Regional Differences in the Prevalence of Hypertension and Dyslipidemia in US Urban Hispanic Populations

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ABSTRACT

Background: The US Hispanic population consists of approximately 42.7 million (14% of total population). Hispanic populations living in different geographic areas of the US differ in their heritage: The majority of Hispanics living in Miami-Dade County are Cuban, whereas Puerto Ricans and other Hispanics or Latinos are predominant in New York County (NY), and Mexicans make up the majority of Hispanics in Los Angeles (LA) and Harris Counties. Cardiovascular health status for Hispanics living in specific urban settings has not been carefully examined.

Methods: Hispanic Community Outreach programs were conducted in 4 urban communities in the US (Miami, New York, LA, Houston) during 2004-2006. Retrospective analyses of data collected included blood pressure (BP), fasting and non-fasting glucose, and total cholesterol (TC) measurements in 5288 participants.

Results: Prevalence of cardiovascular risk factors in each of the 4 urban cities is reported in the table below:

	Miami (n = 372)	NY (n = 254)	LA (n = 4037)	Houston (n = 625)
Age, mean years	55.7 (c, e, f)	49.7 (a, b, c)	47.3 (b, d, f)	45.4 (a, d, e)
Female, %	65.1 (c)	75.2 (a, b, c)	60.0 (b, d)	65.0 (a, d)
Diabetes, %	11.0 (c, e)	19.7 (a, b, c)	9.1 (b, d)	5.0 (a, d, e)
Coronary heart disease, %	10.8 (e, f)	10.6 (a, b)	1.1 (b, d, f)	2.7 (a, d, e)
Mean systolic BP, mm Hg	123.0 (e, f)	125.3 (a, b)	129.6 (b, f)	130.5 (a, e)
HTN, %	41.4	42.1	37.1	35.7
Mean TC, mg/dL	201.7 (c, f)	182.7 (a, b, c)	196.8 (b, d, f)	202.7 (a, d)
DYS, %	37.9 (e, f)	31.9 (b)	25.1 (b, f)	26.7 (e)
HTN and DYS, %	20.4 (e, f)	19.3	14.8 (f)	14.4 (e)

Statistically significant differences (P <0.05) are indicated for comparisons between (a) New York and Houston, (b) New York and LA, (c) New York and Miami, (d) Houston and LA, (e) Houston and Miami and (f) LA and Miami
Diabetes, % with glucose ≥126 mg/dL (fasting) or ≥200 mg/dL (non-fasting) or on diabetes medication
Coronary heart disease, self-report of heart disease or previous heart attack
HTN, hypertension: % with BP ≥140/90 mmHg (≥130/80 mm Hg in individuals with diabetes) or on antihypertensive medication
DYS, dyslipidemia: % with TC ≥240 mg/dL (or TC ≥200 mg/dL if with diabetes or prior coronary heart disease) or on anti-lipidemic medication

Conclusion: Differing prevalence of cardiovascular risk factors, such as HTN and DYS, may be due to differences in mean age between the 4 communities examined. However, the dissimilar heritage of the communities may also explain the differences. Hispanic populations in LA and Houston appear to have similar risk factor profiles, which may reflect their predominantly Mexican heritages. Further research on different Hispanic subpopulations and their implications on cardiovascular risk are warranted.

BACKGROUND

- The US Hispanic population consists of approximately 42.7 million people (14% of total population).[1]
- In US government statistics, "Hispanic" or "Latino" includes persons who trace their ancestry to Mexico, Puerto Rico, Cuba, Spain, the Spanish-speaking countries of Central or South America, the Dominican Republic, other Spanish culture or origin, regardless of race.[2]
- Certain geographic settings have attracted Hispanic communities of similar ancestry. For example, Cubans make up the majority of Hispanics living in Miami-Dade County (FL), Puerto Rican Americans are predominant in New York County (NY), whereas Mexican Americans make up the majority of Hispanics living in Los Angeles (CA) and Harris (TX) Counties.
- Hypertension (HTN) and dyslipidemia (DYS) are 2 of the major risk factors for cardiovascular disease, and are highly prevalent in the US.[3,4]
- Although the prevalence of combined HTN and DYS is lower among Hispanics compared with African Americans or non-Hispanic whites,[5] awareness of HTN as a cardiovascular (CV) risk factor is low among certain Hispanic subpopulations (e.g., Mexican Americans, Puerto Rican Americans, Cuban Americans), and treatment and control rates are poor.[2]
- Awareness and treatment rates of dyslipidemia among Mexican Americans are also lower compared with non-Hispanic whites.[6,7]
- The CV risk profile of Hispanic communities living in distinct urban settings has not been carefully examined, nor compared between the different US geographic regions.

STUDY OBJECTIVES

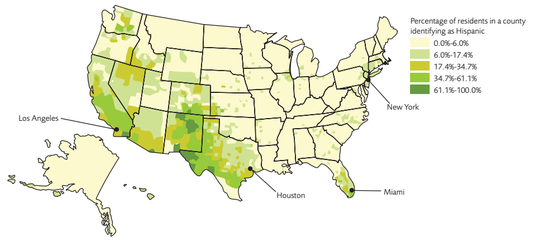
- To investigate the CV health profile of Hispanic communities living in 4 distinct US communities.

METHODS

Study Population

- In partnership with various organizations, such as local chapters of the American Heart Association, retailers (Albertson's, Navarros), hospitals, and local Young Men's Christian Association (YMCA), Pfizer Inc. conducted numerous health screening events in 4 US communities with a high concentration of Hispanics (**Figure 1**): Miami, New York (NY), Los Angeles (LA), and Houston. These events were developed to help bridge the healthcare disparity gap between those in the local Hispanic communities and others by increasing CV health awareness and empowering patients and doctors to take action.

Figure 1. Map of US with overlay of density of Hispanic populations



'Hispanic' included Mexicans, Puerto Ricans, Cubans, and other Latin and South American ethnicities (adapted from Census 2000 data provided and analysed by the Social Science Data Analysis Network (available at: http://www.censusscope.org).

- Participants were recruited via advertisements in the media, websites, community calendars, and local flyers, and the screening events were held at various venues:
  - "Community": church, community centers (e.g., YMCA), retail stores (e.g., grocery store), and festivals.
  - "Healthcare facility": outside of outpatient hospitals/clinics, physician offices, and hospitals (e.g., parking lots).
- No incentives were provided to participants, other than a report of their CV risk factor measurements and counseling to seek further medical attention, if needed.
- Cross-sectional analyses were conducted to assess data from 5288 participants enrolled in Hispanic community health screening programs, between 2004–2006, in Miami, New York, Los Angeles, and Houston.
- Blood pressure (BP) measurements were collected utilizing OMRON Automatic Monitors®, and total cholesterol (TC), and glucose levels were measured with Cholestech LDX® instruments. One measurement of each parameter was obtained per participant.
- Medical history to determine presence of coronary heart disease (CHD), as well as current medication usage, was based on participants' self-report on a written questionnaire (administered in both English and Spanish).
- T- and Chi-square tests were used, as appropriate, to check for statistical differences in parameter estimates.

Definition of Risk Factors

- HTN: BP ≥140/90 mm Hg (≥130/80 mm Hg in individuals with diabetes mellitus [DM]) or on antihypertensive medication.
- DYS: % with TC ≥240 mg/dL (or TC ≥200 mg/dL if with DM or prior CHD), or on lipid-lowering medication.
- DM: Measured glucose levels ≥126 mg/dL (fasting) or ≥200 mg/dL (non-fasting), or self-report of being on medication for DM.
- CHD: Self-report of heart disease or previous heart attack.

RESULTS

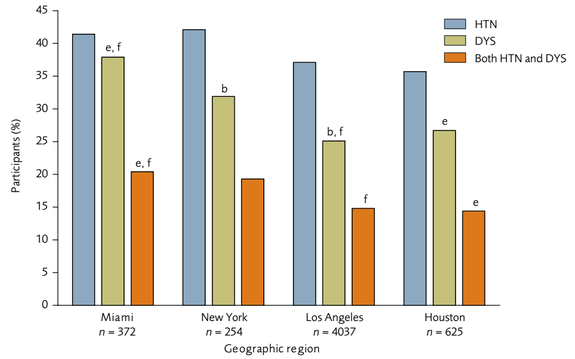
- Baseline demographics are shown in **Table 1.**
- Regional differences in the proportion of patients with HTN, DYS, or HTN and DYS are depicted in **Figure 2**.

Table 1. Baseline demographics

	Miami (n = 372)	New York (n = 254)	Los Angeles (n = 4037)	Houston (n = 625)
Mean age (SD), years	55.7 (11.5)[c,e,f]	49.7 (15.3)[a,b,c]	47.3 (13.7)[b,d,f]	45.4 (14.4)[a,d,e]
Women, %	65.1[c]	75.2[a,b,c]	60.0[b,d]	65.0 [a, d]
DM, %	11.0[c,e]	19.7[a,b,c]	9.1[b,d]	5.0[a,d,e]
CHD, %	10.8[e,f]	10.6[a,b]	1.1[b,d,f]	2.7[a,d,e]
Mean systolic BP (SD), mm Hg	123.0 (16.4)[e,f]	125.3 (19.3)[a,b]	129.6 (19.7)[b,f]	130.5 (19.4)[a,e]
Mean diastolic BP (SD), mm Hg	77.4 (10.2)[c,e]	74.5 (10.2) [a, b, c]	77.8 (11.4)[b,d]	78.9 (10.9)[a,d,e]
Mean TC (SD), mg/dL	201.7 (41.7)[c,f]	182.7 (40.6)[a,b,c]	196.8 (43.0)[b,d,f]	202.7 (42.7)[a,d]

Statistically significant differences (P <0.05) are indicated for comparisons between (a) New York and Houston, (b) New York and LA, (c) New York and Miami, (d) Houston and LA, (e) Houston and Miami, and (f) LA and Miami
LA, Los Angeles; SD, standard deviation; DM, diabetes mellitus; CHD, coronary heart disease; BP, blood pressure; TC, total cholesterol

Figure 2. Regional differences in the prevalence of hypertension (HTN) and/or dyslipidemia (DYS)



Prevalence definitions: For HTN, BP ≥140/90 mm Hg (≥130/80 mm Hg in participants with DM) or on medication; for DYS, TC ≥240 mg/dL (≥200 mg/dL if with DM or prior CHD) or on medication; for HTN and DYS, BP ≥140/90 mm Hg (≥130/80 mm Hg in participants with DM) and TC ≥240 mg/dL (≥200 mg/dL if with DM or prior CHD) or on medication.
Statistically significant differences (P <0.05) are indicated for comparisons between (a) New York and Houston, (b) New York and LA, (c) New York and Miami, (d) Houston and LA, (e) Houston and Miami, and (f) LA and Miami

- Multiple logistic regression examining factors related to the likelihood of having HTN, DYS, or both HTN and DYS showed no significant differences between communities (in comparison with Los Angeles) (**Table 2**).
  - Women were significantly less likely to have each condition compared with men (P <0.001 to P <0.0001) and those participants screened in a community venue compared with a healthcare facility were more likely to have HTN (P <0.0001) and combined HTN and DYS (P <0.0001).
  - Age was strongly related to the likelihood of having all 3 conditions.

Table 2. Multivariable logistic regression analyses (n = 4175*): Likelihood of having HTN, DYS, or both HTN and DYS

Parameter	HTN Odds Ratio (95% CI)	DYS Odds Ratio (95% CI)	Both HTN and DYS Odds Ratio (95% CI)
Community (compared with Los Angeles):			
Miami	1.09 (0.84, 1.43)	1.22 (0.93, 1.58)	1.18 (0.86, 1.62)
New York	1.14 (0.84, 1.55)	1.29 (0.95, 1.77)	1.14 (0.79, 1.66)
Houston	1.16 (0.94, 1.42)	1.22 (0.98, 1.50)	1.07 (0.82, 1.40)
Gender: Women vs. Men	0.61 (0.53, 0.71)[§]	0.71 (0.61, 0.82)[§]	0.72 (0.60, 0.86)[§]
Health insurance: present vs. absent	0.98 (0.82, 1.17)	0.97 (0.81, 1.16)	1.04 (0.84, 1.30)
Venue: community vs. healthcare facility	2.25 (1.73, 2.92)[§]	0.97 (0.76, 1.25)	1.59 (1.15, 2.19)[‡]
Age (continuous)	1.07 (1.07, 1.08)[§]	1.05 (1.05, 1.06)[§]	1.07 (1.06, 1.07)[§]

*Logistic regression analyses included 4175 participants as the venue information was not available for all participants. For all logistic regression models estimated, 39 participants from Houston and 1074 participants from Los Angeles were excluded due to missing venue information.
Significance levels: [‡]P =0.005; [§]P = 0.0003; ¶P <0.0001
HTN, hypertension (BP ≥140/90 mm Hg [≥130/80 mm Hg in participants with DM] or on medication); DYS, dyslipidemia (TC ≥240 mg/dL [≥200 mg/dL if with DM or prior CHD] or on medication)

LIMITATIONS

- Data on other possible confounders (e.g., body mass index, lifestyle) which could affect the results were not available.
- Participants' medical histories, including medication use, were based on self-reports, so it is possible HTN and/or DYS prevalence may have been underestimated.
- Results are based on single measurement of BP, TC, and glucose levels.
- LDL-C data were only available for a fraction of participants and therefore not used for this analysis; inclusion of LDL-C measurements may have improved the precision of the risk estimates.
- All participants included in this analysis were of Hispanic origin, but their specific ancestry was not recorded. Information on birthplace would have also been helpful to examine whether first versus second or higher generation persons were more or less likely to have HTN and/or DYS.
- While the relationships described in the regression analyses are informative, caution should be used when drawing conclusions, as association does not imply causality.

DISCUSSION/CONCLUSIONS

- In these urban Hispanic populations who received health screening services, HTN, DYS, and concomitant HTN and DYS were highly prevalent, regardless of ancestry or geographic region. The prevalence of these CV risk factors did not significantly differ between the four communities studied after adjusting for venue, health insurance, age, and gender.
- The predominance of women in our sample of screened participants is not surprising as women in the Hispanic family/community are more likely to be interested in their health and willing to seek information.
- Relative to men, women have a decreased likelihood of having HTN, DYS, or both HTN and DYS.
- Interestingly, participants who were recruited from community venues were more likely to have HTN, or both HTN and DYS, than those recruited from outside healthcare facilities, suggesting possible under-diagnosed HTN or both HTN and DYS in the general community.
- It is unclear if the different ancestries of Hispanic individuals in these communities play a role in their CV risk profile.
- Further research on Hispanic subpopulations of different ancestry and the implications on CV risk detection and treatment are warranted.

DISCLOSURE

This study was supported by Pfizer Inc.

Authors' financial disclosure information:
Stan Bassin – Nothing to disclose; Sean Candrilli – Consultant, Pfizer Inc; EunMee Lee – Employee, Pfizer Inc; Heather Laird – Consultant, Pfizer Inc; Stewart Levy – Consultant, Pfizer Inc; Simon Tang – Employee, Pfizer Inc; Nathan Wong – Grant support (significant) from Pfizer Inc, and Merck; Speaker's bureau (modest) from Takeda, Pfizer Inc, and Sanofi-Aventis.

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