A Community Partnership to Assess & Mitigate Cardiovascular Risk in South Los Angeles

AF Brown[1], DM Morris[2], KL Kahn[1], KC Norris[1], IC Sankare[1], KM King[1], AL Wright[3,4], C Porter[2], RB Vargas[1], R Bross[5], HE del Pino[3], D Banner[4], OL Pitts[3], S Vangala[1], S Vassar[1], LJ Liang, FU Jones[4], L Zhang[1], N Forge[3], LF Jones[4]

[1]UCLA Division of General Internal Medicine/Health Services Research; [2]Los Angeles Urban League, [3]Charles R. Drew University, [4]Healthy African American Families, [5]LA Biomed

BACKGROUND

- Behavioral, clinical, and public health efforts to improve management and outcomes of cardiovascular disease (CVD) and its risk factors have had limited success in reducing CVD disparities
- The Healthy Community Neighborhood Initiative (HCNI) is a multifaceted community partnered study that aims to improve health and health care in a predominantly African American and Latino community in South Los Angeles (LA)

OBJECTIVES

- To apply community-partnered participatory research (CPPR) methods in a neighborhood in South LA to:
  - Assess traditional and novel clinical and social risk factors for CVD among residents of the community
  - Assess the impact of select social determinants of health on established CVD risk scores in a biethnic, under-resourced community

METHODS

- The HCNI developed and fielded a baseline in-home interview (in English or Spanish), clinical and laboratory exam (Table 1) to understand clinical and social needs and available resources in the community:

Table 1: HCNI Household Survey Data Collection Components

Interview	Clinical and Laboratory Exam
• Demographic Information	• Body Mass Index: Height, Weight
• Heath Behaviors	• Waist Circumference
• Clinical Characteristics	• Blood Pressure, Heart Rate
• Unmet household social needs: employment, education, housing	• Biomarkers: Hemoglobin, A1c, C-Reactive Peptide, High-density lipoprotein cholesterol, Total cholesterol
• Health Care: access, cost, quality	
• Neighborhood Needs and Assets	

- **Service Needs Score**
  - Developed by community partners to measure needs that social service agencies could address. Score ranged from 0 to 10, a higher score indicted more unmet need
- **Modifiable Service Needs Factors**
  - childcare, employment, education, housing, neighborhood safety, emergency response, food insufficiency, legal advice, criminal justice, and health care
- **Social Cohesion Score**
  - Modified from the Project on Human Development in Chicago Neighborhoods (PHDCN) instrument.
  - Agreement with five statements: *satisfied with neighborhood, this is a close-knit neighborhood, people are willing to help their neighbors, people don't get along with each other, adults know the local children*.
  - Response ranged from "strongly agree" to "strongly disagree"
  - Scores ranged from 1 to 5; a higher score indicated lower cohesion
- **Cardiovascular Disease Risk Scores**
  - The American College of Cardiology/American Heart Association (ACC/AHA) Score measures 10-year risk of nonfatal myocardial infarction, coronary heart disease death, and fatal or nonfatal stroke
  - The Framingham Score measures 10-year risk of CHD, coronary death, myocardial infarction, coronary insufficiency, angina, stroke, transient ischemic attack, peripheral artery disease, and heart failure.
  - Linear regression models (ACC/AHA and Framingham) of each log-transformed risk score
  - Models adjusted for age, sex, ethnicity, education, insurance, unmet service needs, and social cohesion

RESULTS

Table 2. Characteristics of 206 HCNI study participants

	Black/African-American (N=154)		Hispanic/Latino (N=52)	
	Male (N=45)	Female(N=109)	Male (N=15)	Female (N=37)
Demographic Characteristics:				
Age , Mean (SD)	44.5 (17.0)	47.6 (15.6)	30.6 (10.1)	41.5 (14.1)
High school graduate, N (%)	42 (93)	90 (83)	8 (53)	19 (51)
Married/living with partner N (%)	15 (33)	27 (25)	7 (47)	21 (57)
Spanish preferred survey language, N (%)	0	0	11 (73)	32 (86)
Full time or self-employed, N (%)	13 (29)	16 (15)	5 (33)	8 (22)
Health Services Use (Self-Report)				
Insured, N (%)	26 (59)	87 (81)	5 (33)	13 (35)
Visit to provider in the past year, N (%)	31 (86)	99 (96)	3 (43)	26 (93)
Unmet Needs				
Unmet service needs score (0-10), Mean (SD)	2.9 (3.12)	3.1 (2.41)	4.2 (3.51)	4.7 (2.93)
Social cohesion score (1-5), Mean (SD)	2.46 (0.70)	2.51 (0.65)	2.77 (0.48)	2.93 (0.71)
CVD Risk Factors				
Total cholesterol (mg/dl), Mean (SD)	157 (32)	175 (45)	168 (43)	189 (54)
HDL cholesterol* (mg/dl), Mean (SD)	52.3 (20.2)	60.6 (18.6)	42.8 (13.9)	58.6 (13.4)
Systolic blood pressure (mmHg), Mean (SD)	128 (21)	127 (20)	119 (12)	122 (21)
Treated for hypertension, N (%)	9 (20)	36 (33)	0	3 (8)
Current smoker, N (%)	18 (40)	27 (25)	2 (13)	3 (8)
Diabetes, N (%)	5 (11)	20 (18)	0	3 (8)
Framingham CVD Risk Score (%), 10-year				
Mean (SD)	11.1 (11.7)	7.41 (7.96)	2.82 (3.12)	5.50 (8.00)
Median (Min, Max)	6.6 (0.2, 41.3)	4.48 (0.09, 38.29)	1.89 (0.16, 11.02)	1.59 (0.14, 33.90)
AHA CVD Risk Score (%), 10-year CVD Risk				
Mean (SD)	8.80 (8.63)	6.11 (8.00)	1.04 (1.48)	4.09 (11.94)
Median (Min, Max)	4.87 (0.34, 26.58)	3.08 (0.00, 37.35)	0.29 (0.00, 5.11)	0.51 (0.04, 65.76)

*High-density lipoprotein cholesterol

Table 3. Framingham and ACC/AHA CVD Risk Score- Linear Regression Models

Variable	Framingham (N=185): Adj R^2 = 0.83		ACC/AHA (N=185): Adj R^2 = 0.75	
	Estimate (SE)	P-Value	Estimate (SE)	P-Value
Age (years)	**0.084 (0.003)**	**<0.0001**	**0.138 (0.006)**	**<0.0001**
Female (v. Male)	**-0.567 (0.10)**	**<0.0001**	**-1.42 (0.21)**	**<0.0001**
African American (v. Latino)	0.190 (0.119)	0.11	0.258 (0.245)	0.29
HS Graduate (v. < HS)	-0.195 (0.112)	0.08	-0.052 (0.231)	0.82
Insured (v. Uninsured)	0.017 (0.102)	0.86	0.152 (0.210)	0.47
Unmet Service Needs Score	**0.045 (0.017)**	**0.0080**	**0.098 (0.035)**	**0.0054**
Social Cohesion Score	0.002 (0.069)	0.98	-0.015 (0.143)	0.92

Limitations

- Small geographic area that may not be representative of South LA
- Income was not included in the regression models
- Limited sample size, but larger than most cohorts marked by distrust
- Chronic conditions were self-reported and may have been undiagnosed, thus under-reported

Conclusions

- We found that unmet need for social services was associated with significantly higher 10-year risk (using both the Framingham and ACC/AHA equations) after adjustment for other traditional biologic and clinical risk factors in multivariable analyses
- In this bi-ethnic, under-resourced community, the HCNI community-academic partnership has developed an effective strategy for understanding clinical and social influences on CVD disparities
- Further work is needed to understand whether interventions that address these modifiable social risk factors can achieve more effective and sustained CVD risk reduction than interventions that address clinical risk factors in isolation

Next Steps

- Data from these analyses will be used to develop CVD risk reduction interventions that are feasible and acceptable within this community
- These analyses will be linked to data from neighborhood observations and community asset mapping collected through the partnership

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