Published in final edited form as:

Am Heart J. 2009 January ; 157(1): 53–59. doi:10.1016/j.ahj.2008.08.015.

Association between Language and Risk Factor Levels among Hispanic Adults with Hypertension, Hypercholesterolemia, or Diabetes

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Abstract

Background—The association of acculturation and cardiovascular risk factor control among populations with high proportions of immigrants has not been well-studied.

Methods—We studied 1492 Hispanic participants in the Multi-Ethnic Study of Atherosclerosis (MESA) with hypertension, hypercholesterolemia, and/or diabetes. We used linear regression to examine the cross-sectional relationships between acculturation measures and cardiovascular risk factor levels. Outcome measures included systolic blood pressure (mmHg), fasting LDL-cholesterol (mg/dL), and fasting blood glucose (mg/dL). Covariates included education, income, health insurance, physical activity, dietary factors, risk factor-specific medication use, duration of medication use, smoking, and BMI.

Results—There were 580 Hispanics with hypertension, 539 with hypercholesterolemia, and 248 with diabetes. After adjustment for age and gender, Spanish-speaking Hispanics with cardiovascular risk factors had higher systolic blood pressure, fasting LDL-cholesterol and fasting blood glucose compared to English-speaking Hispanics. Differences in systolic blood pressure were accounted for mainly by education, whereas differences in LDL-cholesterol were almost entirely accounted for by cholesterol-lowering medication use. Differences in fasting glucose were

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This work was presented orally at the Society of General Internal Medicine 30th Annual Meeting on April 27, 2007.

partly accounted for by socioeconomic variables but were augmented after adjustment for dietary factors. Similar associations were observed between proportion of life in the U.S. and risk factor levels.

Conclusions—Among those with cardiovascular risk factors, Hispanics who spoke Spanish at home and lived less time in the U.S. had worse control of cardiovascular risk factors. Treatment strategies that focus on Hispanics with low levels of acculturation may improve cardiovascular risk factor control.

INTRODUCTION

The immigrant population within the U.S. continues to rise beyond previous records. The Hispanic population comprised 44.3 million (14.8 percent) of the U.S. population in 2006, with nearly half born outside of the U.S. and more than three quarters speaking in a language other than English at home.¹ Some racial/ethnic groups with a large proportion of immigrants have been shown to have higher prevalence of cardiovascular risk factors including hypertension, hypercholesterolemia and diabetes.²³ Not only do some racial/ethnic groups have high prevalence of cardiovascular risk factors, control of these risk factors has also been shown to be worse in groups with a large representation of immigrants.⁴⁵⁶⁷ However, factors associated with differences in the control of hypertension, hypercholesterolemia, or diabetes among minority groups with a large representation of immigrants have not been extensively investigated.

The role of acculturation in explaining variation in health within racial/ethnic groups has received increasing attention in recent years. Acculturation has been previously defined as the process of adaptation to a new culture, measured by the degree that immigrants have integrated the values, beliefs, and attitudes of a new country into their daily lives.⁸ In prior studies⁹¹⁰¹¹, measures of acculturation have generally included place of birth, age of migration, duration of residence in the U.S., language use, language preference, and social interactions. Although more multidimensional assessments of acculturation continue to be developed¹², standardized scales that characterize acculturation more fully¹³¹⁴¹⁵ have not yet been widely adopted in population or clinical studies.

Greater acculturation has been found to be associated with worse cardiovascular risk factor prevalence in the general population,¹¹¹⁶ most likely because of adverse changes in behaviors, like diet and exercise, as immigrants become more acculturated. However, it is plausible that, among persons with risk factors, acculturation results in better risk factor control. Language barriers have been shown to negatively impact health care experiences of non-English speaking patients, particularly Hispanic and Asian immigrants.¹⁷¹⁸ Immigrants with limited English proficiency are less likely to have access to health care, and they receive less preventive care than their U.S.-born counterparts.¹⁹²⁰²¹ In particular, Spanish-speaking Mexican Americans are less likely to be screened for cardiovascular disease than their English-speaking counterparts.²² Increased duration of residence in the U.S. may also be correlated with improved health access²³ and hence improved control of cardiovascular risk factors. On the other hand, increasing duration of residence in the U.S. has also been

associated with worse dietary habits and obesity which could contribute to poor control of risk factors.¹⁶²⁴

In order to determine if Hispanic adults with low acculturation might be at greater risk of poorly-controlled cardiovascular risk factors, we investigated the association between language spoken at home and proportion of life spent in the U.S. with risk factor levels among participants with hypertension, hypercholesterolemia, or diabetes in the Multi-Ethnic Study of Atherosclerosis (MESA). We also investigated the mediating contribution of socioeconomic position, health insurance, physical activity, dietary factors, medication use, smoking, and BMI to any observed differences.

METHODS

Study Population

This analysis focuses on cross-sectional data from MESA, a population-based cohort of 6814 subjects supported by the National Heart, Lung, and Blood Institute. The MESA cohort includes men and women aged 45-84 from six sites in the U.S.: Baltimore, MD; Chicago, IL; Forsyth County, NC; Los Angeles, CA; New York, NY; and St Paul, MN. The sampling and recruitment protocol have been previously described.²⁵ Hispanics were recruited in Los Angeles, New York, and St Paul. All participants were free of clinical cardiovascular disease at baseline and were recruited between July 2000 and September 2002. All MESA subjects were interviewed by trained research staff and completed publicly-available MESA questionnaires available in English and Spanish (<http://mesa-nhlbi.org/ex1forms.aspx>).

As the focus of these analyses was on risk factor control among persons with recognized risk factors, analyses were restricted to MESA participants with hypertension, hypercholesterolemia, and/or diabetes. Persons were defined as having hypertension if their doctor told them they had high blood pressure or they were on an anti-hypertensive medication. Persons were defined as having hypercholesterolemia if their doctor told them they had high blood cholesterol or they were on an anti-lipid medication. Persons were defined as having diabetes if their doctor told them they had diabetes or if they were on an anti-diabetic medication. Analyses were further restricted to Hispanic participants due to a very limited number of immigrants among non-Hispanic white and black MESA participants (<10%) and a very limited number of U.S.-born Chinese participants (3%).

Control of cardiovascular risk factor levels

Blood pressure was measured three times at one minute intervals with a Dinamap PRO 100 automated oscillometric device (Critikon) with the subject in a seated position. The average of the second and third blood pressure measurements was used for analysis. Lipid and lipoprotein levels were measured on fasting samples. Goal LDL cholesterol levels were determined by Adult Treatment Panel II recommendations (ATP II), based on coronary heart disease risk classification.²⁶ This includes LDL <190mg/dL for individuals with 0-1 risk factors, <160mg/dL for individuals with 2 or more risk factors, and <130 mg/dL for pre-existing coronary artery disease (recognizing that this was an exclusion criterion for MESA).

ATP III recommendations were not published until 2001, after recruitment of MESA began. Serum glucose was measured on fasting samples by rate reflectance spectrophotometry. During the baseline wave of interviews in MESA 2000-2002, hemoglobin A1c was not measured. Therefore, to determine adequate control of diabetes, we utilized a cutoff fasting glucose level of 160 mg/dL which corresponds approximately to a hemoglobin A1c of 6.5-7.0%.

Primary outcome measures included systolic blood pressure for participants with hypertension, fasting LDL-cholesterol for participants with hypercholesterolemia, and fasting blood glucose for participants with diabetes. As our primary interest was in cardiovascular risk factor levels among those with physician-diagnosed risk factors, we focused on control of risk factor levels rather than awareness.

Predictors

We assessed two predictors: language spoken at home and proportion of life in the U.S. as these predictors were available in MESA and have been used previously as part of validated acculturation scales.^{27,28} Language was determined by the question, "What language is generally spoken in your home?" Language categories included English and Spanish for comparisons among Hispanic participants. If a participant spoke English at home, they were placed in the English-speaking group, regardless if they also spoke another language at home. As a secondary analysis, we also used language in which the interview was conducted.

Proportion of life in the U.S. was determined by dividing duration of residence in U.S. by age. U.S.-born participants therefore had a value of 1. We also evaluated duration of residence which yielded similar but weaker associations with cardiovascular risk factors as compared to those observed for proportion of life in the U.S. Among a total of 1025 foreign-born Hispanics, the main Hispanic subgroups (>10%) included 168 participants from Puerto Rico (16%), 369 participants from Mexico (36%), and 120 participants from the Dominican Republic (12%). Hispanics born in Puerto Rico were included in the foreign-born group, as in previous work²⁹, because of their cultural similarity with non-US born Hispanics. Results were similar when Puerto Ricans were excluded. Given the small sample size of individual Hispanic subgroups, we did not have the power to draw conclusions about specific subgroups.

Confounders and mediators

Information on baseline characteristics included age, gender, highest level of education completed, household income, and health insurance coverage. Education was divided into four categories: less than high school, high school diploma and some college (without a degree), technical or associate degree, and bachelor or graduate degree. Income was reported in thirteen categories. Insurance was categorized as: no insurance, Medicare/Medicaid/VA, and other insurance. Medicare, Medicaid, and VA were combined due to small sample sizes within each group. Other insurance was mainly comprised of private insurance, as well as combinations of private insurance with other types of insurance. Physical activity was assessed in MET-minutes/week with a self-reported, detailed, semiquantitative

questionnaire, as previously described.²⁵ Assessed activities included household chores, exercise, hobbies including sports and dance, conditioning, walking, driving, traveling, watching television, reading, volunteer work, and occupational duties. Dietary factors was assessed by a previously validated questionnaire^{30, 31} which included total kcal/day, percentage of calories from carbohydrates, percentage from fat, fiber intake, and alcohol intake. Alcohol use was categorized as: never, former use, current use 0-6 drinks/week, and current use >7 drinks/week. Physical activity and food frequency questionnaires utilized are publicly available (<http://mesanhlbi.org/exlforms.aspx>). Center for Epidemiologic Studies Depression score was also utilized. Smoking was categorized as current smoker (smoked within last 30 days), previous smoker (smoked >100 cigarettes in lifetime and none within the last 30 days), or non-smoker. BMI was categorized as: <25kg/m², 25-29.9 kg/m², and >30kg/m². Age at which patient first used medication (duration of medication use) was also assessed for hypertension, hypercholesterolemia, and diabetes, separately.

Statistical analysis

Two-sided t-tests were performed to compare cardiovascular risk factor levels between non-English- and English-speaking participants. Analysis of variance was performed to compare cardiovascular risk factor levels between categories of proportion of life spent in the U.S. Initial linear regression models were adjusted for age (continuous) and gender. Because education was likely to have preceded immigration and hence confound (rather than mediate) the association between predictors and risk factor control, we examined subsequent models adjusted for education; mean age at immigration was 31 years. As correlates or potential mediators, income (modeled using the midpoints of categories as a linear variable), insurance, physical activity (quartiles), dietary factors (quartiles), risk factor-specific medication use, duration of risk factor-specific medication use, smoking, and BMI were then added individually to models with age, gender, and education. For comparability, we established reference categories as English-speaking Hispanics and U.S.-born Hispanics.

RESULTS

Cardiovascular risk factor control and characteristics of the MESA cohort by race/ethnicity have been described previously.⁶³²³³ Table I shows the prevalence and control of cardiovascular risk factors in all Hispanic participants. Table II provides descriptive characteristics of our analytic sample, Hispanic participants with at least one risk factor (hypertension, hypercholesterolemia, and/or diabetes). Compared to English-speaking Hispanics, Spanish-speaking Hispanics tended to be of female gender, were more likely to have a high school education or less, to earn less income, to be uninsured, to be foreign-born, and to have lived less time in the U.S.

Unadjusted levels of cardiovascular risk factors

For each cardiovascular risk factor, Spanish-speaking Hispanics had worse risk factor levels than English-speaking Hispanics (Table III). Similarly, Hispanics who had lived less than half their lives in the U.S. had higher risk factor levels for each cardiovascular risk factor compared to U.S.-born Hispanics (Table IV).

Language and adjusted cardiovascular risk factor levels

In age- and gender-adjusted analyses of Hispanics with cardiovascular risk factors, Spanish-speakers had significantly higher systolic blood pressure, LDL-cholesterol, and fasting blood glucose compared to English-speaking Hispanics (Table V). Adjustment for education alone strongly attenuated the effect on systolic blood pressure, but had lesser effect on the LDL-cholesterol and fasting glucose. Additional adjustment for insurance, income, physical activity, dietary factors, and BMI did not change the association of LDL-cholesterol dramatically. Further adjustment for insurance and income attenuated the association with fasting glucose (both insurance and income had similar effects on cardiovascular risk factor levels when adjusted individually), but further adjustment for dietary factors increased the association by a similar amount. Center for Epidemiologic Studies Depression score, smoking, and duration of medication use did not affect the observed relationships.

As a secondary analysis, we also examined language in which the MESA interview was conducted. Language spoken at home and interview language were correlated ($\kappa=0.71$). The associations between language of interview and cardiovascular risk factor levels tended to be similar to the corresponding associations with language spoken at home, although somewhat weaker for systolic blood pressure (age- and sex-adjusted comparison of English vs. Spanish – 3.2 ± 1.8 mmHg) and LDL-cholesterol (-5.8 ± 3.3 mg/dl) while somewhat stronger for fasting glucose (-26.8 ± 8.0 mg/dl). We also investigated the association between recruitment site and cardiovascular risk factors levels which did not change the observed differences in cardiovascular risk factor levels by language or proportion of life spent in the U.S.

Proportion of life in the U.S. and adjusted cardiovascular risk factor levels

Table V also shows the results for proportion of life in the U.S. on cardiovascular risk factors that generally tended to parallel the associations for language. Similar to language, there was an association of proportion of life in the U.S. and systolic blood pressure that was largely attenuated by education. Patterns observed for LDL-cholesterol and glucose were also similar to those observed for language. Consistent with the hypothesis that longer residence in the U.S. leads to worse dietary habits, the relationship between proportion of life in the U.S. and fasting blood glucose was stronger after adjustment for dietary factors.

Adjustment for medication use

Lastly, we examined whether medication use could mediate the association between predictors and risk factor control. Systolic blood pressure and fasting blood glucose levels did not change significantly when adjusted for being on anti-hypertensive or anti-diabetic medications, respectively (model 6 in Table V). Being on anti-lipid medication markedly attenuated the association of LDL-cholesterol with language spoken at home (6.7 ± 3.3 , $p=0.04$) and proportion of life in U.S. (4.7 ± 5.8 , $p=0.41$).

DISCUSSION

Our findings demonstrate that Hispanics with hypertension, hypercholesterolemia, and/or diabetes who speak Spanish at home and/or have spent less than half their lives in the U.S.

have higher systolic blood pressure, LDL-cholesterol, and fasting blood glucose, respectively, compared to Hispanics who speak English and have lived more time in the U.S.

Given what is known about the relationships of acculturation with socioeconomic status and lifestyle behaviors, one might expect the relationship between less acculturation and greater risk factors levels observed in age- and sex-adjusted analyses to (1) diminish after adjustment for education (2) diminish after adjustment for income and insurance status but (3) increase after adjustment for diet (because less acculturated Hispanics may have better diets^{34, 35}). Our results confirm these hypotheses. Based on the attenuation of the effect size in our multivariable analysis, some of the association was indeed attributable to differences in education, income, and insurance status between less and more acculturated Hispanics. At the same time, the observed relationships tended to be accentuated after adjustment for dietary factors. The adverse effect of diet was particularly important for glucose control among Hispanics who lived more time in the U.S. In contrast, adjustment for physical activity produced little change from age-, gender-, and education-adjusted estimates. The relationship of physical activity to acculturation is complex with studies finding either no association or greater physical activity in more acculturated Hispanics.³⁶⁻³⁸

The relationship between acculturation and LDL-cholesterol was largely driven by anti-lipid medication use (of which >90% were statins). As this is a highly effective and straightforward class of medications to administer, perhaps focusing efforts on statin use may have a particularly important impact on management of LDL-cholesterol control in immigrant populations.

This study highlights the sub-optimal control of cardiovascular risk factors among Hispanics who speak Spanish and who are recently-arrived immigrants. To the extent that speaking English at home and living more time in the U.S. appear to lead to improvement in cardiovascular risk factor levels, several potential mechanisms may be involved. Spanish speakers and newer immigrants may lack knowledge how to navigate the U.S. health care system, have a poorer understanding of their chronic illnesses due to difficulties in patient-physician communication, and have limited access to care due to financial, temporal, or cultural barriers. On the other hand, as immigrants live more time in the U.S., they may become vulnerable to risk factor deterioration through worsened diet.

Our results suggest an interesting bidirectional relationship of language spoken at home/ proportion of life spent in U.S. with cardiovascular risk factor levels. In population samples of Hispanics, greater acculturation is associated with worse health care outcomes related to substance abuse, dietary practices, and birth outcomes.³⁹ Greater length of residence in the U.S. is also associated with an increased risk of all-cause and cardiovascular mortality among Hispanics.⁴⁰ Acculturation also appears to be associated with greater prevalence of coronary calcification in some immigrant groups.³² At the same time, our findings demonstrate that greater acculturation is associated with better risk factor control among Hispanics with physician-diagnosed hypertension, hypercholesterolemia, and diabetes. In the general population, adverse effects of acculturation on risk factor prevalence likely overwhelm any potentially beneficial effects on control among those with risk factors. The

difference in the directionality of the acculturation effect in those with and without risk factors presumably relates to the mechanisms involved, including care-related issues for effects on control among those with risk factors and lifestyle/cultural factors for effects on prevalence of risk factors. Thus, at least for Hispanic immigrants with established cardiovascular risk factors, acculturation may not have a consistently negative effect on health. These findings are important when designing public health interventions, because they highlight the need to consider the bi-directional effect that acculturation may have on risk factor control. Those immigrants who arrived more recently should probably be more intensely targeted for access-improvement initiatives, whereas those with a longer residence in the U.S. may benefit more from lifestyle-change initiatives.

There are several limitations of this study. Although we use the term ‘acculturation’, it is difficult to capture the full breadth of information that determines acculturation status. Language spoken at home, language of interview, and proportion of life in the U.S. are only crude proxies for acculturation, and MESA did not incorporate a formal acculturation scale. However, as Marin et al.²⁷ have shown, multi-dimensional acculturation scales do strongly correlate with duration of U.S. residence as correlation coefficients approximate 0.6-0.8, depending upon the measure and population under study. Given the complex pathways that may link acculturation and cardiovascular risk, we had incomplete information on potential mediators. For example, comorbidities, health-seeking behaviors, and other measures of health access and utilization (e.g. clinic visits, emergency department utilization, and/or hospitalizations) may contribute to the relationship between acculturation and cardiovascular risk factor levels. On the other hand, our findings suggest that language spoken at home and proportion of life spent in the U.S. may constitute simple, easy-to-use instruments to assist in the needs assessment of Hispanic immigrants. No inferences can be made with regard to causality as this analysis was cross-sectional.

Furthermore, although these findings are apt to be important from a population perspective, the modest differences in cardiovascular risk factor levels stratified by our predictor variables may not be as important at the individual level. For example, a 5 mm/Hg difference in systolic blood pressure may not be clinically significant for an individual patient, but this has important implications on cardiovascular outcomes for the Hispanic population. We were also limited in studying Hispanics as a group. There are likely to be differences in Hispanic subgroups but the distribution in our study population did not permit adequate sub-group analyses.

In conclusion, our study demonstrates that, among Hispanics with cardiovascular risk factors, those who speak Spanish at home and have spent less time in the U.S. tend to have worse risk factor levels. Future studies should focus on mediating factors between acculturation and cardiovascular risk factor control, on identification of immigrants most at risk for poor health outcomes, and on promising interventions to decrease cardiovascular risk among specific immigrant populations.

ACKNOWLEDGMENTS

Dr. Eamranond was supported by an Institutional National Research Service Award T32 HP11001-18.

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Table I

Prevalence and proportion with poor control of cardiovascular risk factor among all Hispanic participants in MESA, 2000-2002

	All N=1492	English-speaking N=675	Spanish-speaking N=809
Prevalence of hypertension	580 (39%)	254 (38%)	324 (40%)
Poor control of blood pressure [*]	264	100	163
Prevalence of hypercholesterolemia	539 (36%)	227 (34%)	311 (38%)
Poor control of LDL-cholesterol [†]	65	21	43
Prevalence of diabetes	248 (17%)	120 (18%)	127 (16%)
Poor control of fasting blood glucose [‡]	102	42	60

Note: Prevalence of cardiovascular risk factors was defined by self-report and risk factor-specific medication use.

^{*} Systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg.

[†] Goal LDL-cholesterol levels were determined by Adult Treatment Panel II recommendations (ATP II), based on coronary heart disease risk classification.²⁶ This includes LDL<190mg/dL for individuals with 0-1 risk factors, <160mg/dL for individuals with 2 or more risk factors, and <130 mg/dL for pre-existing coronary artery disease (recognizing that this was an exclusion criteria for MESA). ATP III recommendations were not published until 2001, after recruitment of MESA began.

[‡] As Hgb A1c was not available in MESA 2000-2002, a cutoff of 160mg/dL was utilized, corresponding to a hemoglobin A1c 6.5-7.0.

Table II

Characteristics of Hispanics participants with at least one of the following: hypertension, hypercholesterolemia, and diabetes, MESA 2000-2002.

Characteristic	All N=904	English-speaking N=389	Spanish-speaking N=512
Mean age	63.0 ± 10.0	62.9 ± 10.1	63.0 ± 9.9
Gender (female)	482 (53%)	184 (47%)	297 (58%)
Education (High school)	609 (67%)	190 (49%)	419 (82%)
Family income (< \$40,000)	679 (77%)	246 (64%)	431 (87%)
Insurance			
No health insurance	126 (14%)	18 (5%)	107 (21%)
Medicaid, Medicare, or VA	242 (27%)	73 (19%)	169 (33%)
Other insurance (including other type of insurance or HMO)	534 (59%)	296 (76%)	236 (46%)
US-born	265 (29%)	249 (64%)	16 (3%)
Mean duration of residence in U.S. (for immigrants only)	30.6 ± 14.5	39.9 ± 13.7	28.1 ± 13.6

Table III

Mean levels $\pm$ SD of risk factors according to language spoken at home among Hispanic participants with cardiovascular risk factors in MESA, 2000-2002.

Language status	All		
	English	Spanish	p *
n (hypertension)	254	324	
Systolic blood pressure (mmHg)	135 $\pm$ 22	140 $\pm$ 23	.007
n (hypercholesterolemia)	222	301	
LDL-cholesterol (mg/dL)	122 $\pm$ 35	131 $\pm$ 38	.03
n (diabetes)	120	127	
Fasting blood glucose (mg/dL)	154 $\pm$ 57	172 $\pm$ 69	.03

* Two-sided t-test

Table IV

Mean levels $\pm$ SD of risk factors according to proportion of life in U.S. among participants with cardiovascular risk factors in MESA, 2000-2002

	All			
Proportion of time in U.S.	1 (US-born)	0.5 -1	<0.5	p *
n (hypertension)	177	200	168	.02
Systolic blood pressure (mmHg)	136 $\pm$ 22	137 $\pm$ 22	142 $\pm$ 22	
n (hyperlipidemia)	155	185	146	.02
LDL-cholesterol (mg/dL)	120 $\pm$ 38	130 $\pm$ 26	131 $\pm$ 31	
n (diabetes)	90	76	66	.26
Fasting glucose (mg/dL)	153 $\pm$ 57	166 $\pm$ 62	173 $\pm$ 73	

* ANOVA

Table V

Multivariable analysis of cardiovascular risk factor levels for Hispanics based on language and proportion of life in U.S. among participants with diagnosed risk factors

CVRF* comparing Spanish to English	Model 1 (adj for age, gender)		Model 2 (adj for age, gender, education)		Model 3 (adj for age, gender, education, insurance, income)		Model 4 (adj for age, gender, education, physical activity)		Model 5 (adj for age, gender, education, dietary factors ^{††})		Model 6 (adj for age, gender, education, risk factor-specific medication use)		Model 7 (adj for age, gender, education, BMI)	
	$\beta \pm SE$	p	$\beta \pm SE$	p	$\beta \pm SE$	p	$\beta \pm SE$	p	$\beta \pm SE$	p	$\beta \pm SE$	p	$\beta \pm SE$	p
Systolic blood pressure	4.7±1.8	.01	1.7±2.0	.38	1.1±2.1	.59	1.6±2.0	.44	2.6±2.0	.20	1.6±2.0	.42	1.7±2.0	.40
LDL-cholesterol	9.0±3.3	.006	8.9±3.5	.01	9.2±3.7	.01	8.8±3.6	.01	7.5±3.7	.05	6.7±3.3	.04	8.1±3.5	.02
Fasting glucose	18.8±8.1	.02	15.6±8.9	.08	10.2±9.5	.28	13.0±9.0	.15	21.0±9.1	.02	15.5±8.9	.08	15.5±9.1	.09
CVRF by proportion of life in U.S.*														
Systolic blood pressure	6.5±3.1	.03	2.5±3.2	.44	0.7±3.4	.83	2.3±3.3	.47	3.8±3.3	.24	1.6±3.2	.61	2.5±3.2	.44
LDL-cholesterol	13.0±5.9	.03	12.1±6.1	.05	12.6±6.5	.05	11.3±6.2	.07	9.5±6.5	.14	4.7±5.8	.41	10.5±6.1	.09
Fasting glucose	36.1±13.9	.01	34.9±15.1	.02	27.4±15.7	.08	32.5±15.0	.03	47.1±15.6	.003	35.8±15.1	.27	34.7±15.4	.02

[†] Proportion of life in the U.S. was determined by dividing duration of residence in U.S. by age

* CVRF=cardiovascular risk factor level

^{††} Dietary factors included total kcal/day, percentage of calories from carbohydrates, percentage from fat, fiber intake, and alcohol intake.