

The 12th Conference on Health Care of the Chinese in North America

Hypertension in the Chinese Population

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Little has been published regarding the prevalence, treatment, and outcomes of hypertension in the Chinese in the United States. In fact, much more has been addressed in China than in this country. Using similar statistical techniques and data-collecting methods to the NHANES studies in the United States, the InterASIA Group provided useful data on hypertension in China.

- Overall, 27.2% of adults ages 35-74 years old have blood pressures of greater than 140/90 mm Hg, i.e., 1.3 billion people in China are hypertensive. In the age group of 65-74, 47.3% of men, and 50.2% of women have hypertension. Of those, 44% were aware, 28.2% were on medication, and only 8.1% were controlled. This compares to an average of 34% control, in this country, of all hypertensives. Studies also showed a marked disparity of prevalence between the northern Chinese (33.8%) and the southern Chinese (23.3%)
- Substantial increases in blood pressure occurred at every age and in both males and females between the years 1991 to 2001 (Fig.1). Hypertension is responsible for greater than 50% of all deaths and stroke in China
- There are more than 1 million deaths from stroke each year.

EPIDEMIOLOGY: UNITED STATES

The Chinese outnumber any other Asian group living in the United States (Fig. 2). In 1998, 142,000 people immigrated from China to North America. This is the largest of any ethnic group (Fig. 3). This represents a figure even higher than that for Hispanics, although the numbers for this ethnic group are less reliable! It is extraordinary that we know more about smoking patterns in the different ethnic groups in the United States than we do about hypertension (Fig. 4).

The genetics of hypertension in any ethnic group are diverse. This has been well studied in the Chinese, and appears to be frustrating, in that no single locus has been impuned³. The largest study of hypertension in Asians has been presented at a satellite symposium of the American Heart Association by the Kaiser Permanente Group. (See attached abstract kindly permitted by Dr. Arthur Klatske, senior author to present this data).

Much has been published about the prevalence of hypertension, the difficulties in control, and the poor outcomes in African Americans. Notoriously high morbidity and mortality rates from stroke, congestive heart failure, and renal failure, and myocardial infarction, are duly reported⁴. Prospective data for Asians presented by Ananthkrishnan, et al, from the Kaiser study, is as follows: Of 19,237 patients who were normotensive in 1978 to 1985

(53% Caucasian, 24% African American, 6.9% Chinese, and 4.4% Filipino, 6.2% Hispanic), 1,275 became hypertensive. The relative risk for developing hypertension in the Chinese vs. the Caucasians was 2.0 with a p-value of < 0.001. For comparison, the Filipino women had the highest risk of developing hypertension of 3.4, with a P-value of 0.0001.

Hypertension and other risk factors in various ethnic groups presenting with coronary artery disease for intervention. In our studies at the San Francisco Heart and Vascular Institute, we have studied five ethnic groups, their risk factors and outcomes after coronary intervention, either with coronary artery bypass grafting, or percutaneous intervention. (Please see paper attached). Because of the high prevalence of Asians in San Mateo County, we have a large Asian contingent.

We have previously published specifically on Filipinos, and therefore made them into a separate group. Other Asians were comprised mostly of Chinese, in fact more than 80%.

Four thousand two hundred and forty-six patients were followed for a mean period of sixteen months following intervention. Short-term and long-term outcomes were evaluated based on ethnicity, and clusters of risk factors. In Asians, 75% were hypertensive, 67.5% had hypercholesterolemia, and 30% had diabetes.

Asians had the lowest composite score of risk factors, nevertheless, early and late and morbid events were similar in all groups except for the African Americans, who had the worst outcomes with the highest clusters of risk factors. Thus, the lowest cluster score did not protect the Chinese. Frequent reasons given for this are smaller, more difficult to work with blood vessels, either by PCR or surgically, and later presentation in the course with more advanced disease. The smaller number of Asians in our study also could lead to some statistical bias.

PREVENTION AND TREATMENT

Contrary to the African American group, in whom certain drugs, i.e., beta blockers and ACE inhibitors, are less effective, and in others thiazides are more effective, there is no data to suggest that treatment of Asians is any different than treatment of Caucasians for hypertension. Few have studied this, and there are no good prospective trials.

In my own experience with large numbers of Asians seen at the office, all categories of medication are effective, and have the same side effects. Thiazides and beta blockers are recommended by JNC-7, but few seem to be following that advice. Calcium channel blockers are effective, as are ACE inhibitors, and angiotensin receptor blockers. The caveat for the Asian population, which includes the Chinese, similar to lipid disorders, is that a lower dose of medication should be used to start.

It has also been found, I think globally, that cough associated with ACE inhibitors is more frequent in the Asian population, particularly in Asian women.

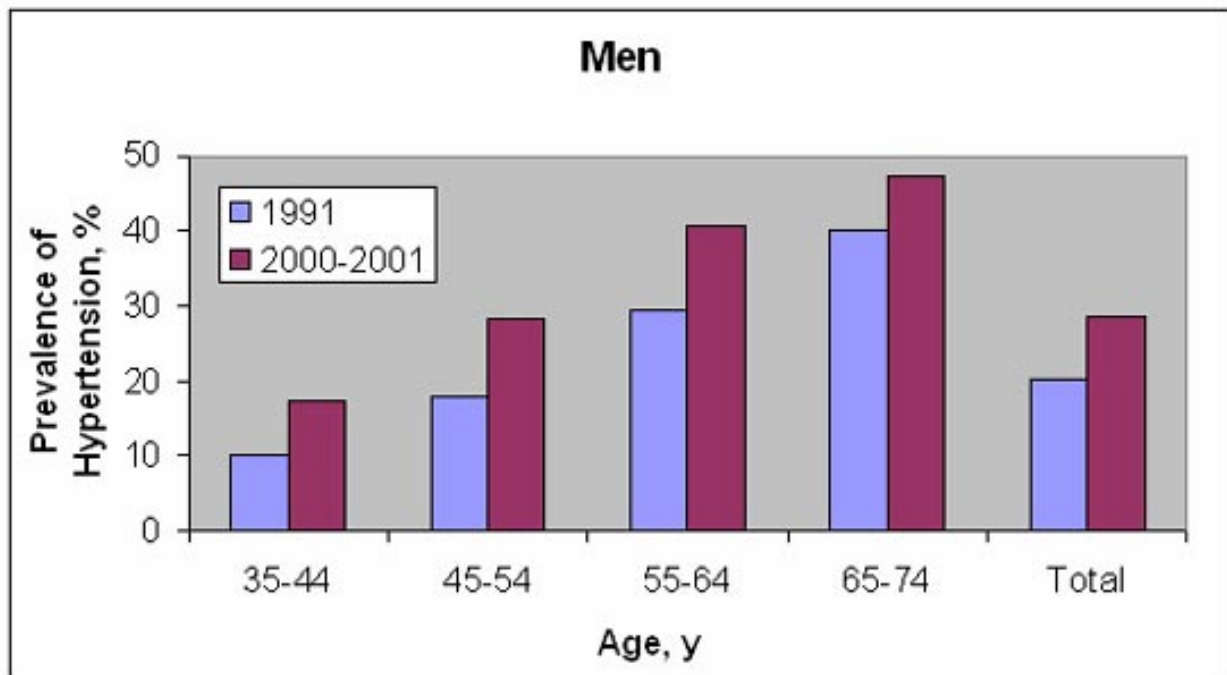
We await good prospective trials for outcomes in relation to treatment of hypertension in Chinese, and for some researchers to pay some attention to treatment outcomes as much in this country as appears to occur in China itself.

REFERENCES

1. Gu D, Reynolds K, et al; InterASIA Collaborative Group. The International Collaborative Study of Cardiovascular Disease in ASIA. Prevalence, awareness, treatment, and control of hypertension in China. *Hypertension* 2002 December;40(6):920-7.
2. Reynolds K, Gu D, et al; InterASIA Collaborative Group. Geographic variations in the prevalence, awareness, treatment, and control of hypertension in China. *J Hypertension* 2003,21:1273-1281.
3. Chen C-H, Lin K-C, et al. Different association of hypertension and insulin-related metabolic syndrome between men and women in 8,437 nondiabetic Chinese. *AJH* 2000,13:846-853.
4. Ananthakrishnan S, Guidry U, et al; Kaiser Permanente Medical Care Program, Oakland, CA. A cohort study of risk of hypertension in Asian American ethnic groups.

Figure 1

Prevalence of hypertension among Chinese, ages 35 to 74 years, in the 1991 Chinese National Hypertension Survey 12 and 2000-2001 InterASIA.



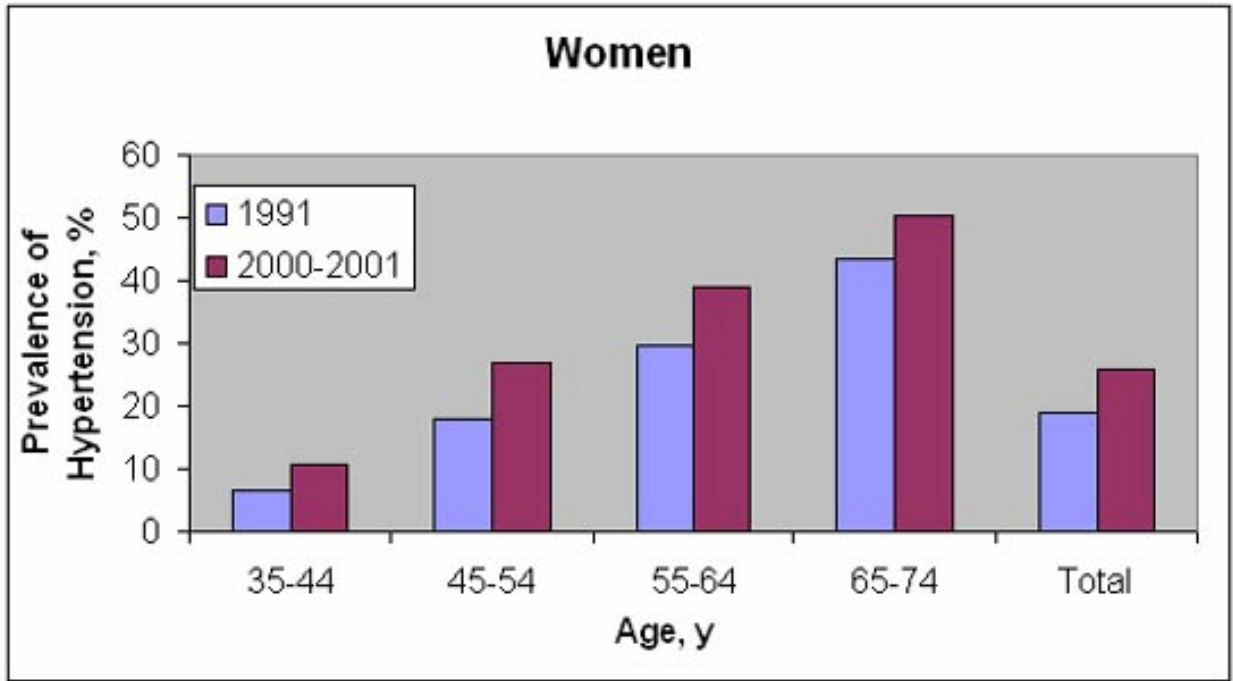


Figure 2

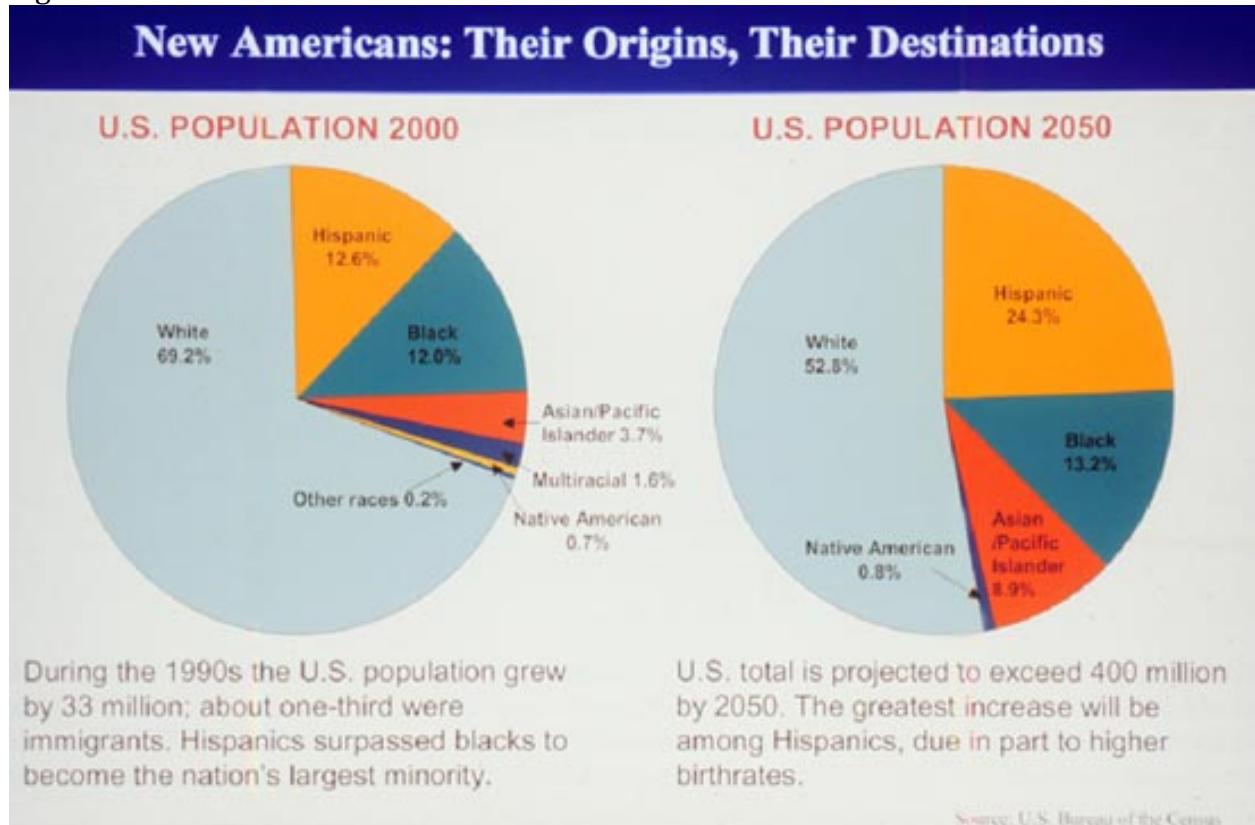


Figure 3

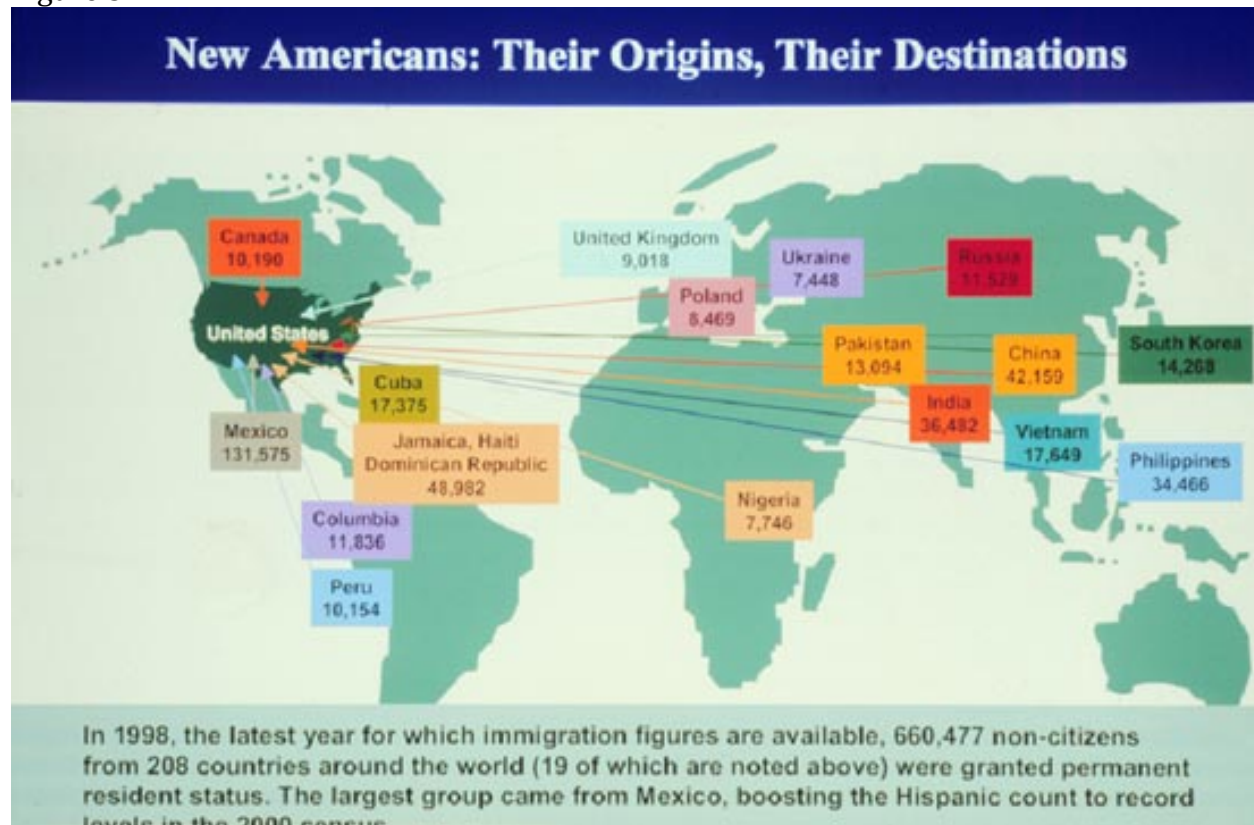


FIGURE 4

Percent smokers, USA, age greater than 18 years, 1999-2001

	Male %	Female %
White	29.1	25.9
Black	30.1	22.2
American Indian	40.9	40.0
Chinese	19.3	5.9
Japanese	18.3	?
Asian Indian	20.0	3.0
Hispanic	29.2	17.3

A Cohort Study of Risk of Hypertension in Asian American Ethnic Groups

Shubha Ananthakrishnan, Ursula Guidry, Natalia Udaltsova and Arthur L. Klatsky, Kaiser Permanente Medical Care Program, Oakland CA

African American ethnicity is an established predictor of increased risk of hypertension (HTN), but prospective data are sparse with respect to HTN risk among Asian Americans. We studied 19,237 members of a prepaid health plan who, at routine health examinations in 1978-85, were free of HTN history or treatment and had "optimal" blood pressures (< 120/80 mmHg) and who remained members of the plan in 1995. These persons classified themselves ethnically on a questionnaire as follows: 52.5% White, 24.0% African-

American, 6.9 % Chinese, 1.7 % Japanese, 4.4% Filipino, 0.7% South Asian, 1.0% other Asian, 6.2% Hispanic, and 1.8% Mixed/Other. From 1995-2000 an out-patient diagnosis of HTN was made in 1275 of these subjects. Predictors of HTN were studied by logistic regression with age, sex, body mass index, education, cigarette smoking, baseline blood pressure and marital status as covariates. With whites as reference, multivariate relative risks (95% CI) of HTN follow: African-Americans = 2.3 (2.0,2.6, p < 0.001), Hispanics = 1.2 (0.9,1.3), all Asian-Americans = 2.3 (1.9,2.7, p = <0.001), Chinese = 2.0 (1.6-2.5, p < 0.001), Japanese = 1.8 (1.2,2.7, p < 0.01), Filipinos = 3.1 (2.4,3.9, p<0.001), South Asians = 1.6 (0.8-3.3), Other Asians = 2.1 (1.2,3.6, p<0.01), Mixed/Others =1.4 (0.9,2.2). These ethnic differences in relative risk of HTN were generally similar in men and women and also in persons < 40 years of age or > 40 years of age at baseline examination. Filipino women had the highest HTN risk of any sex-ethnic subset, with relative risk = 3.4 (2.5,4.5). Covariates predictive of increased HTN risk included increasing age, female sex, body mass index, married (vs. never married) status, cigarette smoking, and level of blood pressure. The covariates had generally similar relations to HTN risk in each ethnic group. These data: 1)show that all Asian-American ethnic groups, but especially Filipino-Americans, have increased HTN risk, and 2)point to an evident public health need to focus on HTN prevention and treatment among Asian-Americans.

CLUSTERING OF RISK FACTORS IS ASSOCIATED WITH POORER LATE OUT COMES IN DIFFERENT ETHNIC GROUPS PRESENTING FOR TREATMENT OF CORONARY ARTERY DISEASE

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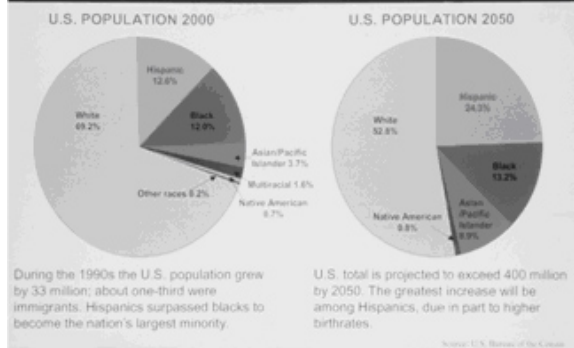
San Francisco Heart Institute
 Seton Medical Center
 Daly City, California, USA

Demographic Change, San Mateo County (as Indicated by 1990 & 2000 Census Data)

Race/Ethnicity	Population (% Total) 1990	Population (% Total) 2000	Total Change 1990 - 2000	(%) Change 1990 - 2000
White	393,088 (60.5)	352,355 (49.8)	-40,733	-10.4
Hispanic	114,627 (17.6)	154,708 (21.9)	+40,081	+35.0
Asian/PI	105,599 (16.2)	149,425 (21.1)	+43,826	+41.5
Black	34,000 (5.2)	23,778 (3.4)	-10,222	-30.1
Nat. American	2,349 (0.4)	1,546 (0.2)	- 803	-34.2
Other	NA	2,217 (0.3)	-	-
≥ 2 Races	NA	23,132 (3.3)	-	-
Total	649,623	707,161	+57,538	+8.9



New Americans: Their Origins, Their Destinations



Purpose

To evaluate the interplay between cardiac risk factors, ethnicity, specific interventions used to treat coronary artery disease, and long-term outcomes in patients being treated with either percutaneous coronary intervention (PCI) or coronary bypass surgery (CABG)

Methods

- Retrospective analysis of prospectively collected data at the San Francisco Heart Institute at Seton Medical Center from January 1, 1995 through December 31, 1999
- 4,246 consecutive patients included
- 5 ethnic groups defined for the purposes of analysis (Caucasian, African-American, Asian, Hispanic and Filipino)
- Long-term follow-up data collected from both patients and responsible physician via mail and/or telephone using a standard questionnaire
- All continuous data expressed in terms of mean \pm S.D.

Comparison of Risk Factors

Factor	Caucasian	African-American	Asian	Hispanic	Filipino
Hypertension	85.0%	81.5%	74.5%	71.8%	80.8%
Elevated Chol.	85.0%	82.3%	87.5%	84.7%	88.3%
Diabetes	26.8%	38.3%	30.2%	48.5%	40.0%
Hx of COPD	13.1%	6.5%	5.9%	7.5%	8.0%
Periph. Vasc. Dis.	12.0%	16.5%	3.4%	9.3%	4.0%
Hx of Renal Failure	5.5%	9.6%	9.4%	7.5%	9.3%
Obesity	14.1%	11.7%	4.5%	11.8%	3.8%
Current Smoker	25.9%	31.2%	20.2%	22.0%	20.9%

Methods (continued)

- Chi-square and means test used for univariate analyses of categorical and continuous variables
- Logistic Regression used to analyze multivariate relationships of factors to in-hospital outcomes
- Cox Proportional Hazard Regression Analysis used to analyze multivariate associations among patient risk factors, ethnicity, type of treatment utilized and long-term outcomes
- A minimum value of $p < 0.05$ used for all tests of statistical significance
- All data stored in HeartBase (SIR Americas, Inc., Chicago) and statistical analyses performed using SPSS 10.07 (SPSS Inc., Chicago)

Treatment Outcomes

PCI*	Caucasian	African-Am.	Asian	Hispanic	Filipino
Post Lab MI	0.9%	1.4%	1.1%	1.5%	1.5%
Death	2.3%	1.4%	2.1%	0.8%	2.0%
Return to Lab	3.1%	7.0%	1.1%	6.1%	2.8%
LOS	4.4 \pm 4	3.6 \pm 3	3.8 \pm 3	4.7 \pm 4	4.8 \pm 4
CABG*					
Post OR MI	0.8%	2.9%	0%	0%	0.4%
Death	2.7%	1.9%	2.4%	2.9%	4.3%
Return to OR	2.9%	1.9%	3.0%	2.9%	2.7%
Post Surg. LOS	6.1	6.7	6.6	6.7	7.6
Overall LOS	6.5 \pm 6	6.6 \pm 6	6.9 \pm 8	7.2 \pm 7	8.4 \pm 7

*No statistically significant differences except for Post Surgery LOS

Patient Ethnic Groupings

Ethnic Group	N	% of Sample
Caucasian (C)	2,815	66.3%
African-American (AF)	169	4.0%
Asian (A)	260	6.1%
Hispanic (H)	440	10.4%
Filipino (F)	562	13.2%

Late Outcomes

Mean Time to Follow-Up 14 ± 12 months

Outcome	Caucasian	African-Am.	Asian	Hispanic	Filipino
Late MI*	1.5%	7.4%	1.5%	2.5%	1.8%
Late Revasc.*	11.1%	29.6%	15.5%	12.3%	14.5%
PCI	9.4%	16.2%	14.5%	9.0%	10.8%
CABG	3.1%	6.6%	3.0%	5.2%	5.4%
Late Death	5.0%	7.4%	6.0%	5.2%	4.5%
N	2328	126	197	356	434

*p<0.01 for African-American vs. Other Ethnic Groups

Predictors of Late Revascularization

(Cox Proportional Hazards Model)

Factor	Regression Coefficient	Significance
Initial CAD Rx PCI	6.2	0.0001
Diabetes	4.7	0.03
MI within 24 hrs.	2.9	0.09
Hx of Remote MI	2.2	0.14
Ethnicity	1.4	0.24
Unstable Angina	1.2	0.29

Summary

Risk factors at presentation differed as follows:

- Caucasians had a higher incidence of obesity, COPD, family hx of CAD and remote MI
- African-Americans were more frequently female, smokers and a higher incidence of PVD, current MI and renal failure
- Asians had a very high incidence of UA
- Hispanics had the highest incidence of Diabetes and Class IV Angina
- Filipinos had the highest combination of risk factors and a high incidence of Diabetes

Need for repeat revascularization was predicted only by PCI and the presence of Diabetes. African-Americans were more likely to have late MI or repeat revascularization.

Composite Score of Risk Factors

<u>Ethnic Group</u>	<u>Score</u>
African-Americans	214
Hispanic	205
Asian	192
Caucasian	184
Filipino	174

Summary (con)

- African-Americans had the highest composite risk score and the worst late outcomes in every category

Implications

Ethnicity plays a major role in the presentation of patients with coronary disease. Isolated, and clusters of risk factors seem to determine the propensity for heart disease.

Identifying these risk factors early by education and discovery is key in prevention. Early treatment of hypercholesterolemia, hypertension and Diabetes in addition to smoking cessation would probably have a major impact on prevention of coronary disease.

This effort seems particularly urgent in the minority groups – of which 30% present with Diabetes. Coronary artery bypass should be favored in the Diabetic patients.