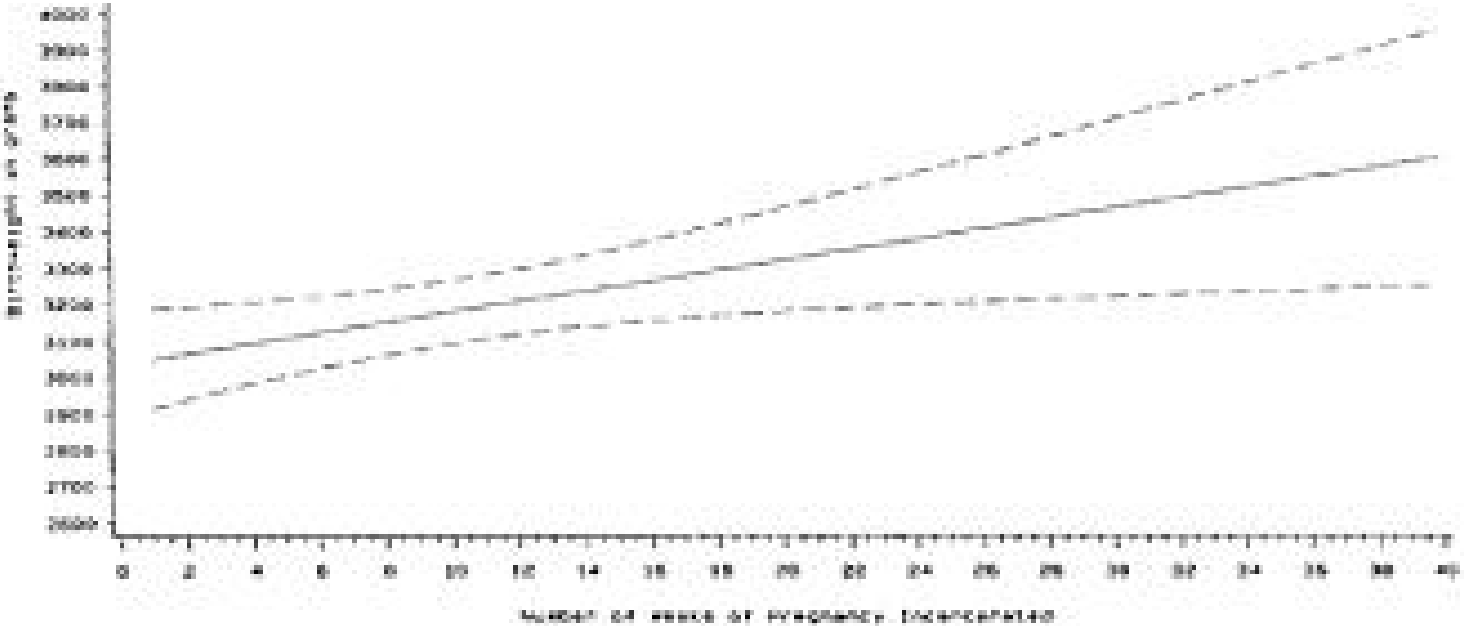

Note. The following coding scheme was used in the multiple linear regression analysis: birthweight (in kilograms); number of weeks of pregnancy incarcerated; racial/ethnic group (1 if non-White, 0 otherwise); age (in years); education (1 if not a high school graduate, 0 otherwise); marital status (1 if never married, 0 otherwise); cigarette smoking (1 if smoked during pregnancy, 0 otherwise); alcohol drinking (1 if drank during pregnancy, 0 otherwise); Medicaid (1 if received Medicaid, 0 otherwise); WIC (1 if received WIC, 0 otherwise); Maternity Care Coordination (1 if received Maternity Care Coordination, 0 otherwise); Prenatal Care Adequacy (1 if adequate on the Kessner Adequacy of Prenatal Care Index, 0 otherwise).

Although birthweight was modeled in kilograms, the adjusted mean birthweights in this graph are plotted in grams. In addition, mean values are used for all control variables in the model.

FIGURE 1—Estimated linear regression line and 95% confidence bands relating the duration of pregnancy spent incarcerated with infant birthweight (n = 168).

Module 33:

Multiple Regression Examples

This module contains several examples of the use of the multiple regression analytical procedure as published in *AJPH*

Extended Coverage for Preventive Services for the Elderly: Response and Results in a Demonstration Population

Pearl S. German, ScD, Lynda C. Burton, ScD, Sam Shapiro, Donald M. Steinwachs, PhD, Ichiro Tsuji, MD, Michael J. Paglia, MA, and Anne M. Damiano, ScD

ABSTRACT

Objectives. This study was undertaken to test the acceptability of preventive services under Medicare waivers to a community-dwelling population aged 65 and over and to examine the effect of such services on health.

Methods. Medicare beneficiaries and designated primary care providers were sampled, and beneficiaries were screened and surveyed. A total of 4195 individuals were then randomized into intervention or control groups. Those in the intervention group were offered free preventive visits (under waivers) to their physicians. A follow-up survey of the entire group was administered after completion of the intervention.

Results. Sixty-three percent of the intervention group made a preventive clinical visit, and about half of them a counseling visit. For men, being married and having a solo practitioner were positively associated with accepting the intervention services, while for women, having had a mammogram, having a confidant, having a high school education, and having a female practitioner were so associated. The intervention group showed a greater health benefit than did the control group and had a significantly lower death rate: 8.3% vs 11.1%.

Conclusions. Older individuals will respond to preventive programs, and such services will result in modest health gains. (*Am J Public Health.* 1995;85:379–386)

TABLE 6—Multivariate Regression Model Explaining Health Status[a] at 2 Years Following Baseline (n = 3474)[b]

Standard Predictors	Estimate	Error	Parameter P
Intervention	0.0794 b_1	.0233	.0006
QWB at baseline	0.6354 b_2	.0352	.0001
Male	−0.0393 b_3	.0077	.0001
Age 75–84[c]	−0.0527 b_4	.0082	.0001
Age 85+[c]	−0.1699 b_5	.0151	.0001
GHQ, moderate[d]	−0.0564 b_6	.0135	.0001
GHQ, severe[d]	−0.0847 b_7	.0195	.0001
Physically active	0.0629 b_8	.0082	.0001
Reduced weight	0.0223 b_9	.0077	.0021
Medigap	0.0240 b_{10}	.0102	.0185
Education	0.0038 b_{11}	.0016	.0211
Educ.* interv.	−0.0061 b_{12}	.0022	.0065
Intercept	0.1323 b_0	.0303	.0001
R^2 = .26			

[a]Health status measured by the Quality of Well-Being (QWB) Scale.

[b]Based on the 3503 persons who responded at time 2 or were deceased and for whom a QWB score could be assigned, minus 29 with missing values.

[c]Compared with age < 75.

[d]General Health Questionnaire (GHQ) score: moderate = 5 to 9, severe = 10 to 28, compared with low = <5.

Dependent variable

y = Quality of Well Being score (QWB) at two years

Independent variables

x_1 : Intervention

$x_1 = 1$ if person was in intervention group
$= 0$ otherwise

x_2 : QWB at baseline

$x_2 =$ baseline score

x_3 : Gender

$x_3 = 1$ if person was a male
$= 0$ otherwise, ie a female

$x_{4\text{-}5}$: Age

$x_4 = 1$ if age 75-84

$= 0$ otherwise

$x_5 = 1$ if age 85 +

$= 0$ otherwise

$x_{6\text{-}7}$: CHQ

$x_6 = 1$ if moderate

$= 0$ otherwise

$x_7 = 1$ if severe

$= 0$ otherwise

x_8: Physically active

$x_8 = 1$ if $\geq$ 3 times per week

$= 0$ if $<$ three times per week

x_9: Reduced weight

$x_9 = 1$ if tried to lose weight

$= 0$ otherwise

x_{10}: Medigap (Other insurance)

$x_{10} = 1$ if Medigap insurance

$= 0$ if otherwise, ie Medicaid

x_{11}: Education

x_{11} = education level in years

x_{12}: Education x Intervention interaction

$x_{12} = (x_{11})*(x_1)$

Example: AJPH, March 1995, Vol. 85, No. 3, p.385

TABLE 6—Multivariate Regression Model Explaining Health Status[a] at 2 Years Following Baseline (n = 3474)[b]

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Age 85+[c]	−0.1699 b_5	.0151	.0001
GHQ, moderate[d]	−0.0564 b_6	.0135	.0001
GHQ, severe[d]	−0.0847 b_7	.0195	.0001
Physically active	0.0629 b_8	.0082	.0001
Reduced weight	0.0223 b_9	.0077	.0021
Medigap	0.0240 b_{10}	.0102	.0185
Education	0.0038 b_{11}	.0016	.0211
Educ * interv.	−0.0061 b_{12}	.0022	.0065
Intercept	0.1323 b_0	.0303	.0001
R^2 = .26			

[a]Health status measured by the Quality of Well-Being (QWB) Scale.
[b]Based on the 3500 persons who responded at time 2 or were deceased and for whom a QWB score could be assigned, minus 29 with missing values.
[c]Compared with age < 75.
[d]General Health Questionnaire (GHQ) score: moderate = 5 to 9, severe = 10 to 28, compared with low = <5.

$$\hat{y} = 0.1323 + 0.0794x_1 + 0.6354x_2 - 0.0393x_3 - 0.0527x_4$$
$$- 0.1699x_5 - 0.0564x_6 - 0.0847x_7 + 0.0629x_8$$
$$+ 0.0223x_9 + 0.0240x_{10} + 0.0038x_{11} - 0.0061x_{12}$$

The Association Between State Housing Policy and Lead Poisoning in Children

James D. Sargent, MD, Madeline Dalton, PhD, Eugene Demidenko, PhD, Peter Simon, MD, and Robert Z. Klein, MD

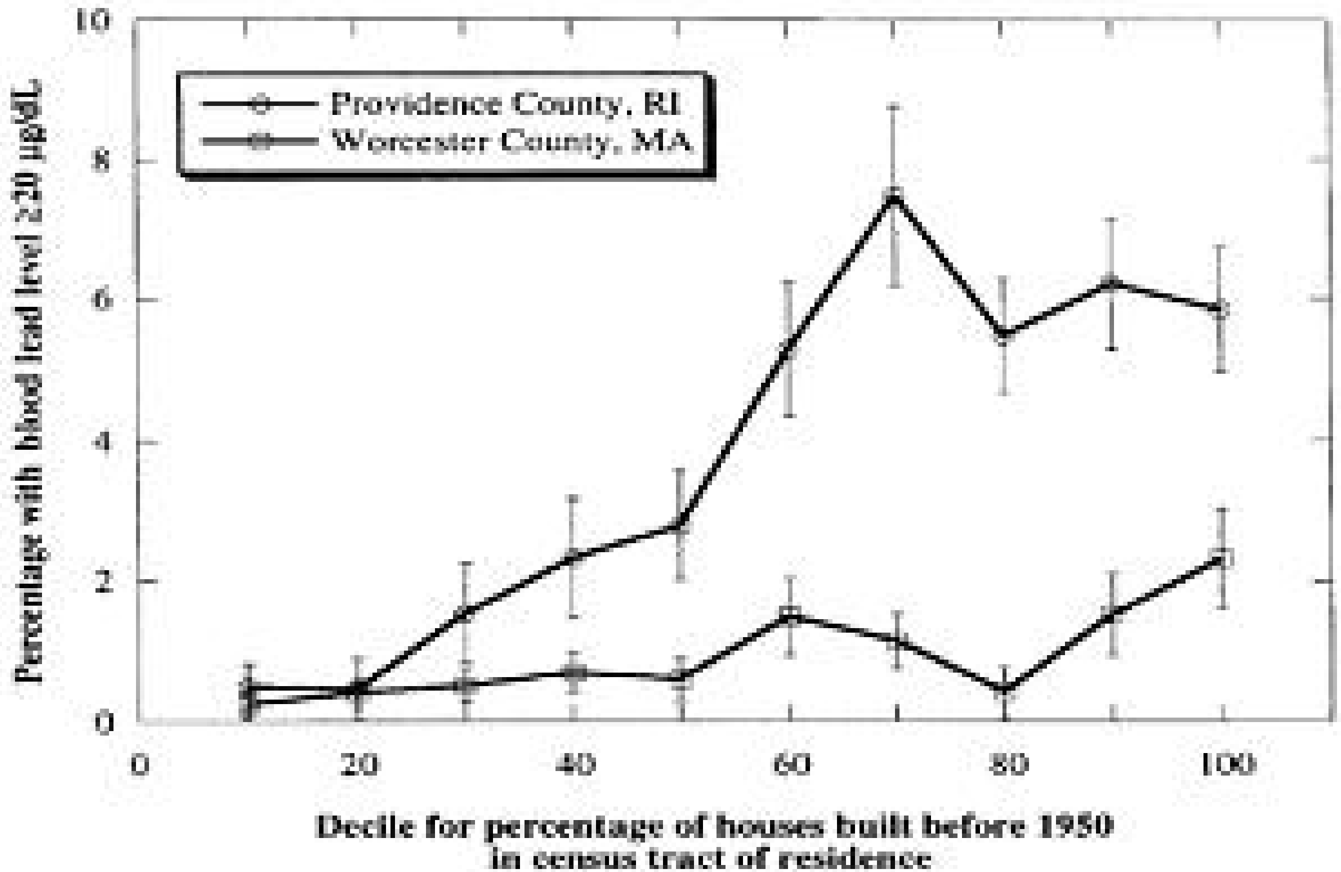
ABSTRACT

Objectives. This study examined the effect of an active program of household lead paint hazard abatement, applied over 22 years, on childhood lead poisoning in Massachusetts.

Methods. A small areas analysis was used to compare screening blood lead levels of children in Worcester County, Mass (n = 27590), with those in Providence County, RI (n = 19071). Data were collapsed according to census tract.

Results. The percentage of children with lead poisoning (blood lead level ≥ 20 μg/dL [Pe20]) was, on average, 3 times higher in Providence County census tracts (3.2% vs 0.9% in Worcester County census tracts, $P < .0001$), despite similar percentages of pre-1950s housing in both counties. The ratio of Pe20 in Providence vs Worcester County census tracts was 2.2 (95% confidence interval = 1.8, 2.7), after adjustment for differences in housing, sociodemographic, and screening characteristics. This estimate was robust to alternative regression methods and sensitivity analyses.

Conclusions. Massachusetts policy, which requires lead paint abatement of children's homes and places liability for lead paint poisoning on property owners, may have substantially reduced childhood lead poisoning in that state. (*Am J Public Health.* 1999;89:1690–1695)



Note. For the percentage of houses built before 1950, cutoff levels for each decile among census tracts are 10th percentile = 21%, 20th percentile = 27%, 30th percentile = 32%, 40th percentile = 41%, 50th percentile = 50%, 60th percentile = 57%, 70th percentile = 63%, 80th percentile = 70%, 90th percentile = 78%, and 100th percentile = 98%.

FIGURE 1—Percentage of children with blood lead levels of 20 μg/dL or greater within each decile for the percentage of houses built before 1950 in Providence and Worcester Counties.

TABLE 3—Results From Least Squares Multiple Regression Analyses: Children Aged 0 to 5 Years With Blood Lead Levels of 20 μg/dL or Greater (Pe20) Against Sociodemographic and Housing Variables in Providence County and Worcester County Census Tracts

No. of Variables	1	2	3	4	5
Pe20: Providence County/ Worcester County (95% CI)	2.9[a] (2.3, 3.7)	1.8 (1.4, 2.4)	2.4 (1.9, 3.0)	2.2 (1.8, 2.8)	2.2 (1.8, 2.7)
Controls					
Housing characteristics					
ln % pre-1950 housing				0.50	0.51
ln % vacant housing			0.82	0.66	0.64
Screening characteristics					
ln % blood lead level determined by capillary sample		−0.67	−0.29 (.05)	−0.31 (.02)	−0.34 (.01)
ln % screened during summer months					0.31 (.20)
Adjusted R^2	0.31	0.41	0.57	0.62	0.62

Note. CI = confidence interval. Regression 1 represents a crude estimate of Pe20 (Providence County) census tracts/Pe20 (Worcester County) census tracts; equations 2 through 5 represent adjusted estimates after control for housing, sociodemographic, and screening characteristics. Only β coefficients for covariates are shown; all $P < .0001$ unless given in parentheses.

Correlates of High-Density Lipoprotein Cholesterol in Black Girls and White Girls: The NHLBI Growth and Health Study

Joel A. Simon, MD, MPH, John A. Morrison, PhD, Shari L. Similo, MS, Robert P. McMahon, PhD, and George B. Schreiber, DSc

ABSTRACT

To determine the correlates of serum high-density lipoprotein cholesterol (HDL-C) in 9- and 10-year-old girls, data were examined from 624 Black girls and 773 White girls. Black girls had, on average, 3.6 mg/dL higher levels than White girls. Each 10-mm increase in sum of skinfolds was associated with a decrease of 1.4 mg/dL; each unit increase in the tricep/suprailiac skinfold ratio was associated with an increase of 2 mg/dL; and each 10% increase in polyunsaturated fat intake was associated with an increase of 3.4 mg/dL. The associations of sedentary activity and sexual maturation with HDL were mediated by differences in adiposity. Interventions to decrease adiposity may be important for the primary prevention of heart disease in women. (*Am J Public Health.* 1995;85:1698–1702)

TABLE 1—Characteristics of the Study Subjects[a] from the NHLBI Growth and Health Study

	Black Girls		White Girls		
	No.	Mean ± SD	No.	Mean ± SD	P[a]
High-density lipoprotein cholesterol (mg/dL)	785	55.3 ± 13.8	861	53.2 ± 11.4	<.001
Anthropometric measures					
Height, cm	783	142.8 ± 7.6	861	139.5 ± 7.1	<.001
Weight, kg	784	39.6 ± 11.2	861	35.0 ± 8.5	<.001
Body mass index, kg/m²	783	19.2 ± 4.3	861	17.8 ± 3.2	<.001
Sum of skinfolds, mm	780	36.0 ± 21.4	876	30.6 ± 16.4	<.001
Tricep/suprailiac skinfold ratio	780	1.5 ± 0.5	877	1.6 ± 0.6	<.001
Dietary intake					
Energy intake, kcal/day	696	1856 ± 586	841	1798 ± 450	<.05
Carbohydrate, % kcal	696	49.9 ± 7.0	841	51.6 ± 6.7	<.001
Saturated fat, % kcal	696	13.3 ± 2.5	841	13.6 ± 2.6	<.01
Monounsaturated fat, % kcal	696	13.9 ± 2.4	841	13.0 ± 2.2	<.001
Polyunsaturated fat, % kcal	696	6.7 ± 2.3	841	5.8 ± 1.8	<.001
Activity					
Television watching, hours/week	755	36.4 ± 17.4	863	25.0 ± 14.4	<.001
Physical activity[b]					
Never or almost never, %	117	15.4	67	7.8	
Sometimes, %	307	40.5	337	39.4	
Usually or always, %	334	44.1	451	52.8	<.001
Sexual maturation stage					
Prepubertal, %	263	34.3	589	68.8	
Pubertal, %	503	65.7	267	31.2	<.001
Level of education of parents or guardians					
High school or less, %	234	29.9	156	17.7	
Some college, %	368	46.9	273	31.0	
College graduate, %	182	23.2	452	51.3	<.001
Pretax annual household income (1986)					
Less than $20 000	318	43.1	120	14.3	
$20 000–$39 999	229	31.0	273	32.5	
$40 000 or greater	191	25.9	448	53.3	<.001

[a]Unpaired t tests to compare means of Blacks and Whites; chi-square to compare proportions in physical activity, maturation stage, level of education, and annual income level.
[b]Response to the question "I am physically active."

TABLE 3—Associations of Anthropometric, Sociodemographic, Dietary, and Physical Measures with Serum Level of High-Density Lipoprotein Cholesterol (HDL-C) (mg/dL)[a] in Black Girls and White Girls

	Simple Regression Models: Slope (95% CI)[b]	Multiple Regression Models: Slope (95% CI)[b]			
		Model 1	Model 2	Model 3	Model 4
Race (Black vs White)	2.09 (0.86, 3.31)	3.62 (2.05, 5.19)	3.61 (2.26, 5.06)	3.55 (2.02, 5.08)	3.62 (2.10, 5.15)
Anthropometric measures					
Height, cm	−0.16 (−0.24, −0.08)				
Weight, kg	−0.30 (−0.35, −0.24)				
Body mass index, kg/m^2	−0.84 (−1.00, −0.69)				
Sum of skinfolds, mm	−0.16 (−0.21, −0.11)			−0.17 (−0.20, −0.13)	−0.14 (−0.18, −0.10)
Triceps/suprailiac skinfold ratio	4.21 (3.07, 5.35)		4.39 (3.11, 5.67)		2.02 (0.59, 3.45)
Dietary intake					
Energy intake, 100 kcal/day	−0.03 (−0.15, 0.10)				
Carbohydrate, % kcal	−0.06 (−0.16, 0.03)				
Saturated fat, % kcal	0.02 (−0.23, 0.27)				
Monounsaturated fat, % kcal	0.16 (−0.11, 0.43)				
Polyunsaturated fat, % kcal	0.36 (0.05, 0.67)	0.34 (0.01, 0.67)	0.38 (0.06, 0.70)	0.31 (−0.01, 0.63)	0.34 (0.02, 0.65)
Activity					
Television watching, 10 hours/wk[c]	−0.09 (−0.46, 0.27)	−0.49 (−0.91, −0.06)	−0.37 (−0.79, 0.05)	−0.26 (−0.68, 0.15)	−0.29 (−0.66, 0.17)
Physical activity					
Sometimes vs never	−0.69 (−2.76, 1.39)				
Usually vs never	0.54 (−1.49, 2.57)				
Sexual maturation stage					
Pubertal vs prepubertal	−1.26 (−2.47, −0.02)	−2.13 (−3.56, −0.71)	−1.31 (−2.74, 0.12)	−0.56 (−1.98, 0.87)	−0.41 (−1.84, 1.01)
Level of education of parents or guardians					
Some college vs no college	0.05 (−1.52, 1.67)				
College graduate vs some college	0.32 (−1.06, 1.70)				
Income[d]					
Medium vs low	−1.49 (−3.12, 0.13)	−0.43 (−2.33, 1.26)	−0.66 (−2.43, 1.11)	−0.61 (−2.35, 1.14)	−0.66 (−2.40, 1.08)
High vs medium	0.61 (−0.87, 2.09)	1.46 (−0.11, 3.03)	1.46 (−0.10, 3.01)	1.40 (−0.13, 2.93)	1.38 (−0.15, 2.91)
		R^2 = .05	R^2 = .06	R^2 = .09	R^2 = .09

[a] Multivariate models include selected variables significant at $P \leq .10$ in univariate analyses and are adjusted for clinical center.
[b] Indicates difference (and 95% confidence intervals [CIs]) in serum level of HDL-C (in mg/dL) per indicated unit of each variable. Each dichotomized variable was coded 1 vs 0.
[c] Excluded because P = .07 after adjustment for race.
[d] Low income < $20 000/year; medium income = $20 000–$39 999/year; high income ≥ $40 000/year.

Racial Differences in Urban Children's Environmental Exposures to Lead

Bruce P. Lanphear, MD, MPH, Michael Weitzman, MD, and Shirley Eberly, MS

ABSTRACT

Objectives. This study explored whether differences in environmental lead exposures explain the racial disparity in children's blood lead levels.

Methods. Environmental sources of lead were identified for a random sample of 172 urban children.

Results. Blood lead levels were significantly higher among Black children. Lead-contamination of dust was higher in Black children's homes, and the condition of floors and interior paint was generally poorer. White children were more likely to put soil in their mouths and to suck their fingers, whereas Black children were more likely to put their mouths on window sills and to use a bottle. Major contributors to blood lead were interior lead exposures for Black children and exterior lead exposures for White children.

Conclusions. Differences in housing conditions and exposures to lead-contaminated house dust contribute strongly to the racial disparity in urban children's blood lead levels. (*Am J Public Health.* 1996;86:1460-1463)

TABLE 3—Multivariate Regression Analysis*: The Association of Blood Lead Levels among 172 Urban Children, by Environmental Lead Exposures, Demographic Characteristics, and Children's Behaviors

Variables	Parameter Estimate	Standard Error	P	R^2
Black race	.2267	.0413	.0001	11.5
Dust lead loading, μg/sq ft	.1603	.0339	.0001	8.6
Eats dirt or soil	.1514	.0378	.0001	6.1
Does not use bottle	.0784	.0338	.022	2.1
Water lead levels, μg/L	.0687	.0351	.052	1.5
Parent has high school education or less	.0732	.0423	.086	1.1

*Percentage of variation explained (R^2) is the independent contribution for each variable. The entire model explains 43% of the variation in children's blood lead levels. Blood lead, dust lead, and water lead levels have been log transformed.

TABLE 4—Multivariate Regression Analysis*: The Association between Race and Blood Lead Levels among 172 Urban Children, by Environmental Lead Exposures, Demographic Characteristics, and Children's Behaviors

Variable	Parameter Estimate	Standard Error	P	R^2
Black children				
Dust lead loading	.3089	.0649	.0001	19.5
Paint lead variables			.007	11.7
Lead content of paint	.2188	.1854	.242	1.2
Paint condition	.1277	.0826	.127	2.1
Paint condition interaction[a]	−.1384	.0663	.041	3.8
Water lead levels	.1404	.0614	.026	4.5
Eats dirt or soil	.1137	.0614	.069	3.0
Soil lead variables			.080	4.4
Soil lead levels	.0685	.0429	.115	2.2
Soil present	−.0826	.1538	.593	0.2
White children				
Soil lead variables			.006	9.1
Soil lead levels	.1079	.0331	.002	9.1
Soil present	−.3251	.1446	.027	4.3
Time spent outdoors	.0039	.0013	.003	8.2
Eats dirt or soil	.1219	.0441	.007	6.5
Ferritin levels	.2199	.0918	.019	4.9
Single-parent household	.1147	.0548	.040	3.7

*Percentage of variation explained (R^2) is the independent contribution for each variable with a P value below .10. The entire model for Black children explains 44% of the variation in blood lead levels and the model for White children explains 32% of the variation. The variable for soil lead levels includes a term to indicate presence of bare soil. The combined effects of the three paint variables and two soil variables are shown on the lines "Paint/Soil Lead variables." Blood lead, dust lead, water lead, soil lead, and serum ferritin levels have been log transformed.

The Effect of Primary Care Physician Supply and Income Inequality on Mortality Among Blacks and Whites in US Metropolitan Areas

Leiyu Shi, DrPH, MBA, and Barbara Starfield, MD, MPH

Objectives. This study assessed whether income inequality and primary care physician supply have a different effect on mortality among Blacks compared with Whites.

Methods. We conducted a multivariate ecologic analysis of 1990 data from 273 US metropolitan areas.

Results. Both income inequality and primary care physician supply were significantly associated with White mortality ($P < .01$). After the inclusion of the socioeconomic status covariates, the effect of income inequality on Black mortality remained significant ($P < .01$), but the effect of primary care physician supply was no longer significant ($P > .10$), particularly in areas with high income inequality.

Conclusions. Improvement in population health requires addressing socioeconomic determinants of health, including income inequality and primary care availability and access. (*Am J Public Health.* 2001;91:1246-1250)

TABLE 1—Bivariate Correlations Between Total Mortality and Its Determinants

	Total Mortality		
	Overall	White	Black
Gini coefficient	0.36**	0.24**	0.34**
Primary care physician-to-population ratio	-0.17**	-0.25**	-0.08
Per capita income	-0.24**	-0.28**	-0.15*
% Population without elementary education	0.28**	0.29**	0.30**
% Workforce population unemployed	0.21**	0.30**	0.15*
% Population urban	-0.11*	-0.13*	-0.16*
% Population below poverty	0.33**	0.28**	0.31**

**P* < .05; ***P* < .01, based on Pearson correlation coefficients.

TABLE 2—Weighted Multiple Regression Coefficients of Income Inequality and Primary Care Physician-to-Population Ratio on Total Mortality: 273 US Metropolitan Areas, 1990

	Total Mortality					
	Overall		White		Black	
	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]	Model 1[a]	Model 2[b]
Gini coefficient	875.50	283.17	451.20	420.11	2119.35	1563.64
	[135.62]	[116.13]	[306.25]	[121.57]	[345.30]	[402.75]
	(6.45***)	(2.44**)	(4.30***)	(3.46***)	(6.14***)	(4.76***)
Primary care physician-to-population ratio	-3.56	-1.33	-3.80	-2.33	-6.05	-6.97
	[1.08]	[0.96]	[0.85]	[0.93]	[3.61]	[4.54]
	(-3.29***)	(-1.38)	(-4.48***)	(-2.51***)	(-1.67*)	(-1.54)
% Population Black		426.51				
		[22.70]				
		(28.79***)				
R^2	0.16	0.64	0.12	0.18	0.15	0.19
Adjusted R^2	0.16	0.63	0.12	0.16	0.14	0.17
F test	25.92***	67.98***	19.00***	9.41***	19.22***	8.38***

Note. Parameter estimates are on top, SEs are in brackets, and t test values are in parentheses.

[a]Reduced model includes income inequality and primary care.

[b]Complete model includes per capita income, percentage of population without elementary education, percentage of workforce population unemployed, and percentage of population that is urban.

*$P < .10$; **$P < .05$; ***$P < .01$.

TABLE 3—Weighted Multiple Regression Coefficients of Primary Care Physician-to-Population Ratio on Total Mortality for Low- and High-Income-Inequality Metropolitan Statistical Areas (MSAs)

	Total Mortality			
	Low-Income-Inequality MSAs (n = 136)		High-Income-Inequality MSAs (n = 137)	
	Model 1	Model 2[a]	Model 1	Model 2[a]
Overall				
Ratio of primary care physicians to population	-3.97 [1.46] (-2.72***)	-1.65 [0.90] (-1.84*)	-2.81 [1.66] (-1.73*)	-0.94 [1.38] (-0.68)
% Population Black		506.76 [33.95] (14.90***)		390.13 [29.89] (13.05***)
White				
Ratio of primary care physicians to population	-4.08 [1.11] (-3.66***)	-2.26 [1.09] (-2.07**)	-3.36 [1.27] (-2.65***)	-2.61 [1.38] (-1.89*)
Black				
Ratio of primary care physicians to population	-10.97 [6.36] (-1.72*)	1.82 [7.50] (0.24)	0.52 [4.39] (0.12)	-0.04 [4.97] (-0.01)

Note. Parameter estimates are on top, SEs are in brackets, and *t* test values are in parentheses.
[a]Complete model includes percentage of population without elementary education, percentage of workforce population unemployed, and percentage of population that is urban.
*$P < .10$; **$P < .05$; ***$P < .01$.

Health and Social Characteristics and Children's Cognitive Functioning: Results from a National Cohort

Rachel A. Kramer, ScD, LaRue Allen, PhD, and Peter J. Gergen, MD, MPH

ABSTRACT

Objectives. The purpose of this study was to examine the associations between cognitive functioning in children and sociodemographic, family, and health characteristics.

Methods. Data from phase 1 of the third National Health and Nutrition Examination Survey were used to evaluate performance on standardized cognitive tests in a representative sample of 2531 children 6 to 16 years of age. Multivariate analyses were used to assess independent associations between covariates and test performance.

Results. Lower income, minority status, and lower education of an adult reference person (one of the persons in the household who owned or rented the home) were independently associated with poorer performance on all cognitive subtests. To a lesser degree, general health status, history of birth complications, and sex also were independent predictors of performance for some of the subtests.

Conclusions. These findings illustrate disparities in cognitive functioning across sociodemographic and health characteristics of children in the US population. They suggest the need for public health policies to take a multifaceted approach to optimizing childhood environments in order to overcome the effects of socioeconomic and minority status. (*Am J Public Health.* 1995;85:312–318)

TABLE 3—Coefficients from Linear Regression Analysis of Age-Standardized WRAT-R Scores, by Age Group: United States, 1988 to 1991

Covariate	Reading, Coefficient ± SE		Arithmetic, Coefficient ± SE	
	6–11-Year Group	12–16-Year Group	6–11-Year Group	12–16-Year Group
Sex				
Male	−1.00 ± 0.24**	−0.16 ± 0.23	−0.64 ± 0.21**	−0.32 ± 0.23
Female	0.00	0.00	0.00	0.00
Race/ethnicity				
Non-Hispanic Black	−0.57 ± 0.29	−2.18 ± 0.42**	−0.68 ± 0.24*	−2.14 ± 0.21**
Mexican American	−0.34 ± 0.47	−0.53 ± 0.46	−0.21 ± 0.27	−0.93 ± 0.27**
Non-Hispanic White	0.00	0.00	0.00	0.00
Income level[a]	0.56 ± 0.14**	0.66 ± 0.18**	0.59 ± 0.14**	0.55 ± 0.14**
Education[b]				
Less than high school	−1.55 ± 0.34**	−2.41 ± 0.35**	−1.57 ± 0.29**	−2.66 ± 0.45**
High school	−0.88 ± 0.27**	−1.17 ± 0.39**	−1.10 ± 0.37**	−1.12 ± 0.48*
More than high school	0.00	0.00	0.00	0.00
General health status				
Fair/poor	−1.65 ± 0.60*	−0.64 ± 0.61	−0.42 ± 0.75	−0.80 ± 0.56
Very good/good	−0.17 ± 0.25	−0.97 ± 0.27**	−0.32 ± 0.22	−0.99 ± 0.29**
Excellent	0.00	0.00	0.00	0.00
Birth complications[c]				
Yes	−0.85 ± 0.34*		−0.79 ± 0.39	
No	0.00		0.00	
R^2	0.15	0.34	0.17	0.32

Note. WRAT-R = Wide Range Achievement Test–Revised. The last category serves as the reference category for categorical variables.
[a]Defined as a continuous value for the poverty income ratio.
[b]Years of education completed by the adult reference person.
[c]Collected only for 6–11-year-olds.
*P = .05; **P < .01.

Smoking Cessation Counseling With Pregnant and Postpartum Women: A Survey of Community Health Center Providers

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ABSTRACT

Objectives. This study assessed providers' performance of smoking cessation counseling steps with low-income pregnant and postpartum women receiving care at community health centers.

Methods. WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) program staff, obstetric clinicians, and pediatric clinicians at 6 community health centers were asked to complete surveys. Smoking intervention practices (performance), knowledge and attitudes, and organizational facilitators were measured. Factors associated with performance were explored with analysis of variance and regression analysis.

Results. Performance scores differed significantly by clinic and provider type. Providers in obstetric clinics had the highest scores and those in pediatric clinics had the lowest scores. Nurse practitioners and nutritionists had higher scores than other providers. Clinic type, greater smoking-related knowledge, older age, and perception of smoking cessation as a priority were independently related to better counseling performance.

Conclusions. Mean performance scores demonstrated room for improvement in all groups. Low scores for performance of steps beyond assessment and advice indicate a need for emphasis on the assistance and follow-up steps of national guidelines. Providers' own commitment to helping mothers stop smoking was important. (*Am J Public Health.* 2000;90:78-84)

TABLE 3—Regression of Performance Scores for Smoking Cessation Counseling With Selected Provider Characteristics, Perceptions, and Knowledge Measures: Boston, Mass, Community Health Centers, 1996–1997

	Scales			
	Mean (SD)	b	P[a]	r
Knowledge (summary scale)[b]	3.50 (1.90)	9.0	.001	0.24
Perceptions (continuous scale)				
Role[c]	4.14 (0.95)	0.22	.0001	0.30
Effectiveness of counseling[c]	3.12 (0.99)	0.19	.0002	0.27
Self-efficacy[c]	2.73 (0.97)	0.27	.0001	0.38
Difficulty (barriers)[d]	1.76 (0.49)	−0.0076	.95	−0.0054
Motivation[e]	3.24 (0.45)	0.30	.01	0.19
Leadership (organizational facilitators)[e]	2.12 (0.46)	−0.2683	.02	−0.1774
System (organizational facilitators)[c]	1.87 (0.51)	−0.08	.46	−0.0576

	Single Items		
Perceptions	No. (%)	Mean Performance Score (SD)	P[f]
a. Mothers we see in our practice have so many other problems in their lives that stopping smoking is a very low priority for them.			.005
Agree	125 (75)	1.34 (0.66)	
Disagree	42 (25)	1.68 (0.73)	
b. Mothers have so many problems in their lives that intervening about smoking is a very low priority for me.			.0001
Agree	28 (17)	0.94 (0.50)	
Disagree	136 (83)	1.52 (0.69)	
c. Most mothers want us to provide them with smoking cessation counseling.			.02
Agree	71 (43)	1.56 (0.69)	
Disagree	95 (57)	1.31 (0.69)	

[a]P for test that correlation is zero.
[b]Range 0–10.
[c]Five-point response scale.
[d]Three-point response scale.
[e]Four-point response scale.
[f]P for test of equality of means.

TABLE 4—Mean Performance Score or Slope for Analysis of Covariance of Performance: Smoking Cessation Counseling: Boston, Mass, Community Health Centers, 1996–1997

	Mean Score	Slope	P[a]
Clinic or program type			.001
WIC	1.40	...	
Prenatal clinic	1.52	...	
Pediatric clinic	0.97	...	
Race/ethnicity			.17
Hispanic	1.22	...	
White, non-Hispanic	1.46	...	
Black, non-Hispanic	1.34	...	
Other	1.16	...	
Age (10-y increments)	...	0.16	.004
Role	...	0.05	.38
Effectiveness of counseling	...	0.06	.30
Self-efficacy	...	0.06	.35
Knowledge	...	0.75	.005
Motivation	...	−0.21	.35
Leadership	...	−0.12	.35
Women's priority low			.21
Agree	1.22	...	
Disagree	1.37	...	
Provider's priority low			.02
Agree	1.14	...	
Disagree	1.45	...	
Women want counseling			.76
Agree	1.28	...	
Disagree	1.31	...	

[a] P for test that characteristic is associated with performance, with other characteristics held constant.

A Cross-National Trial of Brief Interventions with Heavy Drinkers

WHO Brief Intervention Study Group

ABSTRACT

Objectives. The relative effects of simple advice and brief counseling were evaluated with heavy drinkers identified in primary care and other health settings in eight countries.

Methods. Subjects (1260 men, 299 women) with no prior history of alcohol dependence were selected if they consumed alcohol with sufficient frequency or intensity to be considered at risk of alcohol-related problems. Subjects were randomly assigned to a control group, a simple advice group, or a group receiving brief counseling. Seventy-five percent of subjects were evaluated 9 months later.

Results. Male patients exposed to the interventions reported approximately 17% lower average daily alcohol consumption than those in the control group. Reductions in the intensity of drinking were approximately 10%. For women, significant reductions were observed in both the control and the intervention groups. Five minutes of simple advice were as effective as 20 minutes of brief counseling.

Conclusions. Brief interventions are consistently robust across health care settings and sociocultural groups and can make a significant contribution to the secondary prevention of alcohol-related problems if they are widely used in primary care. (*Am J Public Health.* 1996;86:948–955)

TABLE 1—Adjusted Means and Analysis of Covariance Results for Primary Outcome Measures from Eight Cross-National Study Centers, WHO Brief Interventions with Heavy Drinkers Trial

	Control Condition, Mean	Simple Advice Condition, Mean	Brief Counseling Condition, Mean	F		
				Condition	Center	Condition × Center
Male patients						
Average daily consumption	6.29	5.18	5.29	11.12***	5.39***	1.31
Intensity	11.23	10.01	10.16	5.36**	4.01***	1.23
Female patients						
Average daily consumption	3.80	3.39	2.99	0.72	1.71	2.74*
Intensity	6.83	6.27	5.96	1.14	3.64*	2.13

Note. Sample sizes were as follows: control group, 404 men and 84 women; simple advice group, 392 men and 111 women; and brief counseling group, 453 men and 102 women.
*P < .05; **P < .01; ***P < .001.

TABLE 2—Percentages of Male and Female Patients Who Increased, Decreased, or Remained at the Same Level of Alcohol Consumption

	Average Daily Consumption			Intensity of Drinking		
	Control	Simple Advice	Brief Counseling	Control	Simple Advice	Brief Counseling
Male patients						
Decreased	29.0	40.8	40.3	32.9	43.5	46.4
No change	54.5	53.1	50.3	48.6	47.8	42.1
Increased	16.5	6.1	9.3	18.4	8.7	11.5
Female patients						
Decreased	35.7	43.2	45.1	29.8	42.3	51.0
No change	58.3	48.6	50.0	59.5	43.2	41.2
Increased	6.0	8.1	4.9	10.7	14.4	7.8

Note. Sample sizes were as follows: control group, 407 men and 84 women; simple advice group, 392 men and 111 women; and brief counseling group, 461 men and 102 women.

Is Incarceration during Pregnancy Associated with Infant Birthweight?

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ABSTRACT

Objectives. This study examined whether incarceration during pregnancy is associated with infant birthweight.

Methods. Multivariable analyses compared infant birthweight outcomes among three groups of women: 168 women incarcerated during pregnancy, 630 women incarcerated at a time other than during pregnancy, and 3910 women never incarcerated.

Results. After confounders were controlled for, infant birthweights among women incarcerated during pregnancy were not significantly different from women never incarcerated; however, infant birthweights were significantly worse among women incarcerated at a time other than during pregnancy than among never-incarcerated women and women incarcerated during pregnancy.

Conclusions. Certain aspects of the prison environment (shelter, food, etc.) may be health-promoting for high-risk pregnant women. (*Am J Public Health.* 1997;87:1526–1531)

TABLE 3—Results of the Multiple Linear Regression Analysis of the Continuous Birthweight Outcome and the Logistic Regression Analysis of the Categorical Birthweight Outcome (Low Birthweight) (n = 4708)

	Multiple Linear Regression Model[a]		Logistic Regression Model	
Predictor Variables	Estimated Regression Coefficient	*P*	Estimated OR	95% CI
Incarcerated during pregnancy	0.082	.0842	0.86	0.51, 1.45
Incarcerated not during pregnancy	−0.100	.0003	1.58	1.20, 2.10
Racial/ethnic group	−0.201	.0001	1.75	1.36, 2.26
Age	0.002	.2802	1.01	0.99, 1.03
Education level	−0.027	.2309	1.19	0.92, 1.53
Marital status	−0.113	.0001	1.39	1.04, 1.85
Cigarette smoking	−0.212	.0001	1.79	1.41, 2.27
Alcohol drinking	−0.099	.0179	1.52	1.02, 2.25
Medicaid	−0.019	.4371	1.09	0.83, 1.44
WIC	0.076	.0008	0.71	0.55, 0.93
Maternity Care Coordination	−0.009	.7419	1.02	0.75, 1.39
Adequate prenatal care	0.090	.0001	0.63	0.50, 0.80

Note. OR = odds ratio; CI = confidence interval. WIC = Special Supplemental Food Program for Women, Infants, and Children.

[a]The following coding was used in the multiple linear regression analysis: birthweight (in kilograms); incarcerated during pregnancy (1 if pregnant in prison, 0 otherwise); incarcerated not during pregnancy (1 if in prison at a time other than during pregnancy, 0 otherwise); racial/ethnic group (1 if non-White, 0 otherwise); age (in years); education (1 if not a high school graduate, 0 otherwise); marital status (1 if never married, 0 otherwise); cigarette smoking (1 if smoked during pregnancy, 0 otherwise); alcohol drinking (1 if drank during pregnancy, 0 otherwise); Medicaid (1 if received Medicaid, 0 otherwise); WIC (1 if received WIC, 0 otherwise); Maternity Care Coordination (1 if received Maternity Care Coordination, 0 otherwise); prenatal care adequacy (1 if adequate on the Kessner Adequacy of Prenatal Care Index, 0 otherwise). (Although birthweight was modeled in kilograms, the adjusted mean birthweights reported in this paper are reported in grams.) The same coding was used in the logistic regression analysis except that low birthweight was coded as 1 if less than 2500 grams and 0 otherwise.