A Church-Based Cholesterol Education Program

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Synopsis

The leading cause of death among black people in the United States is coronary heart disease, accounting for about 25 percent of the deaths. The Task Force on Black and Minority Health formed by the Secretary of Health and Human Services in 1985 subsequently recommended increased efforts to reduce risk factors for coronary heart disease in the black population. A stated focus of the National Heart, Lung, and Blood Institute's National Cholesterol Education Program has been that of reaching minority groups. This report describes a pilot cholesterol education program conducted in black churches by trained members of those churches.

Cholesterol screening, using a Reflotron, and other coronary heart disease risk factor screening was conducted in six churches with predominantly black members and at a neighborhood library. A total of 348 persons with cholesterol levels of 200 milligrams per deciliter (mg per dl) or higher were identified. At the time of screening, all were provided brief counseling on lowering their cholesterol and were given a copy of the screening results.

Half of those identified, all members of one church, were invited to attend a 6-week nutrition education class of 1 hour each week about techniques to lower blood cholesterol. Information about cholesterol was also mailed to them. They were designated as the education group. Persons in the church were trained to teach the classes.

A report of the screening results was sent to the personal physicians of the remaining 174 people in other churches who had cholesterol levels of 200 mg per dl or higher. This group served as a usual care comparison group.

Six months after the initial screening, members of both groups were invited for followup screening. Among the 75 percent of the education group who returned for followup screening there was a 23.4 mg per dl (10 percent) decrease in the mean cholesterol level. Thirty-six percent of the usual care group returned for followup screening; their mean cholesterol level had decreased 38.7 mg per dl (16 percent).

In this study, the support of churches provided access to large numbers of people. The mean serum cholesterol reductions occurring with both screening and referral and screening and education were statistically significant and large enough to be of clinical importance. The authors recommend that the approach taken in this study be investigated further by the National Cholesterol Education Program as a model for reaching the black population with coronary heart disease risk reduction programs.

A TRADITIONAL PATTERN of mutual assistance is characteristic of some communities (*1*), particularly the social support networks which can provide such things as information on disease prevention (*2, 3*). And within community networks there are lay people to whom others seem to turn naturally for advice, emotional support, and tangible aid in everyday life (*1, 2*). Called "natural helpers," they also can influence others to modify their health behavior (*4*). Formal health education programs can build on those network relationships by encouraging peer counseling (*5*) and by including lay expertise in their programming (*1*). The use of natural helpers in a health education program can aid in the diffusion and adoption of desirable health behaviors within an organization (*6*).

Among blacks in the United States, churches have supplied social, emotional, and material support in addition to religious worship. The churches have set norms, enforced community values, served as a focal point for social networks and as a catalyst for change (*7*). And the clergy have played a major role in the black community (*7, 8*).

Using natural helpers within church communities who have been identified and trained to carry out health programs (*9, 10*) has been tried elsewhere. Levin has argued for an important role for black churches and their clergy in medical care, disease prevention, health promotion, and health policy (*11*).

Because of the strong support of black church members for filling community health needs (*12*), churches have been the focal point for several health education programs. Programs based on the natural helper approach in black churches have focused upon blood pressure screening (*13, 14*), aerobic exercise (*15*), and lay health advisors (*7, 16*).

The general approach of program organizers has been to ask the church pastors initially to identify several people in their churches who already play a key role in advising and aiding people in need (*7, 17*). The pastor may also chair a program development committee usually consisting of lay church members and health professionals (*18*). For those natural helpers identified by church leaders to serve as program facilitators, weekly training sessions of 2 to 3 hours for 10-12 weeks are conducted to teach them about specific health problems, counseling, and problem solving skills and then to certify their competence to conduct the programs. Award programs are often conducted to acknowledge the work of the church volunteers who carried out the programs (*14, 17, 19, 20*).

Many of these programs in black churches have focused on the prevention of cardiovascular disease. Coronary heart disease (CHD) is the leading cause of death among blacks in the United States (*21*). Among blacks between 20 and 64 years, there is an excess of CHD deaths compared with whites (*21, 22a*). Blacks are less likely than other Americans to identify cholesterol formed from fatty foods as a cause of heart disease and to list diet as a preventive measure (*22b*). Despite the high mortality rates of cardiovascular disease among blacks, little is known about the effects of educational intervention on behavioral risk factors among blacks, particularly cholesterol and diet (*23*).

In the Multiple Risk Factor Intervention Trial, black men reported greater consumption of food high in cholesterol-causing fats than whites at baseline (*24*). In the NHANES 1971–74 study, blacks reported higher egg consumption than whites (*25*). In one educational intervention study using nonprofessionals, blacks showed an 8.1-percent decrease in serum cholesterol as well as improvements in knowledge and adherence to dietary recommendations (*26*).

In order to provide some of the information needed about the effectiveness of educational interventions in reducing cholesterol levels, the National Institutes of Health recommended that research be conducted on the effectiveness of community health education programs in influencing food choices (*27*). The National Heart, Lung, and Blood Institute's National Cholesterol Education Program (NCEP) set the desirable blood cholesterol level at less than 200 mg per dl and recommended that serum cholesterol be measured in all adults 20 years of age and older. The primary treatment should be dietary education, according to NCEP recommendations (*28*). A special emphasis of the NCEP is on reaching minority groups (*29*).

The purpose of our pilot research project was to assess the applicability of a dietary education program conducted by natural helpers in a black church community to lower serum cholesterol.

Methods

Screening for risk factors for CHD was conducted at six churches with predominantly black membership and in one neighborhood library in a large city in the southwestern United States. Project staff members met with the local association of black ministers, collectively and individually, to solicit their support and the participation of their congregations. The churches were selected because of the size of their membership (200 to 1,200) and the anticipated support of the church leaders and health professionals. Announcements concerning the screenings were made by ministers from the pulpit, by notices on church bulletin boards, and in the church service bulletins and newsletters. Announcements were also made on local radio stations about the library screening. Black community newspapers carried stories about the screenings.

Screening was conducted at the churches before and after Sunday services in the education rooms and fellowship halls by the nurses and other members of the specific churches, the local black nurses association, and medical and graduate public health students who had been trained in the screening protocol.

A total of 661 black people between 21 and 89 years of age were screened for blood pressure, pulse, height and weight, and serum cholesterol. Nonfasting total cholesterol was measured using a Reflotron (A), a dry chemistry technique requiring a 30μL capillary tube of blood obtained from a finger stick. A venipuncture blood sample was also obtained from approximately every 20th person for comparison with the Hitachi method. The venipuncture sample was processed in a hospital laboratory that reports cholesterol values within 1.2 percent of the Lipid Research Clinics (LRC)

Table 1. Cardiovascular risk factors of education and usual care groups at baseline

Variable	Education (N=174)		Usual care (N=174)		Significance		
	X̄	SD	X̄	SD	T	df	P
Cholesterol[1]	235.40	31.99	238.04	32.20	−0.77	346	0.444
Systolic blood pressure[2]	137.55	23.04	132.64	19.01	2.17	346	0.031
Diastolic blood pressure[2]	85.07	11.81	81.44	9.98	3.10	346	0.002
Body mass index[3]	28.39	5.01	28.56	5.47	−0.29	343	0.774
Age (years)	49.80	14.83	51.73	15.74	−1.17	344	0.242

[1]milligrams per deciliter. [2]millimeters of mercury. [3]kilograms of body weight ÷ by meters of height squared. NOTE: X̄ = mean; SD = standard deviation; df = degrees of freedom; P = probability.

method. With the subject in a seated position, two measures of blood pressure were taken on the right arm using a standard mercury sphygmomanometer. Phase I sounds were recorded as systolic pressure and Phase V Korotokoff sounds as diastolic pressure. The second measurement was taken after 1 minute with the cuff deflated. The average of the two measures was the recorded pressure. Pulse rate was obtained by palpation of the radial pulse for a full 60 seconds. The participants also completed questionnaires concerning a variety of sociodemographic factors, medical history, behavioral risk factors, and dietary intake.

At the time of the screening, all participants were provided a copy of the screening results and received brief counseling from one of the authors. Counseling included recommendations to quit smoking and to reduce their intake of foods high in saturated fat by substituting lower fat foods. A total of 174 persons from one church who had serum cholesterol levels of 200 mg per dl or higher were invited to participate in a nutrition education program to learn how to lower their cholesterol (education group). An additional 174 people at other screening sites with cholesterol levels of 200 mg per dl or higher had a copy of the screening results sent to their personal physician. These people served as a comparison, or nonintervention group (usual care).

The members of the church selected to serve as the education group were chosen largely because the church had an active nursing corps. The project staff members first met with the nursing corps members and church pastors to explain the project and solicit their support. The staff members then presented the project to a meeting of the church elders, deacons, and deaconesses and finally to the congregation. The pastor was the first person in the church to be screened and a photograph was used to publicize the screening to members. The membership of this church was also organized into parish fellowship groups, each with identified leaders who had frequent contact with the group members. Those leaders were contacted to encourage their groups' members to participate in the screening.

The education program consisted of 1-hour classes held weekly for 6 weeks in the education center of the church. Classes were conducted at various times and days throughout the week, including both daytime and evening hours and Saturday. Those assigned to the education group were contacted by telephone to choose the time and day of the class they wished to attend. Seven classes were organized for groups of 10 to 15 persons each.

Table 2. Sex, education, and income characteristics of education and usual care groups at baseline

Variable	Education		Usual care		Significance		
	Number	Percent	Number	Percent	Chi-square	df	P
Sex:							
Female	111	63.8	130	74.7	4.37	1	0.04
Male	63	36.2	44	25.3			
Education:							
High school or less	52	30.2	80	46.5	10.41	2	0.006
College	99	57.6	80	46.5			
Graduate degree	21	12.2	12	7.0			
Income:							
$11,999 or less	43	26.9	46	31.3	2.20	3	0.53
$12,000-$22,499	36	22.5	39	26.5			
$22,500-$39,999	40	25.0	31	21.1			
$40,000 or more	41	25.6	31	21.1			

Volunteers from the church where the education program was conducted taught the nutrition education classes. Instructors were selected because of their enthusiastic participation in the screening and upon the basis of recommendations of parishioners and church leaders. The instructors included three registered nurses, a social worker, a physical educator, two homemakers, and a beautician. All were female except one.

The instructors received 6 hours of training from a registered dietitian with experience in the LRC method and cholesterol reduction counseling. Teachers were provided with an instructor's manual which included all lecture material, handouts, and overhead transparencies. All additional instructional materials such as audio-visual equipment, food models, food packages, and snacks were also provided. After the project was completed, volunteers who had conducted the screening

Table 3. Mean cholesterol level[1] for education and usual care groups at baseline and followup, by sex

Sex	*Education*				*Usual care*			
	Pretest		*Followup*		*Pretest*		*Followup*	
	X̄	*SD*	*X̄*	*SD*	*X̄*	*SD*	*X̄*	*SD*
Women	231.96	30.77	210.10	35.92	236.96	36.81	194.84	37.19
Men	236.84	32.07	210.96	33.39	253.59	42.61	224.06	47.33

[1] milligrams per deciliter. NOTE: X̄ = mean; SD = standard deviation. Females N = 79 in education group, 45 in usual care group; males 51 and 17.

and taught the classes were given certificates and a letter of appreciation.

The education program focused on an eating pattern with modified fat intake. There was emphasis on reducing sources of saturated fat and cholesterol by substituting low fat foods and foods high in mono- and polyunsaturated fats. Classes included information about risk factors for CHD, the fat content of foods, alternative food choices, soluble fiber, sodium substitutes, food preparation, shopping, label reading, and eating in restaurants. Guidelines for weight loss, exercise, and smoking cessation were also included. Lectures, visual aids, self-monitoring, role-playing, behavioral rehearsal, and food sampling were all part of the instructional format of the class.

Each participant was provided with a 64-page instruction manual which included information on all the topics just noted. They were also given a pocket-sized version of the 3-day food record rating system "Rating Your Diet" (*30*). After the first session, the education materials were mailed to those who had not attended. Every 2 weeks after the end of the formal classes until the followup screening (12 weeks) a pamphlet or booklet about some aspect of dietary reduction of cholesterol was mailed to the education group. For example, the first two items mailed to participants were the National Cholesterol Education Program booklets, "So You Have High Blood Cholesterol" and "Eating to Lower Your High Blood Cholesterol" (*31, 32*). The designs of the education program and the instructional manuals were developed by graduate public health education students under the supervision of the authors and a registered dietitian.

The followup screening was conducted 6 months after the initial screening. Three months after the program ended, all those who had been assigned to the education and usual care groups were invited, by letter or telephone or both, for followup screening on a specified date at the location where they had been screened initially. Blood pressure, pulse, weight, and serum cholesterol level were measured again by the same protocol as at the initial screening. Screening was again conducted at the churches and library by the volunteers and project staff members.

Statistical methods. Based on a predicted 10-mg-per-dl difference between the education and usual care groups and an estimated dropout rate of 50 percent, it was calculated that a sample size of 171 in each group would be needed to detect a statistically significant difference at an alpha level of 0.05 and a beta level of 0.80. Baseline differences between the groups on categorical data was analyzed by chi-square. The change in continuous variables between groups was analyzed by t-test (two-tailed) and analysis of covariance, used to adjust continuous data for selected covariates. Regression analysis was used to identify independent predictors of cholesterol change. Statistical analyses were conducted using SPSSX T-TEST, CROSSTABS, MANOVA and SAS Proc REG (*B, C*).

Results

Table 1 shows the cardiovascular risk factors of the education and usual care groups at the time of initial screening. Table 2 shows the sex, education, and income characteristics of the groups. All participants were black. The education group had a higher proportion of men (36 percent to 25 percent in the usual care group) and 70 percent with some college, an undergraduate degree, or a graduate degree as opposed to the usual care group's 54 percent. The education group also had significantly higher mean systolic and diastolic blood pressure readings than the usual care group.

Although attendance records were not available for three of the six education sessions of one class, it was determined that 48 percent of the education group had attended three or more sessions and 64 percent had attended at least one session.

A total of 130 members of the education group—75 percent—returned for followup screening. In the usual care group, however, only 62 of 174 returned (36 percent). Among those who returned, the only statistically significant difference between the education group and the usual care group was baseline mean systolic blood pressure (137.4 ± 22 SD for the education group and 129.5 ± 18 SD for the usual care group; $P<0.02$). There were no significant differences in demographic characteristics.

Of those who returned for followup screening, the mean cholesterol level of the education group decreased 23.4 mg per dl (10 percent) from baseline to followup. Twenty-one percent of the education group had unchanged or higher cholesterol levels. The usual care group decreased 38.7 mg per dl (16 percent). On the whole, 92 percent of the usual care group had lower cholesterol levels. The difference in the change in cholesterol was statistically significant ($P<0.003$). Based upon the initial cholesterol entry criteria, a 7.6-mg-per-dl regression to the mean was calculated. The correlation between the screening measurement of cholesterol using the Reflotron and the laboratory analysis was r = .83 (N = 19; $P<0.0001$).

Among those who returned for the followup screening, the initial mean cholesterol level of the education group was in the borderline high category (233.9 mg per dl) but decreased to near the desirable level (210.4 mg per dl) at followup ($P<0.0001$). At baseline, the usual care group's mean cholesterol level was in the high risk category (241.5 mg per dl), and it also decreased to near the desirable level (202.9 mg per dl) at followup ($P<0.0001$). Comparing the two groups, neither the baseline cholesterol levels nor the followup levels were statistically different.

Twenty percent more of the usual care women had decreased cholesterol levels at followup than did women in the education group. The followup cholesterol level was statistically lower ($P<0.03$) for the women in the usual care group (194.6 mg per dl) than those in the education group (210.1 mg per dl) (table 3). The change in the cholesterol level from baseline to followup was also statistically greater ($P=0.002$) for the women in the usual care group (42.11 mg per dl) than the change among the women in the education group (21.86 mg per dl) (table 4).

Analysis of covariance was conducted on the change in cholesterol level from baseline to followup for the education and usual care groups. Education level and sex were entered as factors; baseline systolic and diastolic blood pressure, body mass index, and age were covariates. Table 5 shows the adjusted mean change in cholesterol level from baseline to followup. In the univariate regression analysis none of the covariates was related to the change in cholesterol level. There was no significant interaction among experimental group, educational level, and sex.

A regression analysis was conducted on factors associated with the change in cholesterol from baseline to followup. Sex, treatment group, age, body mass index, weight change, change in systolic blood pressure, education, income, blood pressure medication status, pulse, and smoking status were entered into the equation. The overall model was of borderline significance

Table 4. Change in cholesterol level from baseline to followup in education and usual care groups

	Education (79 Women) (51 Men)		Usual care (45 Women) (17 Men)	
Sex	Difference (mg/dl)	Percent change	Difference (mg/dl)	Percent change
Female ...	21.86	9	42.11	18
Male	25.88	11	29.53	12

NOTE: mg/dl = milligrams per deciliter.

Table 5. Adjusted[1] mean change in cholesterol level in education and usual care groups by sex and education level

	Education		Usual care	
Variable	Number	$\bar{X}$ Change[2]	Number	$\bar{X}$ Change[2]
High school or less:				
Women	28	18.03	21	38.47
Men	11	18.40	7	34.68
College or graduate level:				
Women	49	27.60	24	43.88
Men	39	23.81	9	44.25

[1]Adjusted for baseline systolic and diastolic blood pressure, body mass index, and age.
[2]Milligrams per deciliter.
NOTE: $\bar{X}$ = mean.

(F = 1.78, $P=0.06$, df = 11, 146) and accounted for a small proportion of the variance in the change in cholesterol (R2 = .12).

Analyses were carried out to determine whether differences existed between those who returned for followup and those who did not. In the education group, there were no statistically significant differences at baseline in their cholesterol level, body mass index, diastolic or systolic blood pressure, or age between the 130 who returned for followup and the 44 who did not. Among those who did not return, there was no difference between the education and usual care groups in their initial cholesterol level.

In the usual care group, the 112 who did not return for followup were an average of 4.99 years older than the 62 who did return ($P\leq 0.04$) (tables 6 and 7). No differences were found, however, in their baseline history of hypertension, diabetes, heart attack, stroke, high cholesterol, or family history of heart attack or in sex, education, or income. Neither were differences found in medication history, including estrogen, hypertensive medication, or cholesterol-lowering drugs. No differences were found in the use of tobacco or previous measurement of cholesterol. Although there was statistically no significant difference on the amount of self-reported regular, strenuous exercise obtained, or pulse rate, a larger proportion of those who returned for fol-

Table 6. Baseline health characteristics of the usual care group by followup status

Variable	With followup (N=62)		Without followup (N=112)	
	X̄	SD	X̄	SD
Cholesterol[1]	241.52	38.85	236.12	27.85
Systolic blood pressure[2]	129.48	17.82	134.38	19.50
Diastolic blood pressure[2]	81.58	9.73	81.36	10.16
Body mass index[3]	27.61	4.55	29.09	5.88
Age (years)	48.52	14.92	[4]53.51	15.96

[1] milligram per deciliter
[2] millimeters of mercury
[3] kilograms of body weight ÷ by meters of height squared.
[4] $P<0.05$.
X̄ = mean; SD = standard deviation

Table 7. Comparison of usual care group members by followup status, sex, education and income characteristics

Variable	With Followup		Without Followup	
	Number	Percent	Number	Percent
Sex:				
Women	17	27.4	27	24.1
Men	45	72.6	85	75.9
Education:				
High school or less	28	45.9	52	46.8
College	29	47.5	51	45.9
Graduate degree	4	6.6	8	7.2
Income:				
$11,999 or less	12	24.5	34	34.7
$12,000-$22,499	13	26.5	26	26.5
$22,500-$39,999	10	20.4	21	21.4
$40,000 or more	14	28.6	17	17.3

lowup perceived that they were physically more active than their peers (chi-square = 10.94, $P<0.001$, df = 1) compared with the proportion among those who did not return for followup screening.

Because of the clustering of risk factors in this population, reported elsewhere (*33*), separate analysis was conducted with the data for those persons with definite hypertension. People were classified as having definite hypertension if, at baseline, their systolic blood pressure was 160 millimeters of mercury (mm Hg) or higher, diastolic blood pressure was 95 mm Hg or higher, or the subjects indicated that they were taking medication for high blood pressure. Among those rescreened at followup, there was a slightly higher proportion of definite hypertensives in the education group (12 percent) than in the usual care group (8 percent). There were no statistically significant differences in baseline variables or change in cholesterol between the two groups. There was, however, a higher proportion of borderline hypertensives (systolic blood pressure from 140 to 160 and diastolic from 90 to 95) in the usual care group (14 percent) compared to the education group (3 percent).

Differences between the education and usual care groups in the change in cholesterol levels, the baseline cholesterol, and baseline systolic blood pressure were statistically significant for those returning for the followup who did not have definite hypertension at baseline. In the usual care group the baseline cholesterol level was 11 mg per dl higher ($P=0.04$) and the change in cholesterol level was 16 mg per dl greater ($P=0.001$) than in the education group. The baseline systolic blood pressure was 5.6 mm Hg higher ($P=0.02$) in the education group than in the usual care group.

Analysis of baseline differences by direction of change in cholesterol showed no significant differences between the women in the two groups. The few men returning for followup prevented meaningful group comparison by direction of change in cholesterol.

Discussion

The results of this study suggest that CHD screening and nutrition classes to lower cholesterol, when conducted in black churches by trained volunteers of the congregation, are an effective method of lowering blood cholesterol levels in a black community. The observed decrease in blood cholesterol in this study, if sustained over time, would have a sizable impact on CHD risk reduction.

However, the greater reduction in blood cholesterol levels seen in the usual care group suggests that screening alone may lead to reduction in blood cholesterol in this population. The low followup rate in the usual care group suggests that the observed decreases in cholesterol were among a unique, possibly highly motivated, subpopulation of the usual care group, although few statistically significant differences were found between those who returned for followup and those who did not.

Although the data are lacking in this regard, some compensatory rivalry, because of the geographic proximity of the usual care churches and the intervention church, may have occurred. This rivalry could account for the large decrease in cholesterol in members of the usual care group who returned for followup. No information was obtained from participants at followup on how they learned about reducing their cholesterol levels.

In addition to this program, several local hospitals conducted cholesterol screening in shopping malls at the same time that our project was under way (although not in the neighborhood where the churches were located). While some members of the usual care group may have obtained additional cholesterol screening and information from such outside sources, the intervention group should have had similar access.

Analyses of initial differences between the education and usual care groups and differences among those members of both groups returning for followup showed distinctions in both systolic and diastolic blood pressures and proportion of hypertension. These findings suggest that blood pressure variables may have influenced the differences in the change in cholesterol.

The approach to organizing cholesterol education programs reported in this pilot study needs to be replicated in such a way that church congregations are randomly assigned to education and usual care groups and are followed for a longer period of time. Future studies should also place a special emphasis on developing strategies to increase the return rate among the usual care group. In this study, the large number of usual care lost to followup and the changes in cholesterol found in the group which did return limits conclusions about the comparative effectiveness of cholesterol screening versus a program of both screening and education.

In addition, an attempt should be made to determine whether or not actions are taken by the personal physicians of the usual care group members to assist them in lowering their cholesterol. Since this project focused only on churches, programs should also be developed to reach other members of black communities unaffiliated with local churches. Neighborhood libraries might offer effective alternative screening sites.

The Secretary's Task Force on Black and Minority Health recommended that support be increased for prevention and education efforts to reduce CHD risk factors in blacks (*34*). Given the central role of the church in the black community, it would seem logical to organize cholesterol education programs within churches, as we report. This approach could serve as a model for the National Cholesterol Education Program as it develops and promotes intervention activities for reaching a substantial proportion of the black population. The churches could be strong allies of public health organizations, and their members could enhance considerably ongoing efforts to lower risk for CHD in the black population.

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Equipment/Materials

A. Reflotron, Boehringer Mannheim, 9115 Hague Rd., Indianapolis, IN, 46250
B. SPSS Inc., 444 North Michigan Av., Suite 3300, Chicago, IL 60611
C. SAS Institute Inc. Box 8000, Cary, NC 27511.

Blood Lead Levels of 4–11-Year-Old Mexican American, Puerto Rican, and Cuban Children

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Synopsis ....

Data from the Hispanic Health and Nutrition Examination Survey were used to estimate arithmetic mean blood lead and percent with elevated blood lead [25 micrograms per deciliter (μg per dl) or greater] for 4–11-year-old Mexican American, Puerto Rican, and Cuban children. The sample size was 1,390 for Mexican American children, 397 for Puerto Rican children, and 114 for Cuban children.

Puerto Rican children had the highest mean blood lead levels (11.5 μg per dl), followed by Mexican American children (10.4 μg per dl) and Cuban children (8.6 μg per dl, P<.05). Puerto Rican children had the highest percent with elevated blood lead (2.7 percent); 1.6 percent of Mexican American children had elevated blood lead; less than 1 percent (0.9 percent) of the Cuban children had elevated blood lead (P<.05). Mexican American girls had a lower mean blood lead level than did boys: 9.7 μg per dl versus 11.0 μg per dl (P<.05). For both Puerto Rican and Mexican American children, younger age indicated a higher risk of having elevated blood lead levels.

Mexican American children who lived in poverty had higher mean blood lead levels than did Mexican American children who did not live in poverty—11.6 μg per dl versus 9.6 μg per dl (P<.05). Despite advances in primary prevention of lead toxicity in children during the past 10 years, many Hispanic children are at risk of lead toxicity. Approximately 19,000 Mexican American 4–11-year-old children living in the Southwest and approximately 8,000 Puerto Rican children living in the New York City area had elevated blood lead levels (≥ 25 μg per dl) during 1982–84.