TABLE 1—Predictors of the Presence of Any Burden Remaining Significant in a Logistic Model in the Whole Population: Great Smoky Mountains Study

	Odds Ratio (95% Confidence Interval)	Standardized Parameter Estimate	SE	P
Total DSM-III-R symptom score	1.15 (1.11, 1.18)	.51	.016	3×10^{-17}
Total functional impairment score	1.23 (1.15, 1.31)	.33	.033	4×10^{-10}
Anxiety or depression diagnosis	.49 (.26, .81)	−.12	.312	.02
Parental history of mental health problems	1.74 (1.18, 2.56)	.14	.198	.005

Note: DSM-III-R = *Diagnostic and Statistical Manual of Mental Disorders, 3rd ed, rev.*

Module 36: Logistic Regression Examples

This module contains several examples of the use of logistic regression procedure as have appeared in recent issues of *AJPH*.

Obstetrical Judgments of Viability and Perinatal Survival of Extremely Low Birthweight Infants

M. Lynne Reuss, MD, MPH, and Howard R. Gordon, MD

ABSTRACT

Objectives. The purpose of the study was to determine whether the obstetrical judgment of viability makes a difference to fetal and neonatal survival of extremely low birthweight infants (500–749 g).

Methods. We assessed the effect of the antenatal judgment of viability in a group of 66 infants born weighing from 500 to 749 g. These infants were alive at maternal hospital admission and were subsequently live-born or stillborn between January 1, 1984, and December 31, 1985. We related the antepartum assessment of viability and other factors recorded in the medical record to fetal survival and to postneonatal survival to hospital discharge.

Results. The obstetrical judgment of viability was strongly associated with outcome. After birthweight and gestational age were controlled, fetuses considered viable were 18 times more likely to survive (95% confidence interval = 2, 175) than those considered nonviable.

Conclusions. The effects of obstetrical practices on perinatal mortality must be taken into consideration in estimating the survival potential of very small fetuses and in evaluating the relationship between survival and disability. (*Am J Public Health.* 1995; 85:362-366)

TABLE 1—Characteristics of Fetuses Weighing 500 to 749 g, by Antenatal Assessment of Viability

	Considered Nonviable (n = 23)	Considered Viable (n = 43)	*P*
Host factors			
Female gender, no. (%)	10 (43)	21 (49)	NS
Mean birthweight, g (SD)	574 (72)	655 (61)	<.001
Median birthweight, g	560	660	
Mean ultrasound weight estimate, g (SD)[a]	579 (66)	725 (71)	<.001
Mean gestational age, wk (SD)	23.6 (0.9)	25.7 (2.0)	<.001
Median gestational age, wk	23	26	
Twins	4 (2 pregnancies)	5 (4 pregnancies)	NS
Risk factors			
Chorioamnionitis, no. (%)	12 (53)	14 (33)	NS
Nonvertex presentation, no. (%)	12 (52)	15 (35)	NS
Interventions			
Maternal transport, no. (%)	14 (63)	32 (75)	NS
Cesarean section, no. (%)	0 (. . .)	23 (53)	
Intubated, no. (% of live-born)	12 (83)	39 (93)	<.001
Outcomes			
Fetal death, no. (%)	5 (22)	1 (2)	<.02
1-min Apgar <5, no. live-born (%)	17 (94)	29 (69)	<.02
5-min Apgar <5, no. live-born (%)	12 (67)	10 (24)	.002
Survival to discharge, no. (%)	1 (4)	19 (44)	<.01

Note. NS = not significant.
[a]For 18 fetuses considered nonviable and 34 considered viable.

TABLE 1—Characteristics of Fetuses Weighing 500 to 749 g, by Antenatal Assessment of Viability

	Considered Nonviable (n = 23)	Considered Viable (n = 43)	P
Host factors			
Female gender, no. (%)	10 (43)	21 (49)	NS

	Non V	V	Total
Female	10	21	31
Male	13	22	33
Total	23	43	66

$$Odds_F = 21/10 = 2.10$$

$$Odds_M = 22/13 = 1.69$$

$$OR_{F/M} = 2.10/1.69 = 1.24$$

TABLE 3—Logistic Regression Models of Factors Influencing Perinatal Survival in a Cohort of Fetuses Weighing 500 to 749 g

	Unadjusted Odds Ratio	95% Confidence Interval	Adjusted* Odds Ratio	95% Confidence Interval
Gender (1 = female, 0 = male)	1.2	0.4, 3.4		
Birthweight (per 10 g)	1.08	1.01, 1.18	1.04	0.94, 1.14
Gestational age (clinical estimate, per week)	1.14	0.90, 1.47	0.8	0.6, 1.2
Vertex presentation (1 = yes, 0 = no)	2.0	0.6, 6.0	...	...
Chorioamnionitis (1 = yes, 0 = no)	1.4	0.5, 4.0	...	...
Considered viable (1 = yes, 0 = no)	17.4	2.2, 141	17.6	1.8, 175
Cesarean section (1 = yes, 0 = no)	2.5	0.9, 7.5	1.2	0.3, 4.8

*Adjusted for other variables in the column.

OR: Unadjusted vs Adjusted

Gestational Age:	OR_{week}		= 1.14 unadjusted
		vs	= 0.8 adjusted
Birthweight:	$OR_{10\ g}$		= 1.08 unadjusted
		vs	= 1.04 adjusted

OR for multiple increments

Suppose, for neonatal survival, the adjusted

$OR_{10 \text{ gms birthweight}} = 1.04$, and you want

$OR_{100 \text{ gms birthweight}} = ?$.

First, calculate the coefficient for 100 gms and then calculate the OR for this new coefficient.

If $OR = e^b = 1.04$, the $b = \ln(1.04) = 0.0392$. For 100 gms, we need $10b = 0.392$ for the new coefficient.

Thus $OR_{100 \text{ gms birthweight}} = e^{0.392} = 1.48$

Environmental Tobacco Smoke and Periodontal Disease in the United States

ABSTRACT

Objectives. Cigarette smoking is a leading risk factor for periodontal disease. This cross-sectional study investigated the relation between environmental tobacco smoke (ETS) and periodontal disease in the United States.

Methods. Data were obtained from the Third National Health and Nutrition Examination Survey (1988–1994). The outcome was periodontal disease, defined as 1 or more periodontal sites with attachment loss of 3 mm or greater and a pocket depth of 4 mm or greater at the same site. Exposure to ETS at home and work was self-reported. The study analyzed 6611 persons 18 years and older who had never smoked cigarettes or used other forms of tobacco.

Results. Exposure to ETS at home only, work only, and both was reported by 18.0%, 10.7%, and 3.8% of the study population, respectively. The adjusted odds of having periodontal disease were 1.6 (95% confidence interval = 1.1, 2.2) times greater for persons exposed to ETS than for persons not exposed.

Conclusions. Among persons in the United States who had never used tobacco, those exposed to ETS were more likely to have periodontal disease than were those not exposed to ETS. (*Am J Public Health.* 2001;91:253–257)

TABLE 1—Bivariate Distribution of Persons, by Study Variables and Periodontal Disease[a]

	n^b	Prevalence of Periodontal Disease, % (SE)	χ^2 P	Crude OR (95% CI)
ETS exposure				
No	4371	7.9 (0.74)		1.00 (reference)
Yes	2240	10.8 (1.11)	.029	1.41 (1.05, 1.90)
Age, y				
18–29	2429	4.3 (0.61)		1.00 (reference)
30–49	2380	9.4 (0.81)		2.31 (1.65, 3.22)
50–69	1133	13.2 (1.82)		3.40 (2.36, 4.91)
≥70	669	17.0 (2.79)	.000	4.56 (2.88, 7.22)
Sex				
Female	4422	8.5 (0.78)		1.00 (reference)
Male	2189	9.5 (0.91)	.390	1.12 (0.86, 1.46)
Race/ethnicity				
Non-Hispanic White	2074	6.7 (0.76)		1.00 (reference)
Non-Hispanic Black	1917	17.5 (1.59)		2.96 (2.23, 3.95)
Mexican American	2259	11.6 (0.83)		1.83 (1.38, 2.43)
Other	361	10.2 (1.74)	.000	1.58 (0.97, 2.59)
Education, y				
<12	2259	15.5 (1.58)		1.00 (reference)
12	2156	9.8 (1.21)		0.59 (0.43, 0.82)
>12	2150	5.5 (0.52)	.000	0.32 (0.25, 0.40)
Poverty index[c]				
0.0–1.9	3110	12.4 (0.98)		1.00 (reference)
2.0–11.9	2866	6.9 (0.71)	.000	0.52 (0.41, 0.66)
History of diabetes				
No	6280	8.5 (0.63)		1.00 (reference)
Yes	323	20.6 (3.80)	.001	2.81 (1.81, 4.36)
Dental visits				
At least once per year	2881	6.1 (0.79)		1.00 (reference)
Every 2 years	182	9.6 (2.21)		1.65 (1.06, 2.55)
<Every 2 years	87	9.8 (3.71)		1.68 (0.65, 4.34)
As needed/other	3115	13.0 (0.93)	.000	2.32 (1.71, 3.16)

Note. OR = odds ratio; CI = confidence interval; ETS = environmental tobacco smoke.
[a]Defined as 1 or more periodontal sites with both an attachment loss of 3 mm or greater and a pocket depth of 4 mm or greater.
[b]Unweighted number of subjects. Totals of less than 6611 are the result of missing observations for those variables.
[c]Family income divided by the poverty threshold adjusted for the calendar year in which the family was interviewed.

TABLE 1—Bivariate Distribution of Persons, by Study Variables and Periodontal Disease*

	n^a	Prevalence of Periodontal Disease, % (SE)	χ^2 P	Crude OR (95% CI)
ETS exposure				
No	4371	7.9 (0.74)		1.00 (reference)
Yes	2240	10.8 (1.11)	.029	1.41 (1.05, 1.90)

$$Odds_{No} = 0.079 / (1 - 0.079) = 0.086$$

$$Odds_{Yes} = 0.108 / (1 - 0.108) = 0.121$$

$$OR_{Yes/No} = 1.408$$

NOTE: Tape prepared 26 Nov 02 based on version of this slide that had a computational error. Calculations as shown above are correct.

TABLE 2—Multivariate Logistic Model for the Presence of Periodontal Disease* **(n = 5658)**

	β Coefficient	SE	Adjusted OR (95% CI)	Wald F P
Intercept	[illegible]	[illegible]	...	...
ETS exposure				
No	0.0000	0.0000	1.00 (reference)	
Yes	0.4534	0.1567	1.57 (1.15, 2.16)	.006
Age, y				
18–29	0.0000	0.0000	1.00 (reference)	
30–49	1.2197	0.1851	3.39 (2.33, 4.91)	
50–69	1.5643	0.2090	4.78 (3.14, 7.27)	
≥70	1.9197	0.2793	6.82 (3.89, 11.95)	.000
Sex				
Female	0.0000	0.0000	1.00 (reference)	
Male	0.3430	0.1560	1.41 (1.03, 1.93)	.033
Race/ethnicity				
Non-Hispanic White	0.0000	0.0000	1.00 (reference)	
Non-Hispanic Black	1.1108	0.1898	3.04 (2.07, 4.45)	
Mexican American	0.3463	0.2123	1.41 (0.92, 2.17)	
Other	0.5488	0.3544	1.73 (0.85, 3.53)	.000
Education, y				
<12	0.0000	0.0000	1.00 (reference)	
12	−0.2601	0.2560	0.77 (0.46, 1.29)	
>12	−0.5724	0.2296	0.56 (0.36, 0.89)	.046
Poverty index				
0.0–1.9	0.0000	0.0000	1.00 (reference)	
2.0–11.9	−0.1404	0.1526	0.87 (0.64, 1.18)	.362
History of diabetes				
No	0.0000	0.0000	1.00 (reference)	
Yes	0.3810	0.2484	1.46 (0.89, 2.41)	.132
Dental visits				
At least once per year	0.0000	0.0000	1.00 (reference)	
Every 2 years	0.4761	0.2710	1.61 (0.93, 2.78)	
<Every 2 years	0.7095	0.5639	2.03 (0.65, 6.31)	
As needed/other	0.5923	0.2031	1.81 (1.20, 2.72)	.032

Note. OR = odds ratio; CI = confidence interval; ETS = environmental tobacco smoke.
*Defined as 1 or more periodontal sites with both an attachment loss of 3 mm or greater and a pocket depth of 4 mm or greater.

TABLE 2—Multivariate Logistic Model for the Presence of Periodontal Disease* (n=5658)

	β Coefficient	SE	Adjusted OR (95% CI)	Wald F P
Intercept	−3.8915	0.3481	...	...
ETS exposure				
No	0.0000	0.0000	1.00 (reference)	
Yes	0.4534	0.1567	1.57 (1.15, 2.16)	.006
Age, y				

OR of Peridontal Disease according to ETS Exposure

$b = 0.4534, \quad e^b = 1.57 = OR_{Yes/No}$

$C[0.4534 - 1.96\,(0.1567) \le \beta \le 0.4534 + 1.96\,(0.1567)] = 0.95$

$C[\ 0.146 \le \beta \le 0.761] = 0.95$

$C[\ e^{0.146} \le (\ e^{\beta} = OR_{Yes/No}\ ) \le e^{0.761}] = 0.95$

$C[\ 1.16 \le OR_{Yes/No} \le 2.14] = 0.95$

Pneumococcal Pneumonia and Influenza Vaccination: Access to and Use by US Hispanic Medicare Beneficiaries

Tami L. Mark, PhD, MBA, and L. Clark Paramore, MSPH

ABSTRACT

Objectives. This study examined differences between elderly Hispanic Medicare beneficiaries and other Medicare beneficiaries in the probability of being immunized for pneumococcal pneumonia and influenza.

Methods. We used the 1992 national Medicare Current Beneficiary Survey to evaluate influenza and pneumococcal pneumonia immunization rates.

Results. Elderly Hispanic Medicare beneficiaries were less likely than non-Hispanic White Medicare beneficiaries to have received an influenza vaccine in the past year or to have ever been immunized for pneumococcal pneumonia. Speaking Spanish was statistically significantly associated with influenza vaccination but not with pneumococcal pneumonia vaccination. Supplemental insurance status, HMO enrollment, having a usual source of care, and being satisfied with access to care were positively associated with immunization.

Conclusions. Strategies that may improve immunization rates among elderly Hispanics include reducing the inconvenience of being immunized, decreasing out-of-pocket costs, linking beneficiaries with providers, and educating Hispanic beneficiaries in Spanish about the benefits of vaccinations. (*Am J Public Health.* 1996;86:1545–1550)

TABLE 3—Multiple Logistic Regression Coefficients Estimating the Effect of Predisposing, Enabling, and Need Characteristics on Medicare Beneficiaries' (n = 8982) Influenza Vaccination

Characteristic	Regression Coefficient	SE	Odds Ratio	95% Confidence Interval
Intercept	−1.78*	0.24	0.17	.11, .27
Age 1 (75–85 y)	0.33*	0.06	1.39	1.24, 1.56
Age 2 (85+ y)	0.32*	0.08	1.38	1.18, 1.61
High school+	0.32*	0.06	1.38	1.22, 1.55
Male	−0.01	0.04	0.99	.92, 1.07
Married	0.11**	0.05	1.12	1.01, 1.23
Spanish interview	−0.87*	0.23	0.42	.27, .66
Income > $10 000	0.20*	0.05	1.22	1.11, 1.35
Lives in metropolitan statistical area	−0.09	0.07	0.91	.80, 1.05
Medicaid	0.13	0.10	1.14	.91, 1.39
Private insurance	0.44*	0.09	1.55	1.30, 1.85
Medicare HMO	0.21**	0.10	1.23	1.01, 1.50
No usual source of care	−1.09*	0.10	0.33	.28, .41
Poor health status	0.20*	0.06	1.22	1.09, 1.37
Had cancer	0.08	0.08	1.08	.93, 1.27
> 30 min to usual source of care	0.15	0.09	1.16	.97, 1.39
Satisfied with access	0.36*	0.09	1.43	1.20, 1.71
Non-Hispanic White	−0.06	0.16	0.94	.69, 1.29
Other non-Hispanic	−0.58*	0.17	0.56	.40, .78

Note. Satterthwaite adjusted F statistic = 22.57 (significant at the .01 level).
Source. Data are from the 1992 Medicare Current Beneficiary Survey.
*Significant at the .01 level.
**Significant at the .05 level.

TABLE 3—Multiple Logistic Regression Coefficients Estimating the Effect of Predisposing, Enabling, and Need Characteristics on Medicare Beneficiaries' (n = 8982) Influenza Vaccination

Characteristic	Regression Coefficient	SE	Odds Ratio	95% Confidence Interval
Intercept	−1.78*	0.24	0.17	.11, .27
Age 1 (75–85 y)	0.33*	0.06	1.39	1.24, 1.56
Age 2 (85+ y)	0.32*	0.08	1.38	1.18, 1.61
High school+	0.32*	0.06	1.38	1.22, 1.55
Male	−0.01	0.04	0.99	.92, 1.07
Married	0.11**	0.05	1.12	1.01, 1.23
Spanish interview	−0.87*	0.23	0.42	.27, .66

$$b = -0.87, \quad e^{b} = OR_{Yes/No} = 0.419$$

$$C[-0.87 - 1.96\,(0.23) \le \beta \le -0.87 + 1.96\,(0.23)] = 0.095$$

$$C[-1.32 \le \beta \le -0.42] = 0.95$$

$$C[e^{-1.32} \le (e^{\beta} = OR_{Yes/No}) \le e^{-0.42}] = 0.95$$

$$C[0.267 \le OR_{Yes/No} \le 0.657] = 0.95$$

TABLE 4—Multiple Logistic Regression Coefficients Estimating the Effect of Predisposing, Enabling, and Need Characteristics on Medicare Beneficiaries' (n = 8888) Pneumococcal Pneumonia Vaccination

Characteristic	Regression Coefficient	SE	Odds Ratio	95% Confidence Interval
Intercept	−2.23*	0.33	0.11	.06, .21
Age 1 (75–85 y)	0.42*	0.07	1.52	1.33, 1.75
Age 2 (85+ y)	0.18	0.09	1.20	1.00, 1.43
High school +	0.06	0.07	1.06	.93, 1.22
Male	−0.07	0.06	0.93	.83, 1.05
Married	0.08	0.07	1.08	.94, 1.24
Spanish interview	−0.35	0.36	0.70	.35, 1.43
Income [illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Note: Accept OR = 1 for this vaccination, but rejected this hypothesis for influenza vaccination.

Characteristic	Regression Coefficient	SE	Odds Ratio	95% Confidence Interval
Had cancer	0.24*	0.07	1.27	1.11, 1.46
> 30 min to usual source of care	0.26*	0.10	1.30	1.07, 1.58
Satisfied with access	0.25**	0.10	1.28	1.06, 1.56
Non-Hispanic White	0.00	0.24	1.00	.62, 1.60
Other non-Hispanic	−0.61**	0.28	0.54	.31, .94

Note. Satterthwaite adjusted F statistic = 94.6 (significant at the .01 level).
Source: Data are from the 1992 Medicare Current Beneficiary Survey.
*Significant at the .01 level.
**Significant at the .05 level.

Prevalence of Hepatitis B Virus Infection in the United States: The National Health and Nutrition Examination Surveys, 1976 Through 1994

Geraldine M. McQuillan, PhD, Patrick J. Coleman, PhD, Deanna Kruszon-Moran, MS, Linda A. Moyer, RN, Stephen B. Lambert, MS, and Harold S. Margolis, MD

ABSTRACT

Objectives. Data from 2 National Health and Nutrition Examination Surveys (NHANES), NHANES II (1976–1980) and NHANES III (1988–1994), were analyzed to examine trends in the prevalence of hepatitis B infection in the United States.

Methods. Serum specimens were tested for markers of hepatitis B virus infection, and risk factors were determined from questionnaires.

Results. The overall age-adjusted prevalence of hepatitis B virus infection was 5.5% (95% confidence interval [CI] = 4.8, 6.2) in NHANES II, as compared with 4.9% (95% CI = 4.3, 5.6) in NHANES III. In both surveys, Black participants had the highest prevalence of infection (NHANES II, 15.8%; NHANES III, 11.9%). No differences in infection were found in the major racial groups between surveys, except for a decrease among those older than 50 years. Black race, increasing number of lifetime sexual partners, and foreign birth had the strongest independent associations with hepatitis B virus infection.

Conclusions. Testing of participants in 2 national surveys demonstrates no significant decrease in hepatitis B virus infection, despite the availability of hepatitis B vaccine. (*Am J Public Health.* 1999;89:14–18)

TABLE 3—Relative Odds of Hepatitis B Virus Positivity From Logistic Regression Model for Adults Aged 17–59 Years, Controlled for Age: NHANES III Participants

	Odds Ratio (95% Confidence Interval)			
	Total	Non-Hispanic White	Non-Hispanic Black	Mexican American
Ethnicity				
Non-Hispanic Black	3.9 (2.9, 5.0)	...	...	...
Mexican American	0.7 (0.4, 1.3)	...	...	...
Non-Hispanic White	Reference	...	...	...
Lifetime sexual partners				
50+	6.5 (3.5, 12.2)	12.2 (5.1, 29.6)	1.3 (0.6, 2.9)	2.8 (0.9, 8.5)
10–49	2.9 (1.9, 4.3)	4.0 (2.0, 7.9)	1.3 (0.8, 2.1)	2.6 (1.7, 3.8)
2–9	2.1 (1.4, 3.2)	2.4 (1.2, 5.0)	1.4 (0.9, 2.1)	1.7 (0.9, 3.1)
0–1	Reference	Reference	Reference	Reference
Ever used cocaine				
Yes	1.8 (1.2, 2.7)	1.3 (0.7, 2.6)	3.1 (2.3, 4.1)	2.0 (1.3, 3.1)
No	Reference	Reference	Reference	Reference
Marital status				
Divorced/separated	1.6 (1.1, 2.2)	2.0 (1.2, 3.4)	0.9 (0.7, 1.3)	0.7 (0.5, 1.1)
Other	Reference	Reference	Reference	Reference
Age at first intercourse, y				
<18	1.2 (0.9, 1.6)	1.1 (0.7, 1.7)	1.3 (1.0, 1.7)	1.4 (0.8, 2.4)
18+	Reference	Reference	Reference	Reference
Education				
Less than high school	1.5 (1.1, 2.1)	1.8 (1.1, 2.8)	1.5 (1.1, 2.0)	1.3 (0.8, 2.3)
High school	1.1 (0.9, 1.5)	1.1 (0.7, 1.6)	1.4 (1.0, 1.9)	1.0 (0.5, 1.9)
Some college	Reference	Reference	Reference	Reference
Place of birth				
Other	3.4 (2.0, 5.8)	4.5 (2.1, 9.9)	3.2 (2.0, 5.2)	1.1 (0.5, 2.2)
United States	Reference	Reference	Reference	Reference

Quality of Life in Relation to Overweight and Body Fat Distribution

T.S. Han, PhD, M.A.R. Tijhuis, PhD, M.E.J. Lean, MD, and J.C. Seidell, PhD

ABSTRACT

Objectives. This study quantified the impairment of quality of life attributable to body fatness by using the standardized SF-36 Health Survey.

Methods. Tertiles of waist circumference and body mass index (BMI) in 1885 men and 2156 women aged 20 to 59 years in the Netherlands in 1995 were compared.

Results. The odds ratios and 95% confidence intervals of subjects with the largest waist circumferences, compared with those in the lowest tertile, were 1.8 (1.3, 2.4) in men and 2.2 (1.7, 2.9) in women with difficulties in bending, kneeling, or stooping; 2.2 (1.4, 3.7) in men and 1.7 (1.2, 2.6) in women with difficulties in walking 500 m; and 1.3 (1.0, 1.9) in men and 1.5 (1.1, 1.9) in women with difficulties in lifting or carrying groceries. Anthropometric measures were less strongly associated with social functioning, role limitations due to physical or emotional problems, mental health, vitality, pain, or health change in 1 year. The relationship between quality of life measures and BMI were similar to those between quality of life measures and waist circumference.

Conclusions. Large waist circumferences and high BMIs are more likely to be associated with impaired quality of life and disability affecting basic activities of daily living. (*Am J Public Health.* 1998;88:1814–1820)

TABLE 4—Odds Ratios (Adjusted for Age, Lifestyle, and Demographic Factors) of Poor Self-Rated Health Scores for Each Item of Mental Health and General Health, by Waist Circumference and Body Mass Index

	Waist Circumference (cm)					Body Mass Index (kg/m²)				
		Tertile 2		Tertile 3			Tertile 2		Tertile 3	
	Tertile 1[a]	OR	95% CI	OR	95% CI	Tertile 1[a]	OR	95% CI	OR	95% CI
Men (n = 1665)										
Mean anthropometry (SD)	80.8 (4.6)	91.6 (2.6)		104.3 (7.7)		22.1 (1.6)	25.5 (0.7)		29.6 (2.8)	
Mental health										
Nervous	1.00	0.89	0.59, 1.35	1.01	0.66, 1.54	1.00	0.80	0.53, 1.19	0.86	0.57, 1.29
Down in the dumps	1.00	1.28	0.65, 2.53	1.46	0.74, 2.89	1.00	0.89	0.45, 1.74	1.37	0.72, 2.61
Not calm and peaceful	1.00	0.96	0.71, 1.30	0.99	0.72, 1.36	1.00	1.17	0.87, 1.58	1.14	0.84, 1.56
Downhearted and blue	1.00	1.32	0.79, 2.19	1.38	0.81, 2.35	1.00	1.23	0.74, 2.03	1.45	0.87, 2.41
Not a happy person	1.00	1.01	0.75, 1.37	0.90	0.65, 1.24	1.00	1.12	0.73, 1.71	1.54*	1.02, 2.34
General health										
Poor health in general	1.00	0.81	0.54, 1.20	1.23	0.83, 1.81	1.00	1.04	0.71, 1.53	1.20	0.82, 1.75
Getting sick more easily than others	1.00	1.24	0.88, 1.75	1.23	0.86, 1.75	1.00	1.17	0.84, 1.64	1.22	0.87, 1.72
Not as healthy as others	1.00	0.85	0.66, 1.09	0.97	0.75, 1.27	1.00	1.14	0.89, 1.45	1.06	0.82, 1.37
Expecting worse health	1.00	1.27	1.00, 1.61	1.39*	1.08, 1.80	1.00	1.28*	1.01, 1.62	1.30*	1.02, 1.66
Health not excellent[b]	1.00	1.01	0.75, 1.35	1.35*	1.00, 1.82	1.00	1.30	0.98, 1.73	1.48**	1.11, 1.98
Women (n = 2156)										
Mean anthropometry (SD)	80.8 (4.6)	91.6 (2.6)		104.3 (7.7)		22.1 (1.6)	25.5 (0.7)		29.6 (2.8)	
Mental health										
Nervous	1.00	1.13	0.81, 1.59	1.10	0.77, 1.57	1.00	0.93	0.67, 1.31	1.02	0.73, 1.44
Down in the dumps	1.00	1.15	0.66, 2.01	1.45	0.83, 2.53	1.00	0.97	0.54, 1.75	1.79*	1.05, 3.05
Not calm and peaceful	1.00	1.16	0.93, 1.49	1.19	0.92, 1.52	1.00	1.04	0.82, 1.32	1.10	0.86, 1.40
Downhearted and blue	1.00	1.02	0.69, 1.51	1.09	0.72, 1.65	1.00	0.94	0.63, 1.40	1.22	0.82, 1.81
Not a happy person	1.00	1.13	0.87, 1.47	1.10	0.83, 1.47	1.00	1.05	0.81, 1.36	1.00	0.76, 1.31
General health										
Poor health in general	1.00	1.21	0.87, 1.70	1.52*	1.09, 2.13	1.00	0.91	0.64, 1.27	1.64**	1.19, 2.25
Getting sick more easily than others	1.00	0.97	0.74, 1.28	1.18	0.89, 1.57	1.00	0.85	0.64, 1.12	1.19	0.91, 1.57
Not as healthy as others	1.00	0.93	0.74, 1.18	0.97	0.76, 1.24	1.00	1.11	0.88, 1.40	1.02	0.81, 1.30
Expecting worse health	1.00	1.04	0.83, 1.30	0.96	0.75, 1.21	1.00	1.03	0.82, 1.28	1.18	0.93, 1.48
Health not excellent[b]	1.00	1.11	0.86, 1.43	1.28	0.99, 1.67	1.00	1.09	0.84, 1.41	1.41	1.09, 1.82

Note. Lifestyle and demographic factors are described in the Logistic Regression Analyses section of Statistical Methods.
[a]Reference group.
[b]Responded "don't know" or "false" to the question "do you rate your health as excellent? (don't know, true, or false)."
*** $P < .001$; ** $P < .01$; * $P < .05$.

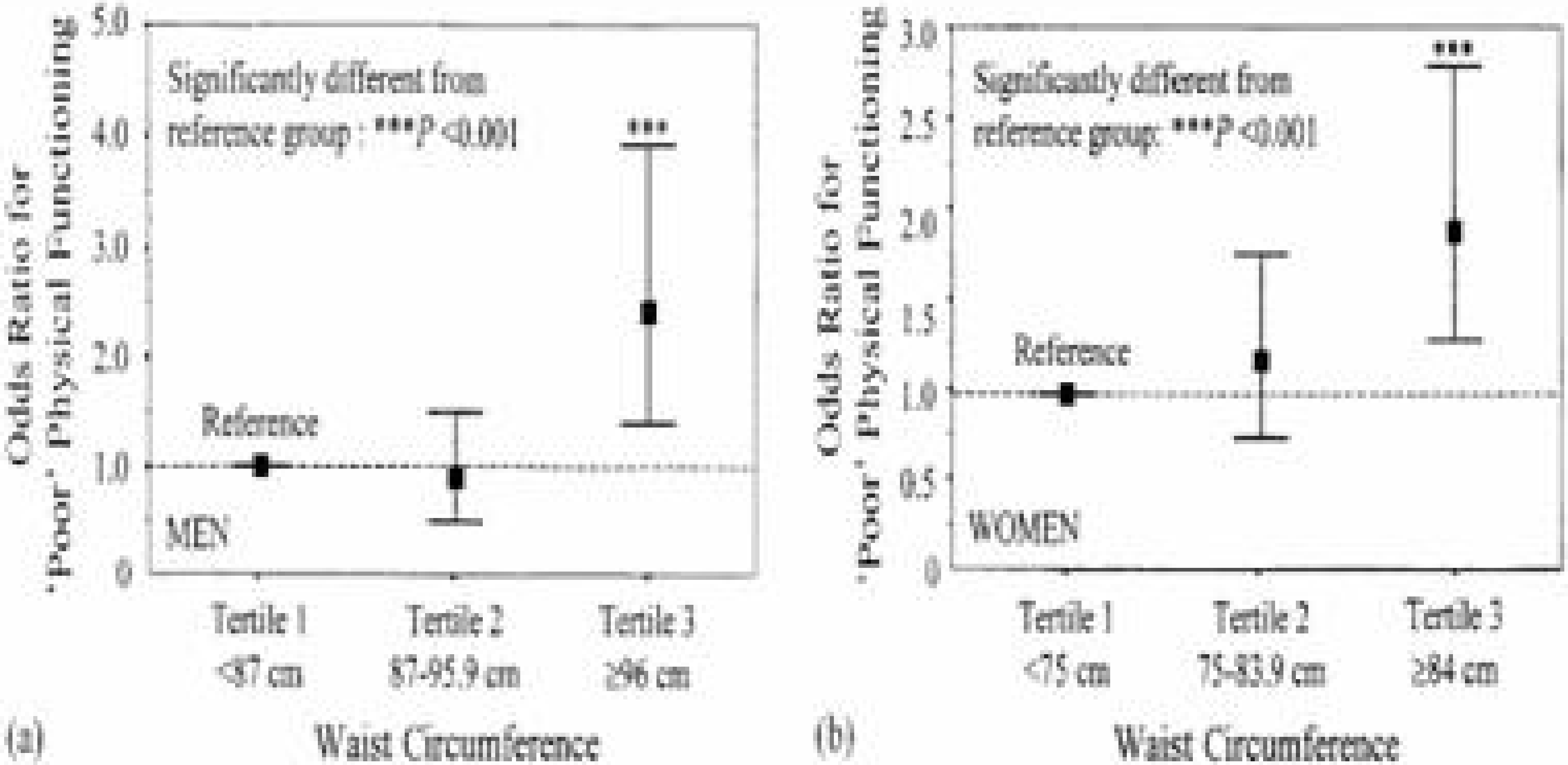

FIGURE 2—Odds ratios (■) and 95% CIs (vertical bars) for subjects with poor (<66.7% of standardized scores) physical functioning, by different tertiles of waist circumference in men (a) and women (b). Odds ratios were adjusted for age, lifestyle, and demographic factors as described in Methods.

Racial and Ethnic Differences in the Use of Invasive Cardiac Procedures among Cardiac Patients in Los Angeles County, 1986 through 1988

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ABSTRACT

Objectives. The purpose of the study was to compare use of invasive cardiovascular procedures among Latino, Asian, African-American, and White patients.

Methods. In a cross-sectional study of hospital discharge data, multiple logistic regression was used to model use of coronary artery angiography, bypass graft surgery, and angioplasty among adult Los Angeles County residents discharged from California hospitals between 1986 and 1988 with primary diagnoses consistent with possible ischemic heart disease.

Results. After potential demographic, socioeconomic, and clinical confounders, including hospital procedure volume, were controlled, Latinos were less likely than Whites to undergo angiography (odds ratio [OR] = 0.90) and bypass graft surgery (OR = 0.87). African Americans were less likely to receive bypass graft surgery (OR = 0.62) and angioplasty (OR = 0.80). Asians were as likely as Whites to receive each procedure. The impact of adjustment for hospital procedure volume was greater for Latinos and Asians than for African Americans.

Conclusions. Administrative data suggest that disparities in use of invasive cardiovascular procedures are not limited to African Americans. Hospital procedure volume appears to be an important factor related to such disparities. The causes of racial/ethnic differences in reported procedure rates remain unclear. (*Am J Public Health.* 1995;85:352–356)

TABLE 3—Distribution of Patients by Racial/Ethnic Group and Hospital Procedure Volume

Hospital Procedure Volume[a]	% of Patients			
	White	African American	Latino	Asian
Angiography				
High	56.7	40.5[b]	39.8[b]	46.6[b]
Medium	9.9	8.0[b]	9.3[b]	9.9
Low	9.5	17.8[b]	10.1[b]	7.7[b]
Very low	5.7	13.2[b]	7.1[b]	7.1[b]
None	18.2	20.5[b]	33.8[b]	28.7[b]
Bypass graft surgery				
High	21.4	14.8[b]	8.5[b]	22.4
Medium	23.2	15.4[b]	11.0[b]	12.1[b]
Low	16.6	18.8[b]	29.9[b]	20.8[b]
Very low	2.8	5.7[b]	1.8[b]	1.7[b]
None	36.0	45.4[b]	48.8[b]	43.1[b]
Angioplasty				
High	21.5	16.0[b]	7.9[b]	20.6
Medium	9.8	5.2[b]	6.5[b]	4.7[b]
Low	23.6	16.0[b]	17.0[b]	18.5[b]
Very low	12.3	18.3[b]	23.0[b]	13.3
None	32.8	44.6[b]	45.7[b]	42.9[b]

[a]Volume was defined as number of procedures performed per year: high = more than 200; medium = 101–200; low = 20–100; very low = fewer than 20.

[b]Caucasian–African American, Caucasian–Asian, and Caucasian–Latino differences are significant (*P* < .01) by two-tailed chi-square test.

TABLE 4—Summary of Logistic Regression Analyses of Invasive Cardiac Procedures: Odds Ratios (Relative to White Patients), by Racial/Ethnic Group

	Model 1[a] Unadjusted OR (95% CI)	Model 2[b] OR (95% CI)	Model 3[c] OR (95% CI)	Model 4[d] OR (95% CI)
Angiography				
African American	.50 (.48, .53)	.80 (.76, .84)	.78 (.74, .82)	.94 (.89, 1.00)
Asian	.78 (.73, .83)	.85 (.80, .92)	1.01 (.94, 1.09)	1.03 (.95, 1.11)
Latino	.49 (.47, .51)	.69 (.65, .72)	.81 (.77, .85)	.90 (.85, .95)
Bypass graft				
African American	.35 (.32, .38)	.58 (.52, .64)	.57 (.52, .63)	.62 (.56, .69)
Asian	.95 (.87, 1.05)	.98 (.88, 1.09)	1.11 (1.00, 1.24)	1.03 (.92, 1.15)
Latino	.49 (.45, .52)	.70 (.64, .76)	.77 (.71, .83)	.87 (.79, .94)
Angioplasty				
African American	.38 (.35, .42)	.76 (.69, .84)	.76 (.69, .83)	.80 (.72, .88)
Asian	.75 (.67, .83)	.88 (.79, .99)	.99 (.88, 1.10)	.89 (.79,1.01)
Latino	.38 (.35, .41)	.65 (.60, .71)	.75 (.69, .82)	.99 (.90, 1.09)

Note. OR = odds ratio; CI = confidence interval.
[a]No additional independent variables are used.
[b]Controlling for primary diagnosis, age, gender, primary insurance type, admission type, income, and number of comorbidities.
[c]Identical to model 2 except that discharges from hospitals not performing procedures are deleted.
[d]Indentical to model 3 with categorical hospital procedure volume variable added.

Perceived Parental Burden and Service Use for Child and Adolescent Psychiatric Disorders

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ABSTRACT

Objectives. Pediatric chronic physical illness and adult psychiatric disorders are substantial sources of burden for family caretakers, but little attention has been paid to parental burden resulting from children's or adolescents' psychiatric disorders. This paper describes the predictors of perceived parental burden and its impact on the use of specialty mental health and school services.

Methods. A representative general population sample of 1015 9-, 11-, and 13-year-olds and their parents completed structured psychiatric diagnostic interviews and the Child and Adolescent Burden Assessment.

Results. Weighted estimates indicated that 10.7% of parents in the general population perceived burden resulting from their children's symptomatology. Significant predictors of perceived burden were levels of child symptomatology and impairment and parental mental health problems. Children's depressive and anxiety disorders were associated with less burden than other diagnoses. The effects of child disorder severity on specialty mental health service use appeared to be mediated by the level of burden induced.

Conclusions. Substantial levels of parental burden resulted from child psychiatric disorders and were a major reason for specialist mental health service use. (*Am J Public Health.* 1998;88:75-80)