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Nutrition and Health Characteristics of Low-Income Populations

Volume IV, Older Adults

Nancy Cole
Mary Kay Fox



*Food Assistance & Nutrition
Research Program*



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By Nancy Cole and Mary Kay Fox, 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 older adults—men and women ages 60 years and older. Three groups of older adults 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 older Americans over time, particularly those in low- and lowest income groups.

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Executive Summary

This report describes the nutrition and health characteristics of the Nation's older adults—men and women aged 60 years and older—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 older Americans 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 older adults (also referred to as seniors) 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 lowest-income group corresponds to the criterion used to define income eligibility for the Food Stamp Program (FSP).

A broad array of measures is used to describe the nutrition and health characteristics of older Americans. These measures include dietary intake, body weight, nutritional biochemistries, bone density, health-related behaviors, measures of health status, and access to health care services. The following summary highlights major findings for each group of measures. For the most part, highlighted findings refer to differences observed for the older adult population as a whole. The full report provides details about the extent to which findings varied by gender 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 older adults were assessed using data from a single 24-hour recall. In addition to energy, intakes of nine key nutrients and dietary components were examined: 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 three-quarters (76%) of all older adults consumed at least three meals per day. Older adults in the lowest-income group were less likely to consume three meals per day than older adults in the higher-income group (67% vs. 80%). Older adults in the lowest-income group were significantly less likely than older adults in the other two income groups to consume breakfast every day (78% vs. 83% and 84%).

¹Similar reports have been prepared for participants and nonparticipants in the Food Stamp Program (FSP) (Fox and Cole, 2004a), participants and nonparticipants in the WIC Program (Cole and Fox, 2004), and for school-age children (Fox and Cole, 2004b).

²Beginning 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.

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

- **Energy.** On average, the usual energy intake of older adults approximated 82 percent of the 1989 Recommended Energy Allowance (REA). Mean usual energy intake was lower for older adults in the lowest-income group than for adults in the low-income and higher-income groups (73% of the 1989 REA vs. 79% and 86%).
- **Vitamin C.** Overall, 72 percent of older adults had usual intakes of vitamin C that met Estimated Average Requirements (EARs) and 28 percent had usual vitamin C intakes that did not meet their requirements. Older adults in the lowest-income group were less likely than those in the higher-income group to have adequate usual intakes of vitamin C (66% vs. 76%).
- **Iron.** Close to 100 percent of all older adults had adequate usual intakes of iron. Nonetheless, older adults in the lowest-income group were significantly less likely than those in the two other income groups to consume an adequate amount of iron (96% vs. 98% and 100%).
- **Zinc.** Roughly 7 out of 10 older adults had adequate usual intakes of zinc. Older adults in the lowest-income group were significantly less likely than those in either of the other income groups to have adequate usual intakes of zinc (57% vs. 63% and 77%).
- **Calcium.** It was not possible to assess the prevalence of adequate calcium intakes among older adults because the required dietary standard—the EAR—has not been established for calcium. Mean usual calcium intakes of older adults were compared to established Adequate Intake (AI) levels. On average, the usual diets consumed by older adults provided 61 percent of the AI. Mean usual calcium intakes of older adults in the lowest-income group were significantly lower, as a percent of the AI, than mean usual calcium intakes of older adults in either of the other income groups (53% of the AI vs. 58% and 64%).
- **Percent of Energy from Fat.** On average, older adults obtained 32.2 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 energy⁴ but fell within the more recently defined Acceptable Macronutrient Distribution Range (AMDR) for fat intake (20-35% of total energy) (Institute of Medicine, Food and Nutrition Board (IOM, FNB), 2002b). Older adults in the lowest-income group had a significantly lower mean intake of fat than older adults in either of the other income groups (31.6% of usual energy intake vs. 32.7% and 32.4%).

Detailed distributions of usual fat intake indicate that more than 25 percent of all older adults had usual fat intakes that exceeded the AMDR. There were few statistically significant differences between income groups in the distribution of usual fat intakes. Differences that were observed were largely concentrated among females and at the lower end of the distribution.

- **Percent of Energy from Saturated Fat.** Mean usual saturated fat intakes of older adults exceeded the *Dietary Guidelines* recommendation that saturated fat provide less than 10 percent of total energy. In all three income groups, saturated fat contributed an average of about 11 percent of usual energy intake. Older adults in the lowest-income group had significantly lower usual intakes of

⁴ The *Dietary Guidelines* recommendations were developed by the U.S. Departments of Agriculture and Health and Human Services (USDA and U.S. DHHS, 2000). *Dietary Guidelines* were used to assess intakes of energy, fat, saturated fat, cholesterol, and sodium.

saturated fat, on average, than older adults in the low-income group (10.5% vs. 11.0%). The lowest-income adults were also more likely than low-income older adults to meet the *Dietary Guidelines* standard for saturated fat (45% vs. 39%). Both of these differences were largely attributable to differences among females.

- **Cholesterol.** The mean usual cholesterol intake of older adults (227 mg.) was consistent with the *Dietary Guidelines* recommended maximum of 300 mg.. There were no significant differences between income groups in either mean intake or the percentage of individuals meeting the standard.
- **Sodium.** The mean usual sodium intakes of older adults (2,840 mg.) exceeded the *Dietary Guidelines* recommended maximum of 2,400 mg. as well as the more recently defined Tolerable Upper Intake Level (UL) of 2,300 mg. (IOM, FNB, 2004). Older adults in the lowest-income group had significantly lower mean usual sodium intake than older adults in either of the other income groups (2,538 mg. vs. 2,706 mg. and 2,984 mg.).⁵

Distributions of usual sodium intake indicate that less than half of all older adults consumed diets that did not exceed the UL. Differences in sodium intakes at the 25th and 50th percentiles of the distributions for the lowest-income and higher-income older adults—1,840 mg. and 2,370 mg. vs. 2,305 mg. and 2,870 mg.—suggest that older adults in the lowest-income group were more likely than older adults in the higher-income group to have usual sodium intakes consistent with the UL.

Healthy Eating Index Scores

- On average, older adults scored 68.4, out of a possible 100, on the HEI. Older adults in the lowest-income group scored lower than older adults in either of the other income groups (64.3 vs. 67.0 and 70.0). 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.⁶
- Based on total HEI scores, the diets consumed by the lowest-income older adults were more likely to be of “poor” nutritional quality than the diets consumed by older adults in the other two income groups (19% vs. 13% and 9%). Moreover, older adults in the lowest-income group were less likely than those in the higher-income group to consume diets that were considered to be of “good” nutritional quality (13% vs. 25%).
- Males in the lowest-income group scored lower, on average, than males in either of the other income groups on all six of the food-based HEI components. With one exception (the difference between the lowest- and low-income groups on the vegetable score), all of the between-group differences were statistically significant. In addition, the percentage of males who satisfied the various food-based HEI standards tended to be lower for the lowest-income group than for either of the other income groups. Differences between males in the lowest-income group and those in the low-income group were statistically significant for the dairy, meat, and variety components. Differences between males in the

⁵This difference may be a reflection of the fact that, as discussed above, older adults in the lowest-income group consumed less food energy than older adults in either of the other income groups.

⁶The nutrient-based components compare intakes of total fat, saturated fat, cholesterol, and sodium to recommended maximums.

lowest- and higher-income groups were statistically significant for grains, fruit, dairy, and variety. The only food-based component for which no statistical difference was observed between groups was vegetables.

- For the food-based HEI components, females in the lowest-income group scored lower, on average, than females in the low-income group on the fruit component and the variety component. In addition, the percentage of older adult females who satisfied the HEI standard for dietary variety was significantly smaller for the lowest-income group, relative to the low-income group.
- Differences between females in the lowest-income group and the higher-income group were more widespread. Females in the lowest-income group had significantly lower mean HEI scores than females in the higher-income group for all food-based components except meat. Moreover, for all food-based components except grains and meat, older adult females in the lowest-income group were less likely than their higher-income counterparts to satisfy the HEI standard.

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).⁷ For adults, a healthy weight is defined as a BMI that is at least 18.5 but less than 25. Overweight is defined as a BMI of 25.0 to 29.9, and obesity is defined as a BMI of 30 or more. A BMI below 18.5 indicates underweight.

- Older adults had a mean BMI of 26.7, indicating that, on average, older adults were overweight.
- Older adults in the lowest-income group had a significantly greater mean BMI than older adults in the higher-income group (27.3 vs. 26.5).
- There was no statistically significant difference in the distribution of body weights of older adults in the lowest- and low-income groups overall. However, older adult females in the lowest-income group were *less* likely than older adult females in the higher-income group to be at a healthy weight (30% vs. 42%) and *more* likely to be obese (30% vs. 21%).
- A decidedly different pattern was noted for males. Specifically, older adult males in the lowest-income group were *less* likely than older adult males in the higher-income group to be overweight (37% vs. 46%) and *more* likely to be underweight (4% vs. 1%).

Nutritional Biochemistries

- **Low Serum Albumin.** A low level of serum albumin in older adults is suggestive of sustained undernutrition. However, serum albumin levels can also be affected by other factors, including inflammation, cirrhosis, and kidney disease. Using a conservative measure of low serum albumin (<

⁷BMI is equal to [weight in kilograms] ÷ [height in meters]².

3.5 g/dL), 5 percent of all older adults had low levels of serum albumin.⁸ Older adults in the lowest-income group were more likely than those in either of the other income groups to have this condition (6% vs. 3% and 4%). These differences were concentrated among males.

- **Iron Deficiency.** The overall prevalence of iron deficiency among older adults was 6 percent. There were no statistically significant differences between income groups in the prevalence of iron deficiency.
- **Iron-deficiency Anemia.** Iron-deficiency anemia was observed in 3 percent of all older adults. Overall, there were no statistically significant differences between income groups on this measure.
- **Anemia.** The prevalence of anemia, defined on the basis of low hemoglobin, was 14 percent overall. Prevalence was greater in the lowest-income group than in either of the other income groups (18% vs. 12-13%). The primary causes of anemia in older adults are iron deficiency, chronic disease, deficiencies of folate and/or vitamin B₁₂, gastrointestinal bleeding, and cancer (Smith, 2000). The relatively low prevalence of iron deficiency and iron-deficiency anemia observed in this population suggests that much of the anemia observed in older adults is due to causes other than iron deficiency.⁹
- **Low Red Blood Cell (RBC) Folate.** Overall, 5 percent of older adults had low RBC folate. Low levels of RBC folate were significantly more common in the lowest-income group than the higher-income group (9% vs. 3%).
- **Low Serum Vitamin B₁₂.** Five percent of all older adults had low serum vitamin B₁₂. Overall, there were no significant differences between income groups in the prevalence of this condition. However, among the two oldest cohorts (80-84-year-olds and 85 years and above), the problem of low serum vitamin B₁₂ was less common in the lowest-income group than in the higher-income group. These differences were concentrated among females.
- **High and Borderline-high Total Cholesterol.** One in three older adults had a high cholesterol level, and a slightly higher percentage (36%) had cholesterol levels that were borderline-high. There were no significant differences between income groups in the prevalence of high serum cholesterol, overall or by gender. Nor were there any significant between-income-group differences in the prevalence of borderline-high cholesterol for the older adult population as a whole.

Among 65-69-year-old males, however, the lowest-income group was *more* likely than the higher-income group to have high serum cholesterol (41% vs. 20%) and was *less* likely to have borderline-high serum cholesterol (23% vs. 45%). The lowest-income males were also less likely than their low-income counterparts to have borderline-high serum cholesterol levels (23% vs. 41%).

⁸A more liberal measure of low serum albumin (< 3.8 g/dL) was also used. With this measure, prevalence increased dramatically—to 18 percent overall—and there were no statistically significant differences between income groups in the prevalence of low serum albumin.

⁹Anemia is a good predictor of iron deficiency when the prevalence of iron deficiency is high. However, when the prevalence of iron deficiency is low, the majority of anemia is due to other causes (U.S. DHHS, 2000a).

- **High and Borderline-high Low-Density Lipoprotein (LDL) Cholesterol.** Older adults in the lowest-income group were significantly *more* likely than those in the higher-income group to have high levels of LDL cholesterol (34% vs. 26%)¹⁰ and *less* likely to have borderline-high levels of LDL cholesterol (27% vs. 36%). These differences were concentrated among females.

Bone Density

- Overall, 50 percent of adults 60 years of age and older had reduced or severely reduced bone density. Older adults in the lowest-income group were more likely than those in either of the other income groups to have reduced or severely reduced bone density (58% vs. 50% and 48%).
- Older adults in the lowest-income group were also more likely than older adults in the other two income groups to have severely reduced bone density, or osteoporosis (21% vs. 14% for each of the other groups).

Health-related Behaviors

Physical Activity

- Older adults in the lowest-income group were significantly less active than older adults in either of the other income groups. They were *more* likely to report engaging in *no* physical activity during the preceding month (40% vs. 32% and 20%) and *less* likely to report engaging in some type of physical activity three or more times per week (37% vs. 44% and 59%). In addition, older adults in the lowest-income group were less likely than older adults in the higher-income group to report engaging in physical activity five or more times per week (32% vs. 48%).

Alcohol Consumption

- Older adults in the lowest-income group were significantly less likely than older adults in either of the other income groups to have consumed 12 or more alcoholic beverages during their lifetime (67% vs. 74% and 85%). Older adults in the lowest-income group were also significantly less likely than older adults in the higher-income group to report this level of alcohol consumption in the past year (18% vs. 42%).
- When consuming alcohol, females in the lowest-income group consumed more drinks, on average, than females in the higher-income group.

Tobacco Consumption

- Older adults in the lowest-income group were less likely than older adults in the higher-income group to have ever smoked (49% vs. 56%).¹¹ However, older adults in the lowest-income group were more likely to report *current* cigarette use (20% vs. 17% vs. 14%).

¹⁰The cutoff used to define high levels of LDL cholesterol (= 160 mg./dL) includes both high and very high LDL cholesterol levels as defined by the National Cholesterol Education Program (NIH, 2001).

¹¹People who had “ever” smoked were defined as those who had consumed at least 100 cigarettes in their lifetime.

- Among current smokers, those in the lowest-income group smoked significantly fewer cigarettes than those in the higher-income group (66.6 cigarettes during the preceding 5-day period vs. 77.3 cigarettes).
- Nonsmoking older adults in the lowest-income group were significantly more likely to be exposed to second-hand smoke than nonsmoking older adults in the higher-income group (14% vs. 7%).
- The percentage of nonsmoking older adults with high serum cotinine levels was significantly greater for the lowest-income group than for either of the other income groups (60% vs. 52% and 50%). Cotinine is a breakdown product of nicotine, and is used as a biological marker for tobacco use and exposure to environmental tobacco smoke.

Social Interaction

- In comparison with older adults in the higher-income group, older adults in the lowest-income group were less likely to visit friends or relatives at least weekly (69% vs. 76%), to attend church at least weekly (42% vs. 49%), to belong to a club or organization (25% vs. 50%) and to attend meetings of a club or organization at least monthly (18% vs. 35%).
- For one type of interaction the trend was reversed: Older adults in the lowest-income group were *more* likely than older adults in the higher-income group to visit neighbors at least weekly (46% vs. 40%).
- Older adults in the lowest-income group had less stable housing over the past two decades than older adults in the other two income groups. They were less likely than the other groups of older adults to have lived at their current address for 10 or more years (56% vs. 71% and 70%) or for 20 or more years (37% vs. 50% for each of the other groups).

Health Status

General Health Status

- Older adults in the lowest-income group had a more negative perception of their health status than older adults in the other two income groups. The lowest-income older adults were *more* likely to rate their health status as fair or poor (48% vs. 37% and 23%) and *less* likely to rate their health status as very good or excellent (21% vs. 28% and 43%).
- Physician assessments of general health status were consistently more positive than individuals' self-assessments. However, general trends in the data were largely consistent with those observed in the self-reported data. Older adults in the lowest-income group were *more* likely than those in the other two income groups to be assessed as having fair or poor health (38% vs. 28% and 17%). They were also *less* likely than older adults in the higher-income group to be rated as having very good or excellent health (27% vs. 48%).

Chronic Health Conditions

- The leading chronic health problem reported by older adults in all three income groups was high blood pressure. Older adults in the lowest-income group were more likely than those in the higher-income group to report this condition (46% vs. 37%).
- The actual prevalence of high blood pressure, as measured in physician exams, was greater than the self-reported prevalence. Based on physician-assessed blood pressures, older adults in the lowest-income group were still more likely than those in the higher-income group to have high blood pressure (52% vs. 48%).
- Older adults in the lowest-income group were more likely than their counterparts in the higher-income group to have diabetes (18% vs. 11%), to have had a heart attack (15% vs. 11%) or stroke (11% vs. 6%), and to have emphysema or congestive heart failure (16% vs. 11%).

Dental Health

- Older adults in the lowest-income group had more missing, decayed, and filled teeth than their counterparts in the higher-income group (22.8 vs. 21.2). This difference was largely attributable to a difference among females.
- Overall, 97 percent of older adults reported visiting a dental health professional at least once in their lifetime. Nonetheless, older adults in the lowest-income group were less likely than those in the other two income groups to have ever visited a dental health professional (93% vs. 96% and 98%). The lowest-income older adults were also significantly less likely to have visited a dental health professional *within the past year* (35% vs. 42% and 65%).

Physical Limitations

- Based on physician assessments of functional limitations, older adults in the lowest-income group were more likely than older adults in the higher-income group to be able to perform a range of tasks with difficulty, including walking a quarter mile, running 100 yards, stooping, crouching or kneeling, making small motor movements with the hands, and engaging in physically active tasks such as heavy housework, gardening, and exercise. For two of the five tasks (walking a quarter mile and engaging in physically active tasks such as heavy housework, gardening, and exercise), the difference between the lowest-income group and the low-income group was also statistically significant, with the lowest-income group having greater difficulty.
- Respondents were also asked to rate how much difficulty they experienced (or would experience) performing a variety of tasks, including walking a quarter mile, walking up 10 steps without resting, lifting or carrying 10 pounds, doing chores around the house, preparing meals, managing money, stooping, crouching, or kneeling, walking from one room to another, standing up straight from an armless chair, getting in and out of bed, eating or drinking from a glass, and dressing oneself. For most of these tasks, the percentage of older adults who reported that they could only do a task with difficulty or could not do it at all was greater for the lowest-income group than for one or both of the other income groups.

- Oldest adults in the lowest-income group were more likely than older adults in the two other income groups to require assistance with personal-care needs (11% vs. 8% and 6%) and to need assistance with routine chores (17% vs. 10% and 8%).
- Older adults in the lowest-income group were more likely than those in the higher-income group to use mobility aids (canes, wheelchairs, crutches, and walkers) (20% vs. 11%).

Access to Health Care Services

Health Insurance Coverage

- Overall, 98 percent of all older adults had some form of health insurance, although the prevalence of health insurance was lowest for the lowest income group (94% vs. 97% and 99%). Older adults who lacked health insurance were significantly more likely to be in the lowest-income group than in either of the other income groups.
- Rates of Medicare coverage were comparable for the three income groups, but the difference between the lowest-income group and the low-income group was statistically significant (77% vs. 80%). This was due primarily to differences among individuals between the ages of 65 (the age at which seniors become eligible for Medicare) and 79. In the low-income group, virtually all individuals in this age range reported Medicare coverage. In the lowest-income group, however, reported Medicare coverage for these older adults ranged from a low of 89 percent (65-69 years) to a high of 96 percent (75-79 years).
- Older adults in the lowest-income group were more likely than those in the two other income groups to report enrollment in Medicaid (30% vs. 9% and 4%).
- The lowest-income older adults were significantly less likely than those in the other two income groups to be covered by private health insurance (49% vs. 77% and 93%).

Regular Source of Health Care

- More than 9 out of 10 older adults reported having 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. Older adults in the lowest-income group, however, were significantly less likely than those in the other two income groups to have a regular source of care (88% vs. 92% and 93%). This difference was entirely attributable to a difference among males (83% vs. 92% for each of the other groups).
- Older adult males in the lowest-income group were also less likely than their counterparts in the other two income groups to have a regular health care provider (72% vs. 81% and 86%).