Agenda

- 1. The Latino Paradox? Less or more cardiovascular disease
- 2. Latin America, geography and population
- 3. Latinos or Hispanics? A race or an ethnicity?
- 4. CVD in Latin America
- 5. When does it start
- 6. What needs to be done

The Latin Paradox

- **Latino/Hispanics have more diabetes, more obesity and cardiovascular disease with less mortality?**

- **The data is mainly from US Latinos and some from older Mexican studies, showing that despite all the risk factors there is less cardiovascular deaths**

- **No factor has been identified that can explain such paradox**

- **Does it hold correct in 2018**

•Medina-Hinojosa et al. Porg Cardiovasc Dis nov-Dec 2014 57(3):286-92

Latin America

Size: 7.412 million mi^2

Almost double than the European Union: 3.931 million mi^2

Population: over 653 million and growing

Should we put more attention to our neighbors to the South?

Do you know which one of the following is Latina/o?

Latinos or Hispanics?
Race or Ethnicity?

- USA Hispanic: term used by the US census (Spanish Speaking people with origin in Latin American and Spain)

- While the ethnic terms are used interchangeably, the term Latino/Hispano refers to people of any race who trace their origin to Mexico, Cuba, Puerto Rico, Dominican Republic, Central and South America including Brazil but not Spain.

- In Latin America "Hispanic" does not have the same meaning as in the USA
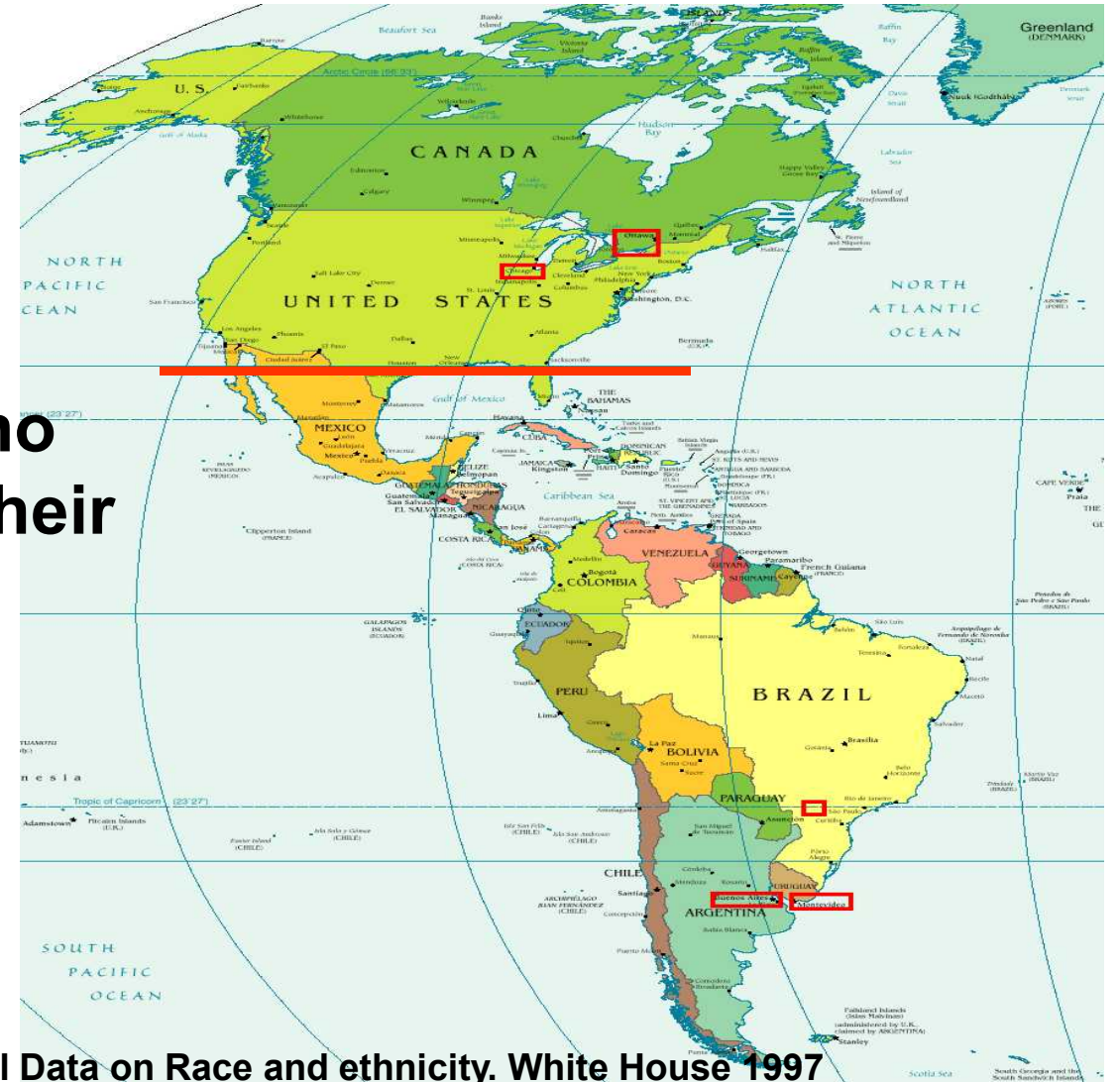
Ethnicity vs Race

- ## Latinos
  - **Diverse racial groups**
  - **Distinct cultural groups**
  - **Different socioeconomic levels**
  - **Varied demographics**
  - **Culturally specific lifestyles**
  - **Ethnicity does not equate race**

Latinos not a race: an Ethnicity

Leading causes of death in Latin America

- **Cardiovascular diseases are the leading causes of death**
- **33.7% of total mortality rates**
- **Highest reported in Venezuela and lower reported in Chile**
- **The predominant form is ischemic heart disease with an adjusted mortality of 66.4 per 100,000 persons**
- **Coronary heart disease accounts for 42.5% of all cardiovascular mortality and 28.8% due to stroke**
- **Chagas heart involvement and rheumatic heart disease, once a major health problem, are responsible for only 1% of the mortality each**

Causes of death in Latin America

- The most important risk factors are well know and similar to those in the USA

- Type 2 Diabetes

- Obesity associated with sedentary lifestyle

  (Mexico: overweight and obesity 64.9% in men, and 73% in women)

- Lipid disorders with low levels of high-density lipoprotein cholesterol (HDL) followed by high levels of low-density lipoprotein cholesterol (LDL) and high triglycerides

- Hypertension

- Tobacco smoking remains a problem in both females and males

Lanas F, Seron P, Lanas A. Global Heart 8, 4, 341-348, 2013

Causes of death and disability in Latin America

- Aging, globalization and urbanization in Latin America has made cardiovascular disease the number 1 cause of death and disability

- Communicable diseases once the number "one" cause of death have significantly decrease

- This epidemiological transition has been more heterogeneous than in order areas of the world

- Argentina, Brazil, Chile and Colombia have lately seen a decrease in CVD mortality, while many other countries have not. In spite of the decreases deaths from CVD, CVD remains the #1 cause of death

- Access to care and to updated medications availability/affordability is a significant problem

From The World in Medicine
End of the Paradox!

- **Patients with heart disease in Latin America appear to receive less aggressive treatment and face mortality rates nearly twice as high as the US and Canada**

- **In PURSUIT study Latin America: 46% of patients underwent diagnostic angiography, 18% received angioplasty, and 11% had cardiac bypass surgery**

- **In North America the numbers were: 79% diagnostic angiography, 34% received angioplasty, and 20% cardiac bypass surgery**

- **Within 30 days of being hospitalized 6.8% of patients in Latin America died compared with 3.6% in North America**

Some recommendations for the treatment of Type 2 Diabetes in Latin America that may contribute to the problem

- According to the fasting glucose:

  >126 to <240 mg/dl. Start lifestyle changes and metformin.
- First combination if not achieving control Met+SU and listed as other posibilities Met+TZD, Met+DPP-4i, Met+ GLP-1 RA
- If HbA1c > 9%: lifestyle changes + NPH insulin once or twice daily or Premixed twice daily
- In second term basal insulin glargine or detemir

Guzman J et al. Latin American Consensus Statement for Type 2 Diabetes Treatment. Rev Panam Salud Publica 28(

INTERHEART STUDY
A study of Risk Factors for First Myocardial Infarction in 52 Countries and Over 27,000 subjects

- **INTERHEART Latin America. Countries: Argentina, Brazil, Colombia, Chile, Guatemala and Mexico**
- **1,237 cases and 1,888 control subjects**
- **Risk factors for AMI included**
- **- Hypertension and and permanent stress- 2.8**
- **- Diabetes-   2.6**
- **- Waist/hip ratio-   2.5**
- **- Smoking-   2.3**
- **- ApoB/ApoA-1 2-   2.3**

Economic burden of Cardiovascular Disease in Latin America

- Until 2016 there was no real Latin American data on cost of cardiovascular disease

- A team of researchers looked at the prevalence of heart disease in Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Panama, Peru and Venezuela, conservatively estimating four conditions (heart attack, heart failure, atrial fibrillation and hypertension). Approximately 89.6 million people in the region or 27.7% of the adult population

- This resulted in 6.8 million years of healthy life lost

Lets look at the two largest Latin American Countries and one of the smallest

Brazil, Mexico and Costa Rica

Cardio-Vascular Disease in Brazil

- In 2011 CVD was responsiblle for 31% of all death impact
- Ischemic heart 31%
- Cerebrovascular diseases 30%
- Lower income sustained the greatest burden on CVD and at younger ages

Ribeiro et al. Circulation 2016. 133(4), 422-33

Contributing Factors

- **High prevalence of hypertension**
- **Rising prevalence of overweight and obesity**
- **Sedentary lifestyle**
- **Unhealthy eating habits**
- **Increased prevalence of diabetes**
- **Low education levels**
- **Insufficient funding for health**

Ribeiro et al. Circulation 2016. 133(4):422-33

Cardiovascular Disease in Mexico

- **Non-communicable diseases , including CVD, are estimated to account for 77% of total deaths in Mexico**
- **CVD accounts for one quarter of these deaths**
- **Risk Factors**
- **More than one in three are obese**
- **23% have hypertension**
- **10- 14% have diabetes**
- **17% smoke tobacco**
- **7.2 Lt of alcohol consumed per person/yearly**

Cardiovascular Mortality in Mexico-US border region

- **Mortality due to CVD along the Mexico-US border was consistently higher than the other municipalities**

- **The Mexican side of the US-Mexico border region is disproportionately affected by CVD mortality as compared to the non-border region of Mexico**

- **This was not explain by education, population density or insurance coverage**

- **Proximity to the US culture and related diet and habits can be explanations of the increasing mortality trend**

Anaya G et al. BMC Public Health 2017. 17:400

Mexico is taking action

- **In 2014 Mexico introduced a new tax levied at a rate of 8% on food with an energy content exceeding 275 calories per 100 grams and one peso per litter of sugar containing beverages**

- **In the first year, on average, people bought 6% less sugar containing drinks and 8% in the second year**

- **In the same period there was a 4% increase in sales of plain bottled water**

- **Such changes were more pronounced in low income families**

www.worldheart-federation.org

Prevalece of Coronary Artery Disease Risk Factors in Costa Rican Adolescents

328 adolescents ages 12-18

- >70% of the studied presented one risk factor for CHD
- Higher in urban adolescents with a FHX OF PREMATURE CHD, sedentary lifestyle, smoking
- In the rural setting hypertension and low HDL where significantly higher
- Girls had the highest % of sedentarism and higher LDL-C
- Elevated saturated fat intake (>10% of total enrgy) was found in 37% of all adolescents

Recommendations

- **The prevalence of CHD risk factors among Costa Rican adolescents is high; particularly of saturated fat intake, sedentary lifestyle and low HDL-C**

- **Primary prevention programs are urgently needed, especially among female adolescents in orden to reduce the increased prevalence of CHD among Costa Rican adults**
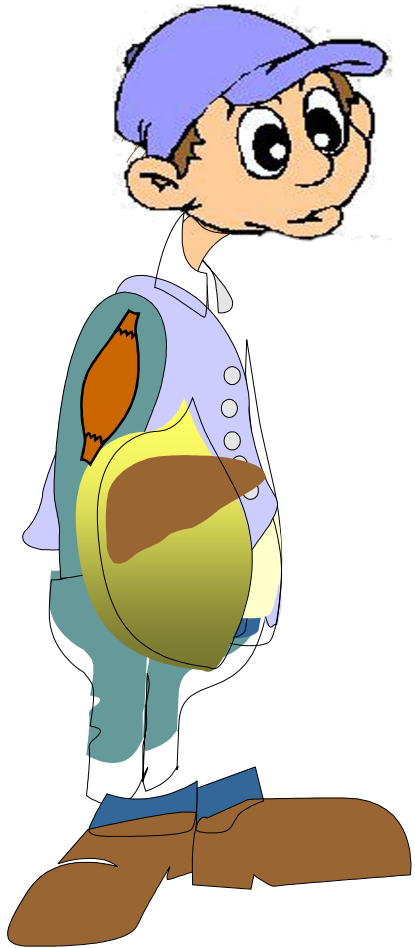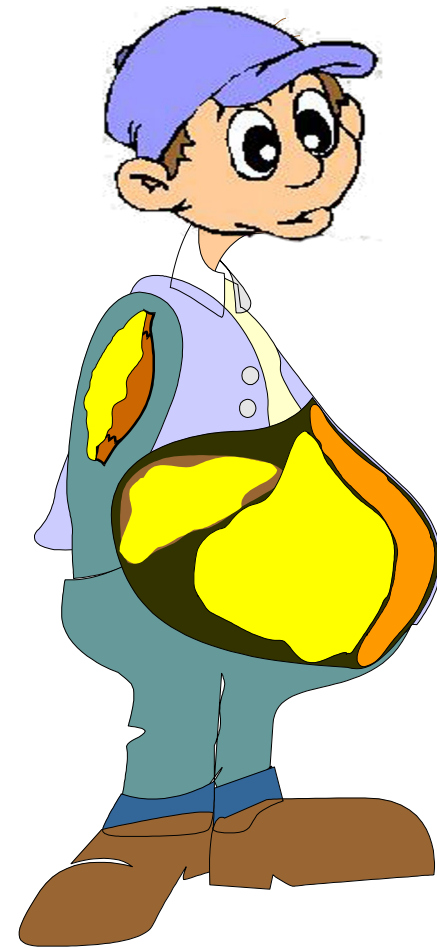
Control
N=20
Age=12
BMI=18
Wt (kg)=42

Overweight
N=31
Age=12
BMI=24
Wt (kg)=57

Moderately Obese
N=244
Age=13
BMI=33
Wt (kg)=86

Severely Obese
N=195
Age=11
BMI=41
Wt (kg)=100

NEJM. June 3, 2004.

A Small Amount of Excess Fat Causes a Marked Deterioration in Glycemic Control

- A 5% weight increase is associated with a 33% increase in diabetes prevalence[1]

- A 1.5 fold BMI increase is associated with:
  - 90-fold increase in diabetes incidence in women[2]
  - A 40-fold increase in diabetes incidence in men[3]

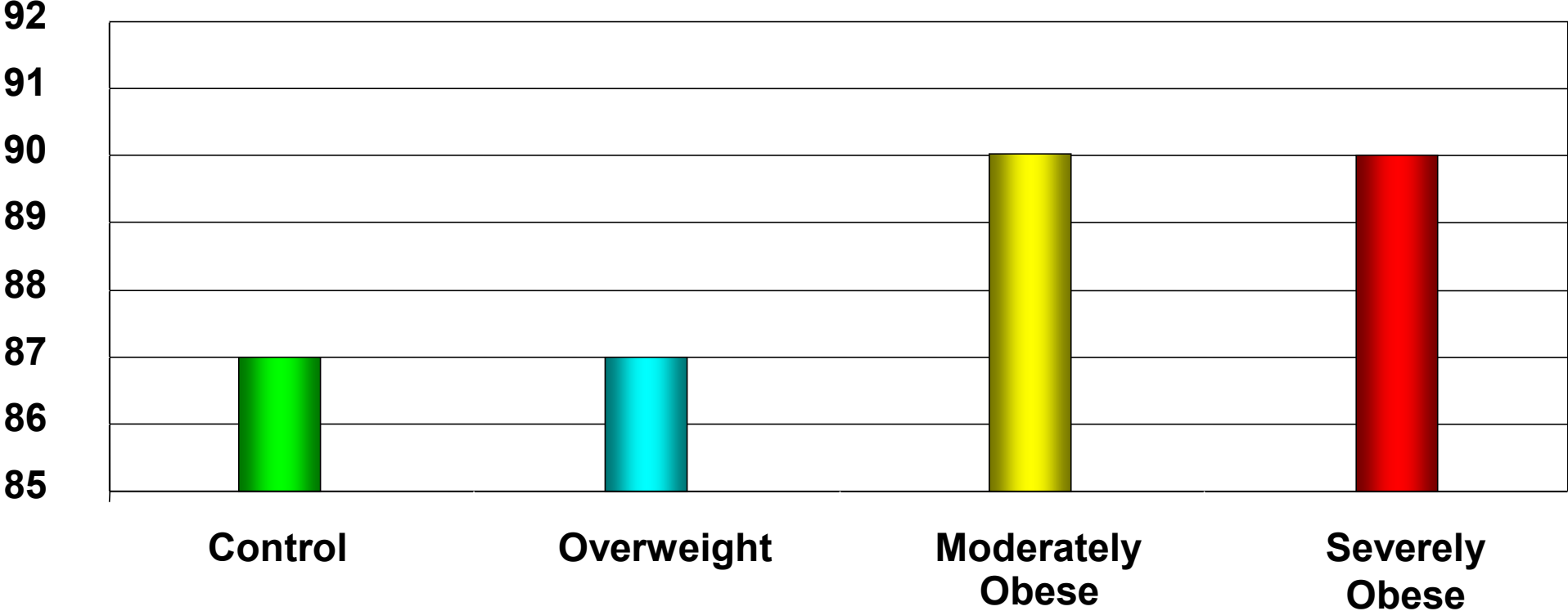[1]Mokdad AH et al. *Diabetes Care*. 2000;23:1278-1283;
[2]Colditz GA et al. *Ann Intern Med*. 1995;122:481-486;
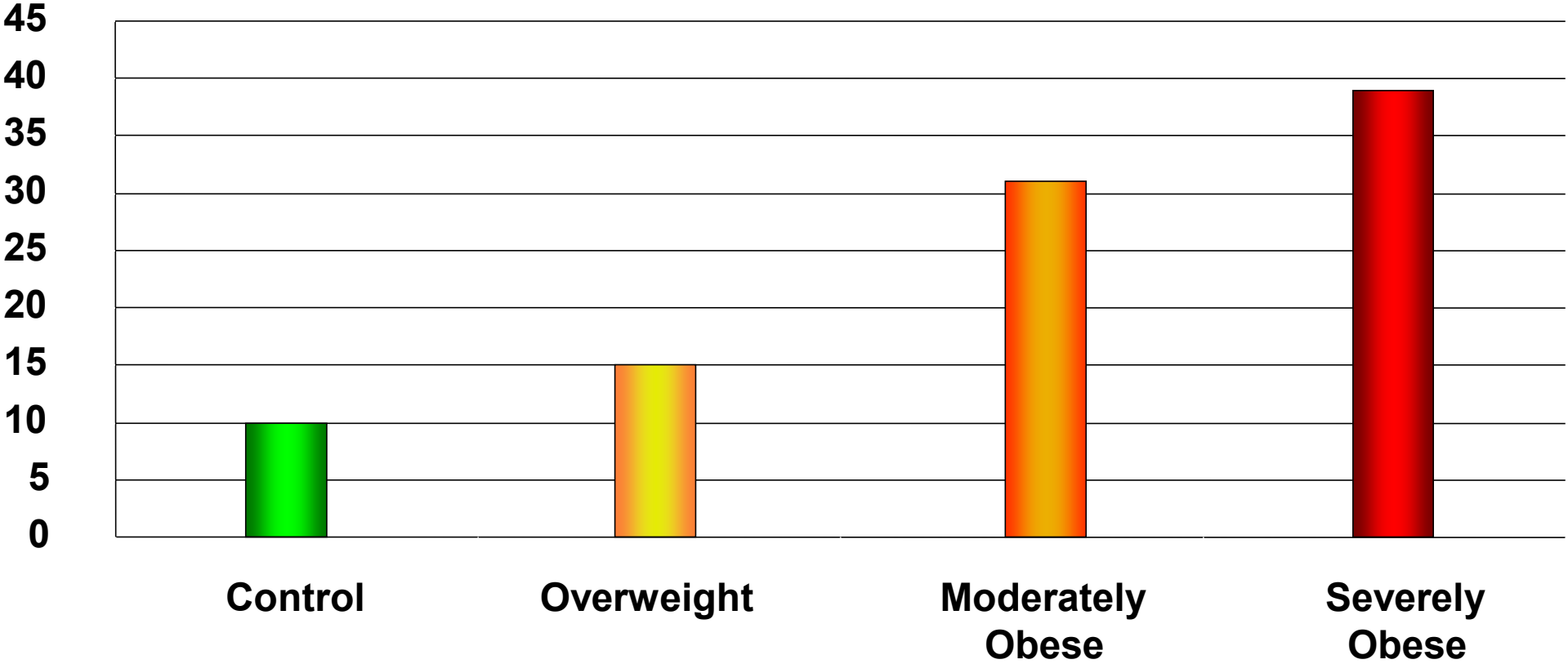[3]Chan JM et al. *Diabetes Care*. 1994;17:961-969

Is not just BMI
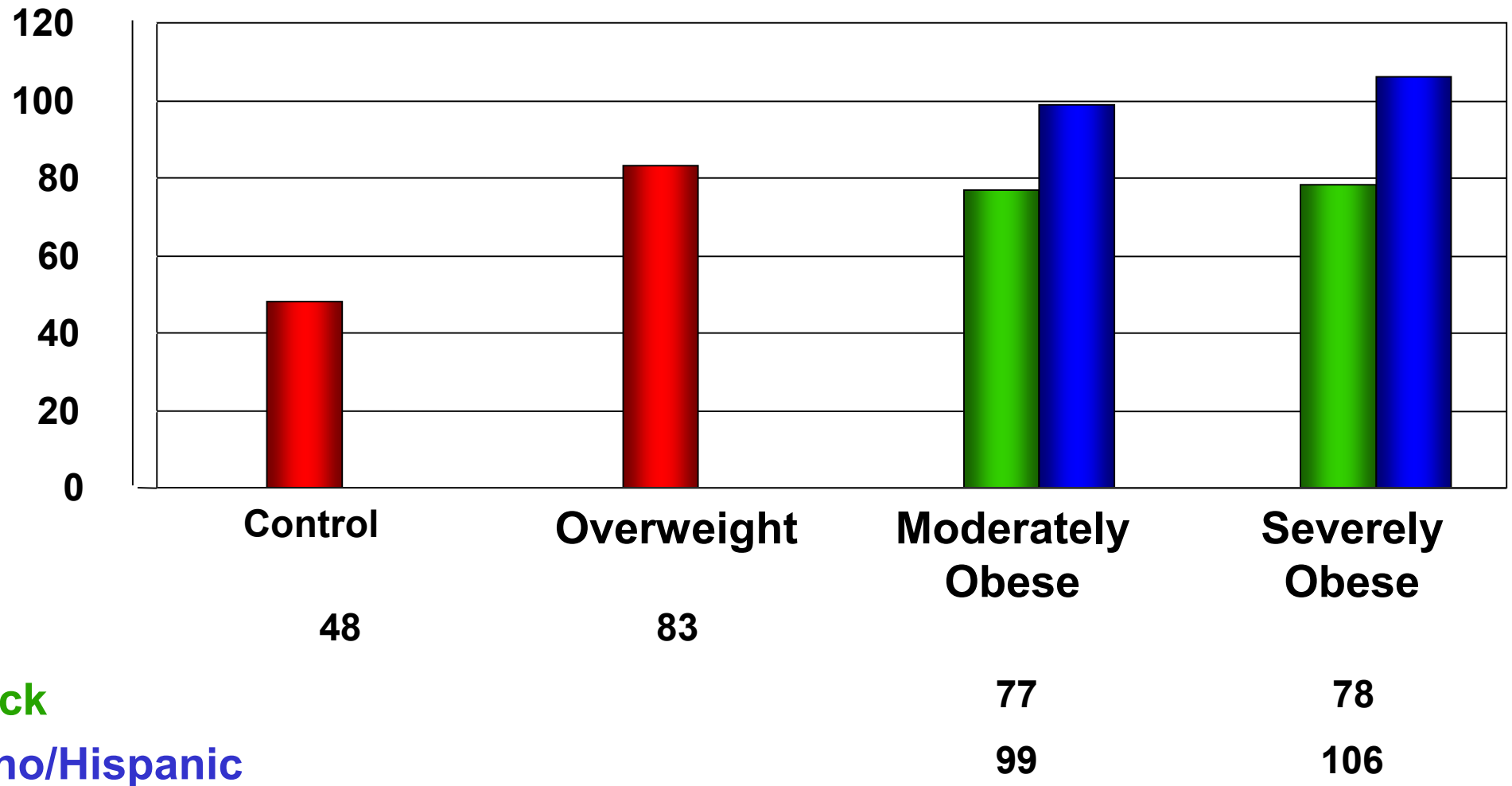# Is where ectopic fat is

Plasma FFA

Muscle Fat

Pancreatic Fat

Hepatic Fat

Subcutaneous Fat

Intraabdominal Fat

Arterial Fat

BM: 23 Kg/m^2

Weight:68 Kg = 149.6 lb
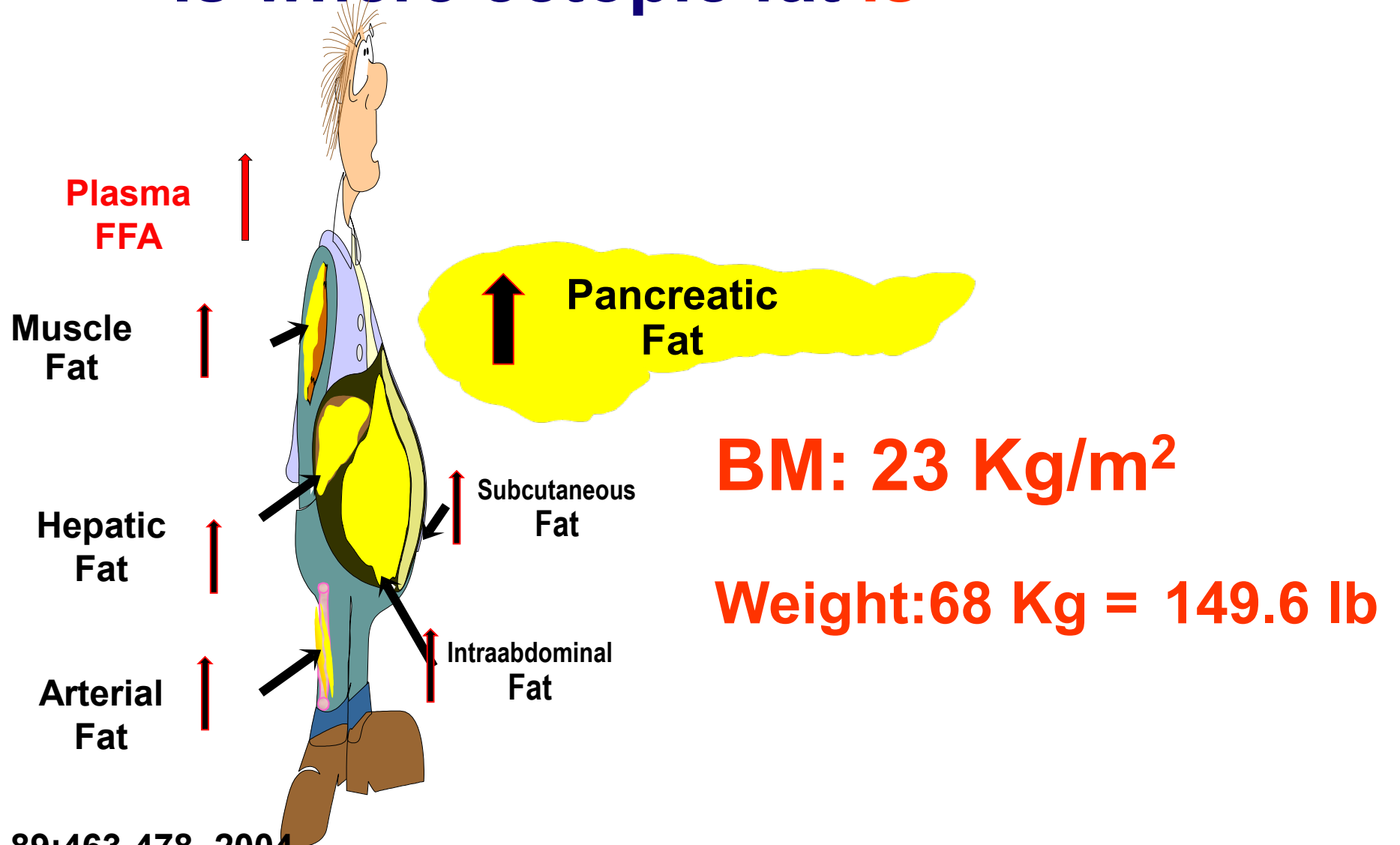
Metabolic Characteristics: Insulin

Triglycerides

120			
100			
80			
60			
40			
20			
0			

Control   **Overweight**   **Moderately Obese**   **Severely Obese**

48   83

                                 77   78

Black

                                 99   106
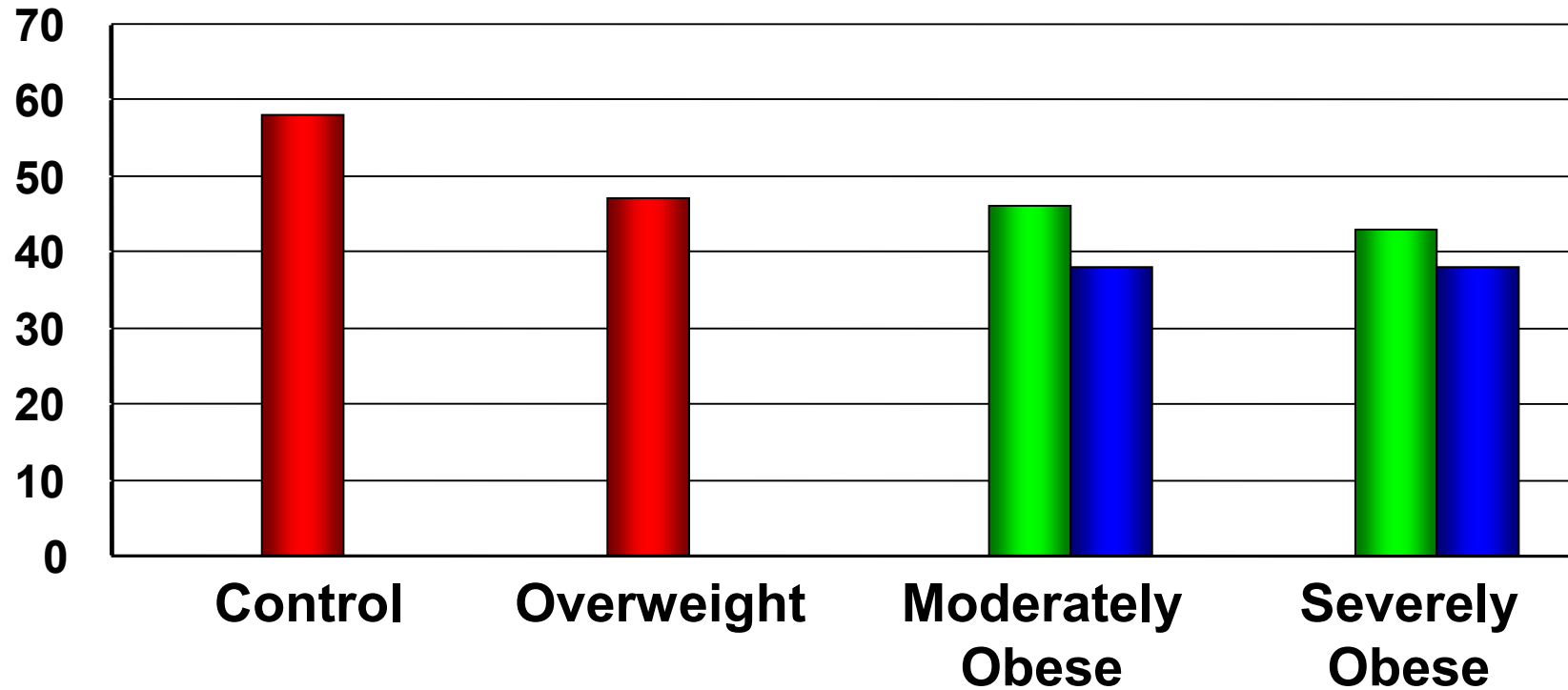
Latino/Hispanic

Systolic Blood Pressure

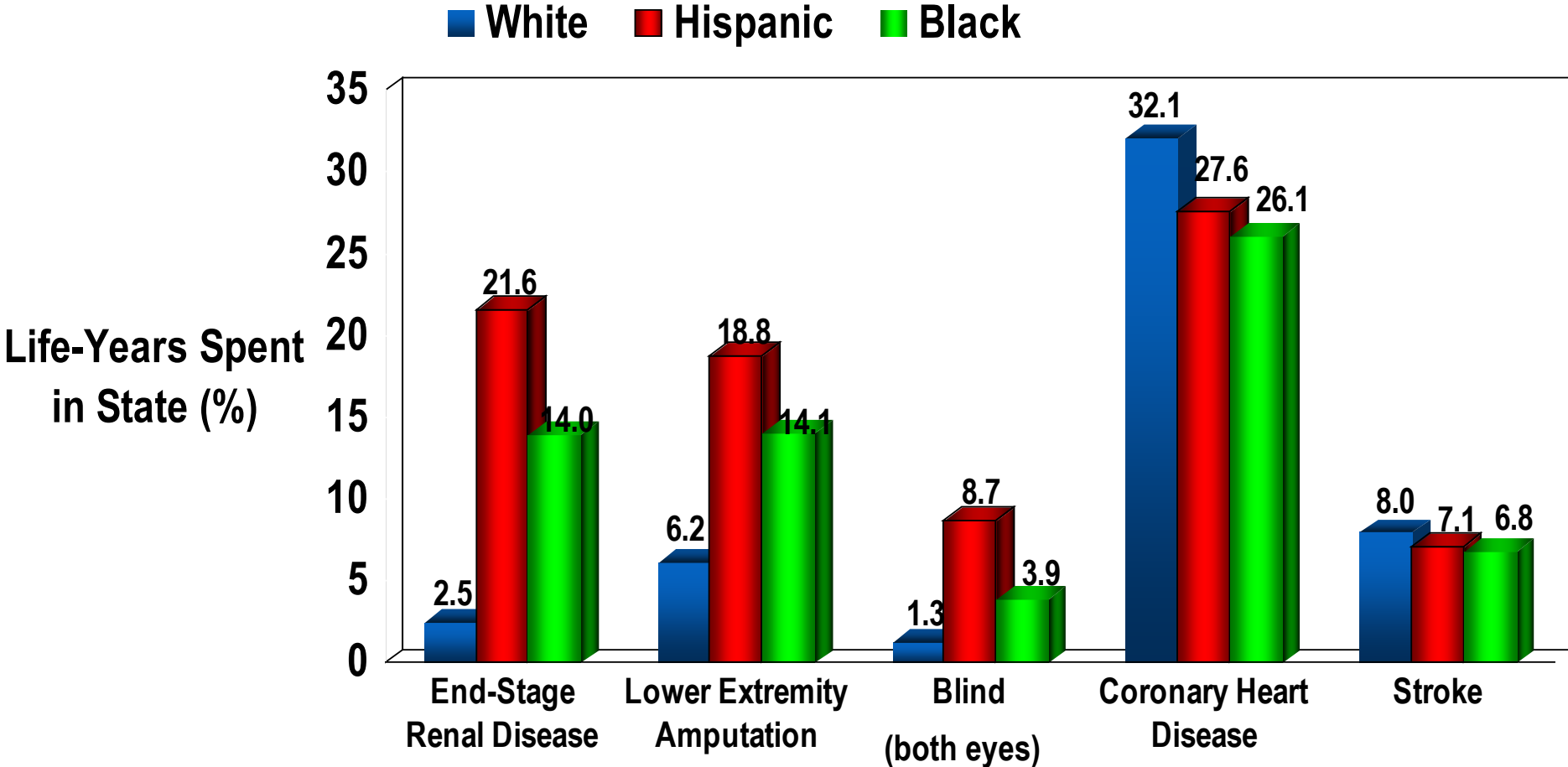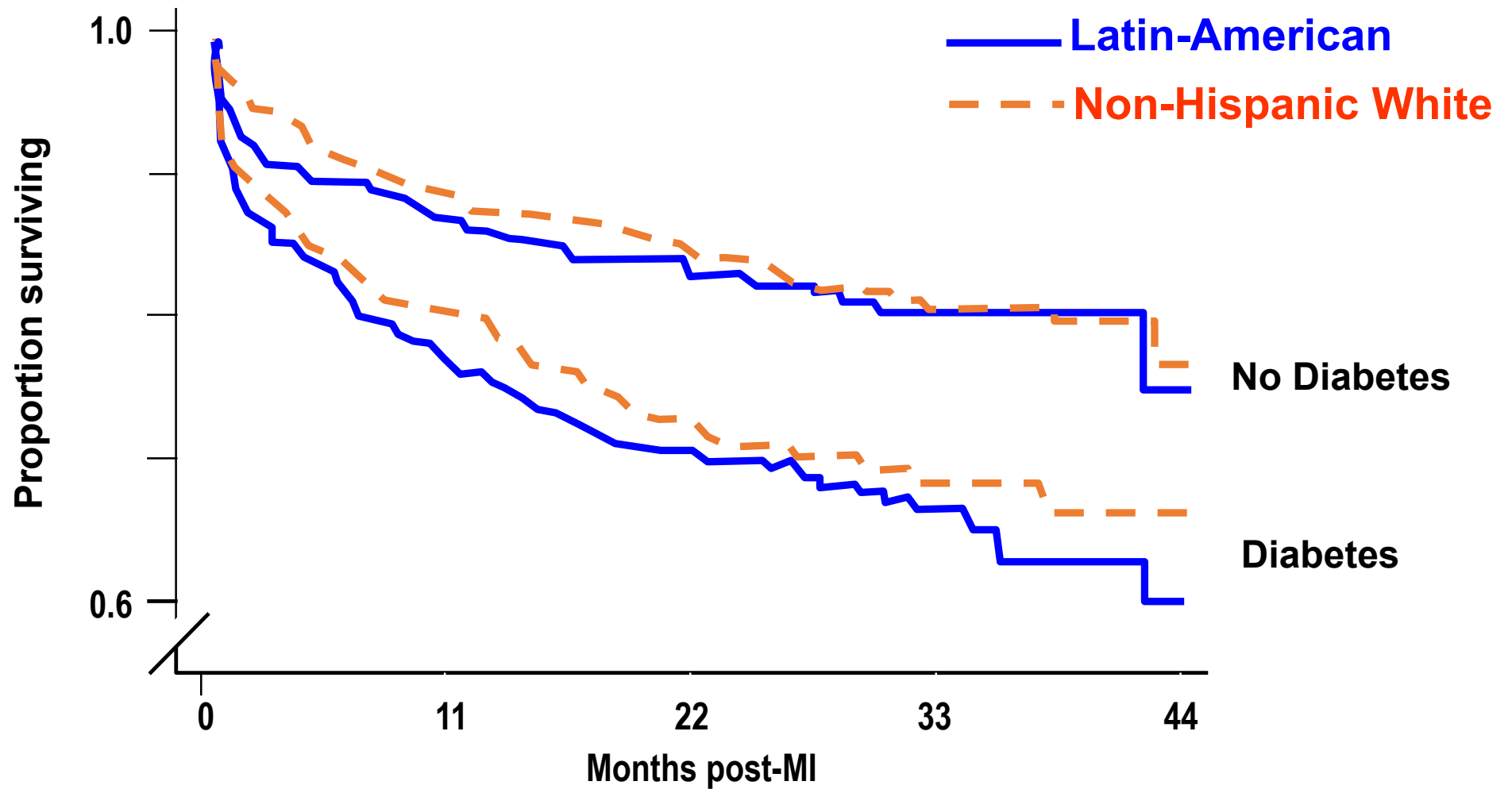|	Control	Overweight	Moderately Obese	Severely Obese
	106	116		
Black			125	124
Hispanic			117	120
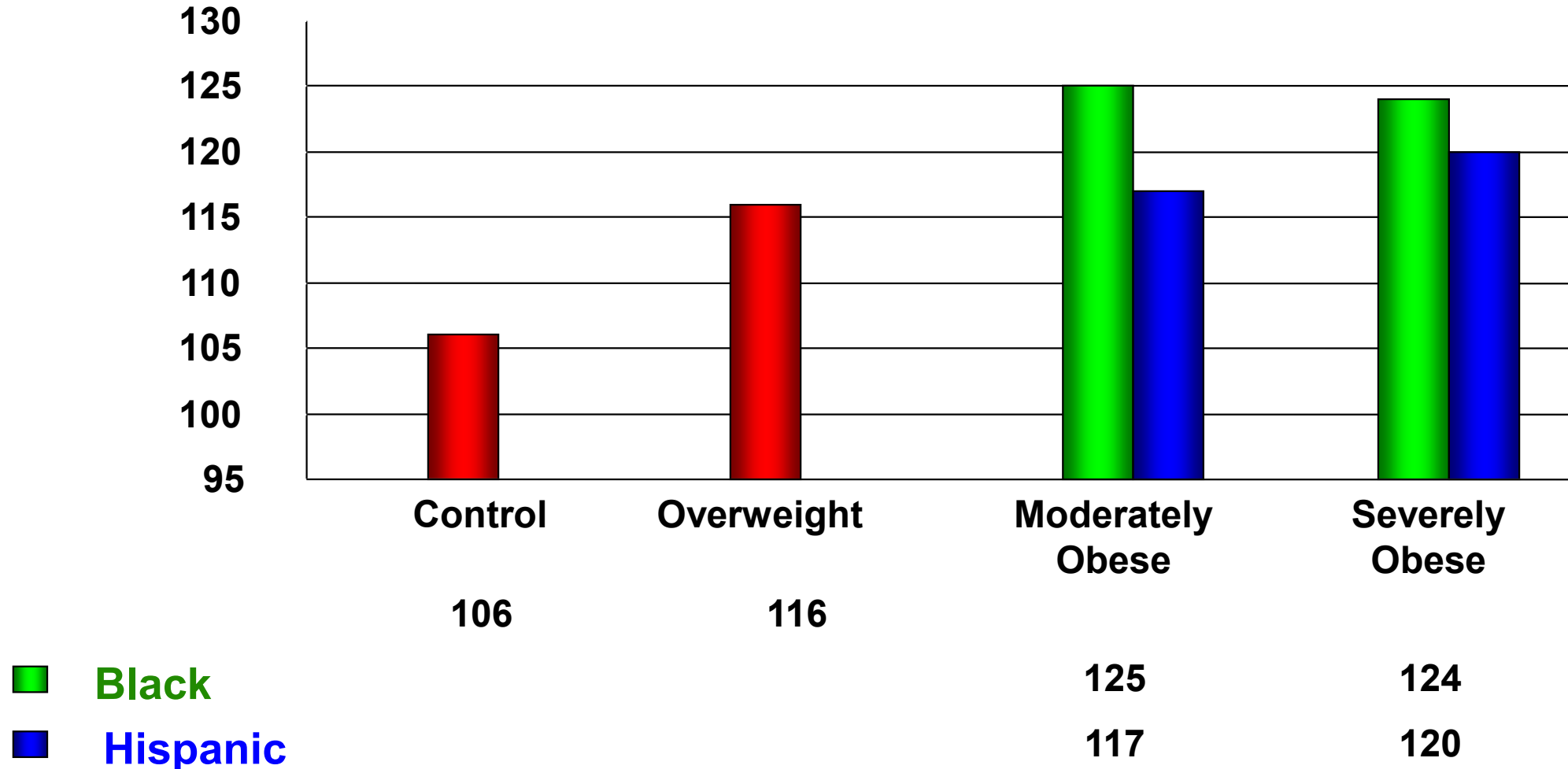
# Proportion of Life-Years Spent in Each Health State for Individuals with T2 Diabetes

Adapted from Richter A, et al. *Diabetes*. 2002;51(suppl 2):A280. Abstract/Poster 1139-P.

Diabetes and Post-MI Survival in Two Ethnic Groups

Orlander PE et al. *Diabetes*. 1994;43;897-902.

Estimated Lifetime Risk of Developing Diabetes for Individuals Born in the USA in 2000

Narayan et al, JAMA, 2003

A Big Problem!
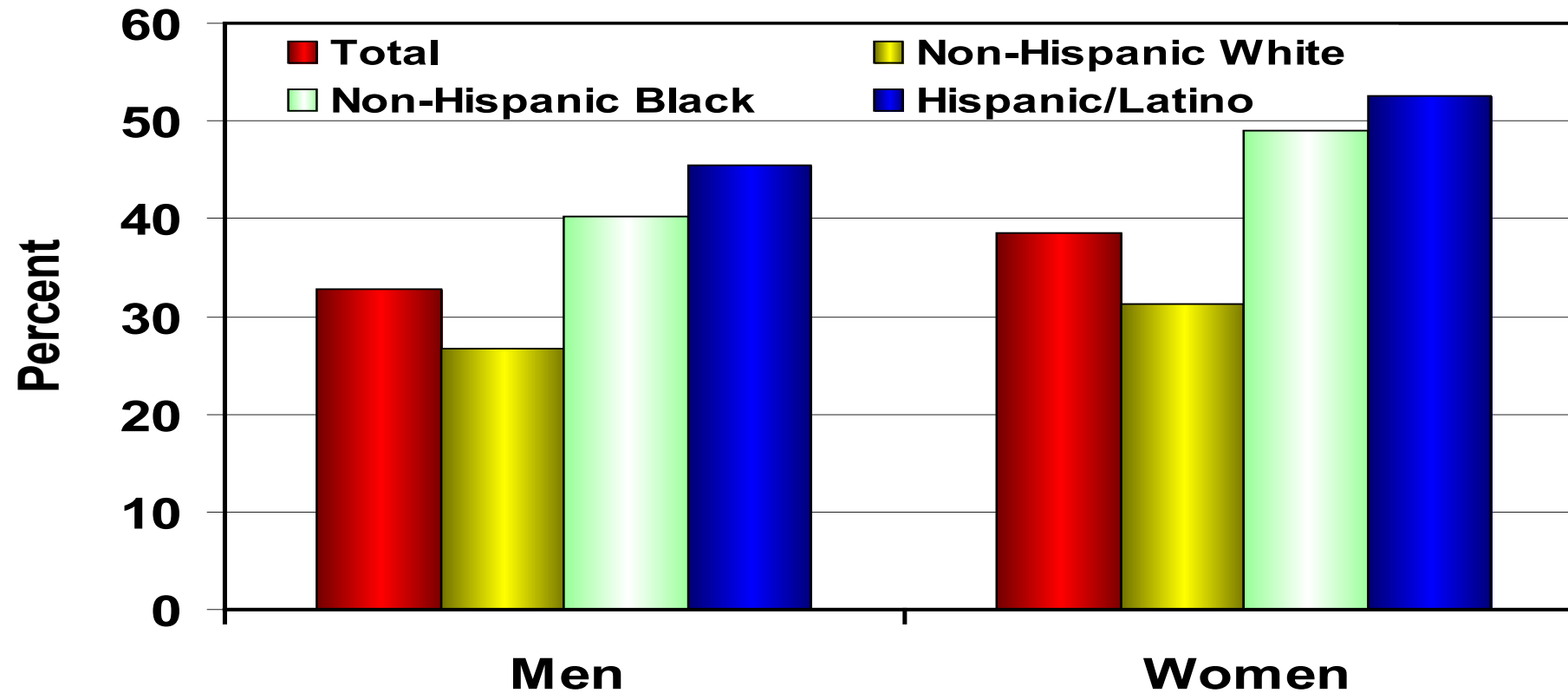
Summary

- **The Spanish Paradox is history**
- **Cardiovascular mortality is today the #1 cause of death in Latin America**
- **The risk factors include poorly controlled diabetes, overweight and obesity, low HDL and high triglycerides and hypertension**
- **Some of the detrimental metabolic changes are presented very early in life**
- **Primary prevention programs must be implemented and better access to optimal care is a must**
- **Pay now or pay later? Pay now is a lot less expensive**