

United States
Department of
Agriculture



Economic
Research
Service

E-FAN-04-014-3

December 2004



Nutrition and Health Characteristics of Low-Income Populations

Volume III, School-Age Children

Mary Kay Fox
Nancy Cole



*Food Assistance & Nutrition
Research Program*



E-FAN-04-014-3

December 2004

Nutrition and Health Characteristics of Low-Income Populations

Volume III, School-Age Children

By Mary Kay Fox and Nancy Cole, Abt Associates Inc.

ERS project representative: Biing-Hwan Lin, 202-694-5458,
blin@ers.usda.gov

Abstract

Data from the Third National Health and Nutrition Examination Survey (NHANES-III), conducted in 1988-94, were used to compare the nutrition and health characteristics of the Nation's school-age children—boys and girls ages 5-18. Three groups of children were compared based on household income: income at or below 130 percent of poverty (lowest income), income between 131 and 185 percent of poverty (low income), and income above 185 percent of poverty (higher income). This research was designed to establish a baseline from which to monitor the nutrition and health characteristics of school-age children over time, particularly those in low- and lowest income groups.

This report was prepared by Abt Associates Inc., under a research contract for the Economic Research Service. The views expressed are those of the authors and not necessarily those of ERS or USDA.

Acknowledgments

The authors wish to acknowledge the invaluable contributions of Ellie Lee, who completed all of the special programming required to estimate usual dietary intakes, and Nancy Burstein, who served as technical reviewer and offered many comments that improved the report. We also acknowledge Tamara Dubowitz and Jay Aronson, who diligently checked and proofed the report, and Linda Hatcher of the Economic Research Service, who completed the final copy edit. Thanks are also due to our project officer at the Economic Research Service, Biing-Hwan Lin, who along with colleagues Betsy Frazao, David Smallwood, Margaret Andrews, and Joanne Guthrie, generated the idea that resulted in this series of reports. Kevin Dodd at the National Cancer Institute and Alicia Carriquiry at the University of Iowa are also acknowledged for the consultation and advice they provided to staff at ERS and Abt Associates in conceptualizing and implementing the approaches used to estimate usual dietary intakes and to assess the adequacy of usual intakes. Finally, the report benefited from thoughtful review and critique by Betsy Frazao of the Economic Research Service and Dawn Aldridge of the Food and Nutrition Service.

Contents

Acknowledgments	ii
Executive Summary.....	vii
Chapter One: Introduction	1
The Third National Health and Nutrition Examination Survey	2
Analytic Approach.....	2
Age Adjustment.....	4
Statistical Tests	6
Chapter Two: Usual Intake of Food Energy and Nutrients	7
Participation in Food and Nutrition Assistance Programs.....	7
The Food Stamp Program	7
The School Meal Programs.....	8
The National School Lunch Program	8
The School Breakfast Program.....	9
Household Food Sufficiency.....	10
Meals and Snacks Consumed.....	11
Number of Meals Consumed.....	11
Consumption of Breakfast	12
Number of Snacks Consumed.....	12
Usual Intake of Food Energy and Key Nutrients	12
Standards Used to Assess Usual Intakes	13
Food Energy	13
Vitamin C	15
Iron	15
Zinc	16
Calcium.....	17
Consumption of Milk and Soft Drinks	18
Use of Dietary Supplements.....	19
Chapter Three: Healthy Eating Index Scores and Usual Intake of Dietary Fiber	21
Healthy Eating Index Scores	21
Total HEI Scores	22
Food-based Component Scores	23
Males	23
Females	25
Nutrient-based Component Scores.....	27
Percent of School-age Children Meeting Standards for HEI Nutrients: Usual Intakes vs.	
24-hr Intakes	28
Percent of Energy from Total Fat.....	28
Percent of Energy from Saturated Fat.....	29
Cholesterol.....	30

Sodium.....	31
Usual Intake of Dietary Fiber	33
Chapter Four: Other Measures of Nutritional Status	35
Prevalence of Overweight.....	35
Risk of Overweight.....	36
Prevalence of Underweight and Growth Retardation	37
Nutritional Biochemistries	37
Iron Deficiency and Iron Deficiency Anemia	37
Red Blood Cell (RBC) Folate	38
Serum Vitamin B ₁₂	39
Serum Cholesterol and Related Measures.....	39
Chapter Five: Health-Related Behaviors.....	41
Physical Activity.....	41
Percent of Children Engaging in Vigorous Physical Activity at Least Three Times per Week	42
Participation in Organized Exercise Programs or Sports Teams.....	43
Television Viewing.....	44
Alcohol Consumption.....	45
Tobacco Use.....	46
Exposure to Second-Hand Smoke.....	46
Chapter Six: Health Status, Conditions, and Risks	49
General Health Status	49
Birth Characteristics.....	50
Measures of Childhood Health.....	51
Hospitalizations Since Birth.....	51
Accidents, Injuries, and Poisonings Requiring Medical Attention	52
Chronic Respiratory Conditions	52
Lead Poisoning.....	53
Dental Health.....	54
Visits to a Dentist or Dental Hygienist	54
Chapter Seven: Access to Health Care Services	57
Health Insurance Coverage	57
Regular Source of Health Care	58
Use of Health Care Services in the Past Year.....	59
References.....	61
Appendix A: NHANES-III Data Files	
Appendix B: Reference Standards	
Appendix C: Statistical and Reporting Guidelines	
Appendix D: Detailed Tables	

List of tables and figures

Table 1—Number of NHANES-III respondents: School-age children	3
Table 2—Age Distribution of school-age children in NHANES-III sample frame and year 2000 population	5
Figure 1—Percent of income-eligible school-age children participating in the Food Stamp Program.....	8
Figure 2—Percent of school-age children eating school lunch 5 days per week.....	9
Figure 3—Percent of school-age children eating school breakfast 5 days per week.....	10
Figure 4—Distribution of school-age children by household food sufficiency status	11
Figure 5—Percent of school-age children consuming fewer than three meals per day	11
Figure 6—Mean usual intake of food energy as a percent of the 1989 Recommended Energy Allowance: School-age children.....	14
Figure 7—Mean usual intake of food energy as a percent of the 1989 Recommended Energy Allowance: School-age males	15
Figure 8—Mean usual intake of food energy as a percent of the 1989 Recommended Energy Allowance: School-age females	15
Figure 9—Percent of 14-18-year-olds with adequate usual intake of Vitamin C	16
Figure 10—Percent of 14-18-year-old females with adequate usual intake of iron.....	16
Figure 11—Percent of school-age children with adequate usual intake of zinc: Males	17
Figure 12—Percent of school-age children with adequate usual intake of zinc: Females.....	17
Figure 13—Mean usual intake of calcium as a percent of Adequate Intake: School-age males	18
Figure 14—Mean usual intake of calcium as a percent of Adequate Intake: School-age females.....	18
Figure 15—Mean daily servings of milk and soft drinks: School-age children.....	19
Figure 16—Mean Healthy Eating Index (HEI) scores: School-age children.....	22
Figure 17—Distribution of total HEI scores: School-age children.....	22
Figure 18—Mean scores for HEI food-based components: School-age males.....	24
Figure 19—Percent of school-age children meeting HEI standards for food-based components: Males	24
Figure 20—Mean scores for HEI food-based components: School-age females	26
Figure 21—Percent of school-age children meeting HEI standards for food-based components: Females	26
Figure 22—Mean scores for HEI nutrient-based components: School-age children	27
Figure 23—Percent of school-age children meeting Dietary Guidelines recommendation for total fat: One-day (HEI) vs. usual intake estimates	28
Figure 24—Percent of school-age children meeting Dietary Guidelines recommendation for saturated fat: One-day (HEI) vs. usual intake estimates	30
Figure 25—Percent of school-age children meeting Dietary Guidelines recommendation for cholesterol: One-day (HEI) vs. usual intake estimates	31
Figure 26—Percent of school-age children meeting Dietary Guidelines recommendation for sodium: One-day (HEI) vs. usual intake estimates	32
Figure 27—Mean usual intake of dietary fiber: School-age children.....	33
Figure 28—Mean Body Mass Index: School-age children.....	36
Figure 29—Percent of school-age children who were overweight.....	36
Figure 30—Percent of school-age children who were at risk of overweight.....	36
Figure 31—Percent of school-age children with growth retardation	37

Figure 32–Percent of school-age children with iron deficiency	38
Figure 33–Percent of school-age children with low levels of RBC folate	39
Figure 34–Percent of school-age children with high levels of total cholesterol	40
Figure 35–Percent of school-age children with borderline high levels of total cholesterol	40
Figure 36–Percent of 8-16-year-olds with vigorous physical activity at least three times per week by gender	42
Figure 37–Percent of 8-16-year-olds with vigorous physical activity at least three times per week by weight status	43
Figure 38–Percent of 8-16-year-olds participating in organized exercise programs or sports teams by gender	43
Figure 39–Percent of 8-16-year-olds participating in organized exercise programs or sports teams by weight status	44
Figure 40–Mean hours of television watched per day by 5-16-year-olds	44
Figure 41–Percent of 5-16-year-olds watching no more than 2 hours of television per day	45
Figure 42–Percent of 14-18-year-olds who have consumed at least 12 alcoholic beverages in their lifetime	45
Figure 43–Percent of nonsmoking school-age children exposed to cigarette smoke at home.....	46
Figure 44–Percent of nonsmoking school-age children with high serum cotinine levels.....	47
Figure 45–Caregiver- or self-reported general health status: School-age children.....	50
Figure 46–Physician-assessed general health status: School-age children.....	50
Figure 47–Birth characteristics of 5-10-year-olds	51
Figure 48–Percent of 5-16-year-olds with hospital stays since birth	51
Figure 49–Percent of 5-16-year-olds with accident, injury, or poisoning requiring medical attention in the past 12 months	52
Figure 50–Percent of 5-16-year-olds with chronic respiratory conditions.....	52
Figure 51–Mean number of decayed, missing, or filled teeth: School-age children.....	54
Figure 52–Percent of school-age children who have visited a dentist or dental hygienist	55
Figure 53–Percent of school-age children with any health insurance coverage.....	58
Figure 54–Percent of school-age children with private health insurance and Medicaid	58
Figure 55–Percent of school-age children with a regular source of health care	58
Figure 56–Percent of school-age children with a regular physician or health care provider	59
Figure 57–Percent of school-age children who saw a health care provider during the past year	59

Executive Summary

This report describes the nutrition and health characteristics of the Nation's school-age children—boys and girls 5 to 18 years of age—using data from the Third National Health and Nutrition Examination Survey (NHANES-III).¹ The NHANES survey is the primary source of information used in monitoring the Nation's nutrition and health status. NHANES-III was completed between 1988 and 1994 and provides data for a large nationally representative sample of individuals.²

This research was designed to establish a baseline from which to monitor the nutrition and health characteristics of school-age children over time, particularly those in the lowest- and low-income groups, and to generate questions and hypotheses for future research. The report compares and contrasts school-age children in three different income groups: income at or below 130 percent of poverty (lowest income), income between 131 and 185 percent of poverty (low income), and income greater than 185 percent of poverty (higher income). The criterion used to define the lowest-income group corresponds to the criterion used to define income eligibility for the Food Stamp Program and free meal benefits in the National School Lunch Program and School Breakfast Program. The criterion used to define the low-income group corresponds to income eligibility for reduced-price meals.

A broad array of measures is used to describe the nutrition and health characteristics of school-age children. These measures include dietary intake, body weight, nutritional biochemistries, health-related behaviors, measures of health status, and access to health care services. Because of variations in NHANES-III data collection protocols, some measures were not available for all school-age children. The following summary highlights major findings for each group of measures. For the most part, highlighted findings refer to differences between income groups observed for the entire population. The full report provides details about the extent to which findings varied by gender and/or age. All reported population estimates have been age-adjusted (based on year 2000 Census data) to eliminate differences between income groups that are due solely to differences in the age distributions of the groups.

Dietary Intake

Dietary intakes of school-age children were assessed using data from a single 24-hour recall. In addition to energy intake, the analysis examined intakes of nine key nutrients and dietary components: vitamin C, iron, zinc, calcium, total fat, saturated fat, cholesterol, sodium, and fiber. Estimates of usual intake were generated using the personal computer version of the Software for Intake Distribution Estimation (Iowa State University, 1996).³ Healthy Eating Index (HEI) scores (Kennedy et al., 1995) were also examined.

- **Meal consumption.** More than a third (36%) of school-age children consumed fewer than three meals in the preceding 24 hours and fewer than half (46%) of all school-age children reportedly ate breakfast every day. School-age children in the lowest-income group were more likely than

¹ Similar reports have been prepared for participants and nonparticipants in the Food Stamp Program (Fox and Cole, 2004), participants and nonparticipants in the WIC Program (Cole and Fox, 2004a), and older adults (Cole and Fox, 2004b).

² Beginning in 1999, NHANES became a continuing survey. Data for the first two continuous years of the ongoing NHANES (1999-2000) have been released since the time the tabulations presented in this report were prepared. Data for subsequent years are expected in mid-2005.

³ Because NHANES-III included a very small sample of second dietary recalls, which are needed to estimate intraindividual variation in intake, variance components were derived from the Continuing Survey of Food Intake of Individuals (CSFII), 1994-96 (see appendix C).

school-age children in the higher-income group to have consumed fewer three meals in the preceding 24 hours (39% vs. 34%) and were less likely to eat breakfast every day (44% vs. 48%).

- **Energy.** On average, the usual energy intake of school-age children approached 100 percent of the 1989 Recommended Energy Allowance (REA) (97%). Overall, there were no differences between income groups in mean usual energy intake as a percent of the 1989 REA. Significant differences were observed, however, in gender-specific analyses. Among male school-age children, the lowest-income group consumed significantly less energy than either the low-income or higher-income groups (100% of the 1989 REA vs. 108% and 105%). Among females, the trend was reversed. Female school-age children in the lowest-income group consumed significantly less energy than their counterparts in the low-income and higher-income groups (93% of the 1989 REA vs. 87% for each of the other groups).
- **Vitamin C.** Overall, 92 percent of school-age children had usual intakes of vitamin C that met Estimated Average Requirements (EARs). Although differences between groups were small, school-age children in the lowest-income group were significantly more likely than school-age children in the higher-income group to have adequate usual intakes of vitamin C (93% vs. 91%).
- **Iron.** Close to 100 percent (97%) of all school-age children had adequate usual intakes of iron. The group most likely to have inadequate intake of iron was 14-18-year-old females. In this subgroup, the lowest-income group was more likely than the higher-income group to have adequate usual intakes of iron (92% vs. 80%).
- **Zinc.** Roughly 9 out of 10 school-age children had adequate usual intakes of zinc. School-age children in the lowest-income group were *less* likely than those in the low-income group and *more* likely than those in the higher-income group to have adequate usual zinc intakes (91% vs. 98% and 89%). However, this pattern varied substantially by gender and age.
- **Calcium.** It was not possible to assess the prevalence of adequate calcium intakes among school-age children because the required dietary standard—the EAR—has not been established for calcium. Mean usual calcium intakes were compared to established Adequate Intake (AI) levels. On average, the usual diets consumed by school-age children provided 83 percent of the AI. Mean usual calcium intakes of school-age children in the lowest-income group were significantly lower, as a percent of the AI, than mean usual calcium intakes of school-age children in the higher-income group (81% vs. 85%). However, there was substantial variation in this finding by gender and age.
- **Percent of Energy from Fat.** On average, school-age children obtained 33.6 percent of their food energy from fat. This level of fat intake exceeded the *Dietary Guidelines for Americans* recommendation of no more than 30 percent of total energy (U.S. Departments of Agriculture and Health (USDA) and Human Services (DHHS), 2000) but fell within the more recently defined Acceptable Macronutrient Distribution Range (AMDR) for fat intake (25-35% of total energy) (Institute of Medicine (IOM), 2002b). In comparison with the higher-income group, school-age children in the lowest-income group obtained a significantly greater percentage of energy from fat (34.0% vs. 33.0%). Moreover, school-age children in the lowest-income group were *more* likely than children in the low-income group and *less* likely than children in the higher-income group to satisfy the *Dietary Guidelines* recommendation for fat intake (14% vs. 10% and 22%).

Detailed distributions of usual fat intake indicate that somewhere between 25 and 50 percent of all school-age children had usual fat intakes that exceeded the AMDR.

- **Percent of Energy from Saturated Fat.** On average, school-age children obtained 12.1 percent of their usual energy intake from saturated fat. This exceeded the *Dietary Guidelines* recommendation that saturated fat provide less than 10 percent of total energy (USDA and U.S. DHHS, 2000). School-age children in the lowest-income group obtained a significantly greater proportion of their energy from saturated fat than school-age children in the higher-income group (12.3% vs. 11.9%) and were less likely to satisfy the *Dietary Guidelines* recommendation for saturated fat (7% vs. 15%).
- **Cholesterol.** The mean usual cholesterol intake of school-age children (245 mg.) was consistent with the *Dietary Guidelines* recommended maximum of 300 mg. (USDA and U.S. DHHS, 2000). Although intakes of both groups were consistent with the *Dietary Guidelines* recommendation, school-age children in the lowest-income group consumed significantly more cholesterol than school-age children in the higher-income group (254 mg. vs. 236 mg.). Overall, there were no significant differences between income groups in the percentage of school-age children whose usual intakes met the *Dietary Guidelines* standard. However, when the data were examined separately by gender, both males and females in the lowest-income group were significantly less likely than their higher-income counterparts to satisfy the recommendation for cholesterol intake.
- **Sodium.** The mean usual sodium intake of school-age children (3,456 mg.) exceeded the *Dietary Guidelines* recommended maximum of 2,400 mg. (USDA and U.S. DHHS, 2000). Mean usual intakes also exceeded the more recently defined Tolerable Upper Intake Levels (UL) (1,900 mg. for 4-8-year-olds, 2,200 mg. for 9-13-year-olds, and 2,300 mg. for 14-18-year-olds) (IOM, 2004). Overall, there were no significant differences between income groups in mean usual sodium intake. Among males, however, the mean usual sodium intake of the lowest-income group was significantly *lower* than the mean usual intake of the low-income group (3,761 mg. vs. 4,286 mg.). Among females, the between-group difference ran in the opposite direction. Females in the lowest-income group consumed significantly *more* sodium, on average, than females in the higher-income group (3,195 mg. vs. 2,898 mg.).

School-age children in the lowest-income group were significantly less likely than school-age children in the higher-income group to satisfy the *Dietary Guidelines* recommendation for sodium (11% vs. 18%). Detailed distributions of usual sodium intake indicate that less than 5 percent of 5-8-year-olds and less than 10 percent of 9-13-year-olds and 14-18-year-olds had usual sodium intakes that did not exceed defined ULs.

Healthy Eating Index Scores

- On average, school-age children scored 62.8, out of a possible 100, on the HEI. Overall, there were no significant differences between income groups on mean HEI scores. The HEI is a composite score constructed from 10 individual scores: five food-based scores that assess intake of grains, vegetables, fruits, dairy, and meat, four nutrient-based scores, and a variety score.⁴

⁴The nutrient-based components compare intakes of total fat, saturated fat, cholesterol, and sodium to recommended maximums.

- The diets of 78 percent of school-age children showed a need for improvement. Only 6 percent of all school-age children had “good” diets and 16 percent had “poor” diets. Overall, there were no significant differences between income groups on these measures. Among males, however, the lowest-income group was more likely than the higher-income group to have a “poor” diet (18% vs. 12%).
- There were relatively few differences between income groups in mean scores for the six food-based HEI components or in the percentage of children meeting the HEI standards. Among males, the lowest-income group had a significantly lower mean score than the higher-income group for the dairy component (7.4, out of a perfect score of 10, vs. 7.8) and a significantly greater mean score than the low-income group for the meat component (6.9 vs. 6.1). In comparison with the low-income group, school-age males in the lowest-income group were less likely to consume the recommended number of grain servings (31% vs. 39%) and were more likely to consume the recommended number of meat servings (33% vs. 26%). Males in the lowest-income group were also less likely than their counterparts in the higher-income group to consume the recommended number of servings from the fruit group (14% vs. 19%) and the dairy group (45% vs. 53%).
- Among school-age females, the lowest-income group had a significantly greater mean score for the grain component than the higher-income group (6.8 vs. 6.4) and a significantly greater mean score for the meat component than either of the other income groups (6.3 vs. 5.5 for both of the other groups). In addition, school-age females in the lowest-income group were more likely than school-age females in the higher-income group to consume the recommended number of servings of grains (23% vs. 16%) and meat (27% vs. 20%).

Body Weight

Body weight was assessed on the basis of body mass index (BMI), a measure of the relationship between height and weight that is the commonly accepted index for classifying adiposity (or fatness) in adults (CDC, 2003).⁵ BMIs were compared to a BMI-for-age growth chart developed by the CDC (Kuczmarski et al., 2002). In assessing children’s weight status, use of the word “obesity” is avoided because of potential negative connotations (CDC, 2003). Instead, assessment of weight status focuses on the prevalence of overweight (defined as BMI-for-age at or above the 95th percentile), the prevalence of being at risk of overweight (defined as BMI-for-age between the 85th and 95th percentiles), and the prevalence of underweight (defined as BMI-for-age below the 5th percentile). The prevalence of retarded linear growth (height-for-age below the 5th percentile) was also assessed.

- Overall, 11 percent of school-age children were overweight and 14 percent were at risk of becoming overweight. School-age children in the lowest-income group were significantly more likely to be overweight than school-age children in either of the other income groups (14% vs. 10% and 9%). There were no statistically significant differences between income groups in the percentage of children at risk of overweight (16% vs. 14% and 13%).

⁵ BMI is equal to [weight in kilograms] ÷ [height in meters]².

- There was no statistically significant difference between income groups in the percentage of school-age children who were underweight.
- School-age children in the lowest-income group were significantly more likely than school-age children in the higher-income group to have short stature or retarded linear growth (5% vs. 3%).

Nutritional Biochemistries

- **Iron Deficiency.** The overall prevalence of iron deficiency among school-age children was about 5 percent. School-age children in the lowest-income group were more likely to be iron deficient than school-age children in the higher-income group (6% vs. 4%). This difference was attributable to a difference among females (10% vs. 5%).
- **Iron-deficiency Anemia.** Iron-deficiency anemia was observed in less than 1 percent of school-age children, overall. There were no significant differences between income groups on this measure.
- **Anemia.** The prevalence of anemia, defined on the basis of low hemoglobin, was 6 percent. Overall, there were no statistically significant differences between income groups on this measure.
- **Low Red Blood Cell (RBC) Folate.** Overall, 6 percent of school-age children had low levels of RBC folate. School-age children in the lowest-income group were more likely than children in either the low-income or higher-income groups to have low levels of RBC folate (9% vs. 4% and 6%). The prevalence of this problem was greatest among 14-18-year-olds, especially females.
- **Low Serum Vitamin B₁₂.** Overall, only 1 percent of school-age children had low levels of serum vitamin B₁₂. (This condition is much more common among older adults).
- **High and Borderline-high Total Cholesterol.** Ten percent of school-age children had high levels of total cholesterol and 28 percent had cholesterol levels that were borderline-high. There were few significant differences between income groups on these measures or on related measures of LDL (“bad”) cholesterol, HDL (“good”) cholesterol, and triglycerides.

Health-related Behaviors

Physical Activity

- Data on reported physical activity were available for 8-16-year-old children. In this age group, children in the lowest-income group reported engaging in vigorous physical activity less often than children in the higher-income group (4.5 times per week vs. 4.9). This difference was concentrated among females (4.0 times per week vs. 4.4 times).
- Eighty percent of 8-16-year-olds reported engaging in vigorous physical activity 3 times per week or more. Overall, there were no significant differences between income groups in this regard. However, among females, the lowest-income group was significantly less likely than the higher-income group to report this level of physical activity (69% vs. 79%).

- Eight-to-16-year-old children in the lowest-income group were less likely than their counterparts in either of the other income groups to be involved in team sports or other organized physical activities (50% vs. 62% and 70%).

Television Viewing

- Data on television viewing were available for 5-16-year-olds. In this age group, children in the lowest-income group watched significantly more television per day than children in either of the other income groups (2.3 hours vs. 2.0 hours for each of the other groups). Moreover, children in the lowest-income group were less likely than children in either of the other income groups to meet the *Healthy People 2010* goal of limiting television viewing to no more than 2 hours per day (58% vs. 68% for each of the other groups).

Alcohol Consumption

- Children 12 and older were asked about alcohol consumption during their lifetime and over the past year. Overall, 28 percent of children in this age range reported consuming at least 12 alcoholic beverages in their lifetime. Alcohol consumption was low among 12- and 13-year-olds—only 9 percent of children in this age group reported that they had consumed at least twelve alcoholic beverages in their lifetime. In contrast, roughly 4 out of 10 14-18-year-olds reported this level of alcohol consumption. There were no significant differences between income groups in reported lifetime alcohol consumption.
- Fourteen percent of all 12-18-year-olds reported consuming 12 or more alcoholic beverages during the past year. The only significant between-group difference in recent alcohol consumption was observed among 14-18-year-old females. In this age group, females in the lowest-income group were less likely than females in the higher-income group to have consumed 12 or more alcoholic beverages during the past year (14% vs. 23%).

Tobacco Consumption

- Children over the age of 8 were asked about tobacco use. Tobacco use was very low among children under the age of 14. No children between the ages of 8 and 10 and only 1.4 percent of 11-13-year-olds reported having used tobacco.
- Overall, 13 percent of 14-18-year-olds reported smoking 100 or more cigarettes (equivalent to 5 or more packs) in their lifetime and 16 percent reported smoking cigarettes during the past 5 days. Males in the lowest-income group were significantly more likely than those in the low-income group to have smoked cigarettes during the preceding five days. Smokers in the lowest-income group started smoking at a significantly younger age, on average, than those in the low-income group.

Exposure to Second-Hand Smoke

- Nonsmoking school-age children (5 to 18 years) in the lowest-income group were more likely than nonsmoking school-age children in the higher-income group to be exposed to second-hand smoke produced by other household members (50% vs. 32%). In addition, based on the number of cigarettes smoked by household smokers, nonsmoking school-age children in the lowest-

income group who resided in smoking households had a greater degree of exposure to second-hand smoke than their counterparts in the higher-income group. On average, smokers in the lowest-income households smoked 19 cigarettes per day, compared with 15 cigarettes per day for smokers in the higher-income households.

- Differences in exposure to second-hand smoke between nonsmoking school-age children in the lowest- and higher-income groups were borne out in high serum cotinine levels. Cotinine, a breakdown product of nicotine, is used as a biological marker for tobacco use and exposure to environmental tobacco smoke. Nonsmoking school-age children in the lowest-income group were significantly more likely to have high serum cotinine levels than nonsmoking children in the higher-income group (78% vs. 59%). The difference was most substantial for 5-10-year-olds, where there was a 24-percentage-point difference between the lowest-income group and the higher-income group (81% vs. 56%).

Health Status

General Health Status

- Based on caregiver reports (5-16-year-olds) and self-reports (17- and 18-year-olds), children in the lowest-income group were *less* likely than those in either of the other income groups to be in excellent or very good health (57% vs. 71% and 84%) and *more* likely to be in fair or poor health (10% vs. 5% and 2%).
- Physician assessments of general health status were consistently more positive than caregiver and self-assessments. Overall, physicians found 87 percent of school-age children to be in very good or excellent health and only 1 percent to be in fair or poor health. Physician-assessed health status did not differ significantly along income lines.

Birth Characteristics

- Among 5-10-year-olds, children in the lowest-income group were born to younger mothers, on average, than children in the higher-income group and were more likely to have been born to an adolescent mother (23% vs. 6%). In addition, mothers of 28 percent of children in the lowest-income group smoked during the pregnancy, compared with 21 percent of children in the higher-income group.
- Based on caregiver reports, children in the lowest-income group had a lower mean birthweight than children in either of the other income groups, as well as a greater prevalence of low birthweight (11% vs. 7% and 4%). A similar pattern was noted for the lowest-income and higher-income groups in the prevalence of very-low birthweight (less than 1,500 gm .or 3.3 pounds).
- Fifteen percent of 5-10-year-olds in the lowest-income group were reportedly hospitalized in neonatal intensive care units (NICUs) at the time of their birth, compared with 10 percent of 5-10-year-olds in the higher-income group.

Measures of Childhood Health

- Thirty-one percent of 5-16-year-old children had been hospitalized at least once since birth. Overall, there were no significant differences between income groups on this measure.
- Fifteen percent of all 5-16-year-olds experienced an accident, injury, or poisoning during the preceding 12 months that was serious enough to require medical attention. Children in the lowest-income group were significantly less likely than children in the higher-income group to have experienced such a medical emergency (10% vs. 18%).
- There were no significant differences between income groups in the prevalence of asthma or chronic bronchitis. However, 5-16-year-old children in the lowest-income group were less likely than their counterparts in the higher-income group to suffer from hay fever (6% vs. 11%).

Lead Poisoning

- Based on caregiver reports, school-age children in the lowest-income group were more likely than school-age children in the low-income and higher-income groups to have been screened for lead poisoning (14% vs. 9% and 5%).
- Based on NHANES-III laboratory tests, the overall prevalence of high blood lead levels among school-age children was low (2%). Among children under the age of 14, the prevalence of high levels of blood lead was significantly greater for the lowest-income group than for either of the other income groups.

Dental Health

- On average, school-age children in the lowest-income group had more missing, decayed, and filled teeth than school-age children in the higher-income group (2.9 vs. 2.3). This difference was concentrated among 5-10-year-olds (2.7 vs. 1.6).
- Overall, 92 percent of school-age children reportedly visited a dental health professional at least once in their lifetime. Children in the lowest-income group were less likely than children in the other two income groups to have had a dental visit (85% vs. 90% and 96%). The same pattern was noted for dental visits within the past year (61% vs. 70% and 88%).

Access to Health Care

Health Insurance Coverage

- Overall, 88 percent of all school-age children had some form of health insurance. School-age children in the lowest-income group were less likely than school-age children in either of the other income groups to have health insurance (77% vs. 87% and 96%).
- School-age children in the lowest-income group were *less* likely than school-age children in the other two income groups to be covered by private health insurance (38% vs. 80% and 93%) and *more* likely to be covered by Medicaid (48% vs. 6% and 1%).

Regular Source of Health Care

- Overall, about 9 out of 10 school-age children reportedly had a regular source of health care—that is, a clinic, health center, or doctor’s office that was usually used for health care needs or to obtain health-related advice and information. School-age children in the lowest-income group, however, were significantly less likely than those in the higher-income group to have a regular source of care (83% vs. 93%).
- More than 7 out of 10 (73%) school-age children had a regular physician or other health care provider. In comparison with higher-income children, children in the lowest-income group were significantly less likely to have a regular provider (64% vs. 80%).