

The Strong Heart Study (SHS)

Cross-Cohort Collaboration attendees

March 7, 2015

- Shelley Cole, Ph.D.
 - SHS Steering Committee Chair and P.I. of the SHS Genetics Center at Texas Biomed in San Antonio
- Barbara Howard, Ph.D.
 - P.I. Arizona Field Center and Specimen Lab and former Chair of the SHS Steering Committee
- Amanda Fretts, Ph.D., MPH
 - SHS collaborator, University of Washington

The Strong Heart Study (SHS)

Key features

- Largest (~7,600 participants) and longest running (since 1988) study of American Indians, from 3 centers (AZ, OK, N.&S. DA) in the U.S.
- SHS cohort
 - 4500 American Indians aged 45-74
 - 3 exams over 10 years, ongoing surveillance
- Strong Heart Family Study (SHFS)
 - 3,800 members of extended pedigrees, aged >14
 - 2 exams, ongoing surveillance

A Cross-Cohort Collaboration to Better Characterize Race/Ethnic Diversity in Risk Factors & Clinical Characteristics of Heart Failure

Mandy Fretts, PhD MPH
on behalf of the Strong Heart Study Investigators

Cross-Cohort Collaboration Meeting

March 7, 2015



SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF WASHINGTON



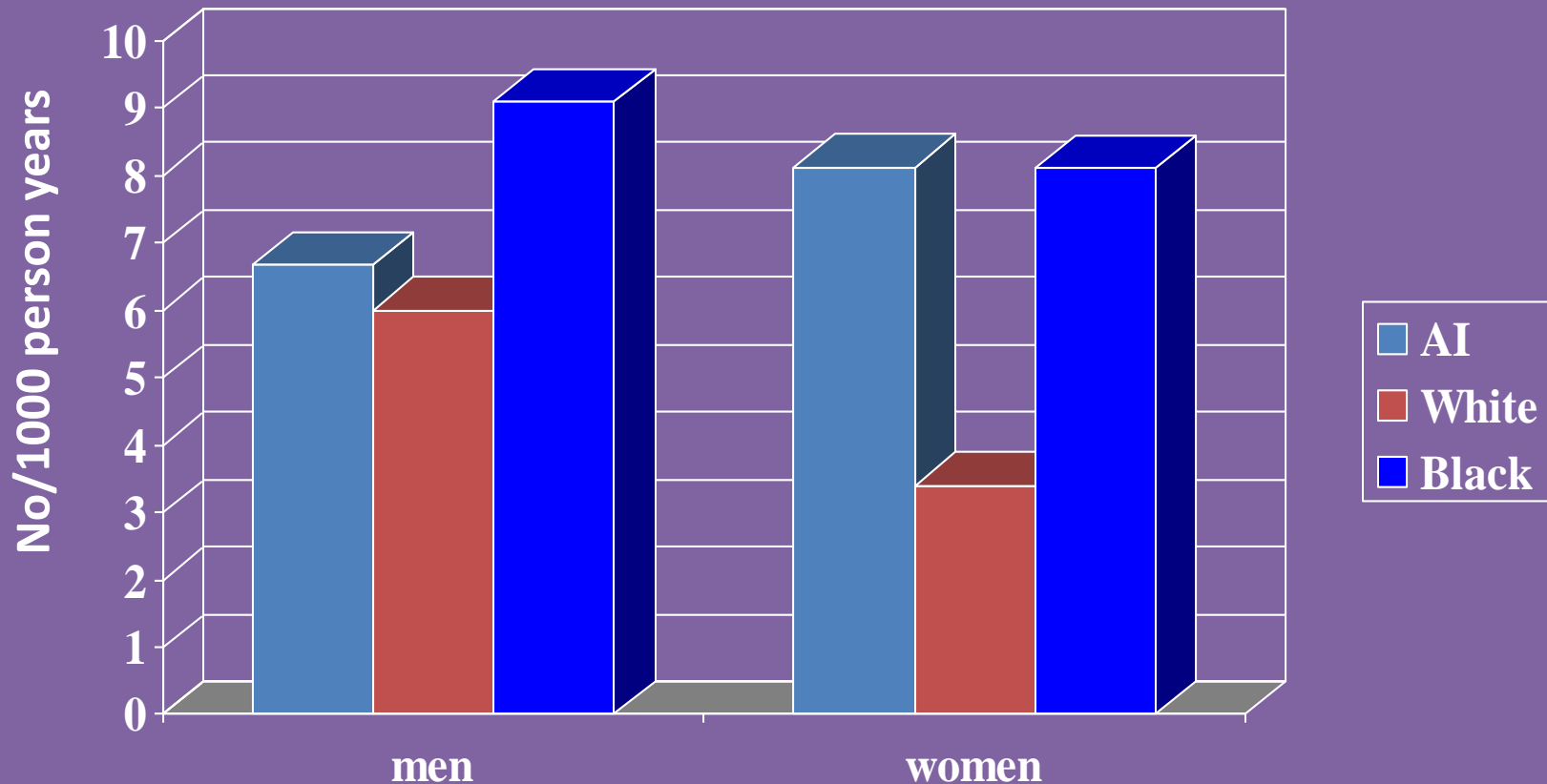
Burden of Heart Failure

- Leading cause of morbidity & mortality for older adults
 - 35% of cardiovascular deaths related to heart failure
- Race/ethnicity important factor in heart failure
- ~50% diagnosed heart failure is heart failure with preserved ejection fraction (HFpEF)--difficult to treat
- Recent studies focus on improving phenotypic classification of HFpEF

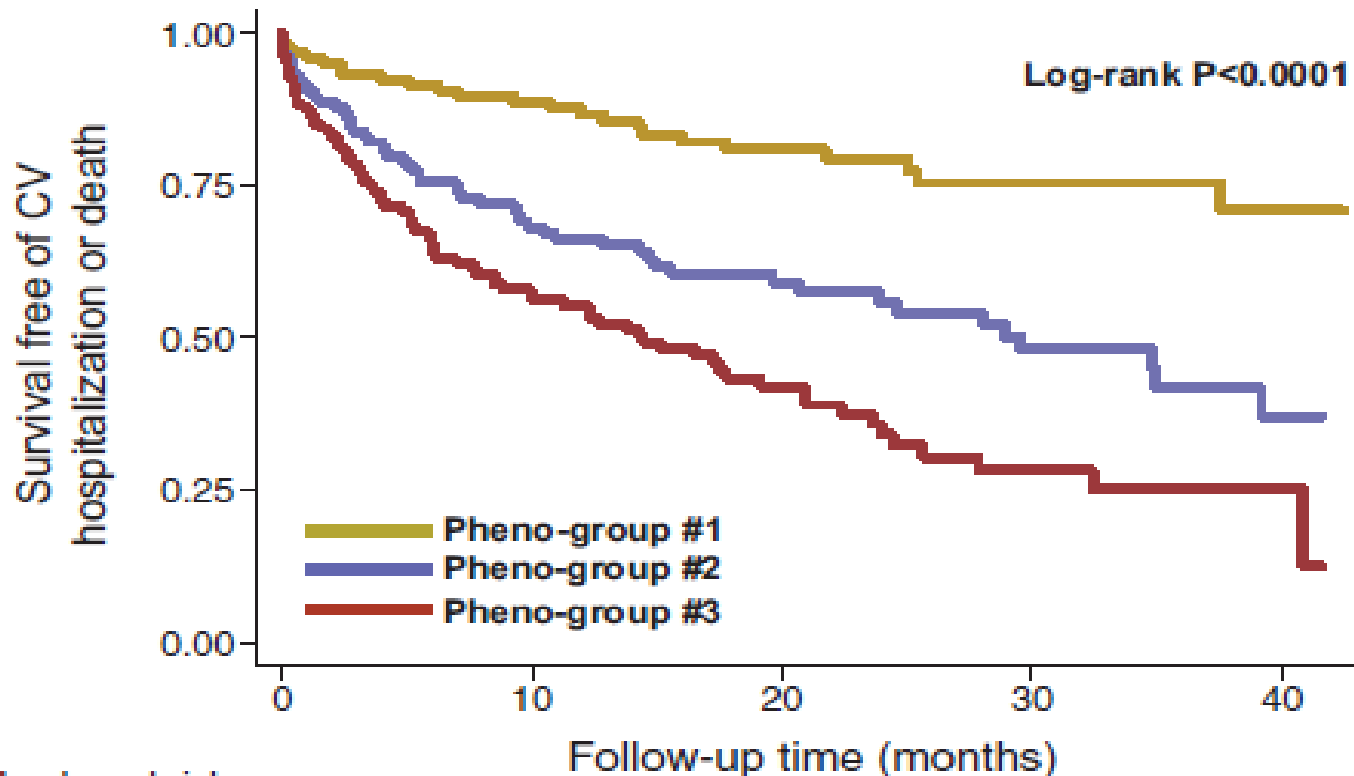
Potential Aims for Cross-Cohort Collaboration

- (1) Characterize ethnic differences in risk factors (e.g., age, sex, hypertension, diabetes, valvular heart disease, etc.) for heart failure
- (2) Examine ethnic variation in heart failure phenotypes (e.g., demographic/clinical characteristics, biomarkers, genetics, ECG & echo parameters)

Age Adjusted Rates of Heart Failure



Data for blacks and whites from ARIC, American Indians (AI) from the SHS



	0	10	20	30	40
Number at risk					
Pheno-group #1	122	90	57	31	6
Pheno-group #2	133	72	42	24	6
Pheno-group #3	142	65	29	12	3

Figure 4. Survival free of cardiovascular (CV) hospitalization or death stratified by phenogroup. Kaplan–Meier curves for the combined outcome of heart failure hospitalization, cardiovascular hospitalization, or death stratified by phenogroup.

Heart Failure: the Strong Heart Study

- Detailed demographic, laboratory, & physical exam measures
- Medical record review for all HF hospitalizations (imaging data collected)
- Digital ECG (1998, 2001, 2006) & echocardiogram (1993, 2001, 2006) on all participants
- Carotid ultrasounds (1998, 2001, 2006)
- Genetic data

Heart Failure in American Indians

- Among American Indians without CVD or severe kidney disease at baseline, cumulative incidence of heart failure during 12 years of follow-up: 291/2740 (10.6%)

Strengths & Challenges

Strengths

- Maximize power
- Inform targeted prevention efforts
- Better understand potential differences in pathophysiology of heart failure across ethnicities

Challenges

- Heart failure is heterogeneous
- Harmonize variables of interest across cohorts

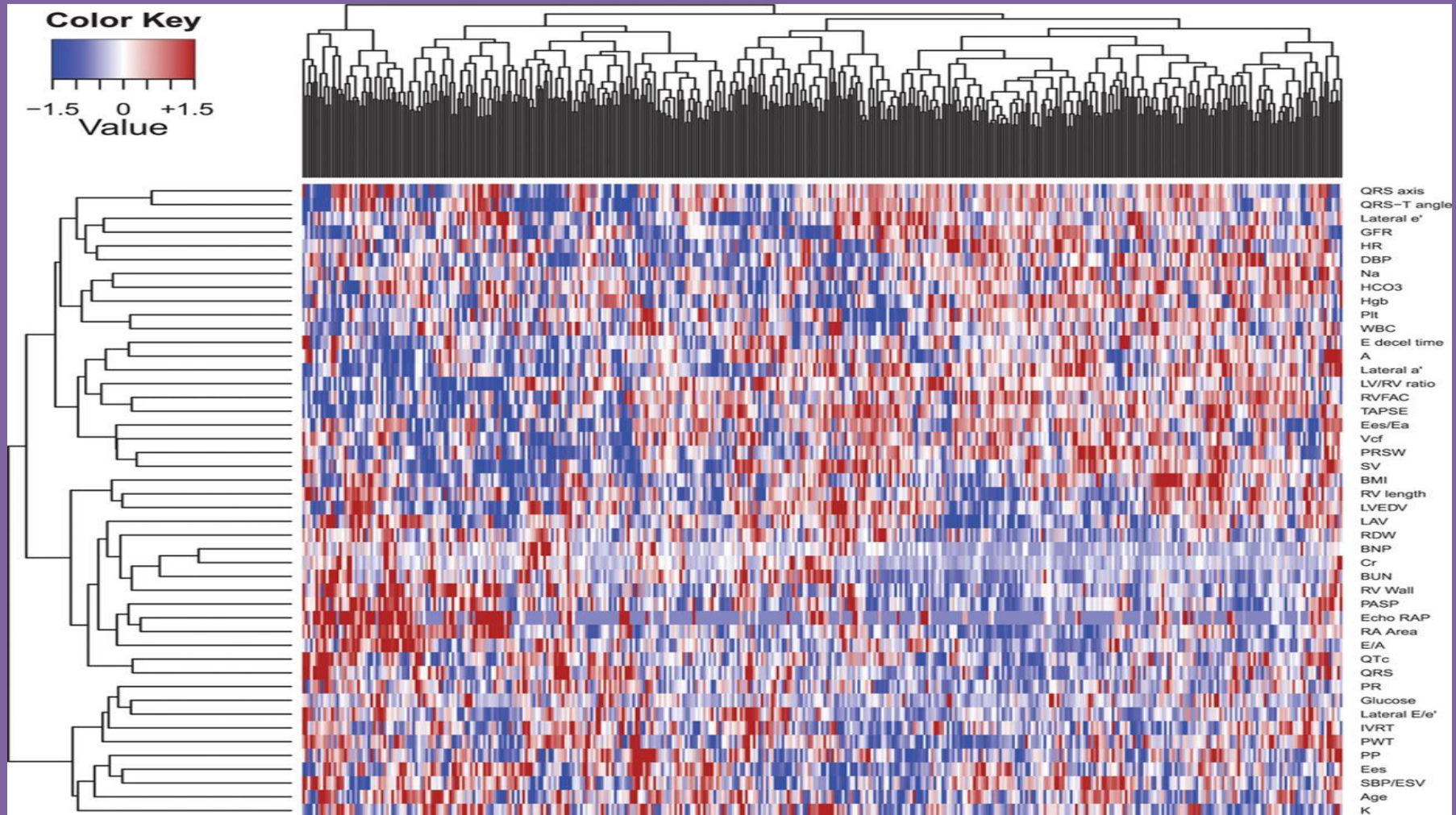
Questions?

Extra Slides

Ethnic Differences in Mechanisms of Heart Failure

- Cardiovascular risk factors vary across ethnicities
- Treatment & control of risk factors
- Post-infarct remodeling

Phenotype Heat Map (Phenomap) of Heart Failure with Preserved Ejection Fraction



Shah SJ. Circulation. 2015

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Parameter	Cluster 1	Cluster 2	Cluster 3
Hypertension, %	66	90	75
Diabetes, %	9	52	34
AF, %	13	22	43
ECHO			
Rel. wall thickness	0.47±0.11	0.49±0.09	0.56±0.20
LV mass index	89.1±22.6	96.4±26.3	122.0±47.3
ECG			
QRS duration, ms	93.8±21.0	91.3±13.6	112.7±33.3
PR interval. ms	166.6±29.6	174.2±29.8	183.3±53.5
MAGGIC score	15.6±6.7	9.8±5.8	22.8±7.5
		Shah SJ. Circulation. 2015	