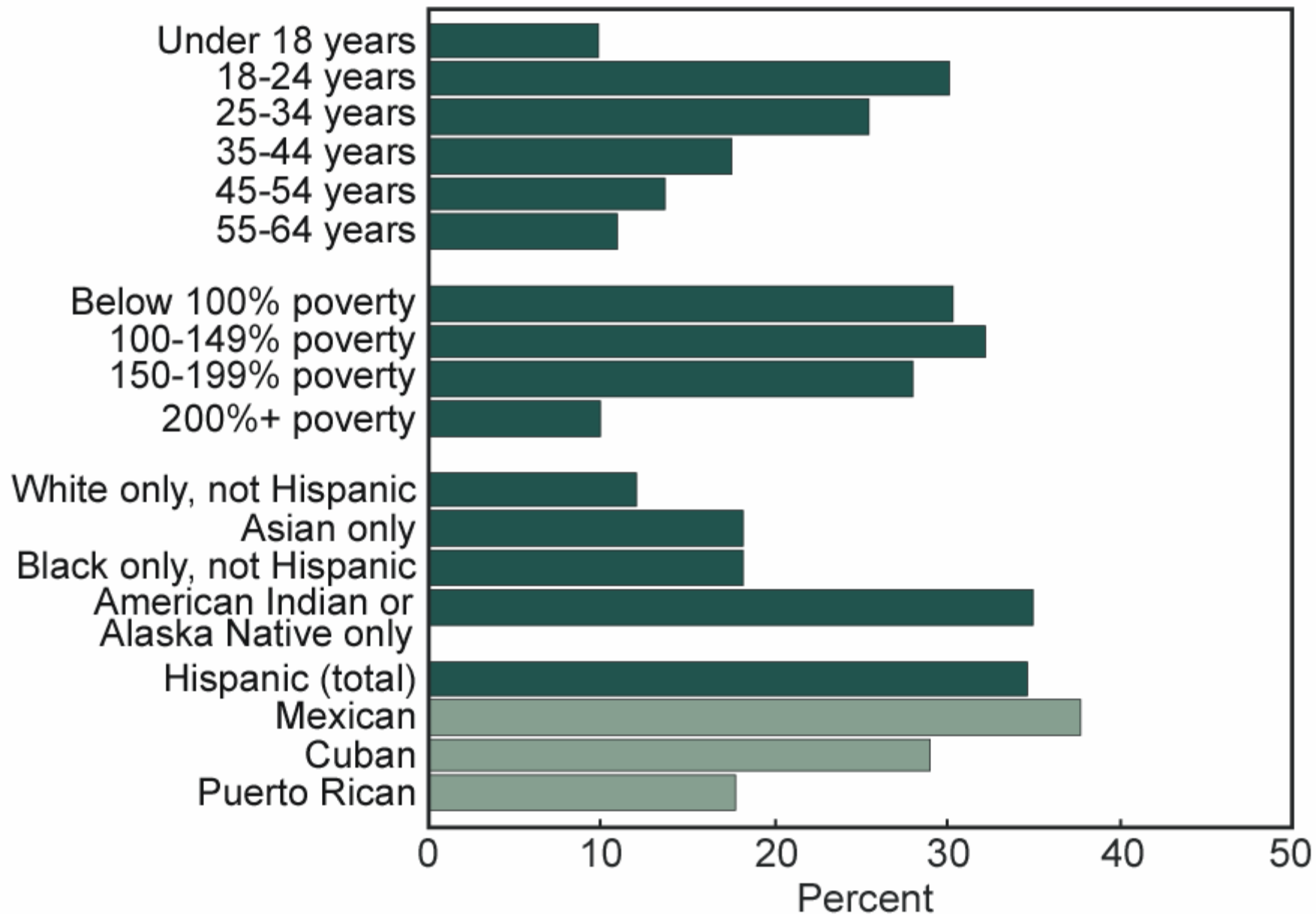
Ischemic Stroke Subtypes for Whites, Blacks, and Hispanics

The Northern Manhattan Study

TABLE 1. Sociodemographic Data and Risk Factors Among Individuals With First Ischemic Stroke in Northern Manhattan 1993–1997

	Overall (n=714)	White (n=207)	Hispanic (n=352)	Black (n=155)
Age at first ischemic stroke, y	70.5±14.0	77.8±12.3	65.8±13.6†	71.1±12.4†
Male gender, n (%)	301 (42)	83 (40)	166 (47)†	52 (34)
More than a high school education,* n (%)	180 (33)	32 (62)	14 (15)†	17 (45)‡
Hypertension, n (%)	530 (75)	129 (64)	278 (81)†	123 (80)‡
Diabetes, n (%)	220 (32)	35 (18)	132 (39)†	53 (35)‡
Hypercholesterolemia, n (%)	222 (32)	46 (23)	126 (37)‡	50 (33)§
Myocardial infarct, n (%)	140 (20)	44 (22)	72 (21)	24 (16)
Atrial fibrillation, n (%)	132 (19)	58 (29)	27 (14)†	27 (18)§
Current smoker, n (%)	137 (20)	22 (11)	74 (22)‡	41 (28)†
Heavy alcohol use, n (%)	72 (11)	10 (5)	41 (12)‡	21 (14)‡
Prior TIA,* n (%)	58 (11)	19 (15)	24 (9)§	13 (11)

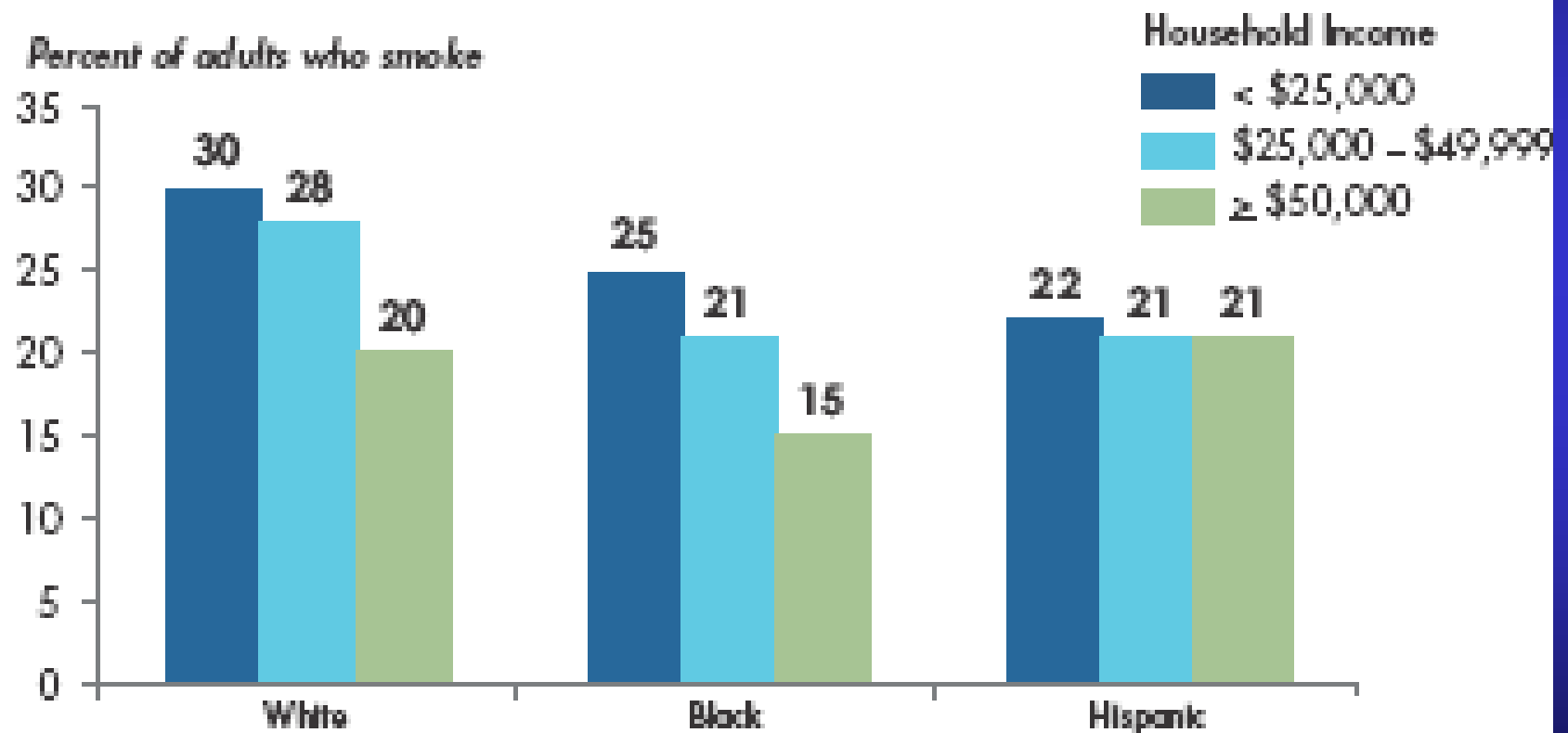
Uninsured persons <65 years, 2003



SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, *Health, United States, 2005*, figure 7.

Smoking in NYC

Current smoking — racial/ethnic disparities and income disparities



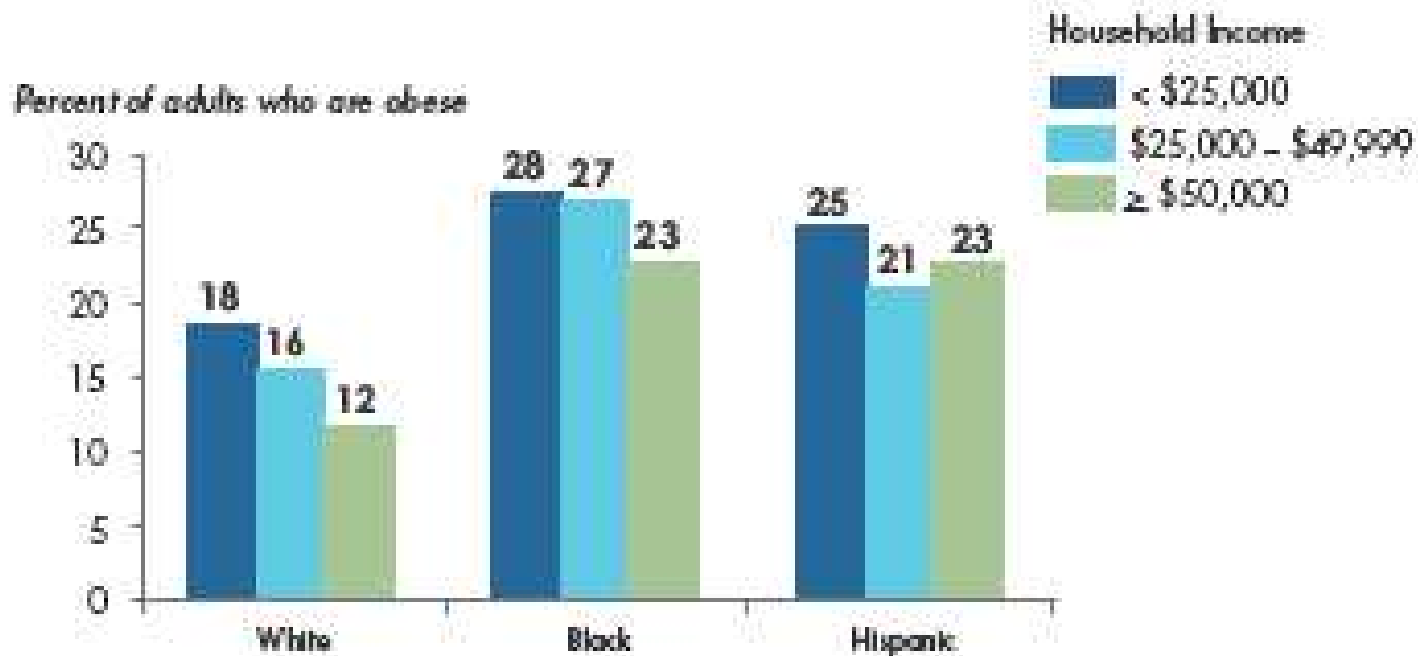
Percents are age-adjusted.

Source: NYC Community Health Survey, 2002

Survey respondents were asked: Do you now smoke cigarettes every day, some days, or not at all?

Obesity, NYC

About 1 in 4 Black and Hispanic New Yorkers are obese



Percentages are age-adjusted.

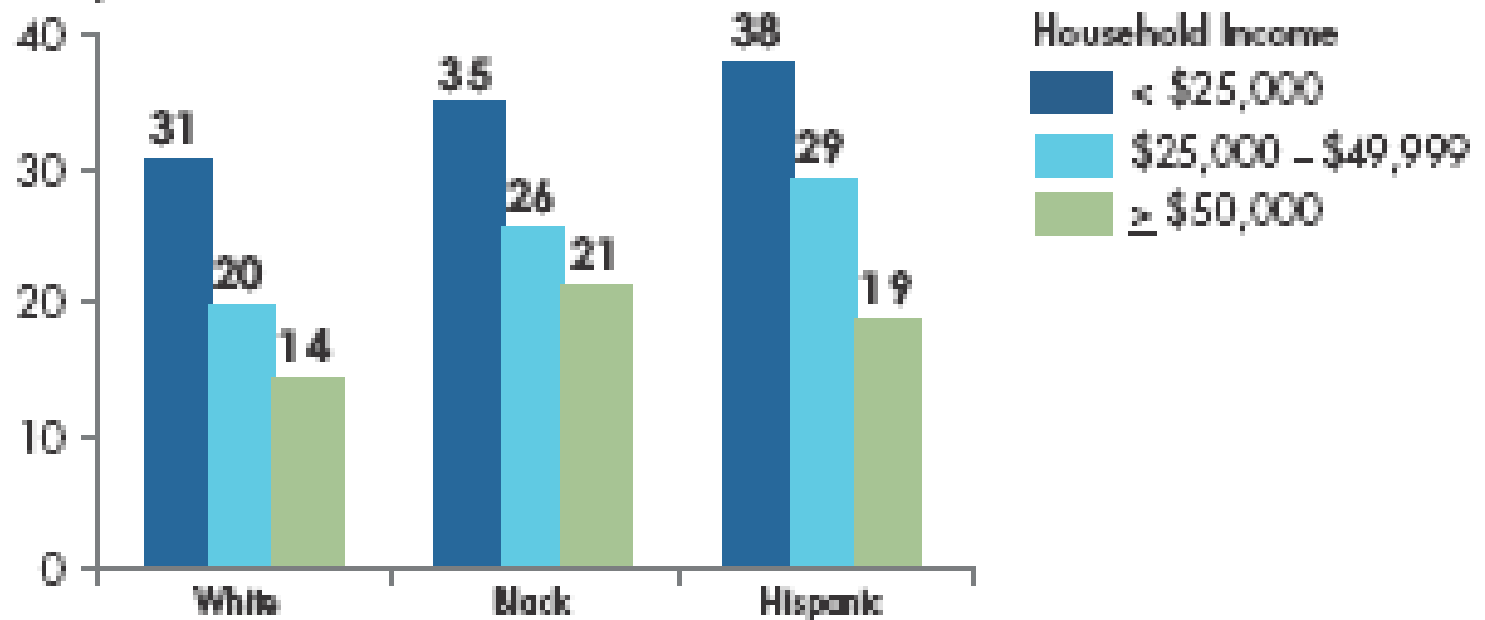
Source: NYC Community Health Survey, 2002.

Obesity was defined as body-mass index ≥ 30 , calculated from respondents' height and weight.

Physical Inactivity, NYC

Income disparities in exercise rates

Percent of adults not exercising
in the past month

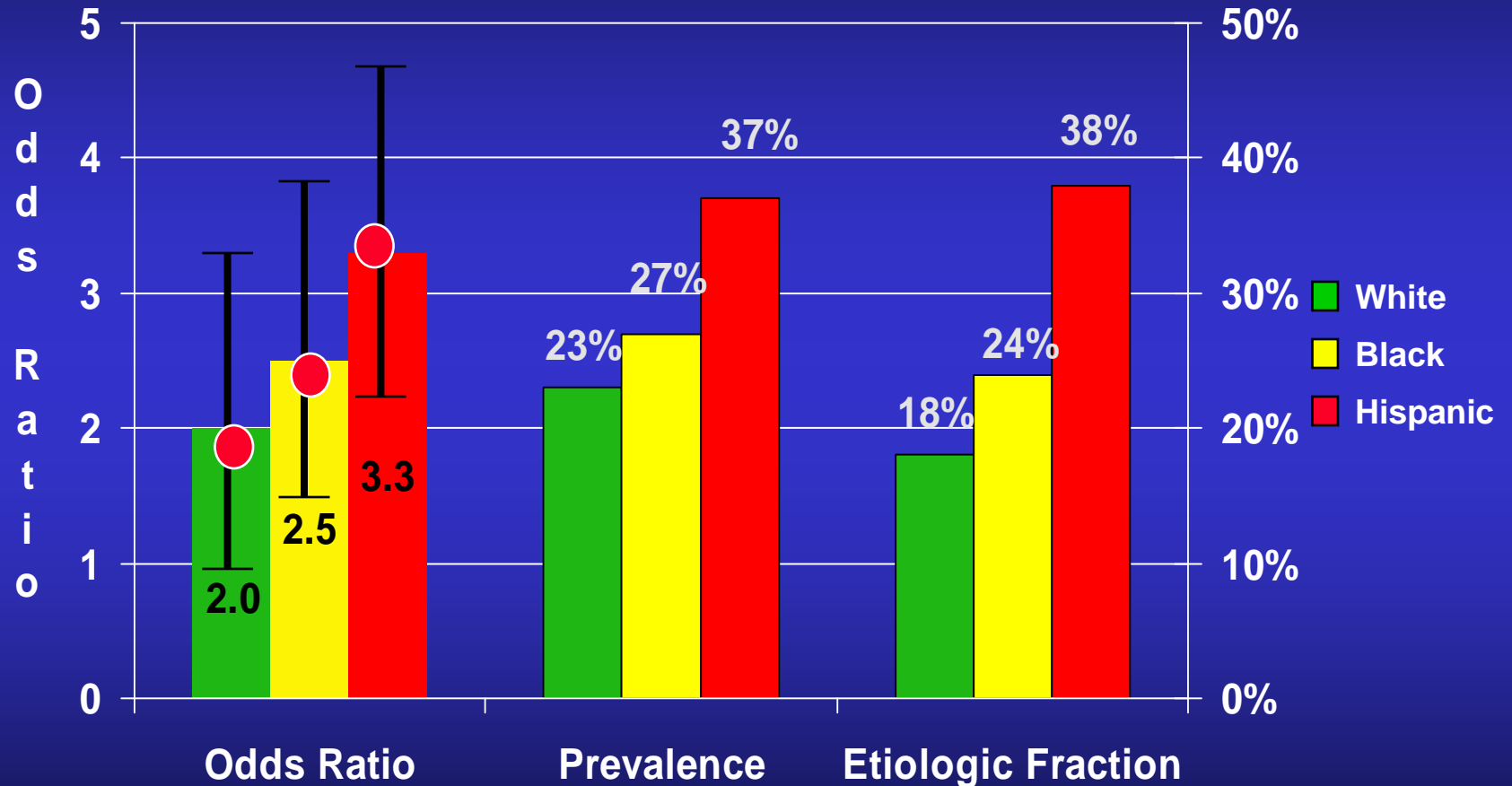


Per cents are age-adjusted.

Source: NYC Community Health Survey, 2002

Survey respondents were asked: During the past 30 days, other than your regular job, did you participate in any physical activities or exercises, such as running, calisthenics, golf, gardening, or walking for exercise?

No Physical Activity: Etiologic Fraction *Northern Manhattan Stroke Study*



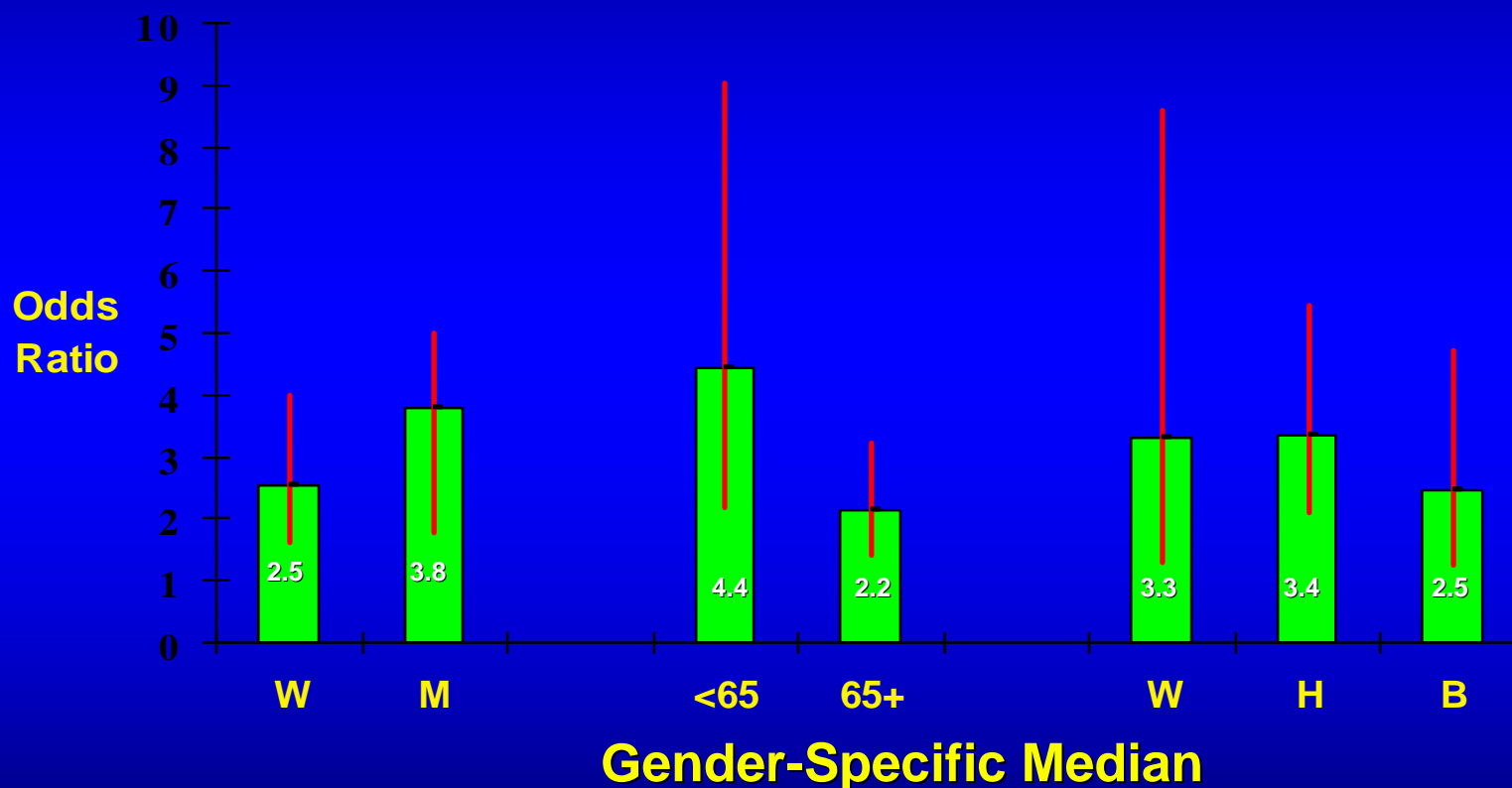
Matched for age and gender and adjusted for HTN, DM, AF, CAD, and education.

Sacco et al. *Stroke* 2001;32:1725-31

WHR and Ischemic Stroke

Stratified by Gender, Age, and Race-ethnicity

Northern Manhattan Stroke Study



Adjusting for HTN, DM, LDL-C, HDL-C, Smoking, Cardiac Disease, Moderate Alcohol, Any Physical activity, Education and BMI

Suk et al. Stroke 2002

RLS 09.06

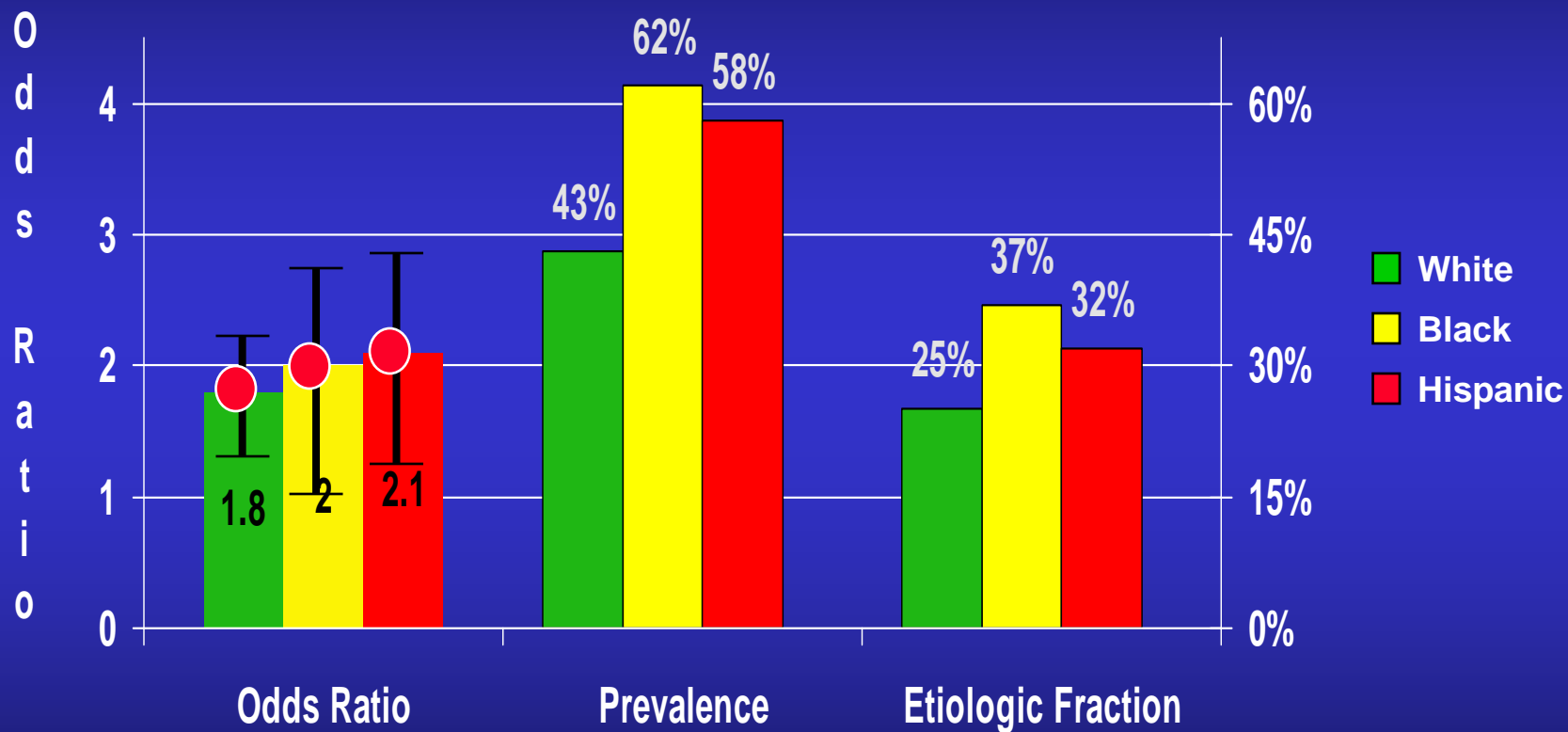
Stroke Risk Factors

Modifiable

Medical

- Hypertension
- Diabetes
- Coronary Artery Disease
- Atrial Fibrillation
- Lipids

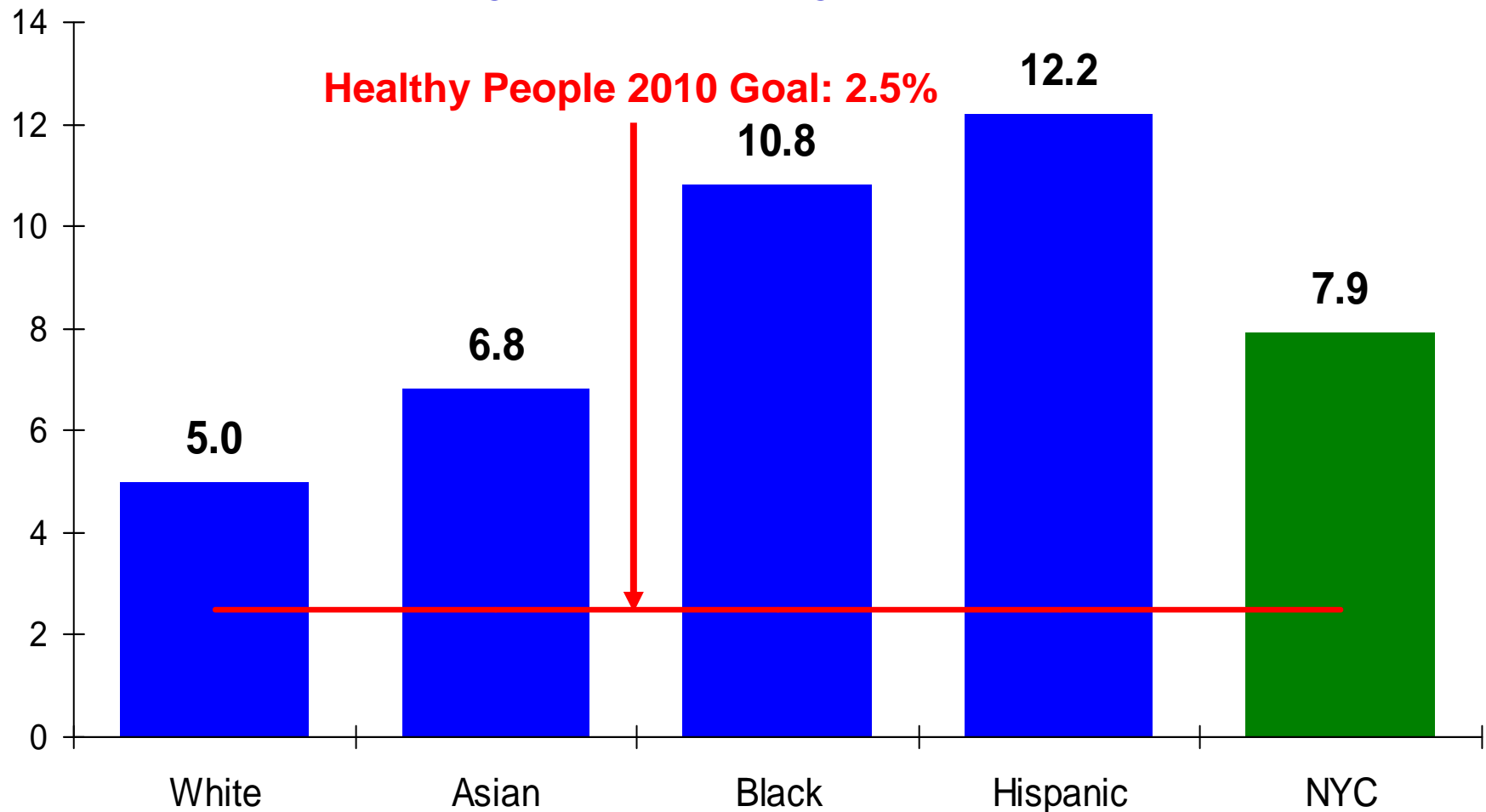
Hypertension: Etiologic Fraction Northern Manhattan Stroke Study



Matched for age and gender and adjusted for DM, AF, CAD, no physical activity, and education.

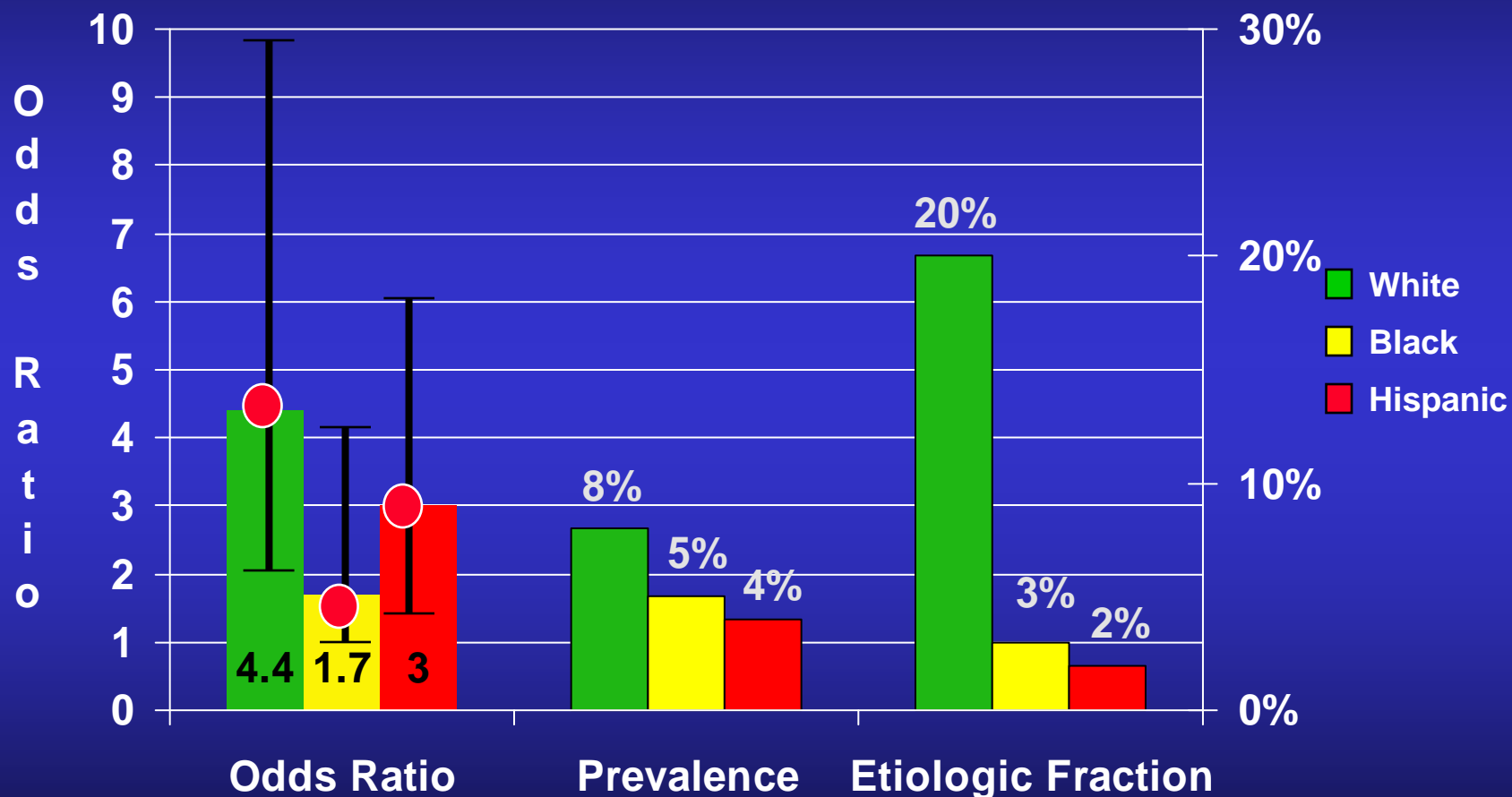
Diabetes Prevalence in NYC

By Ethnicity, 2002



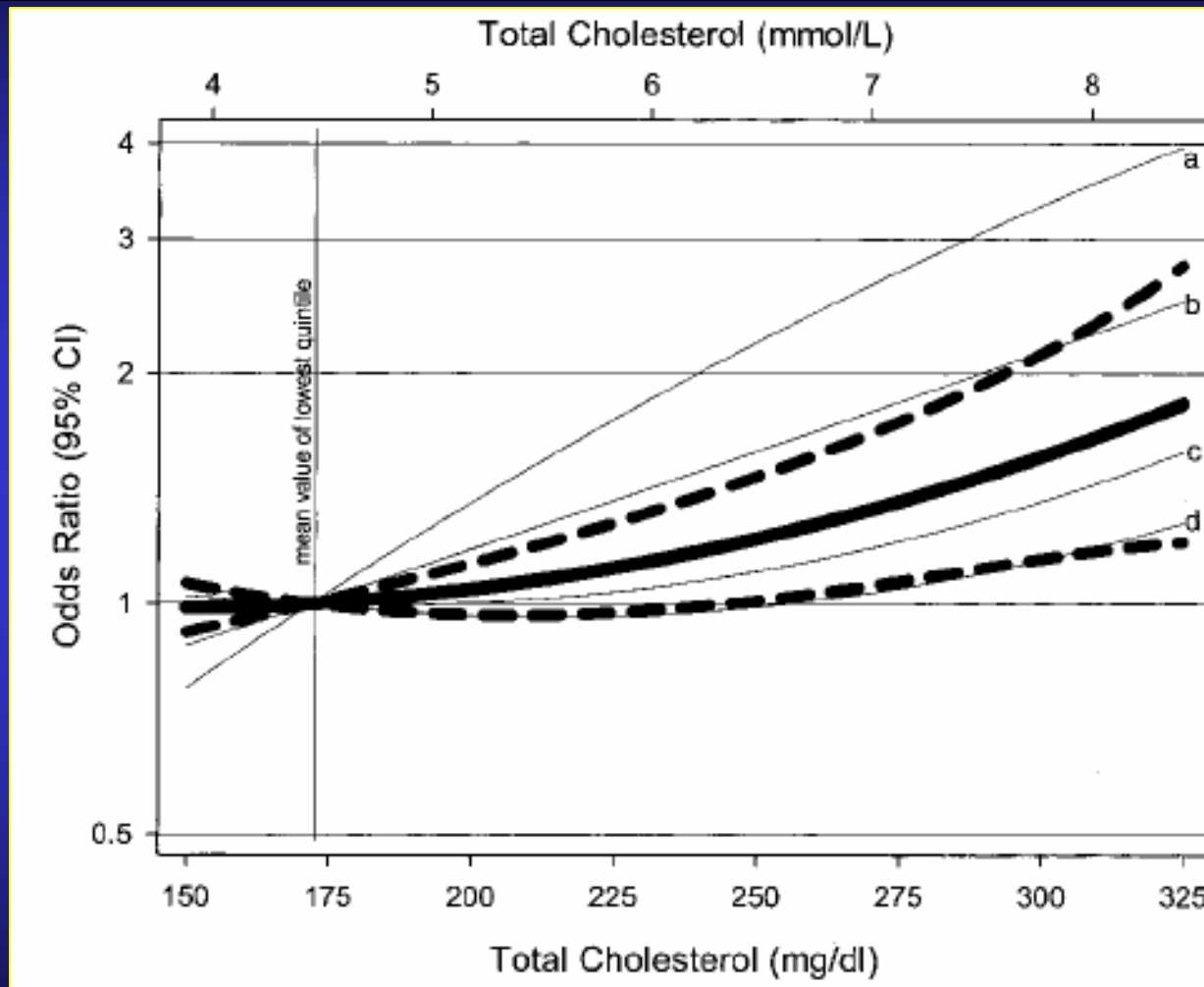
Atrial Fibrillation: Etiologic Fraction

Northern Manhattan Stroke Study



Matched for age and gender and adjusted for HTN, DM, CAD, no physical activity, and education.

Cholesterol and Stroke Subtypes

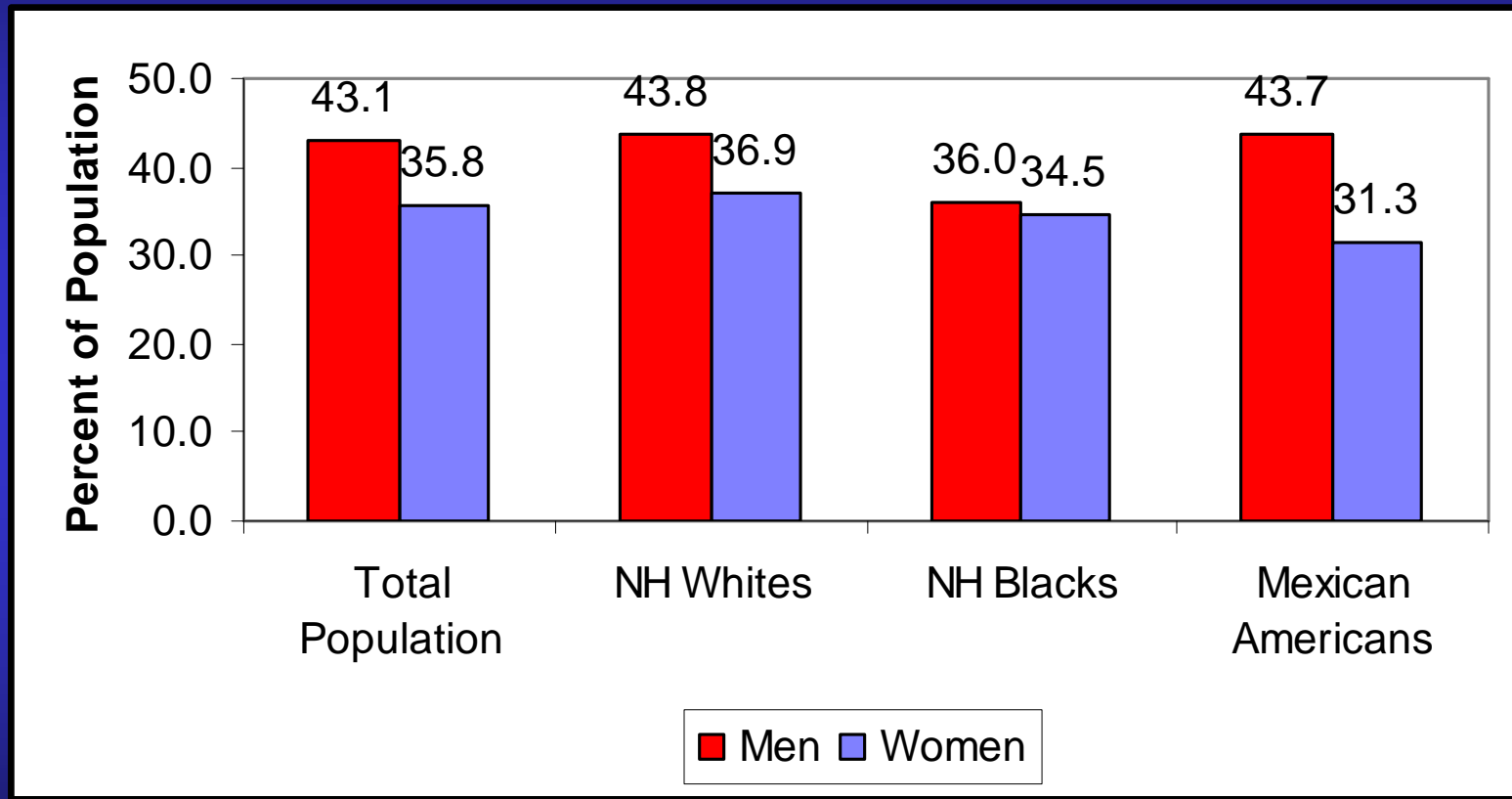


ATH
LAC
OTH
CEMB

Tirschwell, et al. NEUROLOGY 2004;63:1868-1875

Age-Adjusted Prevalence of Americans Age 20 and Older With LDL Cholesterol > 130 mg/dL

NHANESI: 1999-2002



Source: CDC/NCHS and NHLBI. NH – non-Hispanic.

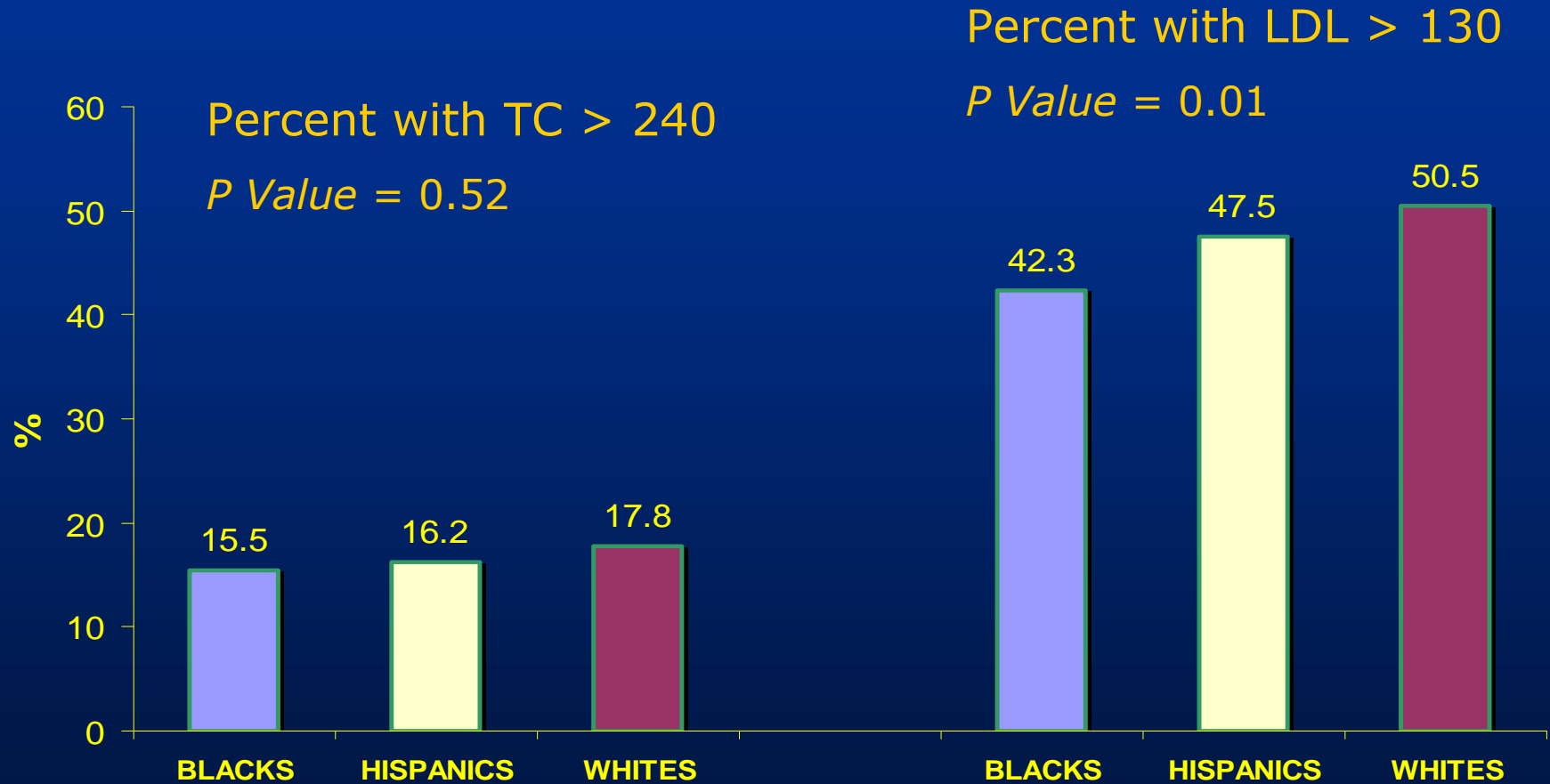
Lipids across Race-Ethnicity

- Washington Height and Inwood Community Aging Program Study (WHICAPS)
 - Cross-Sectional study of 1,118 men and women living in Northern Manhattan
- Race was an independent predictor of all lipid and lipoprotein levels
- Hispanics had lower HDL-C
- African-Americans had higher HDL-C
 - More had HDL-C levels >55mg/Dl
- Triglycerides levels were also lower among African-Americans

Rodriguez C Am J Cardiol 2002;89:178



NOMAS: Dyslipidemia by Ethnicity/Race



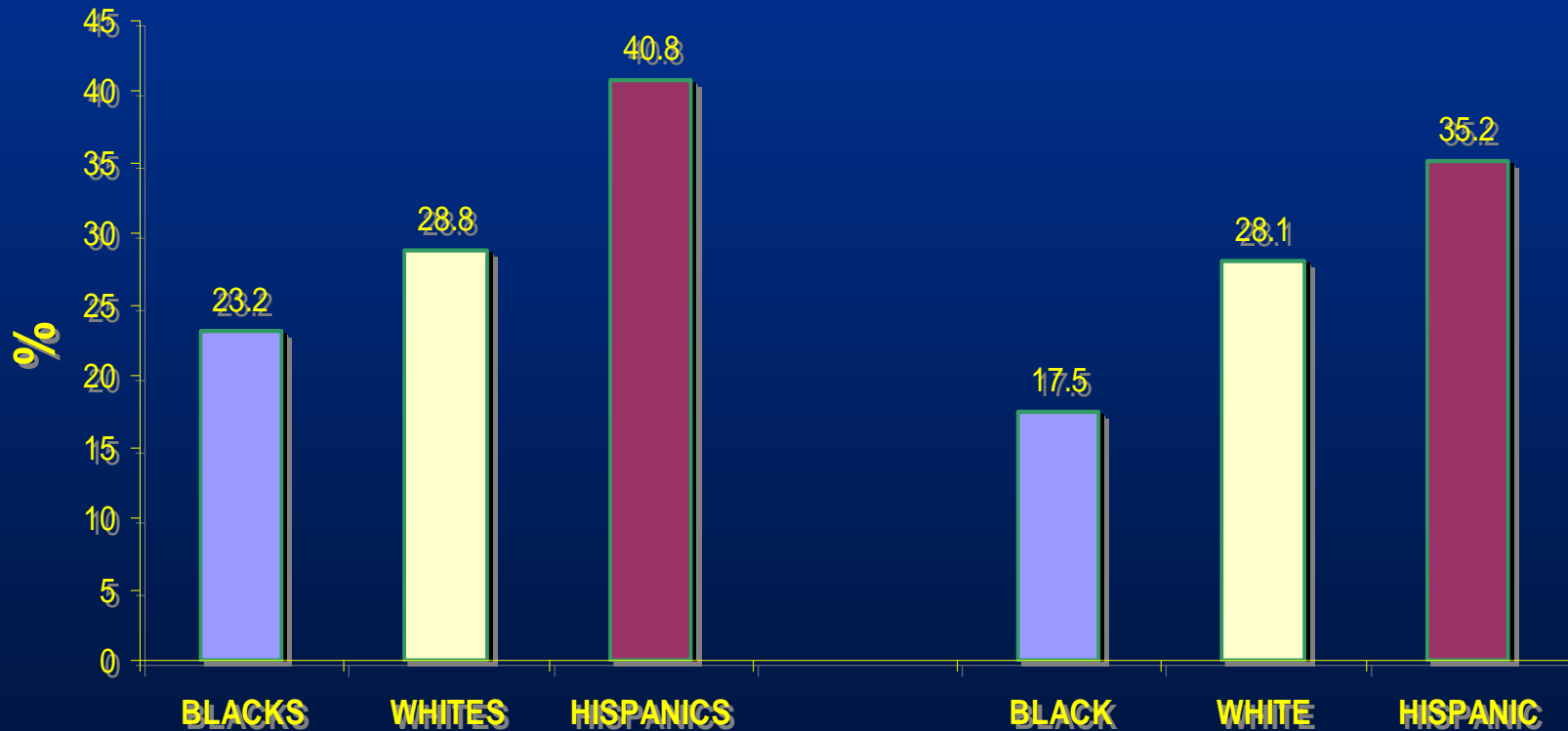
NOMAS: Dyslipidemia by Ethnicity/Race

Percent with HDL < 40

P Value < 0.0001

Percent with TG > 150

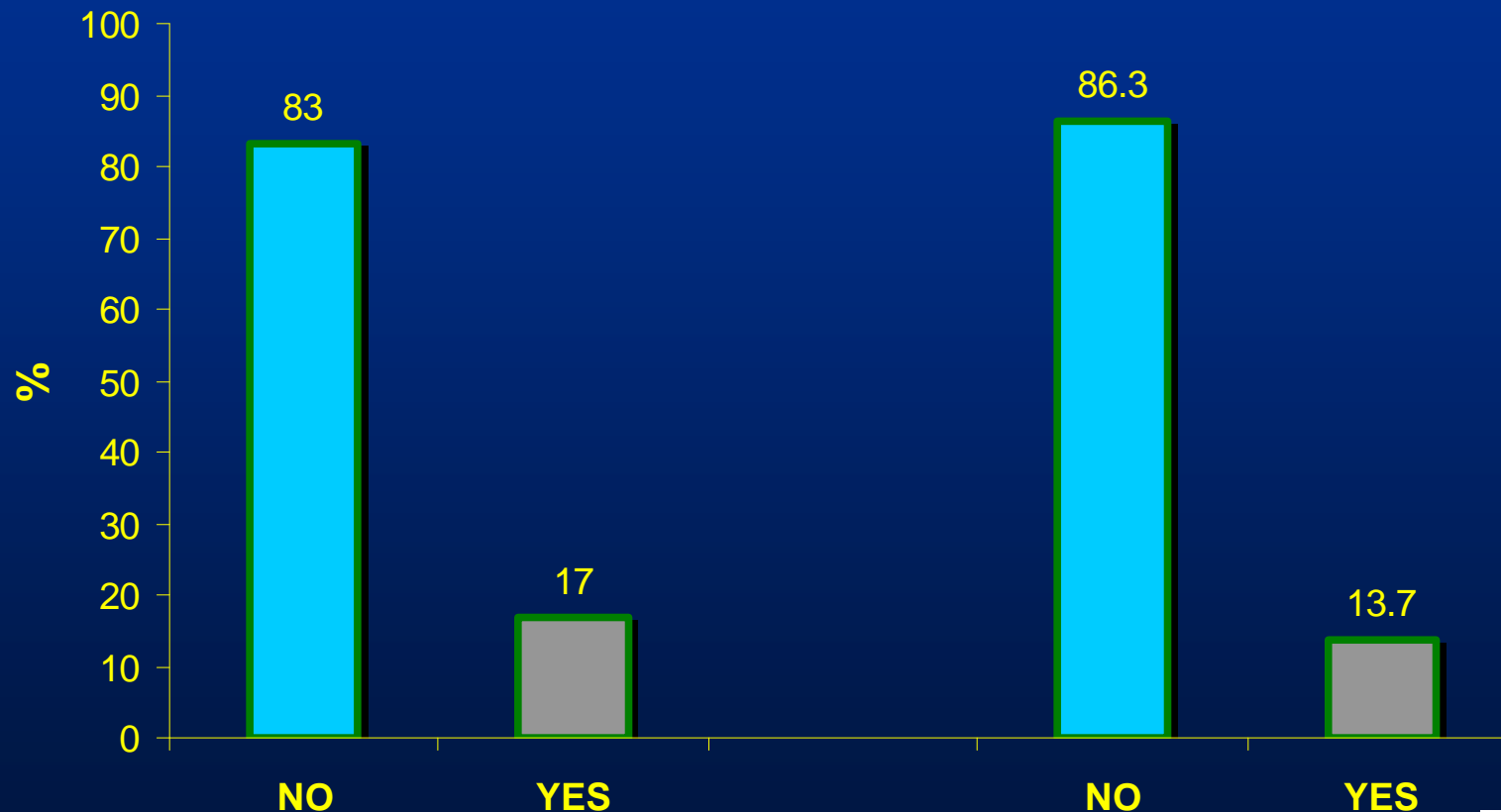
P Value < 0.0001



NOMAS: Treatment of Dyslipidemia Among Hispanics

Of those with TC > 240,
% on Lipid Lowering Therapy at enrollment

Of those with LDL > 130,
% on Lipid Lowering Therapy at enrollment



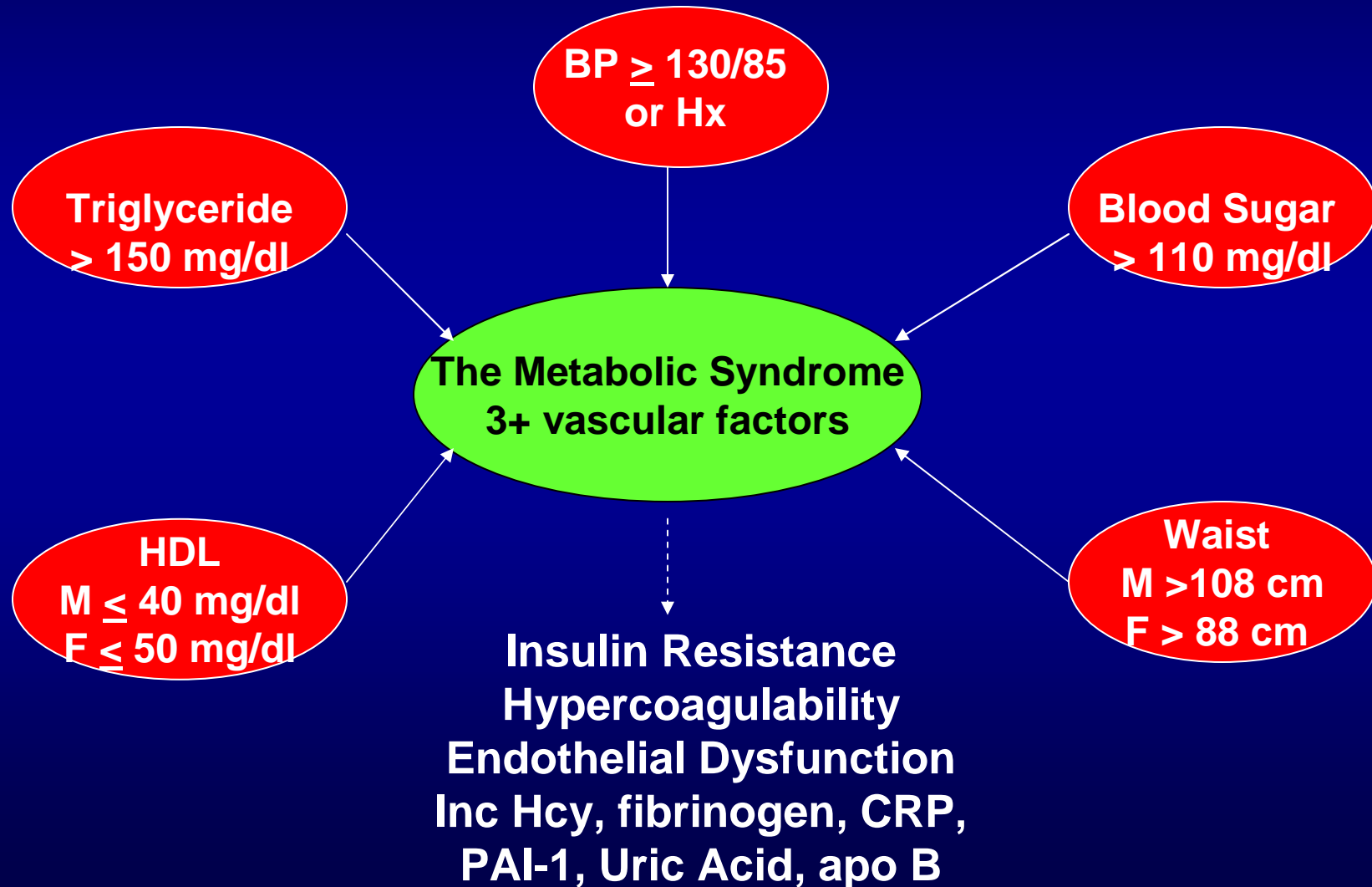
Race, ethnicity, and sociocultural characteristics predict noncompliance with lipid-lowering medications

Robert C. Kaplan, Ph.D.,^{a,*} Narendra C. Bhalodkar, M.D.,^b Edward J. Brown Jr., M.D.,^b Jessica White,^a and David L. Brown, M.D.^{a,c}

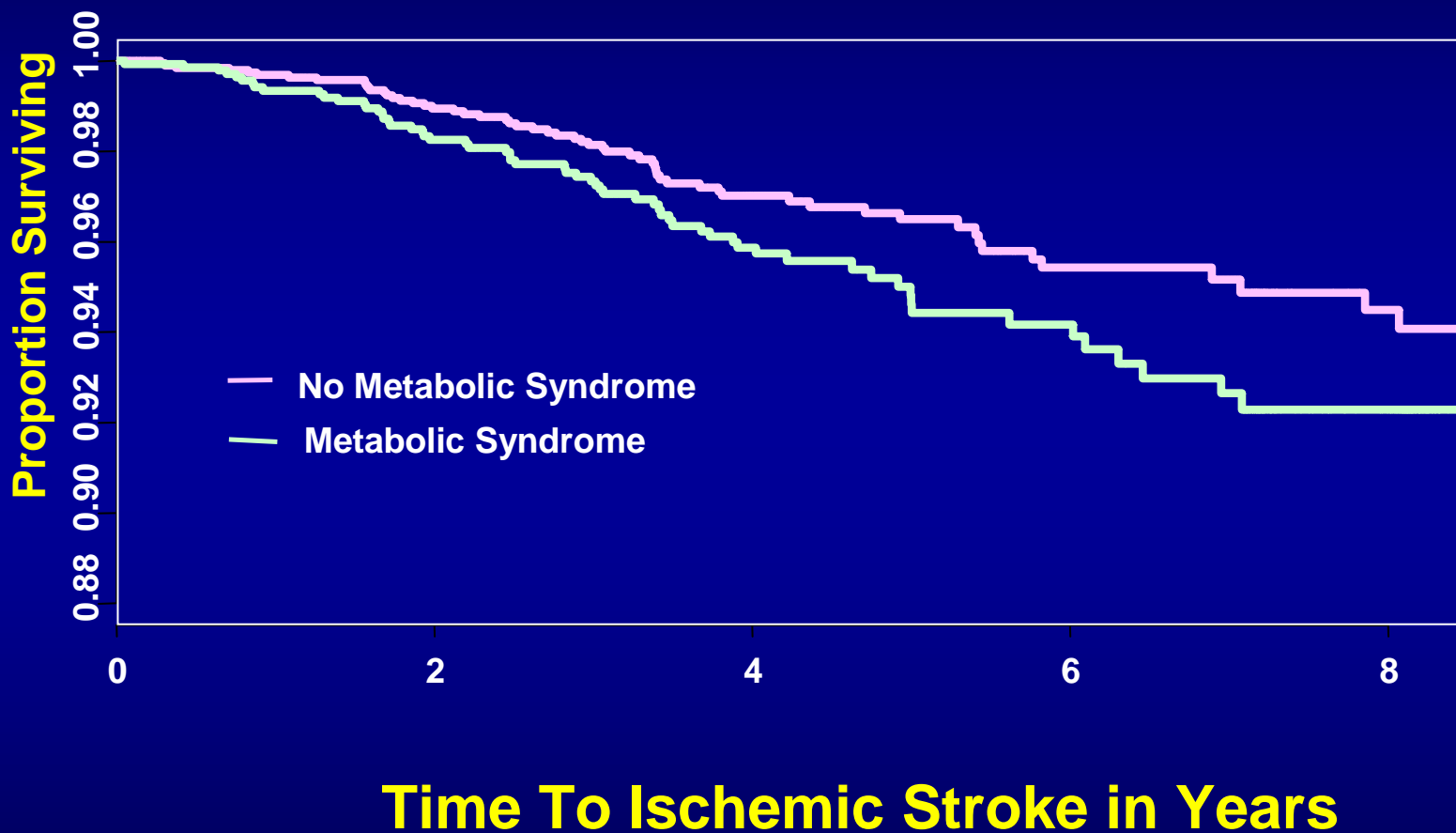
	Multivariate-adjusted OR	95% CI	P value
Less than 50 years	1 reference group		0.78
50–59 years	1.3	0.5, 3.5	
60–69 years	0.9	0.3, 2.5	
70–79 years	1.2	0.4, 3.6	
80 years and older	2.3	0.5, 11.6	
Female sex	0.8	0.4, 1.6	0.54
No side effects	1.0 reference group		< 0.01
Mildly unpleasant side effects	0.6	0.2, 2.0	
Very unpleasant side effects	3.9	1.8, 8.8	
Sad, blue, depressed, or lost pleasure in things >2 weeks of year	1.9	1.0, 3.5	0.05
White Non-Hispanic	1.0 reference group		< 0.01
Black	3.7	1.0, 13.5	
Hispanic	6.3	1.8, 22.2	
Other or unknown race	6.0	1.0, 35.8	
Married or living with partner	1.0 reference group		< 0.01
Single or divorced	2.1	1.1, 4.2	
Widow or widower	0.4	0.1, 1.4	
Children in home (per child)	1.5	1.2, 2.0	< 0.01
No health insurance	2.4	1.0, 5.7	0.05

Stroke Risk and Metabolic Syndrome

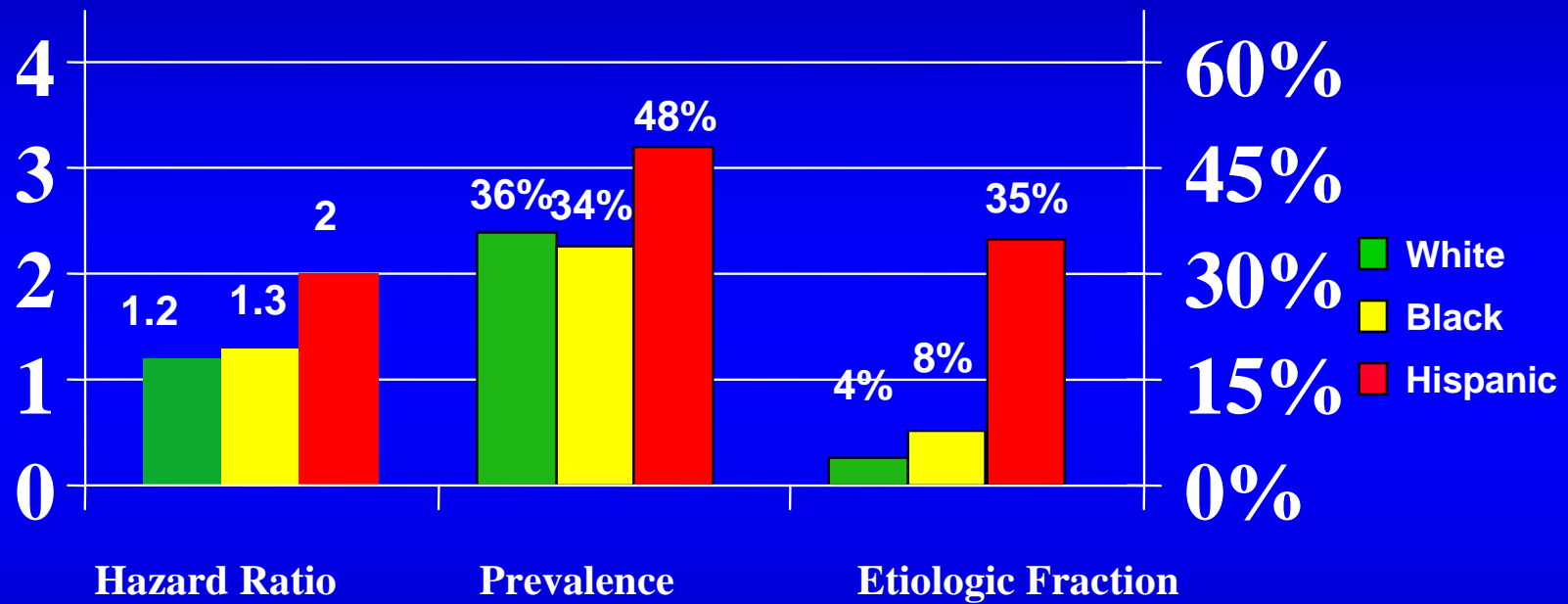
The Northern Manhattan Study



Stroke Risk and Metabolic Syndrome The Northern Manhattan Study



Metabolic Syndrome and Ischemic Stroke Risk by Race-ethnicity



All models adjusted for age, race-ethnicity, gender, education, physical inactivity and current smoking.

Cholesterol Control

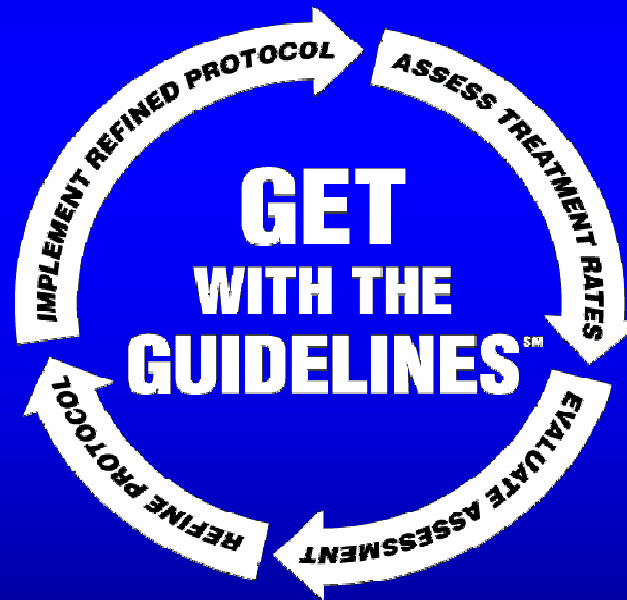
ASA 2006 Secondary Stroke Recs

- Those with elevated chol, CHD, or evidence of an atherosclerotic origin should be managed according to **NCEP III** (Class I, Evidence A).
- **Statins** are recommended with target LDL-C of <100 mg/dL and <70 mg/dL for the very high-risk (Class I, Evidence A).
- Those with no pre-existing indications for statins (nl chol levels, no CHD, or no atherosclerosis), are **reasonable to consider for statins** to reduce the risk of vascular events (Class IIa, Evidence B).

American Stroke
AssociationSM

A Division of American
Heart Association 

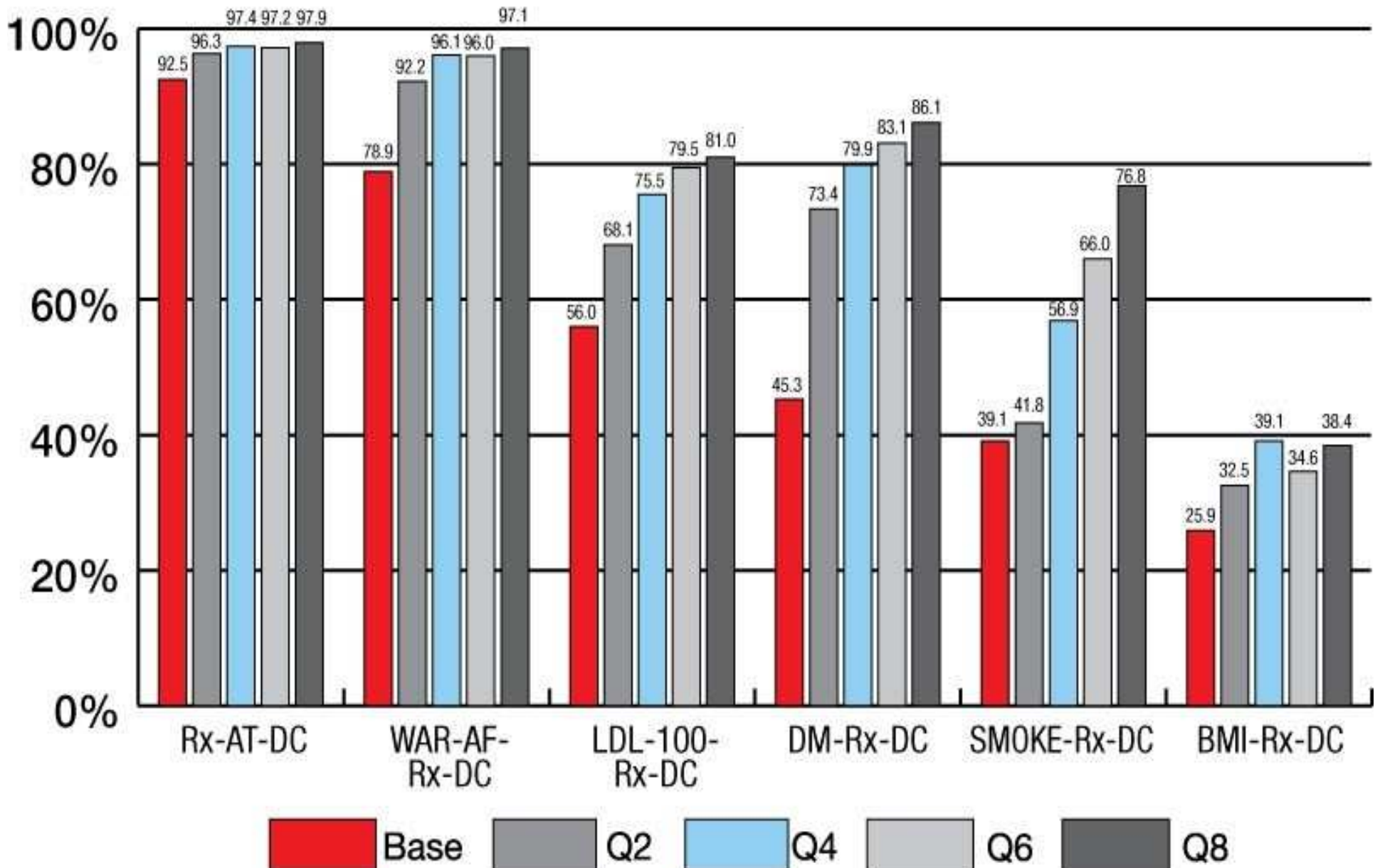
GWTG-Stroke 2005 ASA International Stroke Abstract Presentations



**GET WITH THE
GUIDELINESSM**

STROKE

Table B: Get With The Guidelines—Stroke Produces Sustainable Improvements in Hospital-Based Acute Stroke Care



Other Stroke Risk Factors

- **Diet and Vitamins**
- **Homocysteine**
- **Chronic Infections and Inflammation**
- **Coagulation factors**
- **Stress**
- **Genetic factors**

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**INTERNATIONAL
STROKE
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2006

ASA INITIATIVES – Power to End Stroke Update



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You are the Power

POWER TO END STROKE

Future Research Ethnic Disparities

- **Improve implementation of proven stroke prevention guidelines**
- **Develop and validate better tools for assessment of stroke risk**
- **Detect new modifiable risk factors**
- **Test novel risk factor control strategies**
- **Disseminate news to the Public**