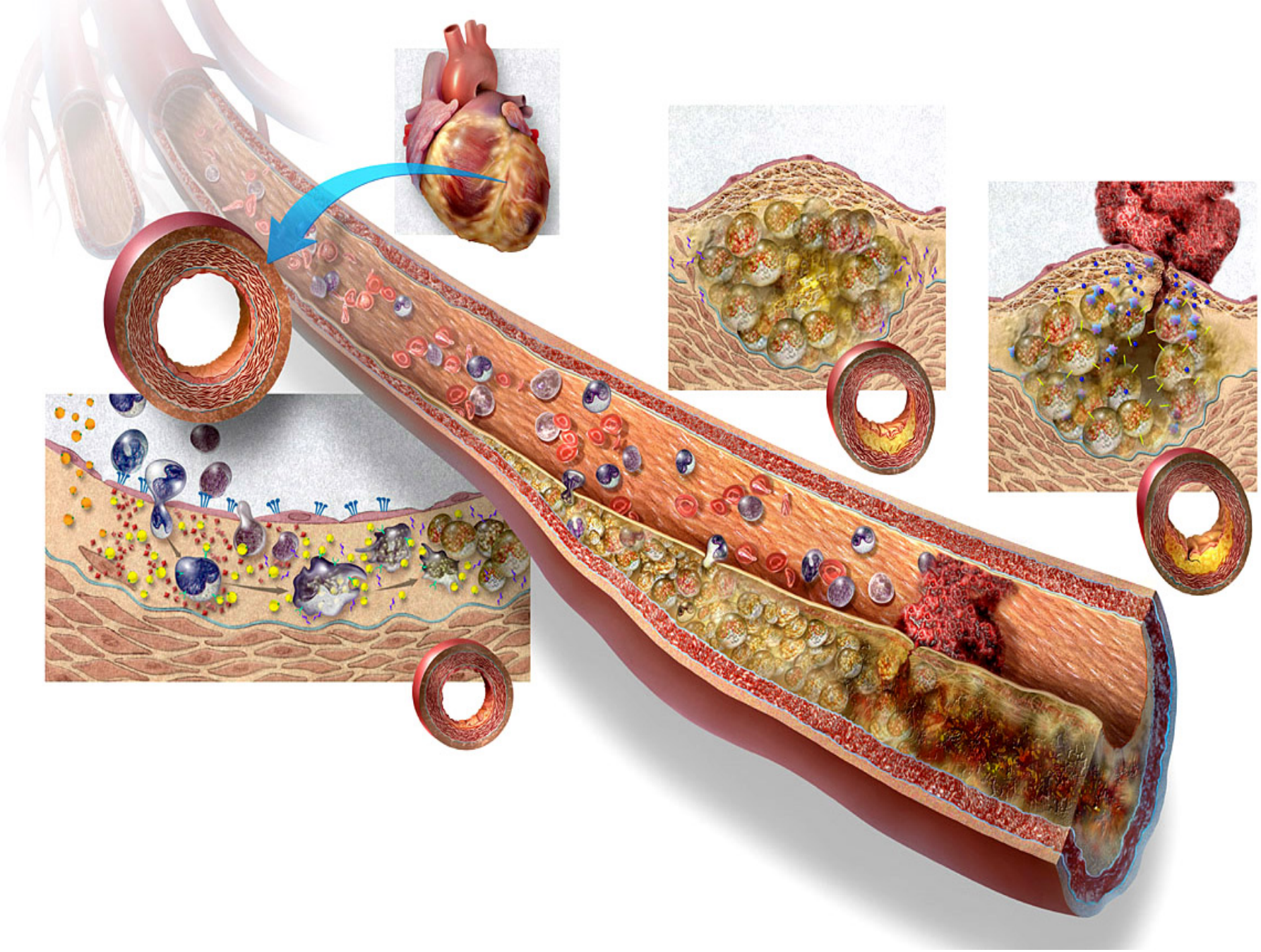
Epidemiology and Impact of Salt-Consumption-Related Chronic Diseases in Latin America

Dr. Simón Barquera
National Researcher (SNI-Conacyt)
President of the College of Professors of Nutrition
Head, Department of Chronic Diseases and Diet, Research Center on Nutrition and Health, National Institute of Public Health, Mexico

PHAC/PAHO Observatory on
Chronic Noncommunicable Disease Policy
Mobilizing for Dietary Salt Reduction Policies and Strategies n the Americas: Expert & Country Consultation
(Miami, Florida, 13–14 January 2009)



Scientific American, May 1998

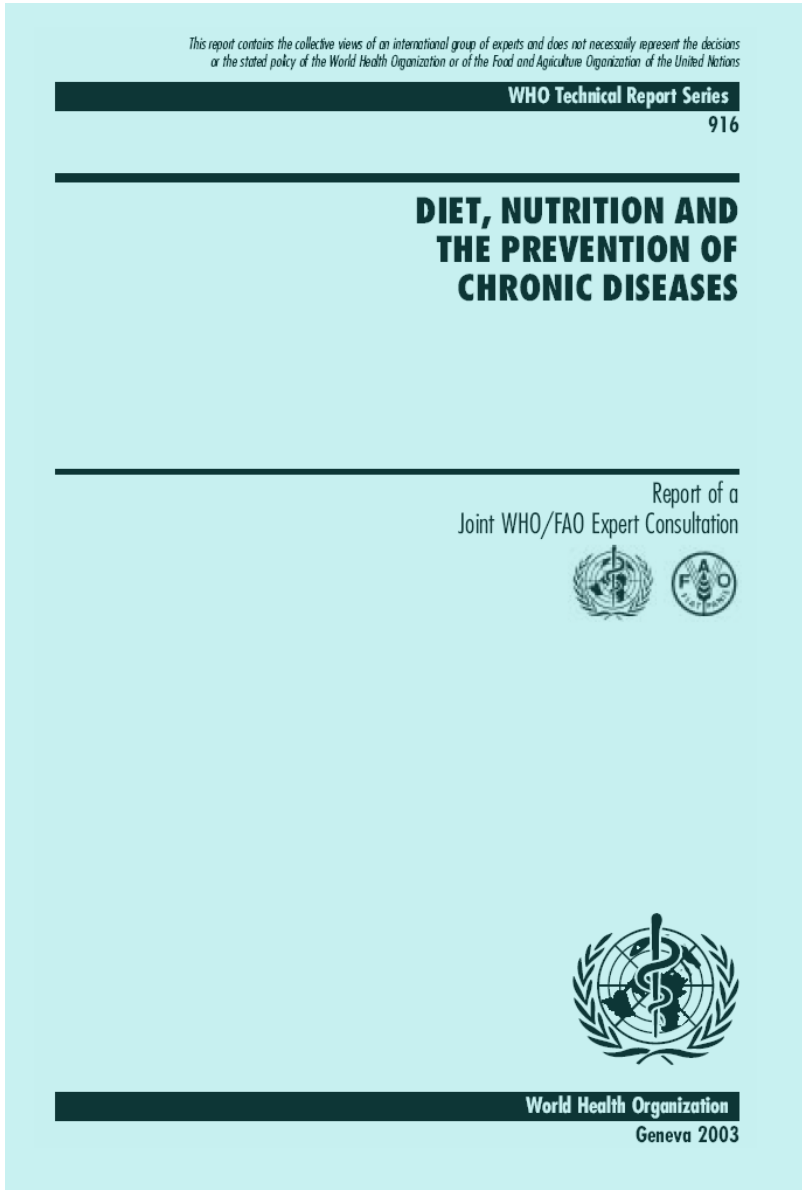
Background

WORLD HEALTH ORGANIZATION

GLOBAL STRATEGY ON DIET, PHYSICAL ACTIVITY AND HEALTH

Resolution WHA 55.23, 2002 World Health Assembly

Background



This report contains the collective views of an international group of experts and does not necessarily represent the decisions or the stated policy of the World Health Organization or of the Food and Agriculture Organization of the United Nations

WHO Technical Report Series
916

DIET, NUTRITION AND THE PREVENTION OF CHRONIC DISEASES

Report of a
Joint WHO/FAO Expert Consultation

World Health Organization
Geneva 2003

House of Commons
Health Committee

Obesity

Third Report of Session 2003–04

Volume I

Report, together with formal minutes

Ordered by The House of Commons to be printed 10 May 2004

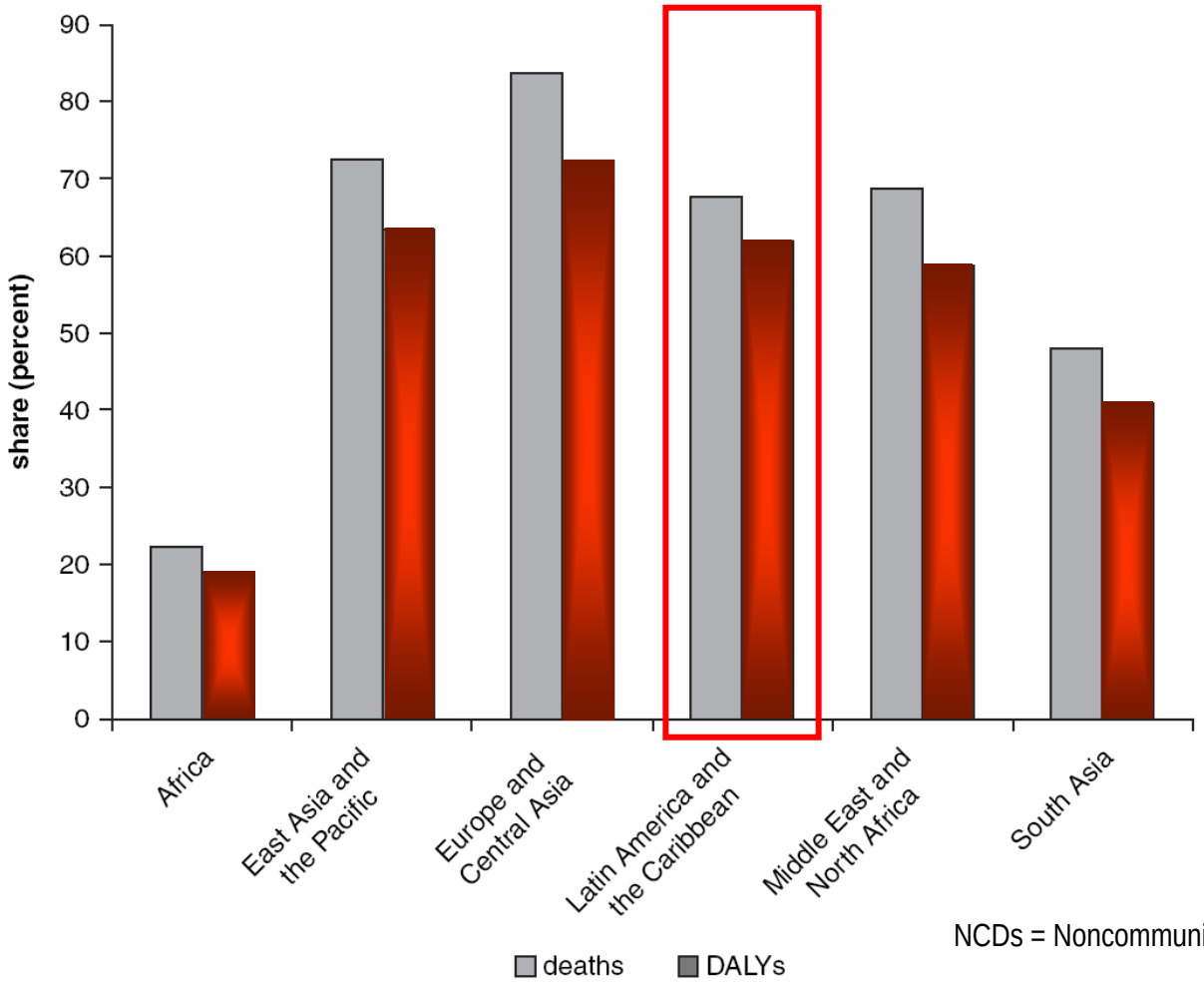
Annual deaths prevented for unit reduction in salt, saturated fat and sugar

	Level of reduction	*Causes of death*	*Deaths prevented*
Salt	One gram reduction	CHD, stroke	4,750
Saturated fat	One percentage point reduction in saturated fatty acids, as % of food energy intake	CHD	600
Sugar	one percentage point reduction in sugar, as % of food energy intake	All causes, via reduction in obesity	750

CHD = Chronic heart disease

Source: UK White Paper 2004, Dept. of Health

Share of the Disease Burden Attributable to NCDs* by World Bank Region, 2002

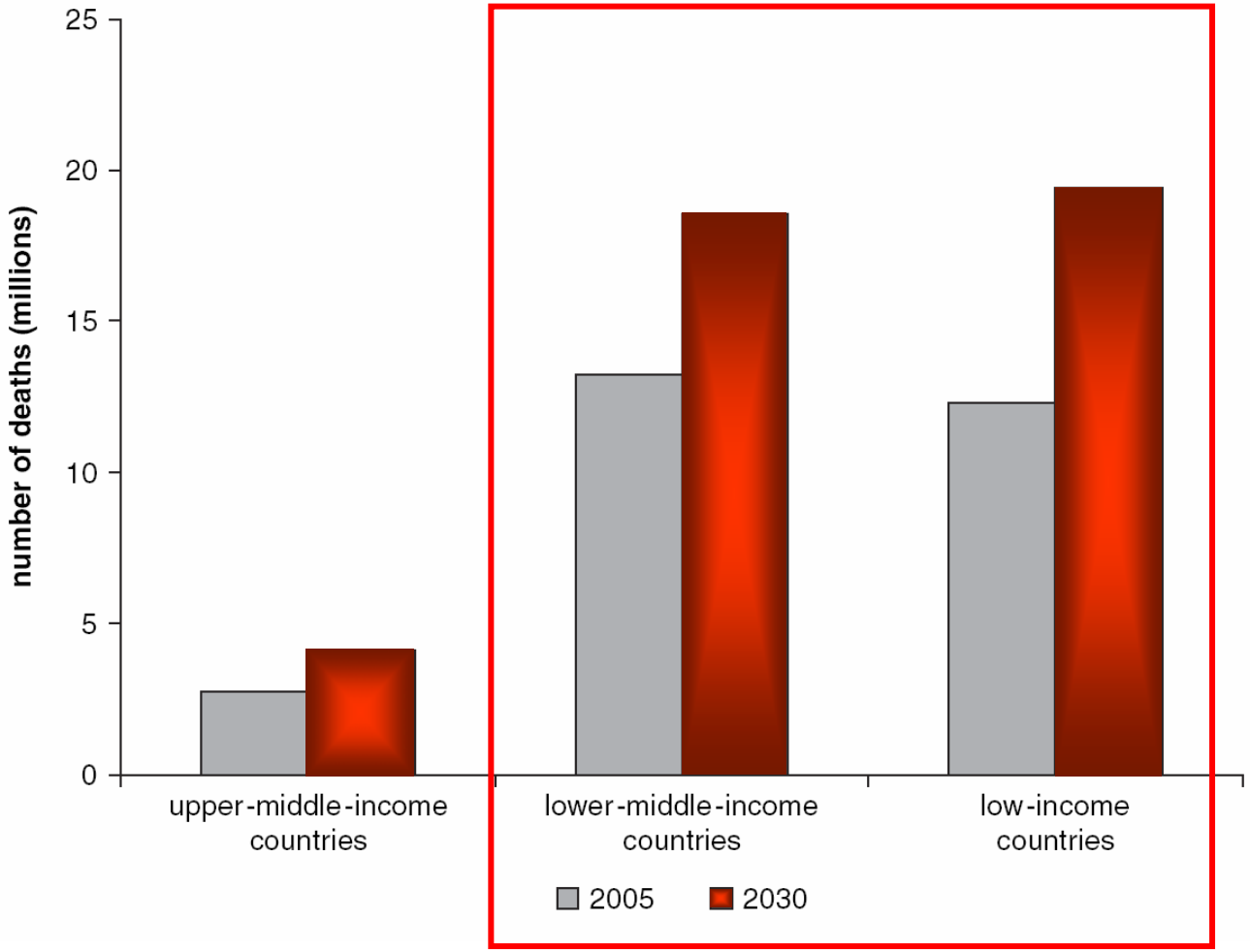


NCDs = Noncommunicable diseases

Source: WHO 2004, annex table 4.
Note: DALYs = disability-adjusted life years.

Source: World Bank, 2007

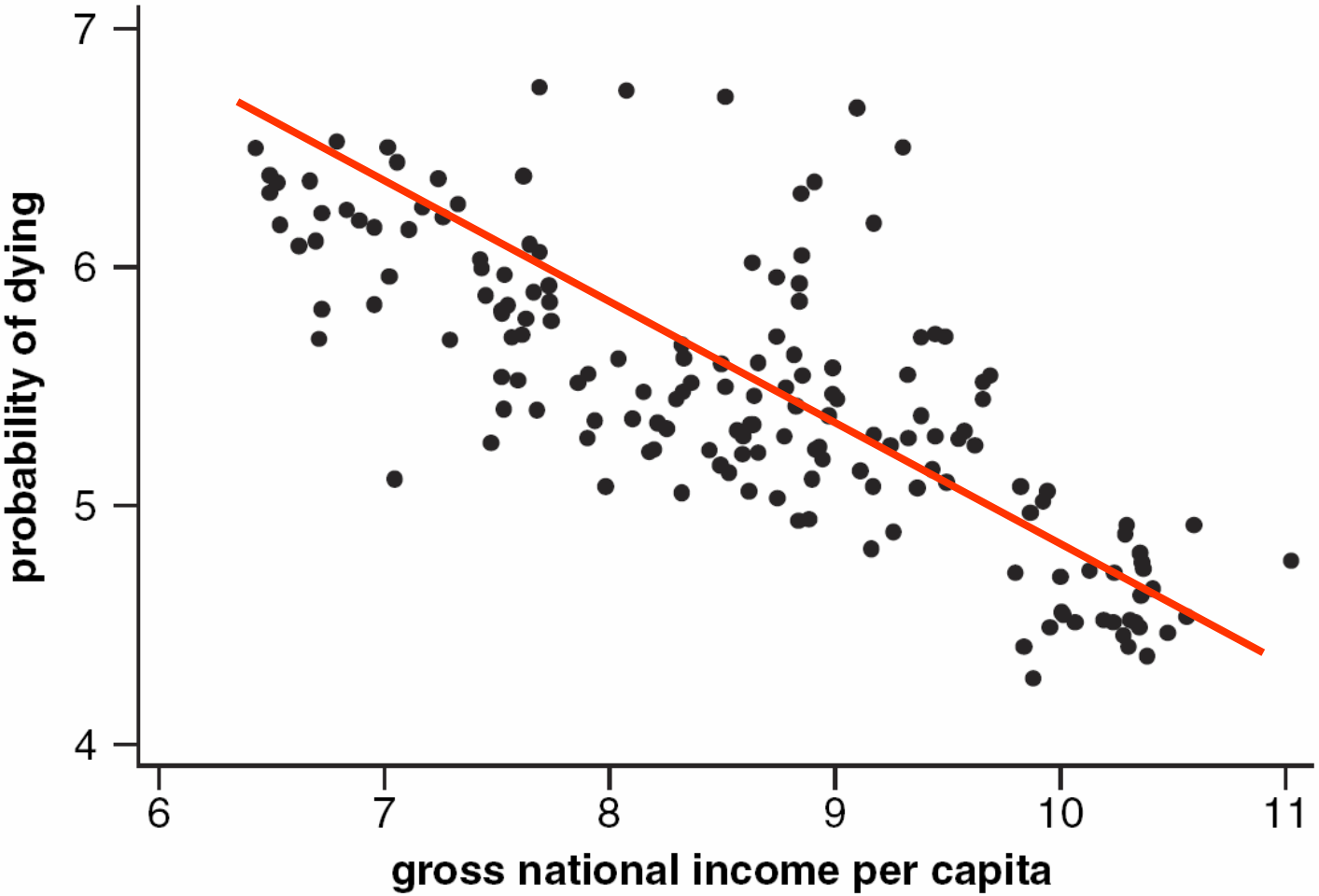
Projected Deaths due to NCDs by Country Income Level, 2005–2030



Source: Lopez et al. *Global Burden of Disease Project* / WHO, 2006.

Background

Premature Mortality among Adults aged 15–59 According to *per capita* GNP in 162 countries, 2004



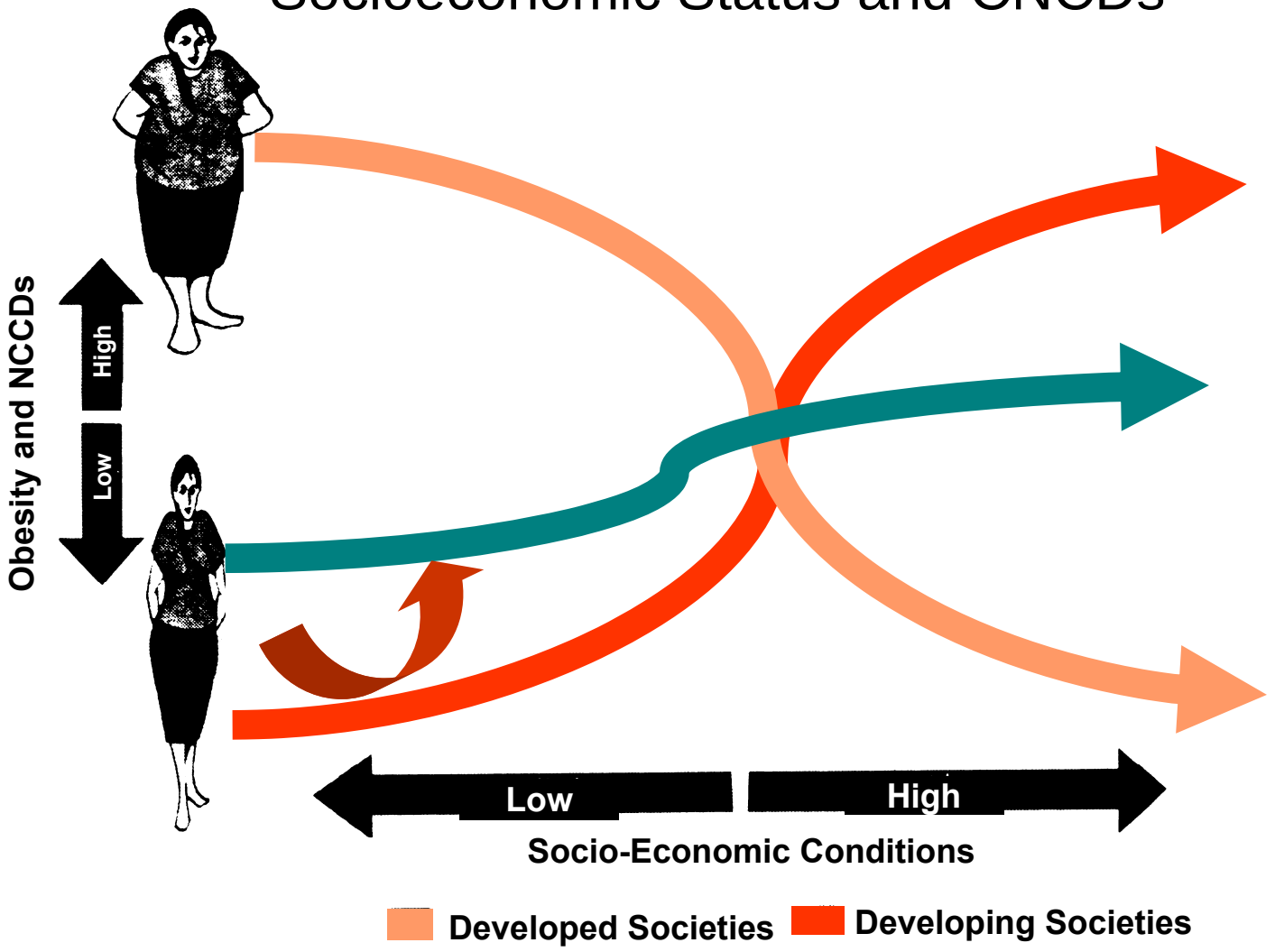
GNP = Gross national product

Source: WHO 2006[a], *World Health Statistics 2006*

Instituto Nacional de Salud Pública

Background

Socioeconomic Status and CNCDs



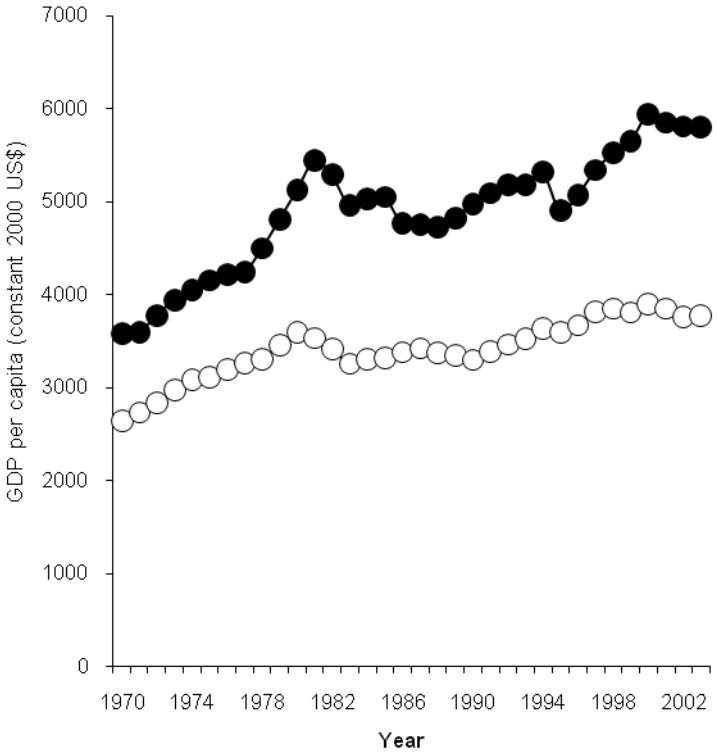
CNCDs = Chronic noncommunicable diseases

Source: Peña y Bacallao, PAHO, 2000

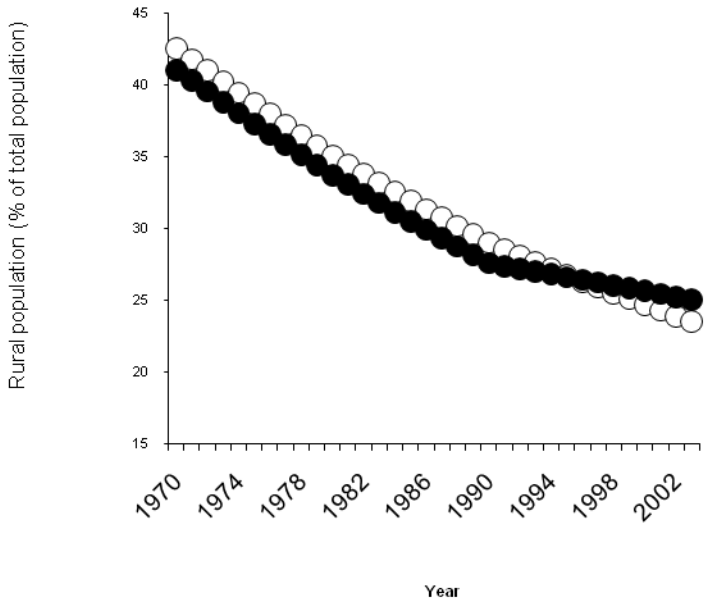
Background

GNP Trends and % of Rural Population in Mexico and Latin America

a. Trends in GDP (1970- 2003)



b. Trends in % of rural population (1970-2003)

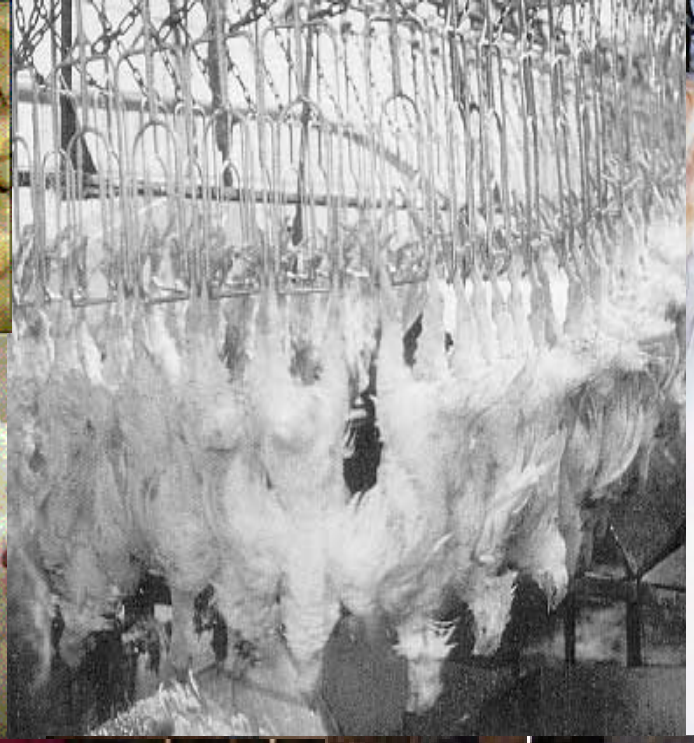


● = Mexico ○ = Latin America

Source: World Development Indicators, World Bank, 2005.

Cardiovascular Epidemiology and Transition in LA

Instituto Nacional de Salud Pública

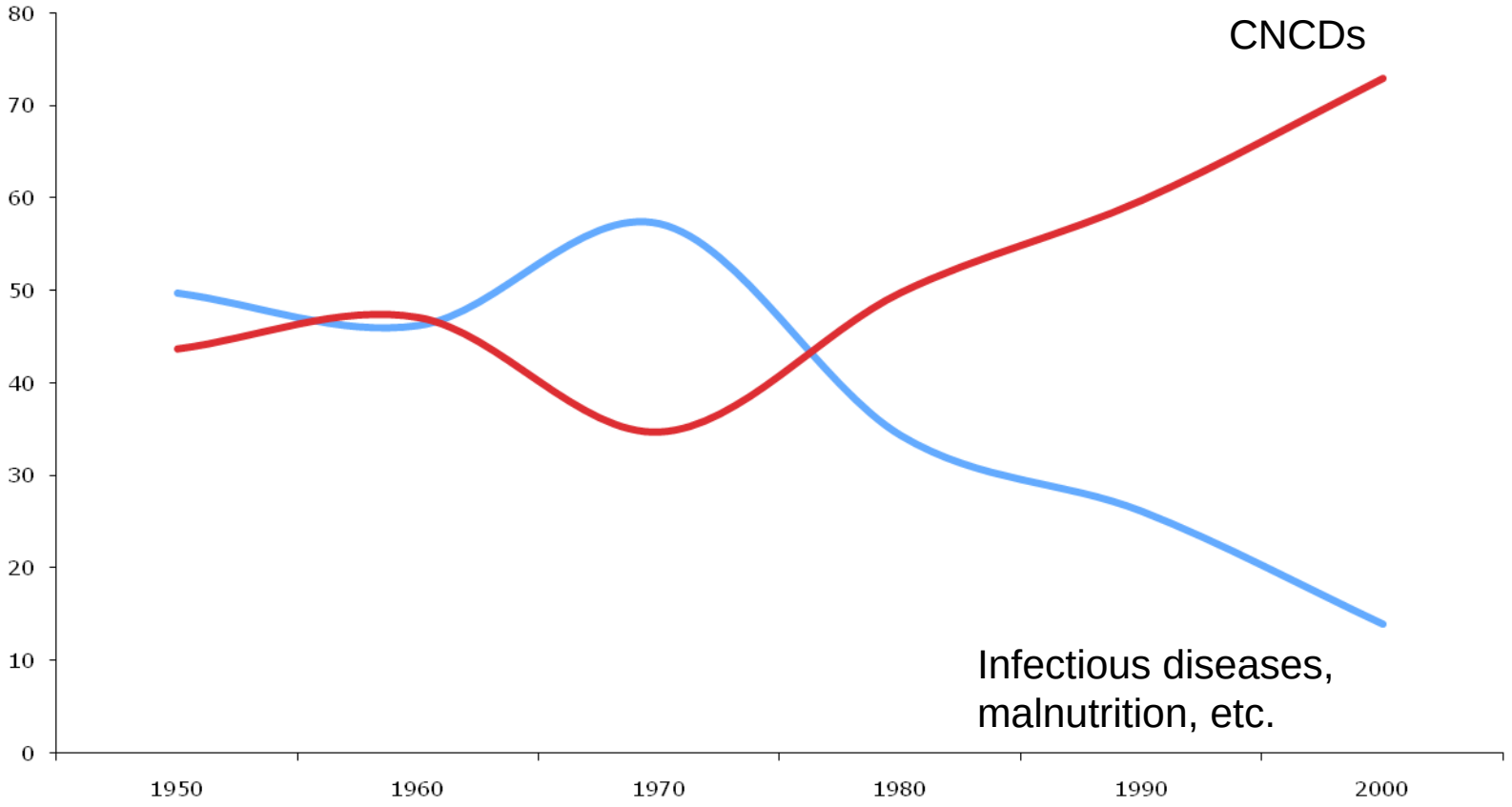


Food consumption, food expenditure, anthropometric status and nutrition-related diseases in Mexico

S. Barquera, C. Hotz, J. Rivera, L. Tolentino, J. Espinoza, I.Campos and T. Shamah, National Institute of Public Health, Cuernavaca, Mexico

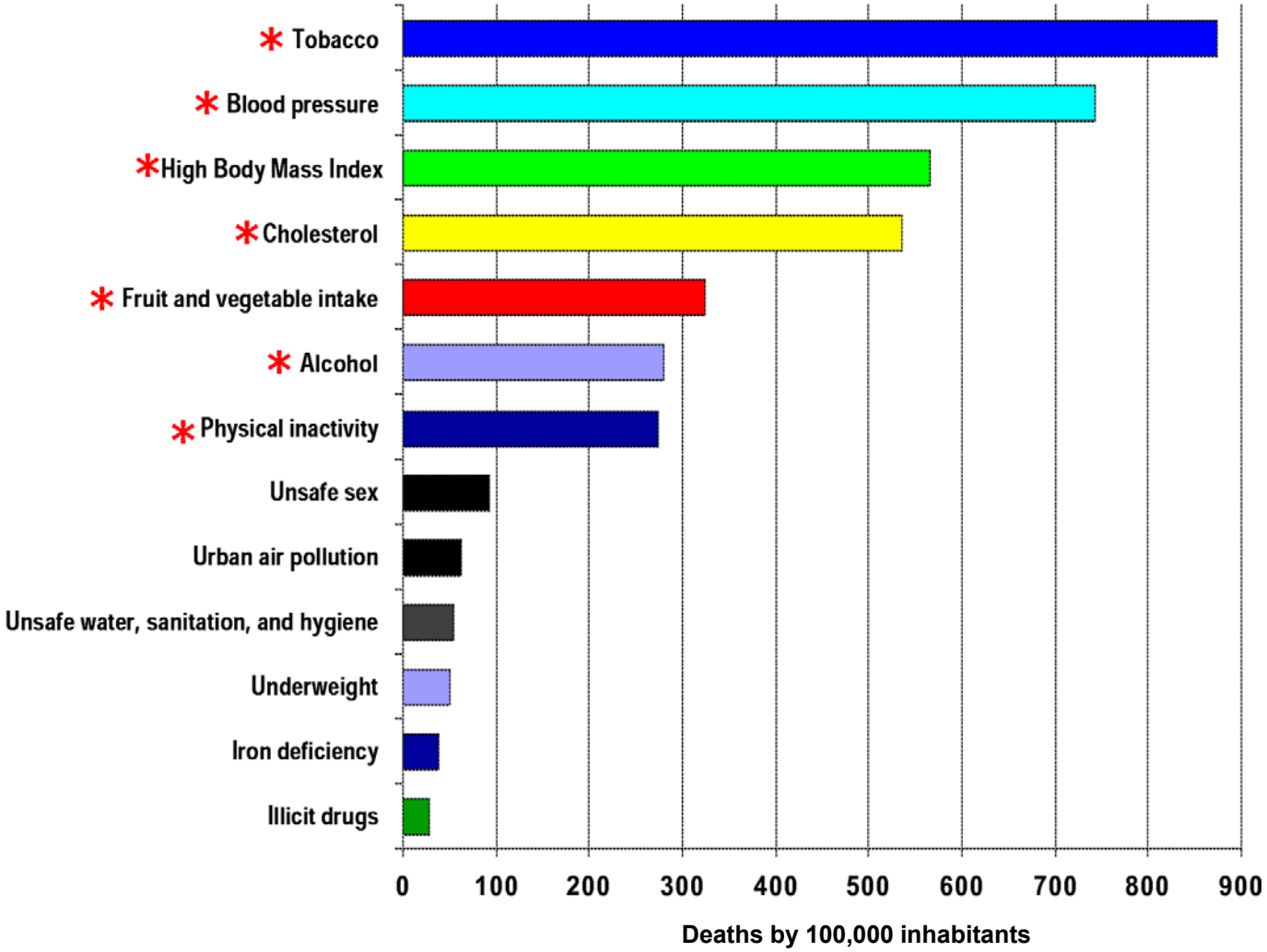
Cardiovascular Epidemiology and Transition in LA

Epidemiologic Transition in Latin American Countries



Source: **Barquera S*, Hotz C , Rivera J , et al. Food consumption, food expenditure,anthropometric status and nutrition related diseases in Mexico. In: *The Double-Burden of Diseases in Developing Countries*. Kennedy et al (eds), Food and Agricultural Organization, Rome (2006).**

Deaths by Risk Factor in the Americas



Source: WHO/PAHO, 2001

Cardiovascular Epidemiology and Transition in LA

OPEN ACCESS Freely available online

PLOS MEDICINE

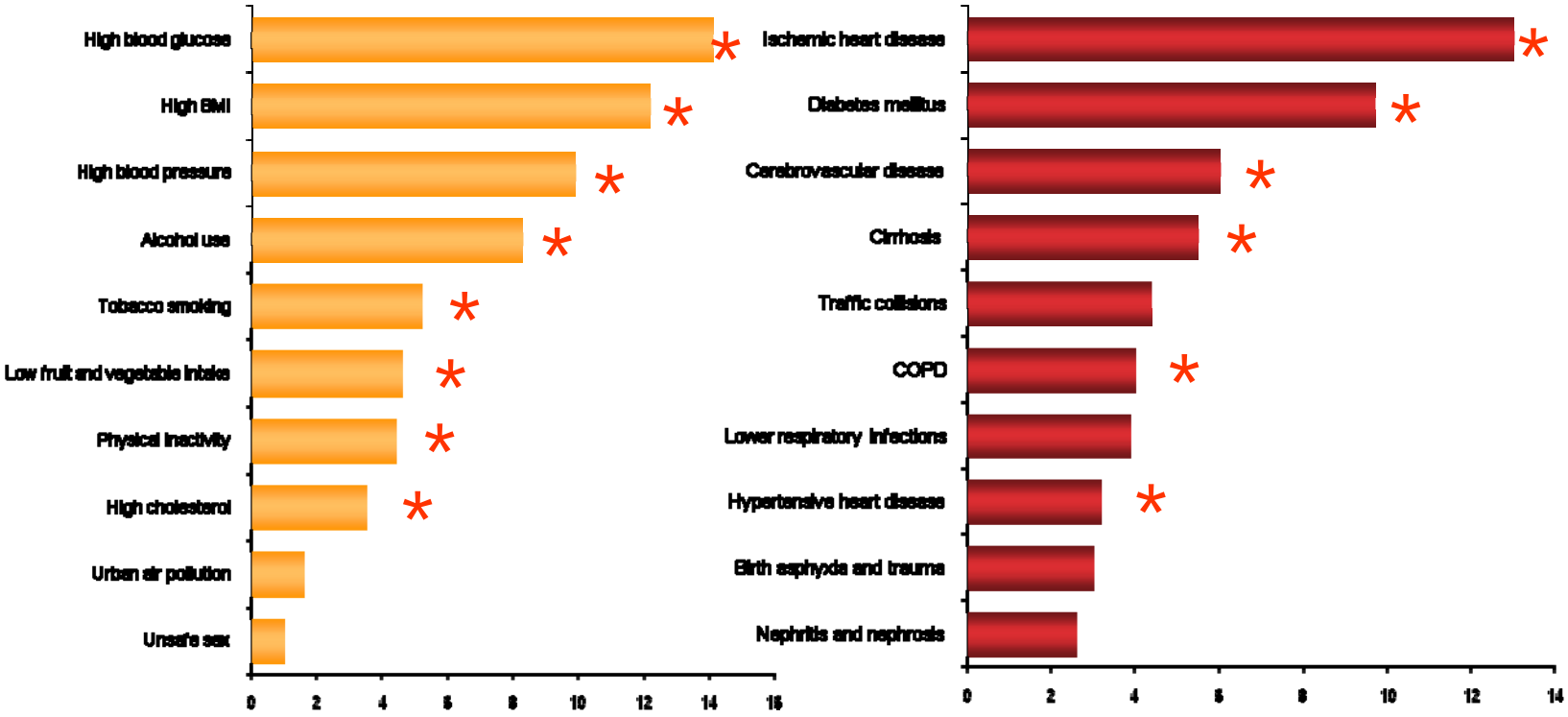
Characterizing the Epidemiological Transition in Mexico: National and Subnational Burden of Diseases, Injuries, and Risk Factors

Gretchen Stevens[1,2,3*], Rodrigo H. Dias[2], Kevin J. A. Thomas[2], Juan A. Rivera[4], Natalie Carvalho[2], Simón Barquera[4], Kenneth Hill[2], Majid Ezzati[1,2]

1 Harvard School of Public Health, Boston, Massachusetts, United States of America, **2** Harvard Initiative for Global Health, Cambridge, Massachusetts, United States of America, **3** World Health Organization, Geneva, Switzerland, **4** Instituto Nacional de Salud Pública, Cuernavaca, Mexico

Instituto Nacional de Salud Pública

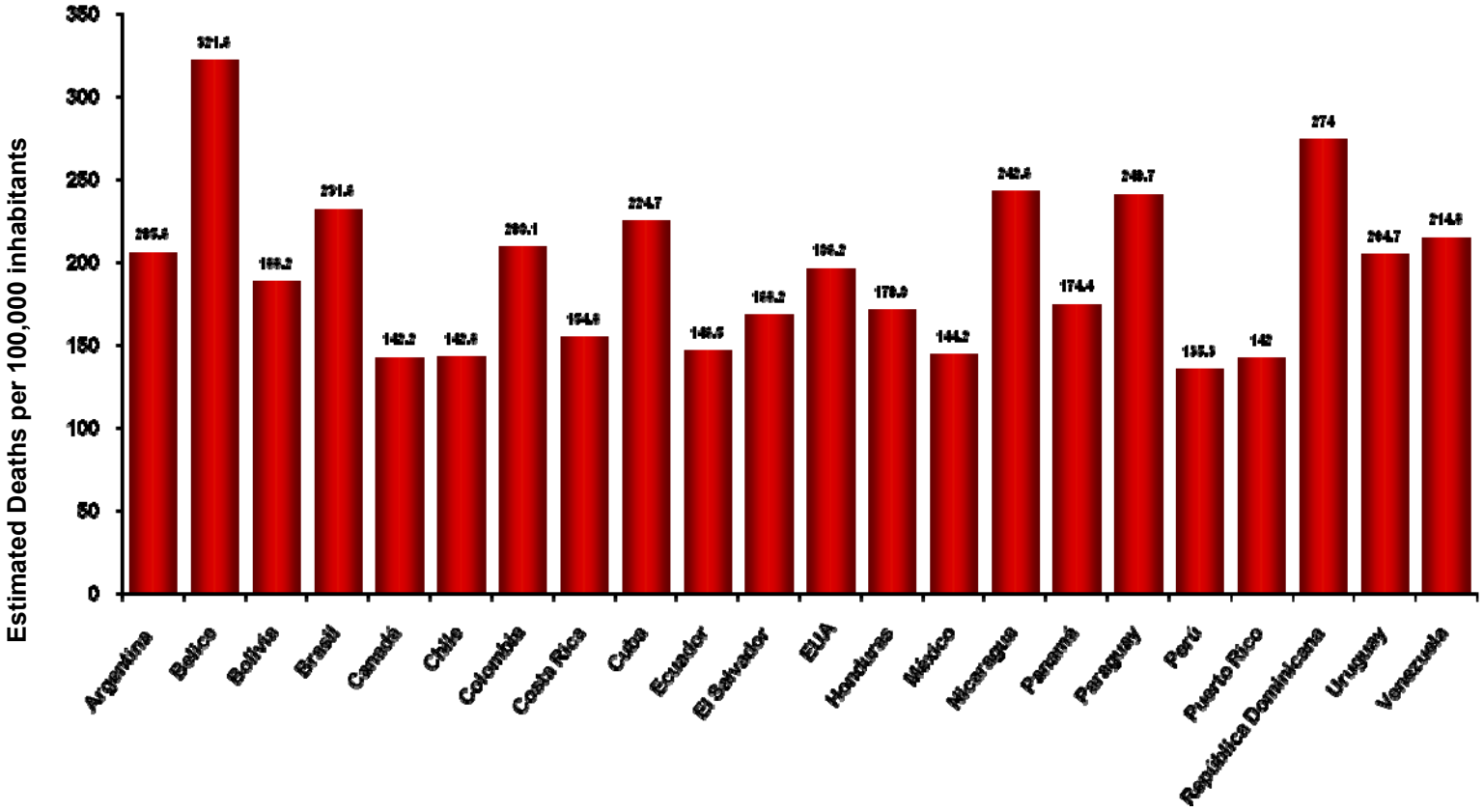
Leading Causes of Death by Risk Factor and Disease in Mexico (2004)



Source: Stevens G, Díaz R, Thomas K, Rivera J, Carvalho N, Barquera S, Ezzati, M. *PLoS Medicine*, 2008

Cardiovascular Epidemiology and Transition in LA

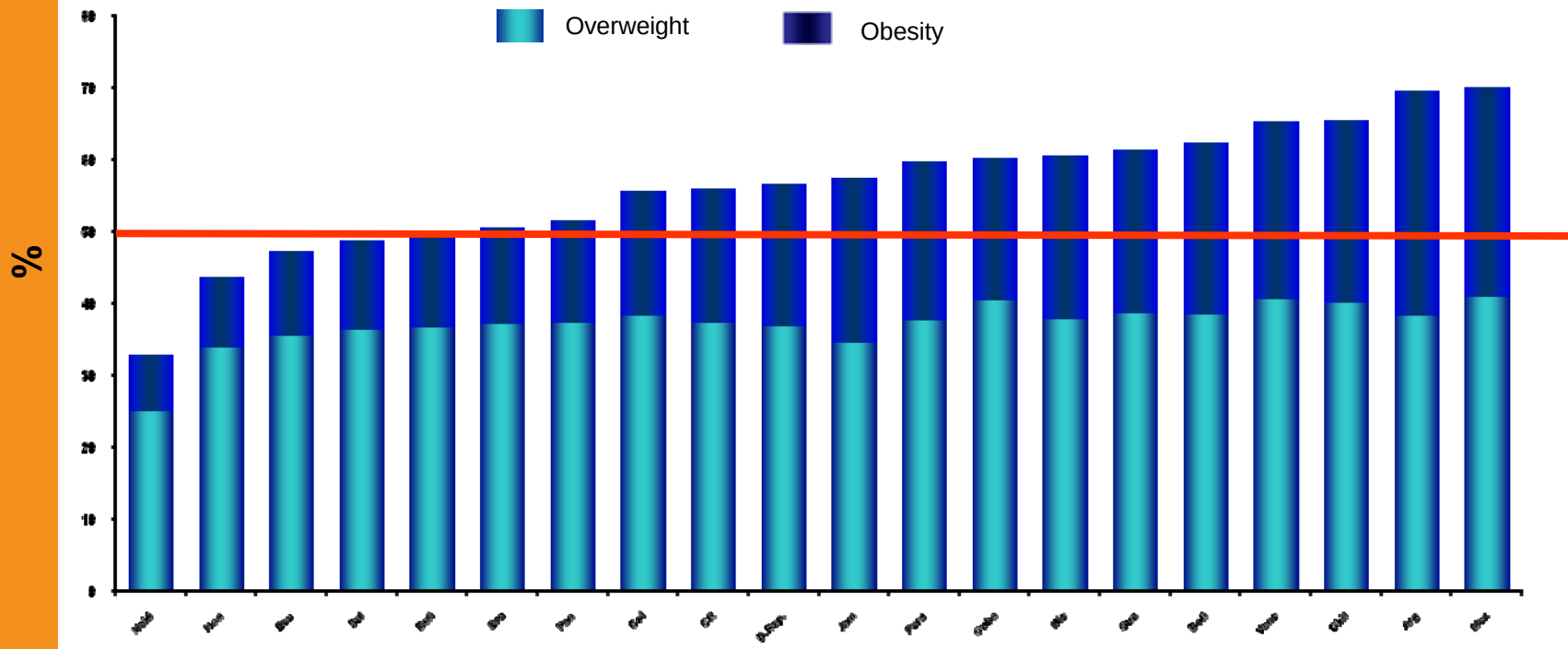
Age-Adjusted Cardiovascular Mortality Rates in Different Countries of the Americas, 2002



Source: PAHO Regional Mortality Database. Direct adjusted mortality rate using the World Population Prospects 2006 Revision. 2007

Instituto Nacional de Salud Pública

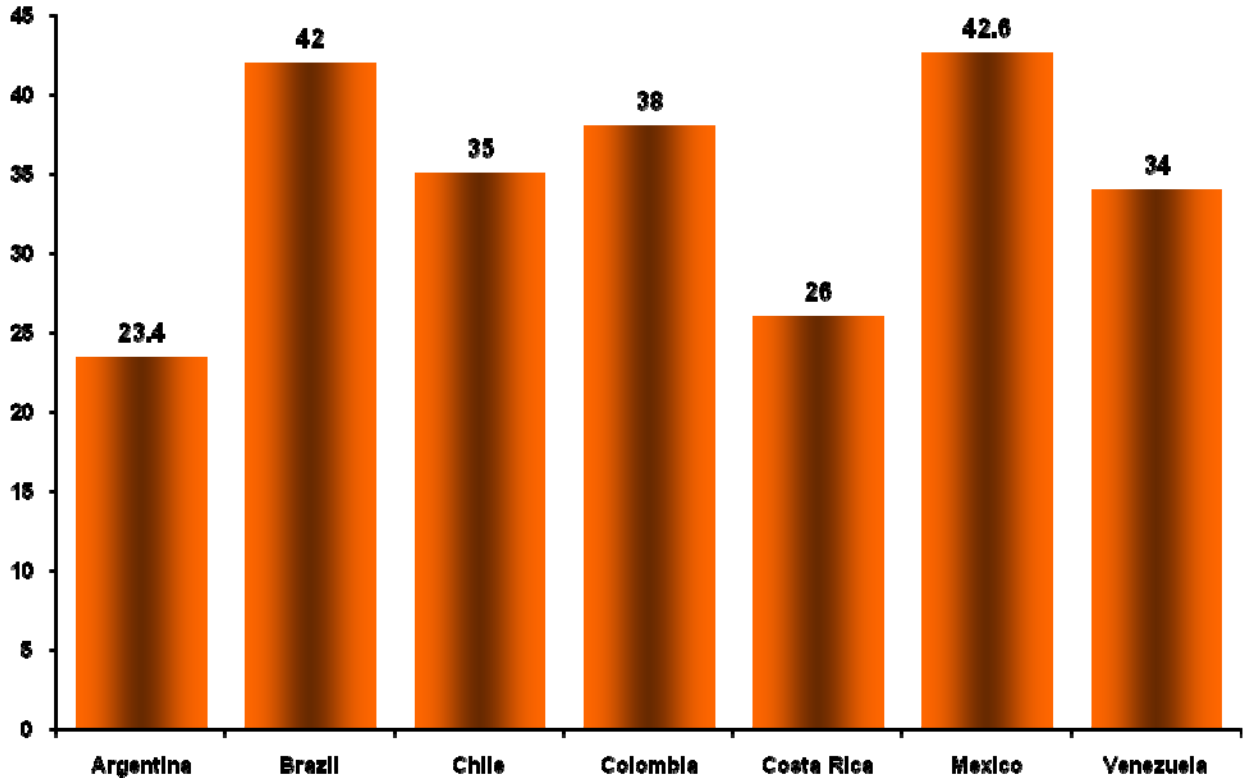
Overweight and Obesity Prevalence in Latin America



Source: Age-standardized prevalences of overweight (kg/m2) and obesity (kg/m2) by country (2005). WHO Global Infobase, World Health Organization

Cardiovascular Epidemiology and Transition in LA

Hypercholesterolemia Prevalence in Adults from Different Latin American Countries



Source: Mexico, ENSA 2000, Chile ENS 2003, Argentina, ENNyS. WHO/PAHO, Venezuela: Florez H et al.

Prevention and Control (2006) x, xxx–xxx

ELSEVIER

WORLD HEART FEDERATION®

www.elsevier.com/locate/precon

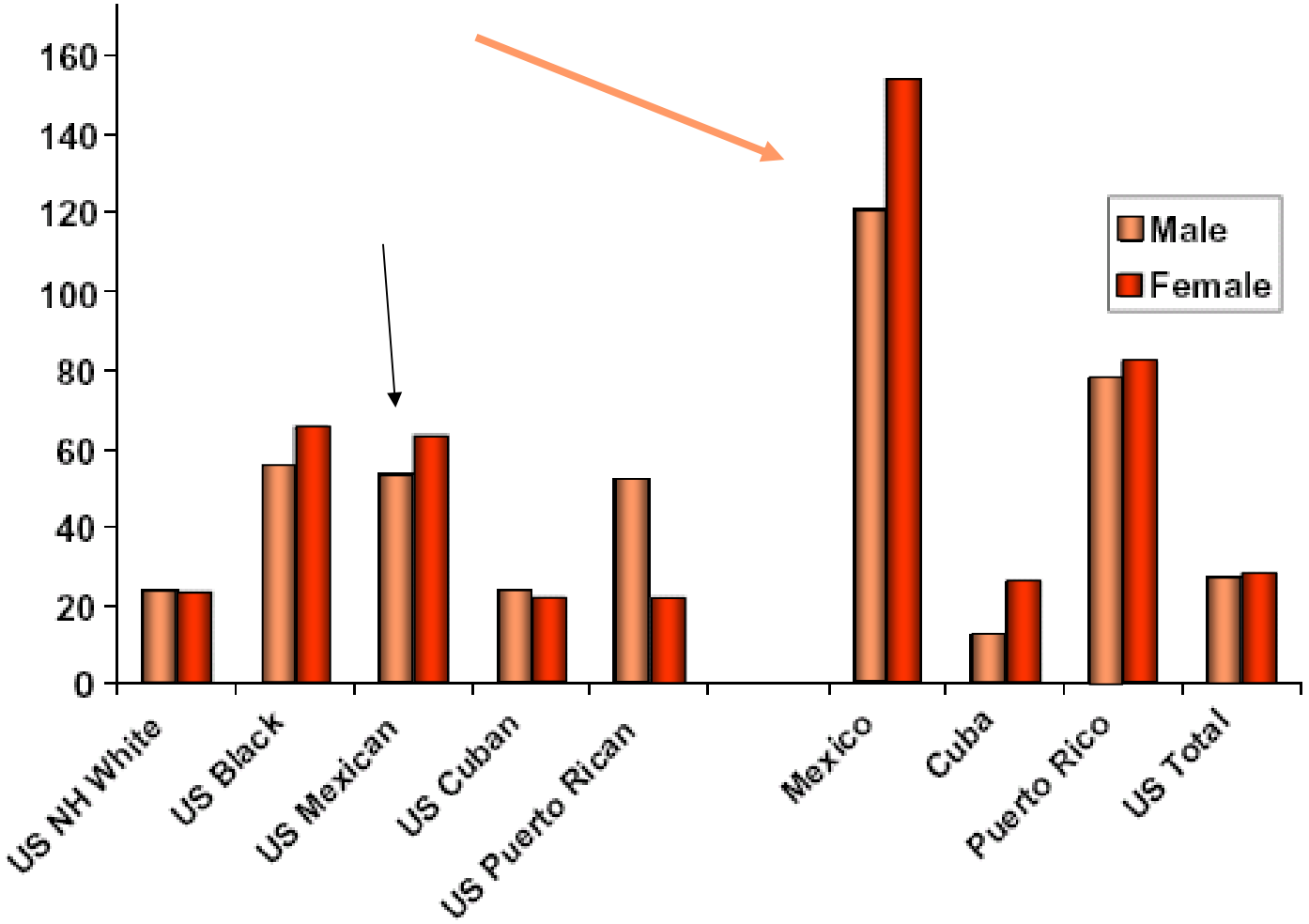
Cardiovascular diseases mortality in Cuba, Mexico, Puerto Rico and US Hispanic populations

Ramon Angel Durazo-Arvizu *, Simon Barquera, Manuel Franco, Mariana Lazo, Armando Seuc, Pedro Ordunez, Alberto Palloni, Richard S. Cooper

PROOF

Cardiovascular Epidemiology and Transition in LA

Diabetes Mellitus (DM) Mortality among Diverse Hispanic Groups



Source: Durazo-Arvizu RA, Barquera S, et al., Cardiovascular diseases mortality in Cuba, Mexico, Puerto Rico and US Hispanic populations, *Prev Control* (2006), doi:10.1016/j.precon.2006.10.004

Instituto Nacional de Salud Pública

Cardiovascular disease surveillance in Mexicans and Mexican Americans: a tale of two countries

Ramón Angel Durazo-Arvizu,[1]
Simon Barquera,[2]
Mariana Lazo-Elizondo,[3]
Manuel Franco,[3]
and Richard S. Cooper[1]

Suggested citation: Durazo-Arvizu RA, Barquera S, Lazo-Elizondo M, Franco M, Cooper RS. Cardiovascular disease surveillance in Mexicans and Mexican Americans: a tale of two countries. Rev Panam Salud Publica. 2008;23(2):119–24.

Diabetes Mortality in US, Mexico, Puerto Rico and Cuba

TABLE 1. Age-adjusted mortality rates from cardiovascular disease and diabetes in Mexico and the United States, 2000[a]

	United States			Mexico			Puerto Rico			Cuba		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
Heart disease (I05–I52)[b]	283	197	239	174	174	174	224	165	193	230	197	215
Coronary heart disease (I20–I25)[b]	212	133	172	126	105	116	151	103	126	182	149	167
Stroke (I60–I69)[b]	49	53	51	62	72	68	46	46	46	86	97	92
Total CVD (I00–I99)[b]	348	262	304	244	255	250	277	216	246	336	318	329
Diabetes (E10–E14)[b]	29	28	28	119	157	138	78	82	80	12	26	19
Total mortality from CVD and diabetes			332			388			326			348

[a] Rates per 100 000 population are adjusted to the adult (20–84-year) U.S. population for the year 2000 using the direct standardization method.
[b] Disease codes from WHO's ICD-10 (International Statistical Classification of Diseases and Related Health Problems, 10th revision).

Journal of Human Hypertension (2008), 1–10
© 2008 Nature Publishing Group All rights reserved 0950-9240/08 $30.00
www.nature.com/jhh

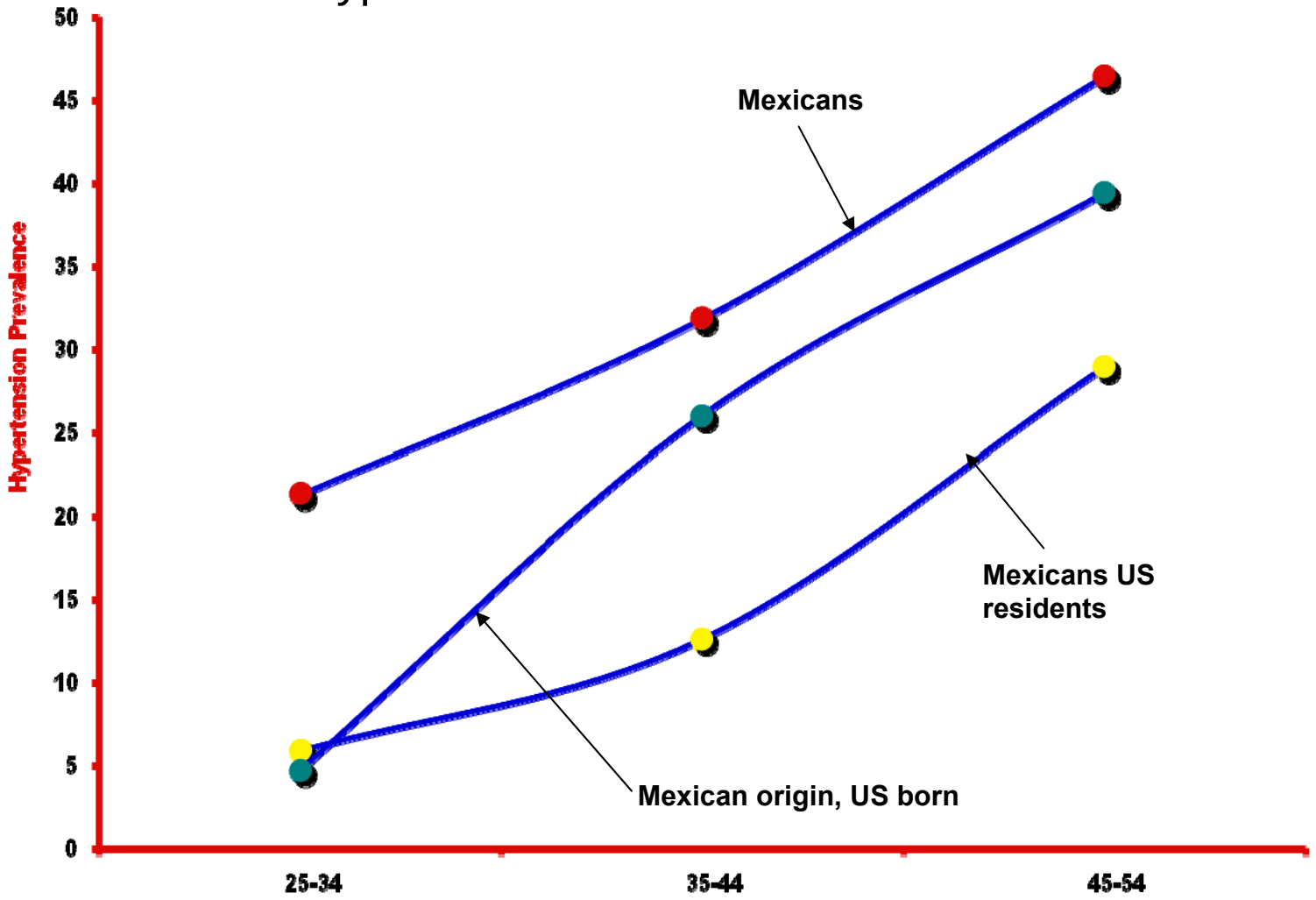
ORIGINAL ARTICLE

Hypertension in Mexico and among Mexican Americans: prevalence and treatment patterns

S Barquera[1], RA Durazo-Arvizu[2], A Luke[2], G Cao[2] and RS Cooper[2]
[1]*Instituto Nacional de Salud Pública, Cuernavaca, Morelos, México and* [2]*Department of Preventive Medicine and Epidemiology, Loyola University Medical Center, Maywood, IL, USA*

Cardiovascular Epidemiology and Transition in LA

Prevalence of Hypertension in Mexicans and Mexican-Americans



Source: Barquera S, Durazo R, Luke A, Cooper R. Hypertension in Mexico and among Mexican-Americans: prevalence and treatment patterns. *International J Hypertension* 2008

Instituto Nacional de Salud Pública

Successful Interventions: Population Based

North Karelia in Finland: Government program that reduced CVD diseases and NCDs mortality promoting consumption of fruits and vegetables and reducing consumption of fat (lifestyle modifications).

- Control of Trans Fatty Acids: Latin America (LA) has developed a network for research and advocacy to regulate and suppress trans fatty acids in industrialized foods.
- Caloric Beverages: Mexico and EUA proposed guidelines of beverages for a healthy lifestyle.
- School Environment: Most LA countries doing serious efforts to implement programs.
- Physical Activity Promotion: contextual determinants

Successful Interventions: Therapy

Effectively treating only four diseases could decrease substantially the burden of NCDs in LA:

Obesity, Hypertension, Type 2 DM, and Dyslipidemias

- Adequate HBP treatment can ⇩ deaths from stroke by 30%, ischemic heart disease by 20% and overall CVD mortality by 19%
- The relationship between HBP and CVD is continuous, consistent and independent of other risk factors
- Dyslipidemias account for 47% and 26% of strokes worldwide
- Reducing LDLc by 39 mg/dl with statins, coronary events can be reduced by 21%

Source: World Bank, 2007

Challenges: Improving Screening, Treatment and Control

- Technology to prevent obesity, HTA, and DM exists
- Effective lifestyle programs for the prevention of CVDRF have been documented.

However:

Adequate control of CVD risk factors is poor, thus adherence is the most important clinical challenge

Conclusion

- Latin America is experiencing and epidemiologic transition with an important increase in cardiovascular disease (CVD) mortality.
- Dietary sodium increases the risk of mortality and policies to decrease its consumption must be a priority.

Department of Chronic Disease and Diet

Research Center for Nutrition and Health

National Institute of Public Health

(Centro de Investigación en Nutrición y Salud, Instituto Nacional de Salud Pública / INSP)

Instituto Nacional de Salud Pública