Coronary Artery Disease among the Chinese in North America and What you can do about it

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Chair, Asian Task Force
American Heart Association

San Francisco, October 22, 2004
Twelfth Conference on Health Care of
The Chinese in North America
"Quality Care – Bridging the Gaps"

In Canada

"Chinese largest visible minority group, surpassing 1 million"

Canadian census 2001

Chinese was the largest visible minority group, surpassing one million for the first time. A **total of 1,029,400 individuals identified themselves as Chinese**, up from 860,100 in 1996.

They accounted for 3.5% of the total national population and 26% of the visible minority population.

Between 1996 and 2001, the number of Chinese increased 20%.

In the U.S.

"Chinese lead Asian tally"

Ryan Kim, SF Chronicle Staff Writer Wednesday, May 16, 2001

Energized by a continuous stream of immigration, the **Chinese American community increased by almost 800,000** nationwide in 10 years, cementing its position as the largest Asian ethnicity in the United States.

According to newly released 2000 US census data, **Americans of Chinese descent numbered 2.43 million in 2000**.

Plaque Rupture

New York Times March 21, 2004

“New Studies Question (long term) Value of Opening Arteries”

By GINA KOLATA

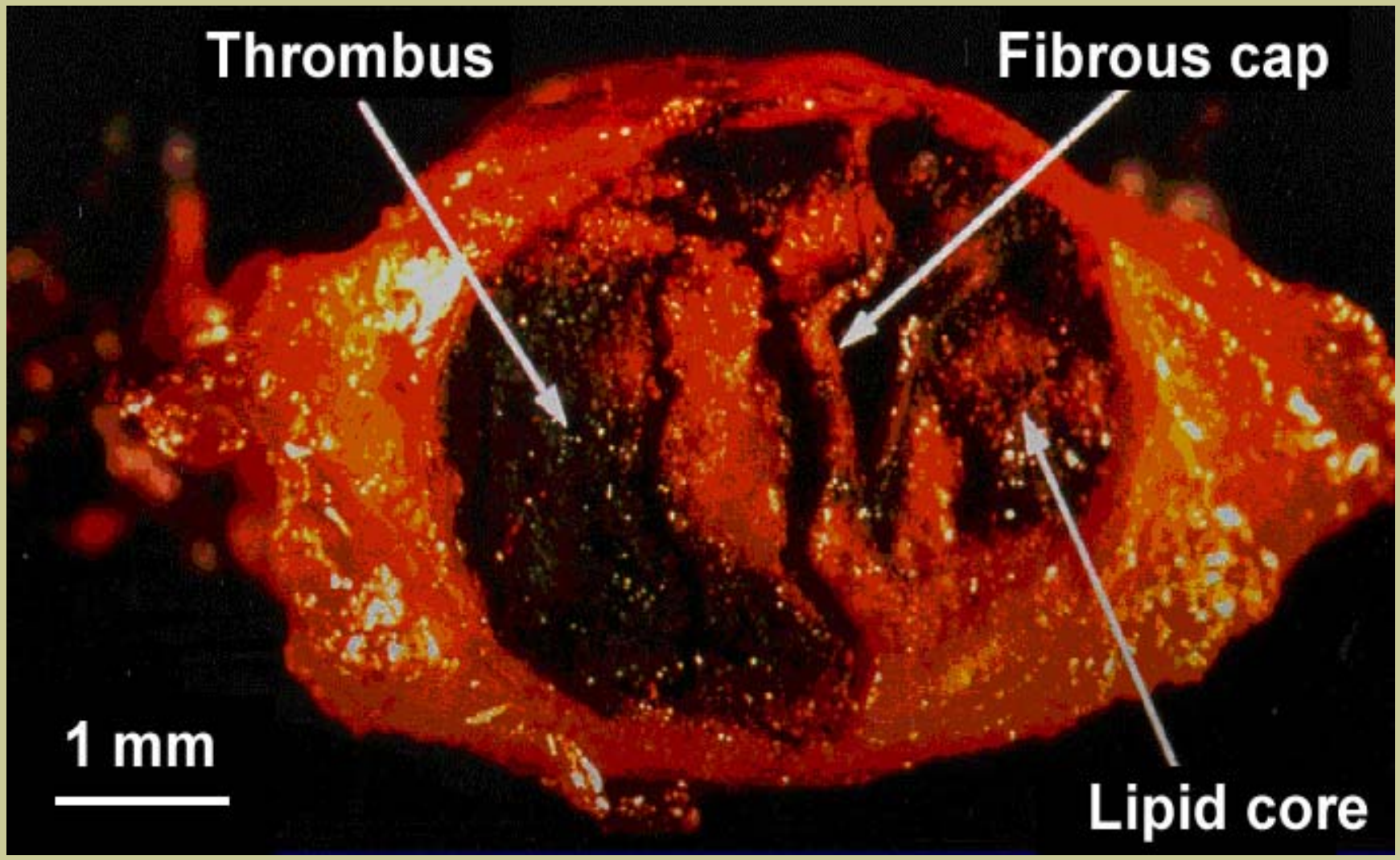
New and emerging understanding of how heart attacks occur indicates that increasingly popular aggressive treatments may be doing little or nothing to prevent them.

The artery-opening methods, like bypass surgery and stents, the widely used wire cages that hold plaque against an artery wall, can alleviate crushing chest pain. Stents can also rescue someone in the midst of a heart attack by destroying an obstruction and holding the closed artery open.

But the new model of heart disease shows that **the vast majority of heart attacks do not originate with obstructions that narrow arteries**.

Instead, recent and continuing studies show that a more powerful way to prevent heart attacks in patients at high risk is to adhere rigorously to what can seem like boring old advice — giving up smoking, for example, and taking drugs to get blood pressure under control, drive cholesterol levels down and prevent blood clotting.

Atherothrombosis: plaque rupture with thrombus occlusion.



Courtesy of Peter Libby, MD.

Plaque Rupture → Fatal Thrombosis

Patients	Age	n	Rupture	Study
Hospital, AMI	62 y	88	71 =81%	Bouch-1970
Hospital, AMI	66 y	91	68 =75%	Sinapius-1972
Hospital, AMI	67 y	49	40 =82%	Falk-1983
Med.exam, SCD	<70 y	61	39 =64%	El Fawal-1987
Coroner, SCD?	?	85	71 =84%	Richardson-1989
Hospital, AMI	63 y	20	12 =60%	van der Wal-1994
Coroner, SCD (all?)	?	202	143 =71%	Davies-1997, update
Hospital, AMI	69 y	291	218 =75%	Arbustini-1999
		887	662 = 75%	Europe
Hospital, ?	?	19	19 = 100%	Chapman-1965
Hospital, ?	?	17	17 = 100%	Constantinides-1966
Hospital, AMI+SCD	58 y	40	39 =98%	Friedman-1966
Coroner, SCD	53 y	20	19 =95%	Friedman-1973
Coroner, SCD	<65 y	32	26 =81%	Tracy-1985
Med.exam, SCD	48 y	125	74 =59%	Virmani-2000, update
		253	194 = 77%	USA

Plaque Rupture → Fatal Thrombosis

Asia: Japan ≈ China

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Hospital, AMI		**76**	**69 = 91%**	**Horie- Japan**
Hospital, AMI		**83**	**52 = 63%**	**Yutani- Japan**
Hospital, AMI		**61**	**56 = 92%**	**Shi- China**
Hospital, AMI		**100**	**81 = 81%**	**Kojima-China**
		320	**258 = 81%**	**Asia**
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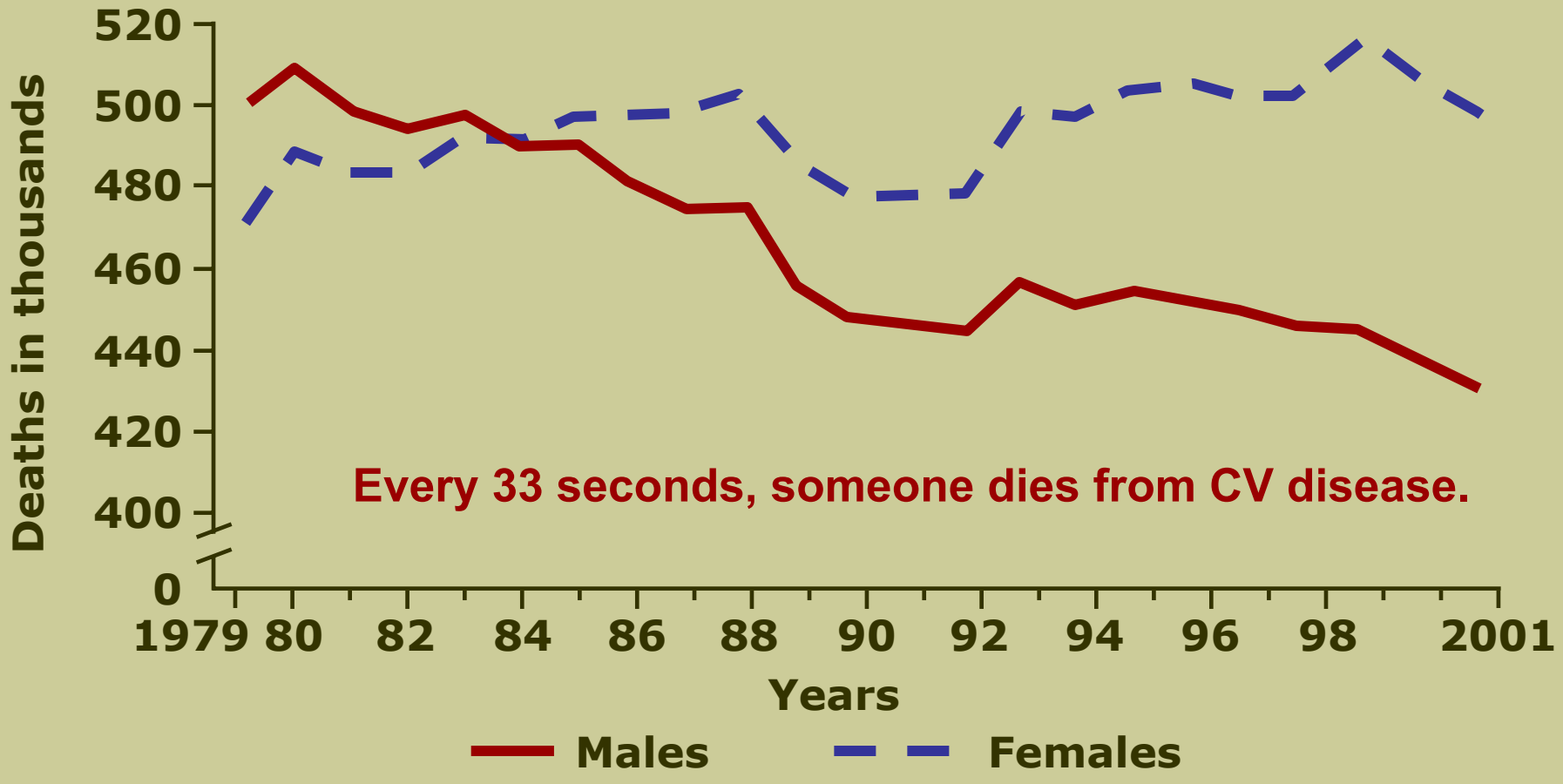
CVD Mortality Trends for US Males and Females



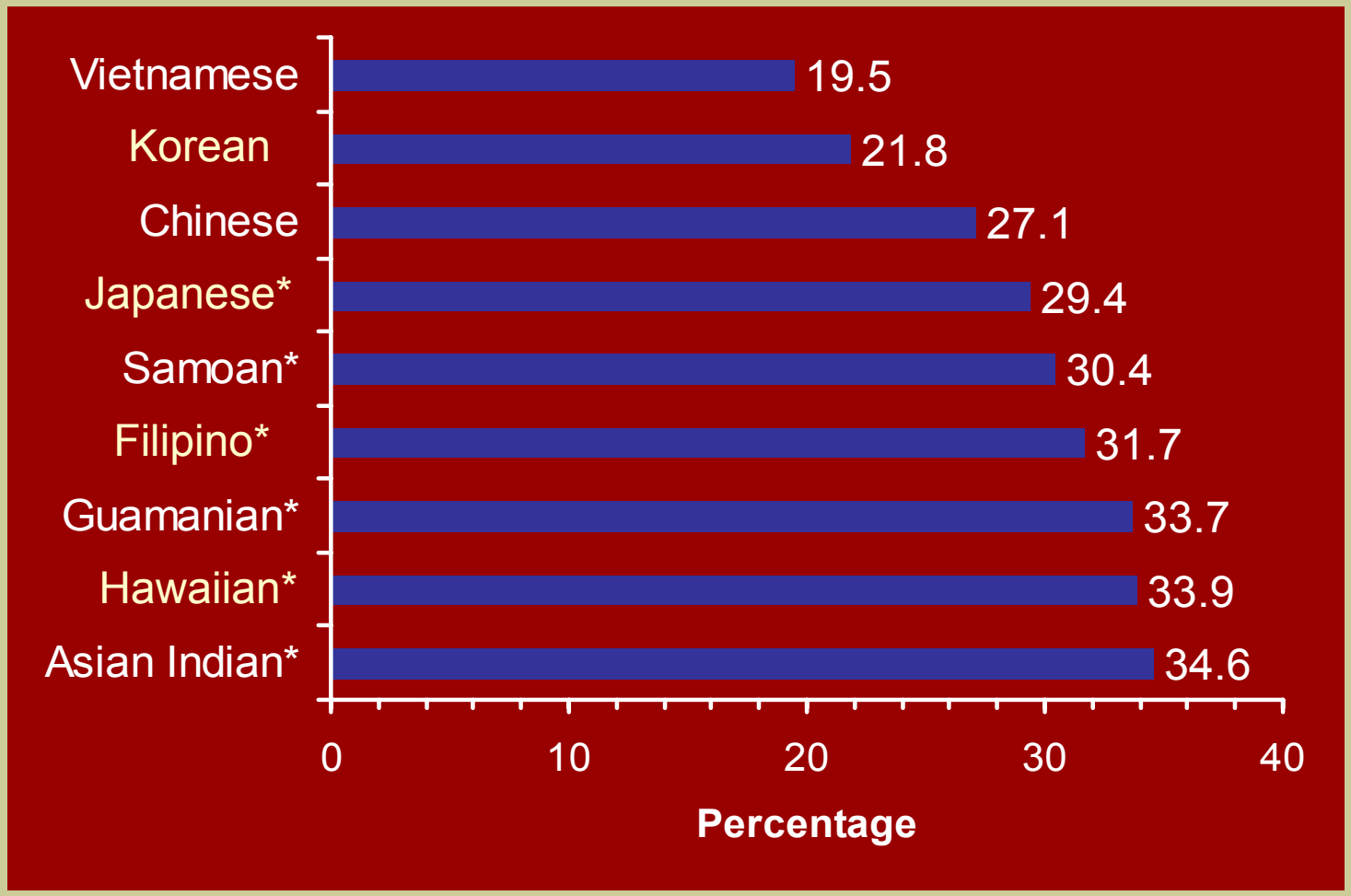
Source: CDC/NCHS.

The Westernization of Non-Europeans In North America

Heart Disease as Percentage of All Deaths

Source: National Vital System, CDC, NCHS, 1994.

CHD CAUSED MORE THAN 20% OF ALL DEATHS IN US in 2001.



* Leading cause of death

The human race adapted over millions of years to living in a world of scarcity, where it paid to eat everything good tasting in sight when you could find it.

The Thrifty Gene Hypothesis: Pima Indians in Arizona and northern Mexico

Arizona Pimas: 50% DM, 95% overweight

Mexican Pimas: 9% DM, not overwt

Am J Epidemiol. **1976** Sep; 104(3): 225-47.

Acculturation and coronary heart disease in Japanese-Americans.

Among men of Japanese ancestry, there is a gradient in the occurrence of coronary heart disease (CHD). It is lowest in Japan, intermediate in Hawaii, and highest in California.

To test the hypothesis that social and cultural differences may account for the CHD differences between Japan and the United States, 3809 Japanese-Americans in California were classified according to the degree to which they retained a traditional Japanese culture.

The most traditional group of Japanese-Americans had a CHD prevalence as low as that observed in Japan.

The group that was **most acculturated to Western culture had a three- to five-fold excess** in CHD prevalence.

This difference in CHD rate between most and least acculturated groups could not be accounted for by differences in the major coronary risk factors.

Obesity Gains on Smoking as Top Cause of U.S. Death

By Maggie Fox, Health and Science Correspondent WASHINGTON (Reuters) – March 9, 2004

Obesity is quickly catching up to smoking as the No. 1 cause of death in the United States.

A report from the Centers for Disease Control and Prevention showed tobacco use was still the leading cause of death in 2000, killing 435,000 people, or **18.1 percent of everyone who died.**

But poor diet and physical inactivity caused 400,000 deaths, or **16.6 percent of the total**, the report showed -- up from 300,000, or 14 percent of deaths, in 1990.

An estimated 129.6 million of adult Americans, or **64 percent of the population, are overweight or obese**, putting them at higher risk of heart disease, diabetes, some types of cancer and various forms of disability.

"In China, battling the girth of a nation"

Western fast foods and a changing lifestyle have meant more overweight Chinese youth - and weight-loss clinics.

By Christopher Johnson | Special to The Christian Science Monitor, January 14, 2002

SHANGHAI, CHINA –

Ho Fang is 20 years old and 265 pounds. And he's hungry.

During three years studying commerce among the barbecues and supermarkets of Melbourne, Australia, he gained 88 pounds.

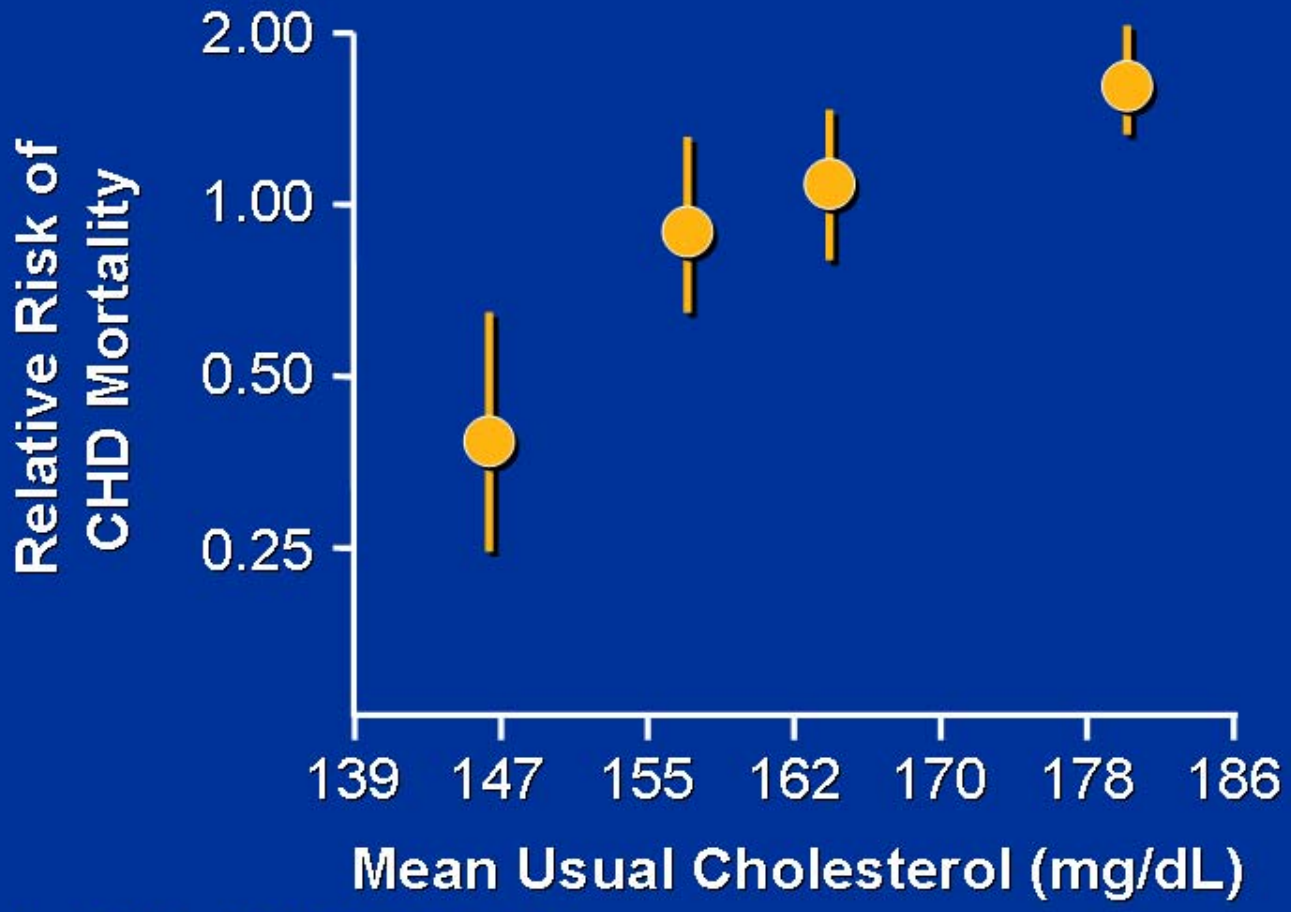
On his return to Beijing, his mother sentenced him to a regimen of 6 a.m. workouts at Shanghai's Xiang Shan hospital, which specializes in expensive cures for China's growing obesity problem.

After a long history of famine, the Chinese now have an emerging weight problem. Chinese health officials recently released a national health survey that said more than 10 percent of boys, and 5 percent of girls aged 7 to 18, were obese, roughly double the figures from 1995.

Another study released last year said 30 million Chinese over age 20 were overweight.

Cholesterol and CHD Mortality in a Low-Cholesterol Population

9021 Chinese 8- to 13-year follow-up



Chen et al. *BMJ*. 1991;303:276-282.

ATP III: The Metabolic (insulin resistance) Syndrome*

Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. *JAMA*. 2001;285:2486-2497.

Risk Factor	Defining Level
Abdominal obesity† (Waist circumference‡)	
Men	>102 cm (>40 in)
Women	>88 cm (>35 in)
TG	≥150 mg/dL
HDL-C	
Men	<40 mg/dL
Women	<50 mg/dL
Blood pressure	≥130/≥85 mm Hg
Fasting glucose	≥110 mg/dL

*Diagnosis is established when ≥3 of these risk factors are present.

†Abdominal obesity is more highly correlated with metabolic risk factors than is ↑BMI.

‡Some men develop metabolic risk factors when circumference is only marginally increased.

CV Risk Factors For Asian Americans

Hypertension: In 1995, 15.7 percent of Asian Americans in Massachusetts reported to have never checked their blood pressure, compared to 5.5 percent of the total State population (MA Dept. of Public Health, 1996).

Cholesterol: In 1993, only 44 percent of AAPIs had their blood cholesterol levels checked within the past 2 years compared to 54 percent of the total population (NCHS, 1993).

Smoking: In 1998 although rates for smoking in the United States are reported to be lowest among AAPIs (18.2 percent), ethnic-specific data show that that 92 percent of Laotians, 71 percent of Cambodians, and 65 percent of Vietnamese smoke (CDC).

Exercise: In 1994, Korean Americans are less likely to exercise at least once in the past month than general Californian population (69 percent vs. 79 percent). This study defined "exercise" as moderate physical activity (30 minutes a day, 3 days a week) (Wismer).

Weight: 2000 WHO redefined BMI for Asians <23; (<25 for the rest of the world). Waist: M 90 cm or 36 inches (102), F 75 or 30 inches (88) cm defines part of the metabolic syndrome.

"Fat pre-teens have arteries of middle-aged smoker" Sharon Kirkey **CanWest News Service**

Tuesday, April 06, 2004

OTTAWA -- Overweight pre-teens have the thick, stiff arteries of a 45-year-old smoker, according to new research that shows there's more going on with fat children than doctors may realize.

Rapid Access Publication in Circulation: Kam S Woo MD, et al. 54 boys, 28 girls, average age 9.9y, 28 overweight, 54 obese. Carotid IMT and brachial artery reactivity measured: 3-5X more like to have heart attack or stroke before age 65.

Treatment: **Diet and exercise** vs diet alone; at 12 months, former group had significantly less carotid wall thickening, more improvement in body fat and lipid measures, and improved brachial artery reactivity.

Emergence of the metabolic syndrome in childhood: an epidemiological overview and mechanistic link to dyslipidemia.

Clin Biochem. 2003 Sep;36(6):413-20. Kohen-Avramoglu R, Theriault A, Adeli K.
Department of Laboratory Medicine and Pathobiology, Hospital for Sick Children, University of Toronto, Toronto, Ontario, Canada

Insulin resistance and type 2 diabetes are rapidly emerging as major disorders of childhood and adolescence.

This appears to be closely linked to a rapid rise in the prevalence of obesity in the pediatric population.

The development of insulin resistance appears to lead to a "metabolic syndrome" which includes a number of major complications such as dyslipidemia and hypertension.

Childhood metabolic syndrome promotes the development of premature atherosclerosis and significantly increases cardiovascular disease risk early in life.

Olijhoek JK, Van Der Graaf Y, Banga JD, Algra A, Rabelink TJ, Visseren FL; For the SMART Study Group.
Eur Heart J. 2004 Feb;25(4):342-8

"The Metabolic Syndrome is associated with advanced vascular damage in patients with coronary heart disease, stroke, peripheral arterial disease or abdominal aortic aneurysm."

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Diabetes. 2004 Apr;53(4):1068-73. Holvoet P, et al, Center for Experimental Surgery and Anesthesiology, Catholic University, Leuven, Belgium.

The metabolic syndrome, circulating oxidized LDL, and risk of myocardial infarction in well-functioning elderly people in the health, aging, and body composition cohort. (n = 3033)

We observed that the metabolic syndrome was associated with higher levels of oxLDL due to a higher fraction of oxLDL, not to higher levels of LDL cholesterol.

Individuals with the metabolic syndrome had twice the odds of having high oxLDL (>1.90 mg/dl) compared with those not having the metabolic syndrome, after adjusting for age, sex, ethnicity, smoking status, and LDL cholesterol.

Among those participants who had the metabolic syndrome at study entry, incidence rates of future CHD events were 1.6-fold higher, after adjusting for age, sex, ethnicity, and smoking status. OxLDL was not an independent predictor of total CHD risk.

However, those with high oxLDL showed a greater disposition to myocardial infarction (relative risk 2.25, 95% confidence interval 1.22-4.15).

We concluded that the metabolic syndrome, a risk factor for CHD, is associated with higher levels of circulating oxLDL that are associated with a greater disposition to atherothrombotic coronary disease.

Relationship of Metabolic Syndrome and Fibrinolytic Dysfunction to Cardiovascular Disease

Circulation, 2003; 108:420-425.

Sonia S. Anand, MD, PhD; Qilong Yi, MSc; Hertzel Gerstein, MD; Eva Lonn, MD; Ruby Jacobs, RN; Vlad Vuksan, PhD; Koon Teo, MBBS; Bonnie Davis, RN; Patty Montague, MSc; Salim Yusuf, DPhil.

***Methods and Results*—**randomly sampled 1276 adults of South Asian, Chinese, European, and Native Indian ancestry from 4 communities in Canada.

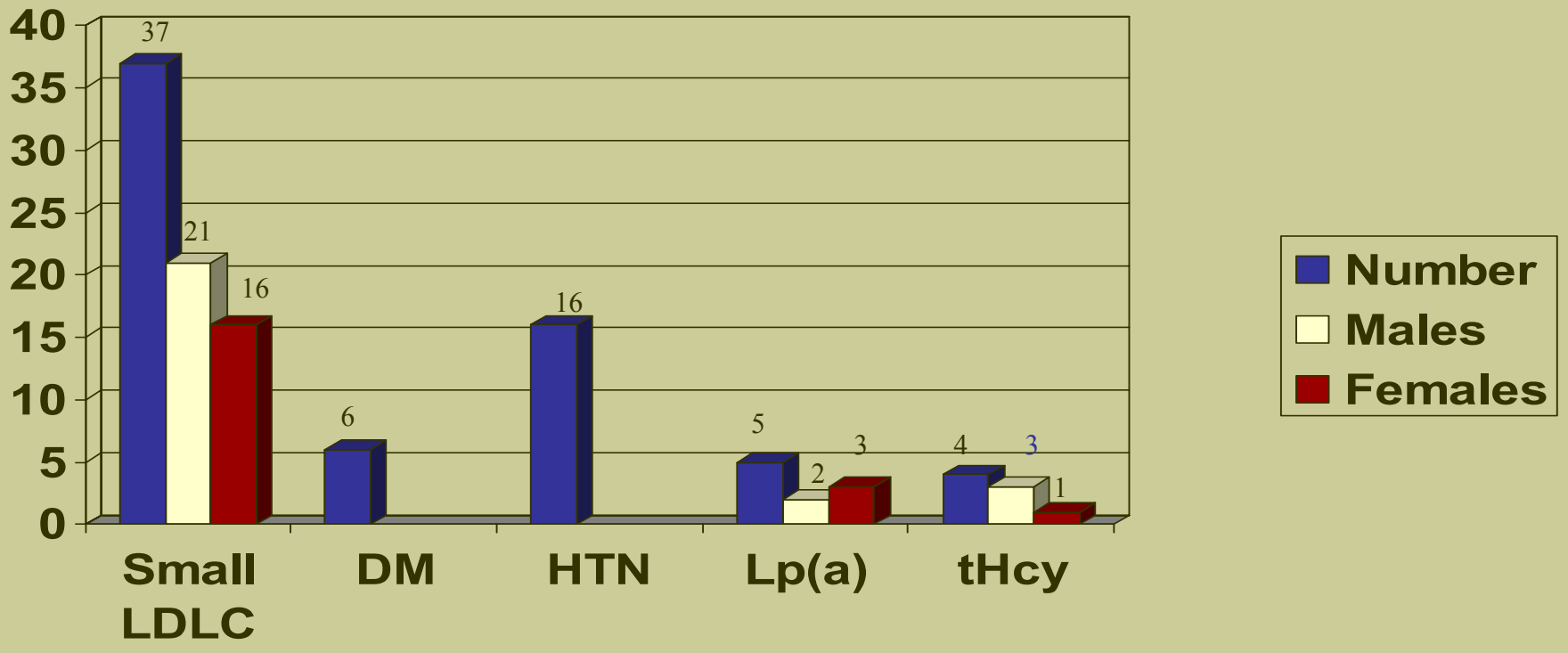
The prevalence of the metabolic syndrome was 25.8% (95% CI, 23.5 to 28.2) and varied substantially by ethnic group: 41.6% among Native Indians, 25.9% among South Asians, and 22.0% among Europeans, compared with **11.0% among the Chinese** (overall, *P*=0.0001).

People with the metabolic syndrome had more atherosclerosis compared with levels among people without the metabolic syndrome.

Disorders other than LDLC are present in Chinese living in Los Angeles

N=49, ages 16-88, 25M, 24F, 29 with AS (CAD, CVD, PVD)

(Guangdong 38, Shanghai 2, Zhejiang 2, Shandong 1, Liaoning 1, Fujian 1)



Wong MJ, Abstract, 9th International Conference on Health Problems related to the Chinese in North America, August 22, 1998, Los Angeles

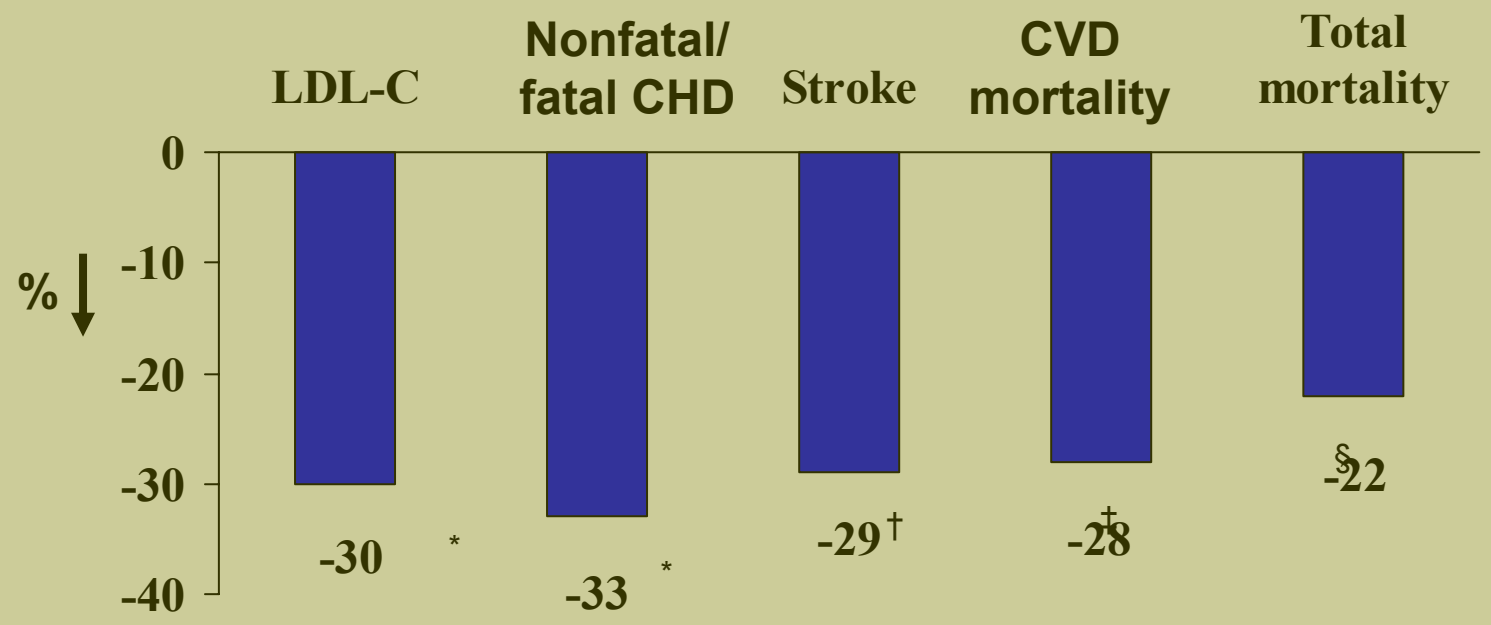
Healthy Chinese Families Screening as of February 4, 2004

Unpublished data, American Heart Association, Western States Affiliate, Chinese Heart Council of Los Angeles

10 sites (8 churches, 2 markets)

BP (>140\90), 295 of 1026: 28.75%
Weight (BMI >23), 180 of 369: 48.8%
Pre-diabetes (FBS 100-124), 96 of 885: 10.85%
Diabetic (FBG >125), 3.2%
Cholesterol (>200), 77 of 938: 8.21%.
Men
Women
Ages\age groups

Impact of Lowering LDL-C on CVD Events and Total Mortality



*Confidence interval (CI) not reported.
†95% CI, 14%-41%.
‡95% CI, 16%-37%.
§95% CI, 12%-31%.

Hebert PR et al. *JAMA*. 1997;278:313-321.

Statins Reduce Stroke

- 24% reduction in meta-analysis of 28 randomized controlled studies: 49,477 subjects.

Bucher, et al, Ann Intern Med, 1998 June 15; 128(2):89-95.

- 29% reduction in meta-analysis of 16 randomized controlled studies: 29,000 subjects.

Hebert et al, JAMA, 1997 July 23:278(4):313-321.

- Superior doctors prevent disease.
- Mediocre doctors treat the disease before evident.
- Inferior doctors treat the full-blown disease.

--Huang Dee: Nai-Ching (2600 BC 1st Chinese Medical Text)

What you can do about heart disease for Chinese living in North America

Counsel patients on:

Avoiding smoking and second hand smoke.

Lowering weight to BMI 23, not 25.

Exercising daily (3 ten minutes sessions gives same benefit as 30 minutes daily).

Seeking out and controlling hypertension, ideally 120\80.

Lowering LDLC to about 60.

Screening for pre-diabetes (FBS 100-125) besides diabetes (126 or higher) to start earlier interventions.

Reducing the amount of simple sugars (carbohydrates) in diet not exceeding 75 gm per day. (Some patients may need to stop eating rice.)