VITAL & HEALTH STATISTICS

Dietary Intake and Cardiovascular Risk Factors, Part I. Blood Pressure Correlates: United States, 1971-75

This report presents analyses of relationships between blood pressure and nutritional variables including dietary intake and selected biochemistries among U.S. adults ages 18-74 and 25-74 years by age, sex, race, body mass, skinfold thickness, and selected behavioral patterns. These estimates are based on standardized examination findings from national probability samples of the civilian noninstitutionalized population examined in the first National Health and Nutrition Examination Survey of 1971-75.

Data From the National Health Survey
Series 11, No. 226

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Cooperation of the U.S. Bureau of the Census and Centers for Disease Control

Under the legislation establishing the National Health Survey, the Public Health Service is authorized to use, insofar as possible, the services or facilities of other Federal, State, or private agencies. In accordance with specifications established by the National Center for Health Statistics, the U.S. Bureau of the Census participated in the design and selection of the sample and carried out the household interview stage of the data collection and certain parts of the statistical processing.

The Centers for Disease Control acted as laboratory consultants and performed a series of biochemical, hematological, and serological assessments on blood specimens of persons participating in the survey.

Foreword and acknowledgments

The National Health and Nutrition Examination Survey (NHANES) is the only source of general U.S. population data that provides a direct link between indicators of health and nutritional status and reported dietary intake information. The Congress provided resources in the Departments of Labor and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1980, to the National Center for Health Statistics (NCHS) to fund an initiative to undertake more detailed analyses of nutrition-related health problems as measured in the first NHANES. As part of this initiative, the Division of Health Examination Statistics funded a contract (no. 223–79–2090) with the School of Public Health at the University of Michigan to examine relationships among dietary intake and cardiovascular risk factors.

The approach and depth of analysis presented in this report differ from most reports from the Division of Health Examination Statistics. This report is based on a statistical rather than a descriptive presentation of the data. The tables and text present the results of univariate and multivariate analyses that incorporate the full design effect of the complex survey.

Cognizant that the underlying assumptions of traditional statistical analyses are violated to some extent, the degree of which is unknown, the authors and NCHS staff jointly determined that the assumptions made in the analyses presented in this report are reasonable in light of present knowledge. In addition, the authors have presented throughout the text and technical appendix material concerning appropriate qualifications that the reader should consider in interpreting the results and conclusions presented.

Jean Roberts, the NCHS Project Officer, was instrumental in bringing the project to a successful completion. Her continuing interaction with the authors and their cooperation throughout the project aided the Center in dealing with difficult and highly technical analytic issues not faced previously by NCHS.

Robert S. Murphy
Director
Division of Health
Examination Statistics

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Symbols

---	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standards of reliability or precision (more than 30 percent relative standard error)
#	Figure suppressed to comply with confidentiality requirements

Dietary Intake and Cardiovascular Risk Factors, Part I. Blood Pressure Correlates

by William R. Harlan, M.D.; Alan L. Hull, Ph.D.; Robert P. Schmouder, M.P.H.; Frances E. Thompson, M.P.H.; Frances A. Larkin, Ph.D.; and J. Richard Landis, Ph.D., University of Michigan

Introduction

Relationships between nutrition and blood pressure generate considerable public health and medical interest because of the potential that nutritional intervention has for prevention and nonpharmacologic treatment of high blood pressure. Studies of specific groups and populations have suggested that adiposity, specific dietary constituents (particularly salt), and alcohol may influence levels of systolic and diastolic blood pressure and may be implicated in the pathogenesis of hypertension.[1–4]

The majority of studies have focused on special groups or populations, many of whom experienced extremes or changes in nutritional intake. The applicability of findings from special groups to the general population of the United States has been questioned. However, with completion of the first National Health and Nutrition Examination Survey in 1974, an extensive set of nutritional and physiologic data became available for a representative sample of the U.S. population.

The first National Health and Nutrition Examination Survey was the first program in which measures were collected of nutritional and health status for a scientifically designed sample representative of the U.S. civilian noninstitutionalized population over a broad age range, 1–74 years. The probability sample design permits estimates to be made for the total population and at the same time allows for more detailed analyses of data for certain groups at high risk of malnutrition: the poor, preschool children, women of childbearing age, and the elderly.[5–7] This latter analysis can be realized because of the oversampling of these high-risk groups. Yet the findings can be applied to the general population if the design and sample biases are handled appropriately.

Data from the first National Health and Nutrition Examination Survey were used to test several *a priori* hypotheses regarding nutritional relationships to blood pressure. For example, previously described relationships between blood pressure and obesity, dietary salt intake, and alcohol were examined. Aspects of personal environment, such as cigarette smoking, oral contraceptive use, and psychological status were analyzed to verify other reports suggesting an influence on blood pressure. In addition, numerous variables were screened for unsuspected associations that might generate new hypotheses about nutritional or biochemical relationships. To provide a more sensitive search for associations, both food frequency history and 24-hour dietary recall were used in analysis, and the extreme percentiles of dietary intake (0–14 and 85–100) were compared. Several unanticipated and potentially important relationships were found in this exploration, and these merit further investigation and potential confirmation.

Despite the extensive nature of this survey and the broad range of measurements, some limitations of the resulting data should be noted initially as they relate to the analytical approach, results, and interpretation. First, one of the major goals of the survey was to determine nutritional and health status in the United States; the survey was not designed to examine specific hypotheses regarding nutrition and blood pressure. Therefore, some nutritional and medical measurements represent compromises in methodology necessitated by a large field survey with more general goals. A second caveat relates to the cross-sectional nature of the survey. Only current nutritional patterns and medical conditions are reliably obtained in a cross-sectional survey. These patterns may not be representative of those prior to the survey. Moreover, many of those surveyed had been informed of a current medical condition, and the therapy advised may potentially alter eating behavior, nutritional status, or levels of serum biochemistries. Therefore, it was often necessary to exclude these examinees from analysis when current therapy could bias the relationship.

Highlights

The National Health and Nutrition Examination Survey of 1971–74 provides the first measures of nutritional status and blood pressure levels ever obtained on the same representative sample of the U.S. population.

Significant findings from the analysis of these data are as follows:

- Of all the nutritional variables in the survey, body mass index (weight/height^2) and adiposity (sum of subscapular and triceps skinfold thickness) had the most consistent and important relationships to systolic and diastolic pressure levels. This association was found in every race, sex, and age group examined.
- Measurements of dietary sodium did not have consistent or significant associations with blood pressure. The ratio of sodium to potassium in the 24-hour dietary intake data was found to be directly related to blood pressure levels among black but not among white adults. However, when the ratio of sodium to potassium intake was held constant, the black-white differences in mean blood pressure levels of adults were minimized or eliminated.
- Reported alcohol consumption was related to systolic and diastolic blood pressure levels. Abstainers and heavy drinkers had higher blood pressure levels, on the average, than light or moderate drinkers.
- The use of oral contraceptive agents was associated with higher systolic and diastolic blood pressure levels in women. This association was found in every age, race, and body mass index group examined.
- Hemoglobin levels were directly related to diastolic pressures in men and women even after control for body mass differences. Hemoglobin levels were not related to systolic pressures.
- Serum inorganic phosphorus levels were inversely related to systolic and diastolic blood pressure. Serum calcium had a direct relationship to blood pressure in women, but not men. The serum calcium-potassium ratio had an even stronger direct relationship to blood pressure that was independent of age, sex, race, and body mass.
- Serum urate level was directly related to systolic and diastolic blood pressure levels of adults irrespective of age, sex, race, and body mass index.

Methods

Data collection for the first National Health and Nutrition Examination Survey (NHANES I) was begun in April 1971, and the initial survey was completed in June 1974. A detailed description of the specific content and plan of operation, including the sample design, has been published,[6] and only general characteristics are described here. Field teams of the National Center for Health Statistics traveled to 65 primary sampling units or areas. They included professional and paraprofessional medical and dental examiners, along with technicians, interviewers, and other staff. The selected sample persons for whom appointments could be made were brought into specially constructed mobile examination centers that were moved into a central location in each primary sampling unit area.

Of the 28,043 sample persons selected to represent the 194 million civilian noninstitutionalized persons ages 1–74 years in the U.S. population at that time, the program examined 20,749, or 74 percent of the sample. This is an effective response rate of 75 percent when adjustment is made for the effect of oversampling among preschool children, women of childbearing age, the poor, and the elderly. Data presenting breakdowns by race are based on findings from NHANES I of a sample of 27,730 white and black persons, of whom 20,514 were examined. Estimates in this report are based on weighted observations; that is, the data obtained for the examined persons are inflated to the level of the total population from which the sample was drawn using the appropriate weights to account for both sampling fractions and response results. (See appendix I.) These analyses are limited to respondents ages 18–74 years, who were given a single-time examination during the period from 1971 through 1974. Those under 18 years were not included in these analyses because growth has an important confounding effect on blood pressure.

A subsample of approximately 20 percent (3,854) of those ages 25–74 years in the initial sample received a more detailed examination. An additional sample of 3,059 persons ages 25–74 years was identified to augment the sample that received the detailed examination in April 1971–June 1974. This "augmentation survey" (NHANES IA) was conducted in 35 additional sites between July 1974 and September 1975. These samples are referred to as the "detailed" and "augmentation" components, respectively. Additional measures (primarily biochemical measurements) were obtained on persons included in the augmentation survey.[7] For this report, analyses utilized the largest number of persons for whom data were available for specific independent variables. The text and tables (limited to data available for those ages 18–74 from the 1971–74 period or 25–74 years from the 1971–75 period) indicate the data sources used for each analysis. Appropriate sample weights were used for each subgroup or combination of groups in the analyses.

Nutritional data

Nutritional status was determined using four different sources: (1) information on the person's dietary intake (kind and quantity of food consumed and its nutritional value), (2) results of various biochemical tests made on blood and urine samples to determine levels of various nutrients, (3) findings of clinical examinations by physicians and dentists alerted to detect stigmata of malnutrition including deformities, infections, and other signs indicative of nutritional problems, and (4) various body measurements that would permit detection of abnormal growth patterns, including obesity.

A dietary interview was conducted with sample persons to obtain information about their total food and drink consumption during the 24 hours—midnight to midnight—preceding the interview. Food recall included foods usually eaten on Monday through Friday. This was followed by recall questions about the frequency of food intake for the preceding 3 months.[8-10] The dietary interview lasted approximately 20 minutes (maximum allowance, 30 minutes) and usually was administered in the mobile examination center. A small percent of the interviews took place in subjects' homes.

Food portion models were used to assist the respondent in estimating amounts of foods consumed for the 24-hour recall. Models developed for another survey were used with slight modifications.[10] A computer program used to determine nutrient values of foods consumed was adapted from one developed and used in the Ten-State Nutrition Survey and was based on a program developed originally at Tulane University.[11] The original nutrient data base used in NHANES I was derived from the U.S. Department of Agriculture Handbook No. 8 (1963), table 1,[12] as well as information from other sources. Because of the constantly changing food supply, nutrient composition values for new food products were added or updated continually according to information provided by the U.S. Department of Agriculture, food processors, and manufacturers.

Dietary intake measurements considered in this report include the following:

- Frequency of consumption of specific food groups: butter and margarine, dried beans and peas, breads and cereals, dairy foods (whole milk, eggs, and cheese and cheese dishes), meat and poultry, total fruits and vegetables, desserts and sweets, candy, sweetened beverages, coffee and tea, and snack foods.
- Frequency of consumption of special food groups: complex carbohydrate and fiber-containing foods, high fat foods, sweets, snacks, coffee and tea, and alcohol.
- Table salt use, dietary sodium, dietary sodium-potassium ratio, dietary sodium per 1,000 calories of caloric intake, and combined dietary sodium intake-table salt use.

Medical and laboratory examination

Complete descriptions of the clinical examination, body measurements, and laboratory assessments are available,[6,7,13,14] and only aspects pertinent to the present analysis are described. A medical history questionnaire was completed by participants ages 12–74 years and by a parent for those under age 12 years. This instrument requested information on health habits and general medical status, as well as specific answers regarding known disease conditions and medical treatments. The medical history questionnaire was reviewed by the examining physician the day before the scheduled examination. In addition, a supplemental medical history (including smoking habits) and the general well-being questionnaire were completed by the detailed sample persons, usually while in the mobile examination centers.

All examinees received a physical examination with emphasis on nutritional aspects. Blood pressure was recorded in the sitting position near the beginning of the examination for persons ages 6–74 years. The recommendations of the American Heart Association were followed. A cuff was selected that was at least 20 percent wider than the diameter of the arm. Both adult (13-centimeter) and pediatric (9.5-centimeter) cuffs were available to examiners. The cuff was deflated at a rate of 2–3 millimeters of mercury (mm Hg) per heartbeat, and readings were made to the nearest 2-millimeter interval on the scale. Diastolic pressure was taken as cessation of Korotkoff's sound (fifth phase) unless there was no loss of sounds, in which case the point of muffling (fourth phase) was used as diastolic pressure.[13,15] If the latter situation was obtained, this was recorded on the form. Some of the examinees (those in the detailed and augmentation surveys) had three blood pressure measurements: the first at the beginning of the physician's examination with the examinee sitting, the second at the end of the physician's examination with the examinee supine, and the third immediately after the second with the examinee sitting on the edge of the examination table. Systolic and diastolic blood pressures were used as continuous variables in analysis, and the following categories (defined in appendix II) were also used for analysis: normotensive, borderline hypertensive, hypertensive (definite), and systolic hypertensive.

Systolic and diastolic blood pressure readings were the dependent variables in these analyses, and their reliability and validity are important issues. This is particularly a concern in the general nutritional survey in which only one pressure was recorded. However, three pressure readings were obtained from the detailed sample examinees, making it possible to assess the variability of blood pressure during the examination and determine misclassifications of blood pressure that might result when only a single reading was used. On categorization of individuals into blood pressure categories by first pressure, one might expect substantial casewise movement between categories with second pressure readings. This problem and the determination of reliability of a single pressure reading are analyzed in detail in appendix II.

This analysis utilized the two pressure readings recorded in the sitting position, one early in the examination sequence and a second near the end of the examination. The analysis revealed that there was a tendency for the second reading to be higher than the first, although the difference was not statistically significant. When examinees were classified into blood pressure categories by first and second readings, approximately 20 percent moved to an adjacent category on the second pressure reading. Therefore, in this survey, utilization of initial blood pressures as continuous variables in the entire population probably affords a relatively reliable dependent variable. Another approach to this question using all three pressure readings also indicates that the variability is minimal.[16]

Standard diagnostic codes[17] were used to classify the examining physicians' diagnostic impressions. In the general survey, body measurements including height, weight, and skinfold thickness were made by specially trained examiners using equipment designed for the study, which were checked weekly during the examination periods and before each examination stand commenced. These procedures are described in detail elsewhere.[13,18,19]

Laboratory assessments on the general nutrition examination included hematologic examinations and nutritional biochemistries on serum and urine specimens. The following additional clinical biochemistries were performed for the detailed sample: serum glutamic oxalacetic transaminase (SGOT), calcium, inorganic phosphorus, and uric acid. Details regarding examinee preparation, sample collection and standardization, and laboratory analytical procedures are described in detail in other reports.[13,14]

Statistical analysis

Procedures for statistical analysis and theoretical considerations are decribed in detail in appendix I. Definitions of selected terms, including those related to the statistical methods, are given in appendix III. The weighted sample and design effect were considered in all statistical analyses presented in this report. The general analytical approach was to examine univariate relationships between blood pressure and nutritional and nonnutritional variables. Following this, potential confounding influences were controlled and, finally, multivariate analyses were undertaken.

The population was divided into age, race, and sex groups. Because of the small numbers and the heterogeneity of the group, races other than white and black were not considered in the analysis. The following age ranges were used: 18–24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years, and 65–74 years. Age, sex, and race categorizations were made for each univariate model. When significant and apparently important relationships were found, potential confounding variables (e.g., body mass index or combinations of age, race, or sex) were controlled. In many instances, the knowledge of elevated blood pressure or prescribed diets or use of medications resulted in changes in blood pressure or diets that might obscure or bias the relationships sought, and individuals reporting therapy were excluded in the analysis. These exclusions are noted in each section.

Independent variables having significant relationships with systolic and diastolic blood pressures in univariate analysis were entered into a multivariate regression model to predict the dependent variables: systolic and diastolic pressures. Appropriate sample weights to avoid distortions of relationships, along with the measures of sample design effect, were used (appendix I). For comparisons, a probability of 5 percent or less that the finding was the result of chance was taken as statistically significant. Because large sample sizes often render even small differences significant, the results were subjected to the additional criteria of consistency and of sufficient magnitude to have biologic importance before they were accepted as potentially important findings.

The findings and detailed tables shown are national estimates based on weighted data with the survey sample design taken into account in the estimation of sampling variability. Statistically significant differences in these national estimates as well as observed differences (which may be of interest even though they are not statistically significant) are discussed. Statistically significant differences are pointed out.

Findings related to blood pressure

Body mass index

Relationships of blood pressure to body mass and relative adiposity were assessed using two measurements—body mass index (Quetelet's Index or weight/height^2) and skinfold thickness. Weight/height^2 (kilograms/meters^2) is a measure of body mass that is commonly accepted as the best measure of body mass and one having defined relationships to morbidity and mortality.[20,21] This index standardizes weight for height and permits indirect prediction of adiposity.[20–25]

Mean values and the distribution of the body mass index (BMI) for males and females differed. Proportionately more females than males were obese on the basis of this adiposity measure (table 1, figure 1). In females, the BMI values were notably higher than those for males from the 75th through the 95th percentiles. This pattern was present in both race groups, although it was more pronounced in the black population. Within race categories, indexes for white females were higher than those for white males at the 90th and 95th percentiles, and black females had higher BMI values from the 50th percentile upward than black males. White males had consistently higher BMI values than black males, except at the 90th and 95th percentiles, where the pattern reversed but the differences were slight. Black females had consistently higher values than white females from the 10th through the 95th percentiles. The more erratic curves for black persons reflects the smaller sample sizes available for them. There were no significant trends with age in males, but for females, BMI values were progressively greater in older groups except at ages 65–74 years for black females.

Body mass index (weight/height^2) was strongly related to systolic and diastolic blood pressure levels of adults. Mean systolic and diastolic blood pressure levels determined for sex, race, and age groups within quintile strata of BMI (cutoff points at the 20th, 40th, 60th, and 80th percentiles) are shown in tables 2 and 3. Examinees who reported taking antihypertensive medication were excluded. Mean systolic blood pressure was higher in progressively higher strata of BMI for all males and white and black persons (figure 2). In each quintile stratum of BMI, mean systolic pressure levels of black males (130.5-mm Hg–143.3-mm Hg) were consistently higher than those of white males (124.9-mm Hg–140.1-mm Hg) in comparable quintile strata. For each age range except 35–44 years, mean systolic pressure tended to be greater in successively higher BMI strata. Although the increase was not progressive across the BMI strata, the mean differences between the highest and lowest quintile strata were large enough to be statistically significant.

Diastolic pressure in males had a similar relationship to BMI. In progressively higher quintile strata of BMI, the mean diastolic pressure tended to be greater for all males and white and black subgroups. Although the differences in pressure were not successive, particularly in the third BMI quintile stratum (40th–59th percentiles), the mean diastolic pressures at the two extremes of BMI differed significantly and to an important degree. For each age group except 55–64 years, progressively higher BMI quintile strata were associated with higher mean diastolic pressure. At ages 25–34 years the trend, though noted, was less consistent. In general, body mass index was related to systolic and diastolic blood pressures in males, and this relationship was independent of race and age.

The relationships between BMI and blood pressure in females were similar to those in males. Successive quintile strata of BMI were associated with higher systolic and diastolic pressures and this relationship persisted when race and age (except 55–64 years) were controlled (table 3).

Skinfold thickness

To assess relationships to skinfold (fatfold) thickness, an estimate of subcutaneous adipose tissue, measurements at the triceps and subscapular sites were

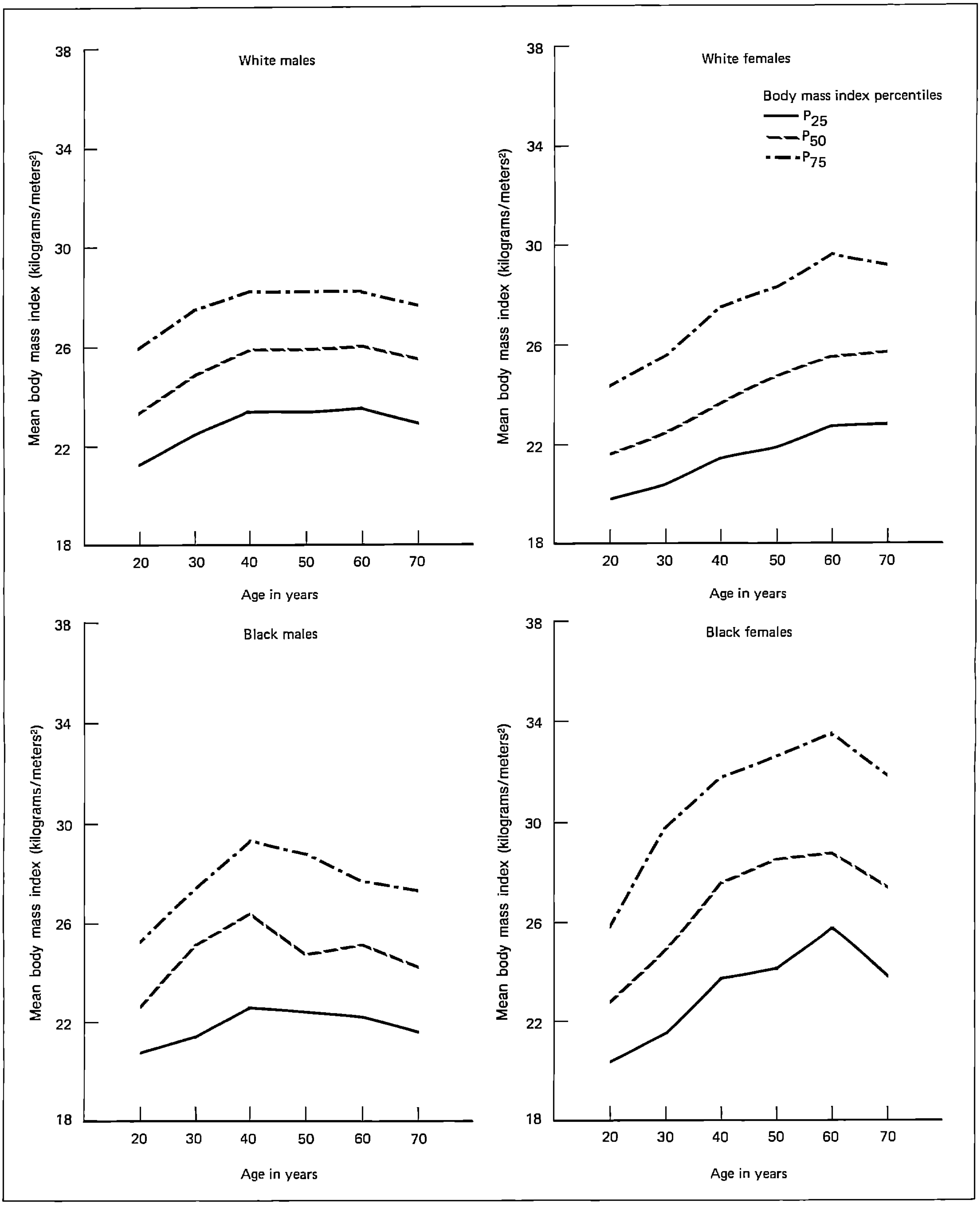

Figure 1. Quartiles in the distribution of body mass index of white and black males and females 18–74 years, by age: United States, 1971–74

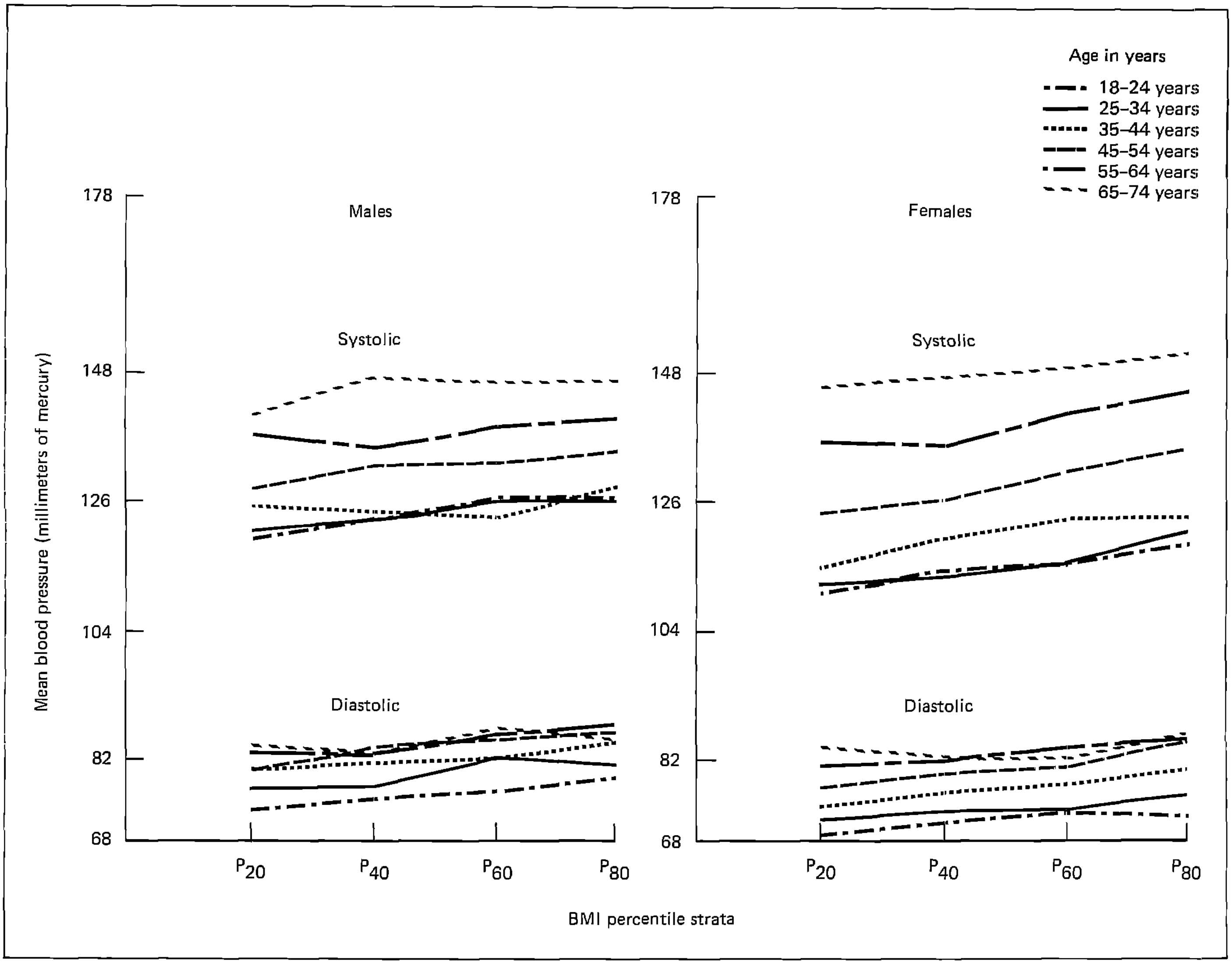

Figure 2. Mean systolic and diastolic blood pressure levels in quintile strata of body mass index (BMI) for males and females 18–74 years, by age: United States, 1971–74

summed for each person. This provided an assessment of both limb (triceps) and truncal (subscapular) adiposity and obviated the concern that individuals may have regional obesity in either the extremities or the trunk. The distribution of total skinfold thickness (triceps plus subscapular) for respondents not reporting antihypertensive medications was divided into quintiles, and mean systolic and diastolic blood pressures were determined for each quintile stratum (tables 4–7, figure 3).

A direct relationship between skinfold thickness and blood pressure was found. The difference in mean blood pressure values for males from the lowest to the highest skinfold categories was 12.0/9.4 mm Hg (systolic/diastolic) and for females, 22.1/13.9 mm Hg. The relationship was consistent in both racial groups, for both sexes, and across the adult age range of 18–74 years. The influence of skinfold thickness on systolic pressure was somewhat greater in females than in males and tended to be somewhat less in the middle adult years (ages 25–44 years). However, the independent influence of this measure of adiposity on blood pressure was significant in each age, race, and sex group.

The pervasive and considerable influence of body mass on systolic and diastolic blood pressures indicated that it must be considered in further analyses of nutritional variables. For this reason, subsequent analyses in this report were controlled for the influence of body mass index by using BMI quartile strata to provide categorizations similar to those developed for sex, race, and age ranges. Body mass index was selected because of its marked and consistent association with blood pressure and the ready availability of the index components (weight and height) to investigators and clinicians. Quartile strata were chosen for

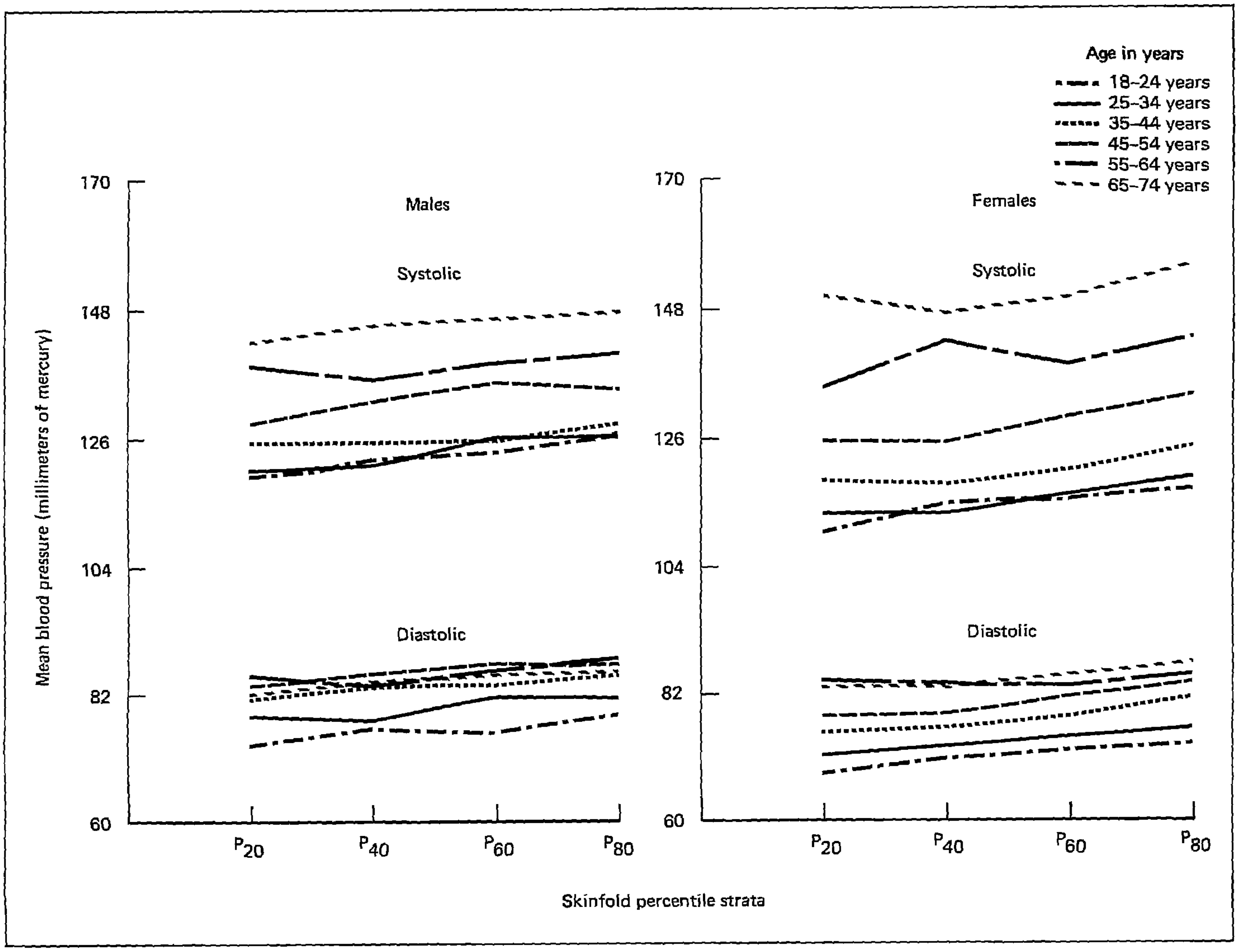

Figure 3. Mean systolic and diastolic blood pressure levels in quintile strata of total skinfold thickness for males and females 18–74 years, by age: United States, 1971–74

categorization to retain sufficient numbers within the analytical cells for reliable national estimates for the various measurements.

Total calories

The relation of blood pressure to the examinees' total energy intake was assessed using the 24-hour dietary recall data. For this, the population was divided into caloric intake strata using cutoff points at the 15th, 50th, and 85th percentiles (tables 8–11). Excluded from the analyses were examinees who reported they were following special or extraordinary diets and also those who reported they were taking antihypertensive medications and who had been told they were hypertensive.

Males had significantly lower mean systolic blood pressure with higher caloric intake ($p < 0.001$). This was found for both races (table 8). However, the relationship was weaker and not significant for black persons ($p < 0.08$). This trend was significant in those ages 18–24 years only ($p < 0.05$) and was found to be significant ($p < 0.05$ to < 0.001) for those in all quartile strata of BMI except the third quartile. A similar pattern of association was found for diastolic blood pressure in males (table 9).

For females and the groups subclassified by race but without controlling for age, the pattern of association was significant ($p < 0.001$). Lower mean systolic values were associated with higher caloric intake (table 10). This trend was significant for those in the highest and lowest quartile of the body mass index ($p < 0.01$). Mean diastolic values for females followed the same general pattern with an inverse relationship between reported caloric intake and blood pressure (table 11).

The inverse relationship between total caloric intake and blood pressure would be expected if age were not controlled since reported caloric intake was lower in successively older age groups while blood pressure was higher.[8,9,15,16] This was found for the total groups. When age was controlled, inverse trends were still found for females, though few were statistically significant. In general, when age was accounted for, there was no consistent or significant relationship between caloric intake and blood pressure. Another important controlling variable was the size of the individual; larger persons require more calories to remain isocaloric. When body mass index was controlled the trend persisted for systolic pressure, but it was neither consistent nor always statistically significant for systolic or diastolic pressure.

Alcohol intake

The relationship between alcohol intake and blood pressure was examined using data from two sources—the medical history on usual weekly alcohol consumption and the 24-hour dietary recall. Because the use of high-blood-pressure medication could bias relationships, respondents reporting use of antihypertensive drugs were not included in these analyses. The methods used for estimating the amount of ethanol consumed per week and caloric intake of ethanol from the 24-hour recall are described in appendix III.

For weekly alcohol consumption, a U-shaped trend was noted between alcohol consumption and blood pressure. In the total group (table 12), abstainers and heavy consumers had significantly higher systolic pressures than light consumers. The differences were not significant for contrasts between moderate and heavy consumers (males and females) or between moderate consumers and abstainers (males only). For males and females, the trends were similar.

When age groups were examined, there was a tendency for heavy drinkers to have higher pressure levels than those who drank less or abstained except in the oldest age group (ages 65–74 years). There was an inconsistent trend for abstainers to have higher systolic pressures than light or moderate consumers when age was controlled. No consistent relationship of systolic pressure to alcohol intake was found when body mass index was controlled.

For diastolic blood pressure, the most consistent finding was that higher pressure levels were present in the heavy alcohol intake group than in the light or moderate intake groups (table 13). This was present after controlling for race, sex, and age, but when body mass index was controlled, the relationship dissipated. In some of the comparisons, abstainers had higher diastolic pressure levels than light or moderate consumers, but this was not a consistent finding.

Caloric contribution from alcohol consumption as reported on the 24-hour recall showed a relationship to adults' blood pressure levels similar to that for weekly alcohol consumption (tables 14 and 15, figure 4). Persons consuming more than 250 calories from alcohol on the day preceding the examination had higher mean systolic and diastolic blood pressures than those consuming 1–250 calories of alcohol. For some groups, those consuming no calories of alcohol had slightly higher pressures than the 1–250-calorie group. The relationship to high alcohol consumption was statistically significant for systolic and diastolic blood pressures and for males and females ages 18–34 years. Controlling for body mass blurred the relationship of calories of alcohol to blood pressure, except for females in the first two quartile strata of body mass index.

In general, respondents reporting the highest alcohol intake either on a weekly basis or on the 24-hour recall had higher mean systolic and diastolic pressures. Less consistently, abstainers (either as a general pattern or during the day of diet recall) tended to have slightly higher mean pressure levels than light to moderate consumers. These patterns were most apparent in the younger groups. There was considerably less alcohol consumption by older groups, thereby reducing the numbers within "heavy" categories. The association between alcohol intake and blood pressure was confounded by body mass, and controlling for BMI obliterated the relationship, except for the leanest male group.

Salt and salty food intake

The relationship between dietary sodium and blood pressure was assessed using the two direct measures of relative levels of salt intake available. Those were the frequency of use of the table salt shaker (rarely, occasionally, or frequently) from the medical questionnaire and the sodium content of food reported on the 24-hour dietary recall. From these, five indicators of relative sodium intake were used: frequency of use of the table salt shaker, sodium contained in foods reported on the 24-hour dietary recall, combination of these two salt sources, frequency of eating salty snack foods, the sodium-potassium ratio from the 24-hour dietary recall, and sodium content of diet (24-hour recall) per 1,000 calories. These measures will only approximate total dietary salt intake because there was no quantification of salt added during food preparation or at the table. Hence the absolute values from this survey cannot be compared with dietary studies where total sodium intake is measured or urinary sodium output is determined.

Excluded from this analysis were individuals on special diets for hypertension, those taking blood pressure medication, those who knew they had hypertension, and those who reported that they did not consume a normal diet during the 24-hour recall period (for 24-hour dietary data only) because they would be expected to have a lower intake of salt and salty foods.

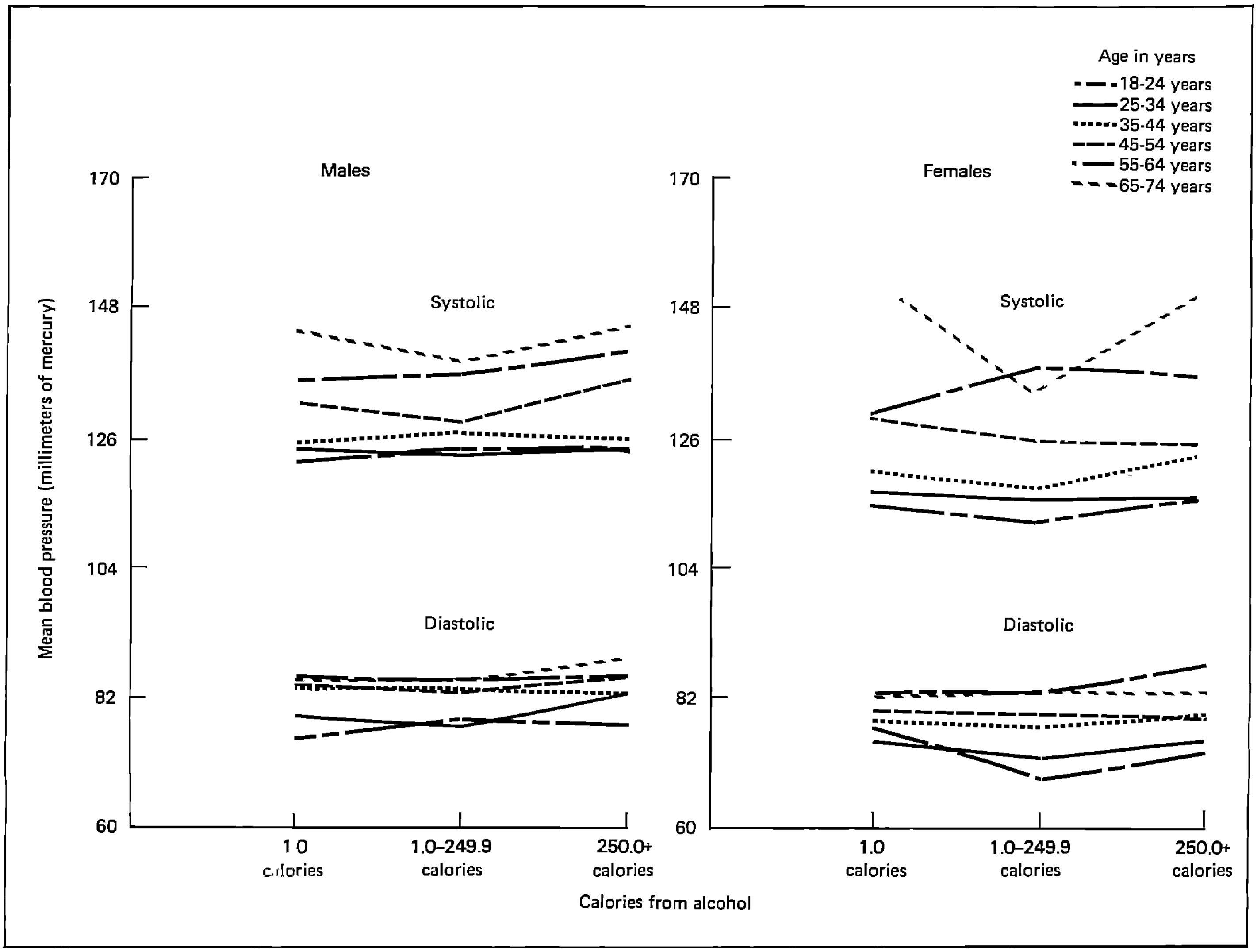

Figure 4. Mean systolic and diastolic blood pressure levels of adults 18–74 years, by 24-hour caloric intake of alcoholic beverages and age: United States, 1971–74

Use of the table salt shaker was inversely related to blood pressure (tables 16 and 17). Mean systolic blood pressure ranged from 127.8-mm Hg to 124.8-mm Hg with reported higher salt shaker use, and these trends were statistically significant ($p < 0.05$). This same relationship existed for males and females, and white but not black persons. However, there was no consistent relationship when age or body mass index was controlled except for males in the highest BMI quartile stratum where a significant inverse relationship was evident. There were no consistent or significant trends for diastolic blood pressure.

Dietary sodium content of foods reported on the 24-hour recall did not have a consistent relationship to blood pressure. There were no consistent or significant trends in mean systolic blood pressure across the sodium intake strata (tables 18–21 showing cutoff points at the 15th, 50th, and 85th percentiles of sodium intake). Mean diastolic blood pressures did not differ significantly across groupings by dietary sodium intake (tables 20 and 21).

Another combined measure of sodium intake was constructed from the frequency of use of the table salt shaker and dietary sodium in the foods reported in the 24-hour recall as described in appendix III. For all males and females, there was no consistent relationship between combined sodium intake and systolic or diastolic pressures. Controlling for race, age, and BMI did not yield consistent relationships with either systolic or diastolic pressure.

Total caloric intake varied widely among the population as estimated from this national survey. Therefore, sodium per 1,000 calories was also determined from the 24-hour recall. This estimate of relative sodium intake will correct somewhat for those with low total caloric intake (tables 22 and 23 showing cutoff points at the 15th, 50th, and 85th percentiles of relative sodium intake). No consistent and significant trends were found for systolic and diastolic blood pressure and dietary sodium per 1,000 calories. For systolic pressure, the stratum having the lowest sodium intake tended to have lower pressure levels, but this finding was inconsistent and not present when age and body mass index were controlled. While some groups had a significant positive relationship (females ages 25–34 years and the second and fourth BMI quartiles for females), the majority of categories did not. For diastolic pressure, no consistent patterns were apparent, and no significant trends were found.

The fifth measure used to study the relationship between salt and blood pressure was the ratio of sodium (Na) to potassium (K) in the diet as reported in the 24-hour recall (tables 24 and 25 and figure 5 using cutoff points for Na/K intake at the 15th, 50th, and 85th percentiles). In the total population, mean systolic blood pressure for those in the lowest Na/K ratio stratum was significantly lower than for those in the highest Na/K ratio stratum (table 24).

For males and females and for white persons, the mean systolic pressures varied relatively little across Na/K strata. However, in black persons, a positive association was observed between systolic blood pressure and Na/K intake ratio.

A positive relationship between Na/K intake ratio and systolic blood pressure was evident for four age groups, excluding the youngest and those ages 55–64 years. This latter group included a small number of persons with a high Na/K ratio and a corresponding large sampling error. When controlled by BMI, mean systolic pressure was observed to be higher for those in the high Na/K stratum for some age, sex, and race groups, but the differences were significant ($p < 0.05$) only for two groups.

Similar trends were found for diastolic blood pressure (table 25), but no significant differences in mean diastolic blood pressure values were found in

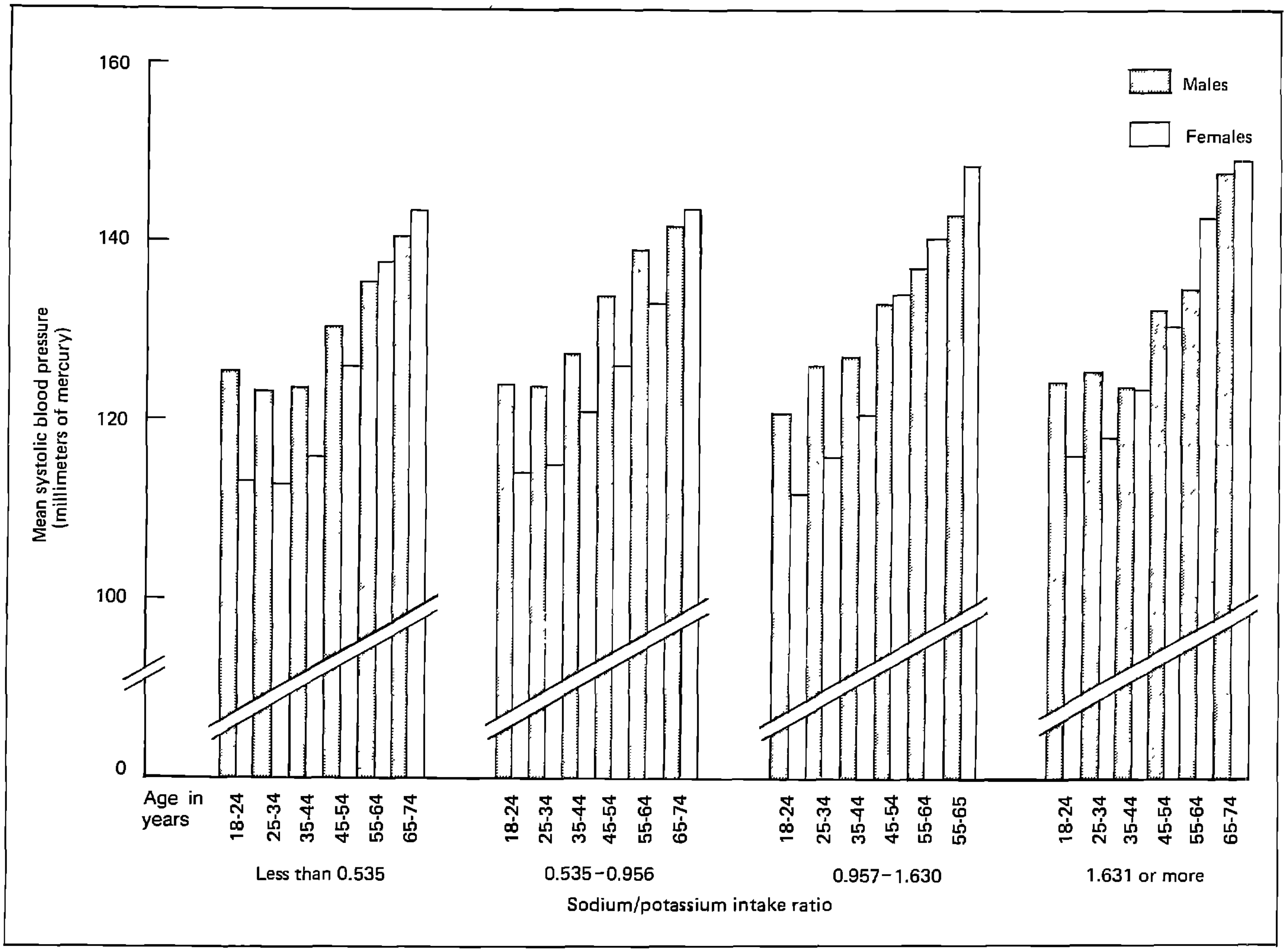

Figure 5. Mean systolic blood pressure in sodium/potassium intake ratio (24-hour recall) quartile strata of adults 18–74 years, by sex and age: United States, 1971–74

comparing the lowest to the highest Na/K intake strata for males or females, or black or white persons. Results of analysis by age and BMI were similar to those for systolic blood pressure. For each age group, mean diastolic blood pressure was greater in the highest percentile stratum of Na/K than in the lowest percentile stratum, except for the 55–64-year age group. Mean diastolic blood pressure by BMI did not show a consistent pattern.

Females, subdivided by age, had a consistent positive association between Na/K intake and blood pressure, although only two age groups had a statistically significant mean difference in diastolic values when comparing respondents with the highest dietary Na/K ratio with those with lowest Na/K ratio. For all but the youngest males, there was a trend toward higher diastolic values with higher Na/K ratios, but there were no significant differences between high and low ratios.

The sixth measure used to study the relationship between blood pressure and salt intake was reported frequency per week of eating salty snack foods. Persons who consumed salty snacks the least frequently had significantly higher ($p < 0.001$) mean systolic blood pressure levels than those who consumed such snacks more frequently. (Table 26 uses cutoff points corresponding to the 15th, 50th, and 85th percentiles of salty snack food intake frequency.) The same inverse trend was evident for each sex and race group. However, mean blood pressure levels tended to increase across salty food intake categories for most age groups except at 65–74 years, where relatively few consumed salty snacks. The mean difference was significant for the two age groups between 18 and 34 years. An inverse relationship was observed between systolic blood pressure and frequency of eating salty snacks among those in the two leanest BMI strata. However, there was no consistent pattern of association between salty snack consumption and systolic blood pressure values when age and sex were controlled.

The pattern for diastolic pressure and salty snack consumption was similar to that for systolic pressure (table 27). When all ages were considered, the relationship tended to be inverse. When age was controlled, only the youngest groups (18–24 years) had significantly higher pressure levels with greatest use of salty foods.

Salt intake, regardless of source, was age-related. Younger persons consumed greater quantities of salty foods and reported more frequent use of the salt shaker. Blood pressure had the opposite relationship to age. Therefore, the inverse relationship between blood pressure and salt intake found when all ages were combined would be anticipated. However, when age was controlled, a direct relationship was observed for some measures of salt intake that was often significant for the younger age groups. The most consistent relationships were observed with the Na/K intake of foods reported on the 24-hour recall.

Other confounding variables included body mass and total food intake. Larger individuals would generally have a greater food intake and hence experience a greater sodium intake. To control for this, dietary sodium was related to total caloric intake and to the body mass index. The latter variable, however, has been shown to be related to a third factor, body adiposity, which is consistently correlated with blood pressure. When these confounding influences (age, total calories, and BMI) were controlled, two measures of relative sodium intake had significant direct relationships to blood pressure but only in the younger groups. These estimates were Na/K content of foods and sodium per 1,000 calories.

Other dietary constituents

Other dietary variables assessed for relationships to blood pressure included total complex carbohydrate, combined fat and complex carbohydrate, frequency of fatty food consumption, proportion of linoleic fatty acid to fat, frequency of consumption of sugar-containing foods, and dietary cholesterol.

The majority of these analyses failed to yield consistent relationships. Excluded from the analysis were examinees who reported that they had altered their diet on advice of a physician or who did not report a customary diet, and those on current antihypertensive medications.

Fat and complex carbohydrate coexist in most diets, and generally the relative proportions vary inversely. The two variables were both investigated separately and combined in a ratio to identify the synergistic or additive effect of the two dietary components on blood pressure.

To explore the role of frequency of intake of foods high in fats, the following food groups were considered: cheese, milk, eggs, butter and margarine, and meat and poultry. No separate effect on blood pressure was apparent for any of these individual food groups. When the five groups of fatty foods were combined, a Gaussian or normal type of distribution was shown between level of intake and blood pressure.

Food groups known to contain a high percentage of complex carbohydrates, (including fiber) were selected from the food frequency data. These included cereals, grains, fruits, vegetables, and beans and peas. Initial analysis of individual groups revealed a high variability similar to the findings for fat groups. Hence the individual complex carbohydrate food items were pooled. The combined complex carbohydrate variable had a symmetrical distribution with a slightly negative skew. Mean systolic blood pressure levels for white persons and females but not males showed a direct significant association with the frequency of consumption of complex carbohydrates ($p = < 0.05$), (table

28). When sex and age were controlled, there was no consistent pattern of association. For diastolic blood pressure, there were few significant mean differences and no pattern when age was controlled (table 29).

When combined fat and complex carbohydrate intake were combined as described in appendix III, the black, white, and female groups showed statistically significant higher mean systolic pressure levels when they reported frequent consumption of low fat and high carbohydrate foods (tables 30 and 31). When body mass index was controlled, conflicting patterns were found for males and females. When separated into sex-age groups, systolic pressures had different relationships depending on age, and no consistent pattern was evident.

Mean systolic blood pressure tended to be higher in those with a low fat and high carbohydrate diet than in those at the opposite extreme, but this was significant only for black males, all females, and black and white females (tables 30–33). When age was controlled, the patterns were inconsistent. Controlling for BMI resulted in no consistent relationship. Trends in mean diastolic blood pressure were not significant or consistent. The inconsistency of these findings indicates the possibility of confounding and interactions.

Total dietary fat, which includes saturated and unsaturated fats, was available from the 24-hour recall data. Four levels of fat intake were created by making separations at the 15th, 50th, and 85th percentiles shown in tables 34–37.

For males there was a statistically significant mean difference ($p < 0.001$) between total fat intake and mean systolic blood pressure, with those who consumed higher levels of fat having lower pressure (table 34). However, when age was controlled no significant relationship was found. When body mass index was controlled, there was no consistent pattern for systolic and diastolic values (table 35).

Similar relationships were found for females. There was an inverse relationship between systolic pressure and total dietary fat for the total group, but the pattern was inconsistent when age was controlled (table 36). However, unlike males, females had a consistent pattern when adiposity was controlled; higher systolic values were associated with lower fat intake in all body mass index quartiles. Diastolic blood pressure relationships followed those observed for systolic pressure (table 37).

An approximation of polyunsaturated fatty acid to saturated fatty acid ratio, which was constructed using the *ratio of linoleic fatty acid to unsaturated fat* reported in the 24-hour dietary recall, showed no relationship to systolic or diastolic pressure in males or females.

A variable indicating the frequency with which *sugar* was *consumed* was developed from three food groups on the food frequency data collection instrument—desserts and sweets, candy, and beverages (sweetened, carbonated, and noncarbonated). Sucrose was not separately reported by respondents, and sugar-containing foods represents a variable likely to correlate with sucrose.

When the frequency of consumption of sugary foods was cross-classified with sex, race, and BMI, there was a clear pattern of lower sugar consumption frequency being related to high systolic blood pressure (table 38). When age was considered, there were no consistent differences. A similar pattern was observed for diastolic pressure (table 39), but no consistent differences were found when age or age and sex were controlled.

Dietary cholesterol was determined from the 24-hour recall data. Four levels of cholesterol intake were created based on the 15th, 50th, and 85th percentiles. For both males and females, mean systolic blood pressure tended to be higher with lower cholesterol intake ($p < 0.1$), but the relationship was inconsistent when age and body mass index were controlled (tables 40 and 42). No significant trends were found for diastolic blood pressure (tables 41 and 43).

Coffee and tea consumption

The relationship of blood pressure to caffeine intake was assessed using the total number of times coffee and tea were consumed per week, derived from the food frequency diet history. Examinees were divided into four levels. The lowest level included individuals whose freqency of consumption was less than 2 times per week; the highest level, those who drank coffee or tea more than 27 times per week (tables 44 and 45).

Significant differences in mean systolic pressure were found for the highest and lowest consumption strata for the total group, for males and females, and for white persons ($p < 0.05$ to < 0.001). No consistent or significant pattern was observed when the group was analyzed by age, although inverse relationships for ages 35–44 years and 55–64 years were statistically significant ($p < 0.01$). When body mass was controlled, there was a slight but insignificant trend to higher pressure levels, with increased caffeine beverage consumption.

The relationships for diastolic blood pressure were similar to those for systolic pressure: a trend to higher mean pressures with greater consumption except when age was controlled. Within specific age ranges, however, the opposite trend was found. The mean differences between high and low consumers were significant for ages 35–44 years ($p < 0.0001$) and 55–64 years ($p = 0.01$). This finding was also obtained in the same age groups for males and females. The inconsistent patterns and reversal of trends for blood pressure and coffee/tea consumption can be attributed partially to the varying intake with age and confounding influence of body mass.

Nondietary environmental variables

Tobacco use

Self-reported data on tobacco use was available only for the detailed and augmentation samples. Examinees were separated into those who reported no current tobacco use ("none"), use of cigar and/or pipe only ("cigar/pipe"), use of cigarettes only ("cigarettes"), and use of some mixture of cigarettes and cigar and/or pipe ("mixed"). The exclusive use of snuff and chewing tobacco was infrequent and not included in the analysis. No consistent or statistically significant differences in systolic or diastolic blood pressure were found for males when categorized in these four groups (tables 46 and 47). Women who smoked showed significantly lower mean systolic and diastolic pressure than those who did not, though the differences were not consistently significant when controlled for age or body mass index (BMI) (tables 48 and 49).

Oral contraceptive use

Use of oral contraceptive agents in the past 6 months was assessed in the medical history questionnaire for women ages 18–44 years in the general and detailed samples. The questionnaire provided information that permitted categorization of use into the following groups: nonusers in the past 6 months, users in the past 6 months but not current users, and current users. Women on high-blood-pressure medications were excluded from this analysis (tables 50 and 51 and figure 6).

Current users of oral contraceptives had the highest mean systolic and diastolic pressure. The differences in their systolic pressure when contrasted with users in the past 6 months but not current users were significant for white and black women and for ages 18–24 years and 25–34 years. Controlling for BMI and age did not alter this relationship. Smaller mean differences were found for diastolic pressure, but only the mean differences in diastolic pressure for those ages 25–34 years were significant.

Users in the past 6 months but not current users of oral contraceptives had significantly lower systolic pressure than those reporting no use in the past 6 months. This difference was attributable primarily to the older users (ages 25–34 years). Although confirmatory information was not available from the questionnaire, this finding might be explained by the avoidance of contraceptive use by those with known elevated blood pressure but who did not take antihypertensive medications.

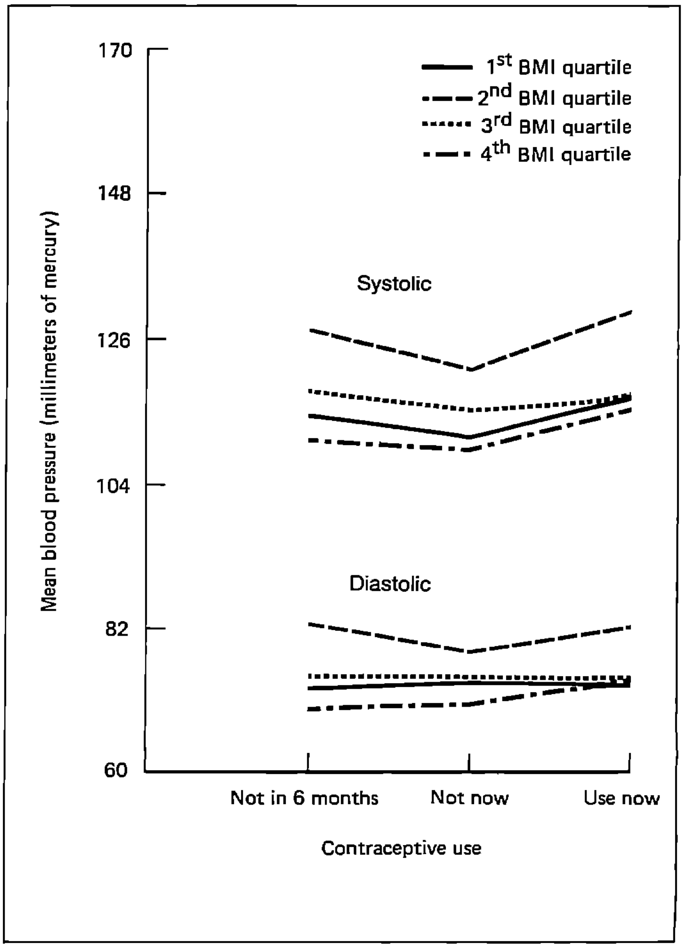

Figure 6. Mean systolic and diastolic blood pressure levels in BMI quartile strata of females 18–44 years, by recency of oral contraceptive use: United States, 1971–74

General well-being scale

Respondents in the detailed and augmentation surveys completed a questionnaire directed to their perceptions of personal health and psychological well-being. Factor analysis of responses to the 18 items revealed that 3 content areas could be identified; the Cronbach alpha coefficients (measures of association)[26] for these items within these areas ranged from 0.7439 to 0.8425. The three factors that explained 58 percent of the variance were those concerning adjustment (items 6, 7, 9, 11, and 16–18); general health and energy (items 1–5); and anxiety and/or depression (items 8, 10, and 12–15). However, the alpha coefficient for all 18 items was 0.9075, indicating a high reliability among all the items. Therefore, the General Well-Being (GWB) score used in the analyses represents the sum of a respondent's responses to all 18 items. Higher scores on the index indicate better perceived well-being (tables 52–55).

For males, there was a trend for systolic pressure to be higher with higher scores on the GWB scale.

This trend was noted for black persons but was significant only for white persons. A similar trend was present for males when body mass index was controlled (table 52). The trend was not observed in the younger age groups (ages 25–34 years and 35–44 years) but was present in the older groups (45–74 years) and was significant for the two older groups. No consistent trends were found for diastolic blood pressure (table 53).

For women, similar trends were found for systolic blood pressure (table 54). Overall, higher mean GWB scores were associated with higher pressure, and this held for white and black women. However, when age and body mass index were controlled, no consistent relationships were found between GWB scores and systolic pressure. As with men, there were no consistent relationships between GWB scores and diastolic blood pressure (table 55).

Clinical hematology and serum biochemistries

To analyze the relationship between systolic and diastolic blood pressure and each of the biochemistry measurements, four groups were created based on the distribution of values for each of the biochemistry measurements. Insofar as possible, the cutoff points used for these groups were the 15th, 50th, and 85th percentiles of the distribution. Many antihypertensive medications are known to alter serum biochemistries (cholesterol and urate), and, therefore, examinees who reported use of medication to lower blood pressure were excluded from the analysis.

Hemoglobin concentration

For males, there were no consistent or statistically significant relationships between hemoglobin concentration and systolic blood pressure (table 56). Higher mean diastolic pressures were present at the highest hemoglobin concentration (16.75 grams/deciliter or more) than at the lowest concentration for males. These differences were significant for all groups except those ages 25–54 years and those in the first quartile stratum of BMI (table 57). By contrast, female respondents had significantly higher systolic pressure at the highest levels of hemoglobin concentration (14.95 grams/deciliter or more) except for black women and all females ages 18–24 years (table 58). Diastolic pressure tended to be higher at the highest levels of hemoglobin concentration except for black females and females ages 18–44 years (table 59). Males and females were similar with respect to the relationships of hemoglobin concentration to diastolic blood pressure, but females also had a direct relationship with systolic pressure while males did not. For both sexes the relationship to hemoglobin tended to persist after correction for body mass index.

Serum cholesterol

A direct relationship was found between serum cholesterol and systolic and diastolic blood pressure (tables 60 and 61). The differences between mean systolic blood pressure in the highest and lowest percentile strata of serum cholesterol were statistically significant ($p < 0.001$). The direct relationship persisted after controlling for race and sex. A positive or direct relationship was present for the younger age groups (ages 18–54 years) but was reversed for those ages 55–64 years and was positive, though diminished, for those ages 65–74 years. The positive relationship was present in males and females after controlling for body mass index except in males at the highest quartile for body mass index. All differences were statistically significant.

For diastolic blood pressure, a similar significant positive relationship to serum cholesterol was found (table 61). The patterns of relationships were similar to those for systolic pressure. The direct relationship was found after accounting for race, sex, and body mass, and in every age range except those ages 55–64 years. These differences were generally statistically significant (except ages 65–74 years), and the mean difference in systolic/diastolic pressure between the high and low groups of serum cholesterol concentration was 13.4/8.6 mm Hg.

Serum urate

In men, there was a direct relationship between serum urate levels and systolic and diastolic blood pressures (tables 62 and 63). The mean differences in pressures between the highest and lowest strata of serum urate were statistically significant ($p < 0.001$). The pattern of direct relationship persisted after controlling for age, race, and body mass index.

There was also a direct relationship between serum urate and systolic and diastolic pressures in females (tables 64 and 65). These significant relationships were present among females after controlling for age, race, and body mass index ($p = 0.05$).

Serum glutamic oxalacetic transaminase (SGOT)

The mean systolic blood pressure for each of the four SGOT levels had a direct linear relationship with SGOT levels (table 66 and figure 7). For males, the mean systolic blood pressure ranged from 129.6 mm Hg for the lowest level of SGOT to 133.6 mm Hg for the highest SGOT level. The range for females was from 122.0 mm Hg to 131.7 mm Hg. A similar relationship was found for race and age groups, where mean systolic blood pressure increased as SGOT levels

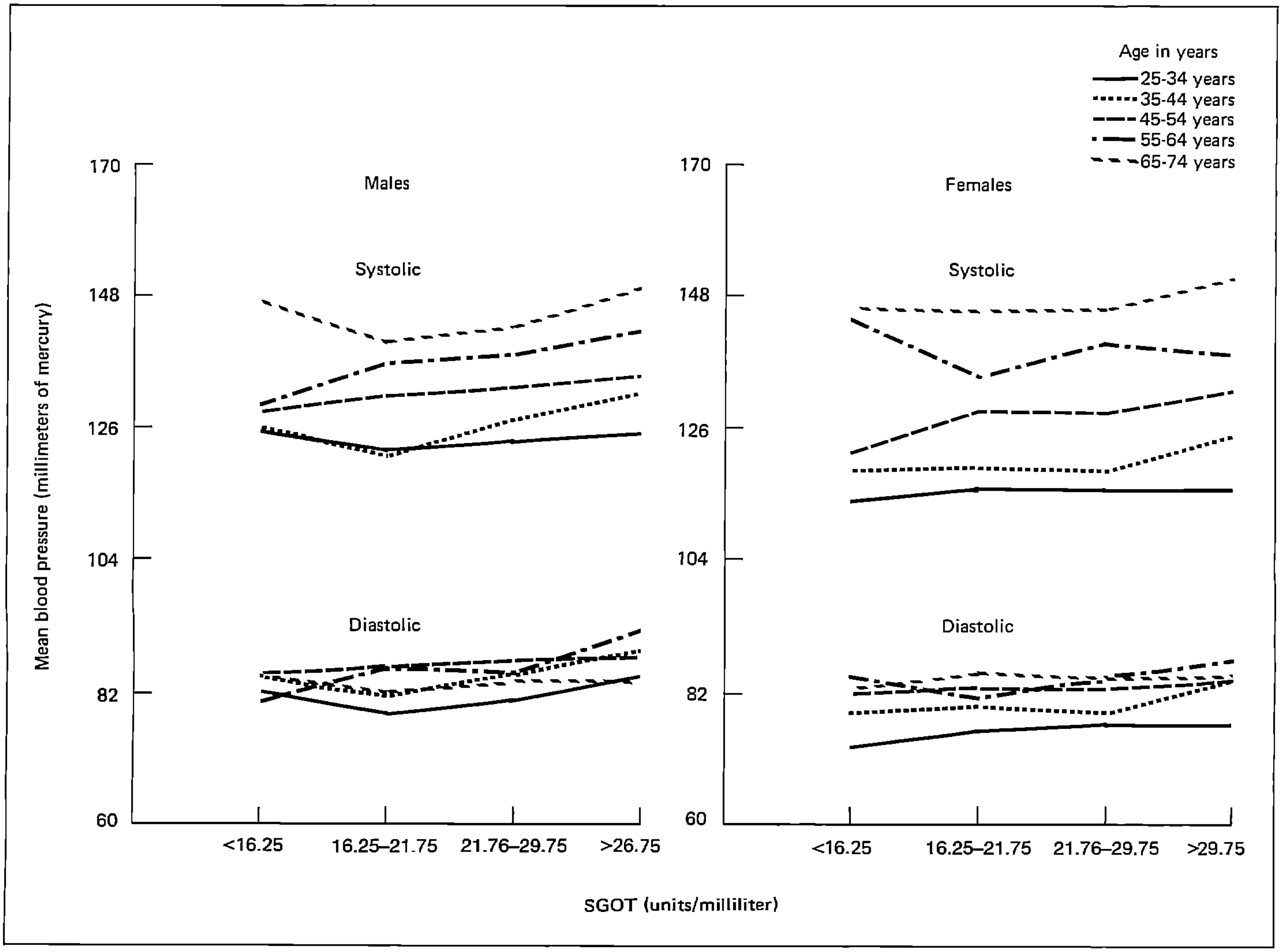

Figure 7. Mean systolic and diastolic blood pressure levels in quartile strata of serum glutamic oxalacetic transaminase (SGOT) levels of adults 25–74 years, by age: United States, 1971–75

increased. The trends were not as evident when body mass index was controlled, but significant differences were present for all female BMI groupings and for the lowest and highest male BMI groupings.

Diastolic blood pressure had a similar direct relationship to SGOT levels (table 67). This trend was found for all the sex, race, age, and BMI groups.

Serum calcium

Serum calcium levels had complex relationships to systolic and diastolic blood pressures (tables 68 and 69). For males, there tended to be an inverse relationship for systolic pressure and no consistent relationship for diastolic pressure. No discernible trends were apparent for black persons, but the sample sizes were small and standard errors relatively large. When age was controlled, a consistently positive relationship for systolic and diastolic pressures was found in the younger age groups but not in the older groups (ages 55–74 years). When body mass index was controlled, systolic and diastolic pressures had a consistent and direct relationship to serum calcium concentration in females but not in males.

Serum inorganic phosphate

Serum inorganic phosphate concentration showed an inverse relationship to systolic blood pressure, and this relationship was consistently present when sex, race, age, and body mass index were controlled (tables 70 and 71). The mean difference in systolic pressure between those in the lowest (0–15) and highest (85–100) percentile strata amounted to 8.4 mm Hg for all persons. A similar trend was found for diastolic pressure, although the difference between those in the upper and lower percentile strata was less, averaging 4.50 mm Hg for all persons. As with systolic blood pressure, the inverse relationship persisted after controlling for age, sex, race, and body mass index.

Serum calcium-phosphate ratio

Because serum calcium and inorganic phosphate usually vary reciprocally and their relationships to blood pressure tend to be reversed, the relationship of serum calcium-serum inorganic phosphate (Ca/P) was analyzed with respect to blood pressure (tables 72 and 73 and figure 8). Mean serum Ca/P was directly related to systolic and diastolic blood pressure. This relationship persisted after controlling for age, sex, race, and body mass index. The mean difference in systolic/diastolic pressure between the 15th and 85th percentile strata of Ca/P was 8.3/4.6 mm Hg. All differences were statistically significant.

Serum magnesium

No consistent or statistically significant relationships were observed between serum magnesium levels and systolic or diastolic blood pressure.

Characteristics of respondents classified by hypertensive status

Persons were categorized into blood pressure strata (hypertensive status) based on the two sitting measurements, using the criteria described in "Methods," regardless of treatment for hypertension. Selected variables were contrasted among the resultant hypertensive status groups (table A). Variables of body mass index, total skinfold thickness, serum urate, hemoglobin, serum cholesterol, serum calcium-phosphate ratio, calories from alcoholic beverages, and dietary sodium-potassium ratio were selected because prior analyses indicated a relationship to blood pressure. The findings generally agreed with those obtained when blood pressure was analyzed as a continuous variable and treated hypertensive examinees were excluded from analysis.

For each race-sex group, body mass index was significantly greater in hypertensives, borderline hy-

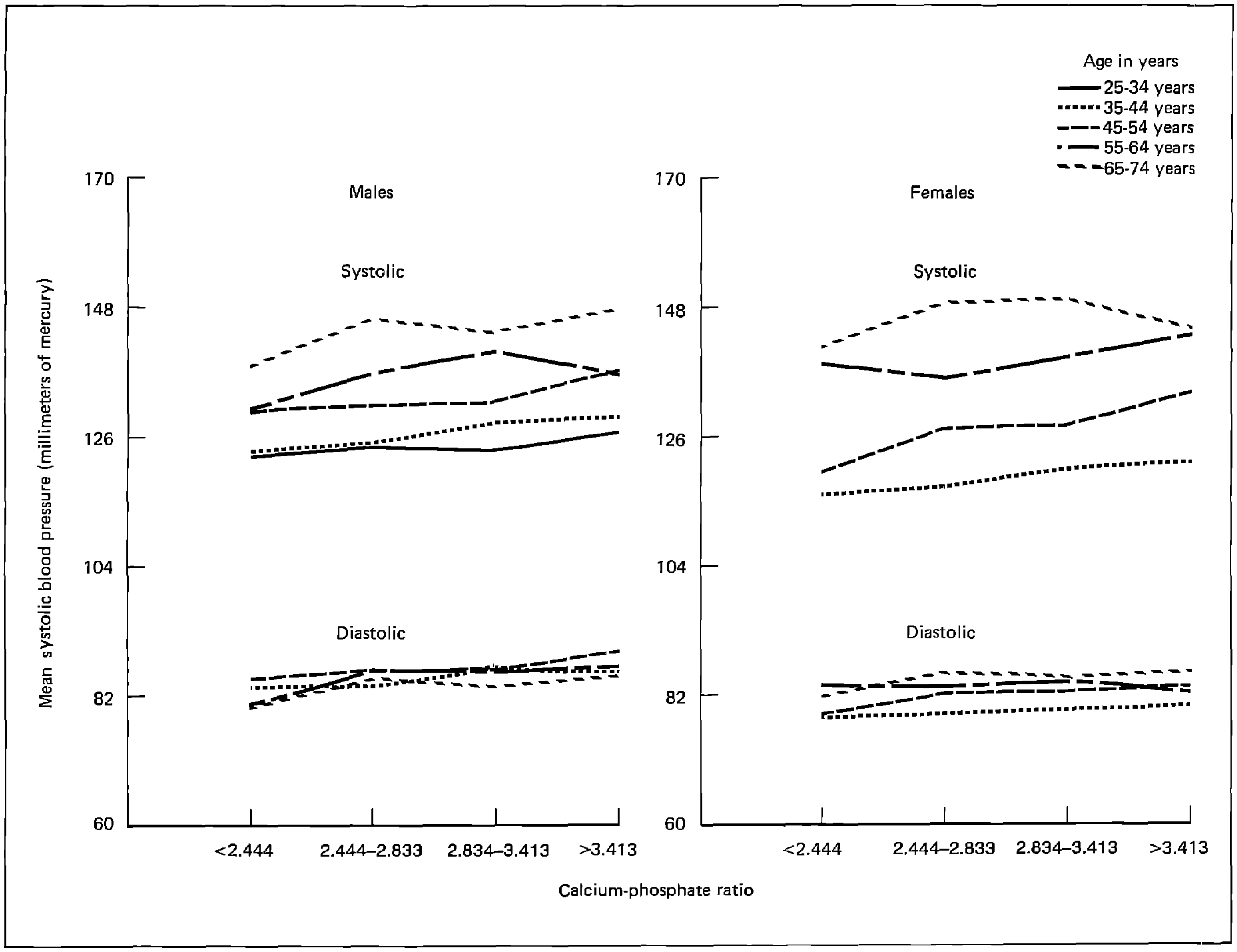

Figure 8. Mean systolic and diastolic blood pressure levels in quartile strata of serum calcium/phosphate ratios of adults 25–74 years, by age: United States, 1971–75

Table A. Selected characteristics of respondents classified as having normotension, borderline hypertension, hypertension, and systolic hypertension ages 25–74 years: United States, 1971–75

Variable	*Normotension*			*Borderline hypertension*			*Hypertension*			*Isolated systolic hypertension*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
Body mass index[1] (kilograms/meters^2)												
White males	24.5	0.10	2,305	26.1	0.17	1,046	27.9	0.30	816	28.1	1.11	158
White females	23.4	0.08	4,435	26.2	0.20	1,126	29.0	0.28	914	26.8	0.47	265
Black males	24.3	0.32	362	26.3	0.45	177	26.7	0.45	273	27.3	1.61	57
Black females	25.0	0.39	822	27.1	0.48	260	31.4	1.00	379	27.1	0.86	68
Total skinfold thickness[1] (millimeters)												
White males	25.8	0.34	2,305	30.1	0.55	1,046	33.1	0.79	816	35.8	2.74	158
White females	37.6	0.30	4,435	46.0	0.69	1,126	52.7	0.83	914	46.2	1.73	265
Black males	23.7	1.15	362	28.9	1.36	177	29.1	1.63	273	46.2	4.64	57
Black females	41.4	1.18	822	48.7	1.75	260	59.1	2.55	379	47.1	3.42	68
Serum urate (milligrams/deciliter)												
White males	6.0	0.06	757	6.1	0.09	377	6.6	0.08	312	6.2	0.40	35
White females	4.6	0.06	949	5.0	0.08	311	5.3	0.12	270	4.9	0.25	69
Black males	6.2	0.19	84	6.5	0.27	59	6.8	0.20	113	5.2	0.38	12
Black females	4.8	0.15	125	4.9	0.18	51	5.7	0.25	116	5.2	0.25	22
Hemoglobin[1] (grams/deciliter)												
White males	15.7	0.15	2,211	15.7	0.06	1,008	15.9	0.09	782	15.3	0.14	153
White females	13.8	0.05	4,249	14.1	0.05	1,064	14.3	0.05	878	13.9	0.10	247
Black males	15.1	0.12	330	15.2	0.14	167	15.2	0.17	253	14.3	0.21	48
Black females	13.1	0.07	757	12.9	0.09	238	13.4	0.12	336	13.1	0.20	64
Serum cholesterol[1] (milligrams/deciliter)												
White males	206.0	1.25	2,305	215.3	2.14	1,046	228.0	1.77	816	215.6	5.15	158
White females	204.8	1.23	4,435	232.7	2.55	1,126	238.4	2.57	914	245.3	4.97	265
Black males	200.1	3.88	362	220.1	6.99	177	221.3	5.34	273	217.3	7.90	57
Black females	204.9	2.64	822	217.0	3.38	260	229.6	4.09	379	234.4	7.84	68
Serum calcium-phosphate ratio												
Total	2.9	0.02	1,573	3.0	0.03	641	3.1	0.03	661	3.0	0.06	99
Calories from alcoholic beverages[1]												
Total	160.6	4.80	8,038	154.5	8.88	2,632	127.6	6.77	2,407	134.6	10.36	493
Dietary sodium-potassium ratio[1]												
White	1.1	0.01	6,739	1.0	0.02	2,172	1.0	0.02	1,729	1.0	0.04	423
Black	1.2	0.04	1,184	1.3	0.05	437	1.3	0.10	652	1.4	0.18	94

[1] Data for persons examined in the NHANES I general or nutrition sample, 1971–74.

pertensives, and, except for black males, in those with isolated systolic hypertension than in the normotensive persons ($p < 0.05$). The relationship between adiposity and blood pressure categories generally was observed for total skinfold thickness (triceps plus subscapular skinfolds). Differences in skinfold thickness between normotensive and hypertensive groups were statistically significant, but the differences for black females in the systolic hypertensive category were not significant, and variability was relatively large.

Regarding dietary intake, the number of calories from alcohol was greater for the normotensives than for those in the hypertensive categories (excluding the borderline group). No significant differences between the normotensive and hypertensive groups in sodium-potassium (Na/K) dietary intake were found for white or black persons. However, black persons in the hypertensive categories had higher Na/K content.

Serum urate concentration was significantly higher in each race-sex group of hypertensives than in the comparable race-sex groups of normotensives, but the mean differences between the normotensives and the borderline and systolic hypertensive groups were not significant.

For hemoglobin concentration, the only significant mean difference between groups was the slight but significantly greater hemoglobin concentration for hypertensive white and black females when contrasted with normotensives. Serum cholesterol was significantly higher on the average in the hypertensive group than in the normotensive stratum for each race-sex group. In addition, mean serum cholesterol levels were higher in the isolated systolic hypertension category for white and black females, but it must be remembered that virtually all persons with systolic hypertension were over 55 years of age and cholesterol levels increase with age. The mean serum calcium-inorganic phosphate ratio was significantly higher in hypertensive and borderline hypertensive respondents than in the normotensive group.

Multivariate analysis

The discovery of numerous associations between nutritional variables and blood pressure poses the question of the relative importance and potential overlap of these factors. To address this question, regression analyses were developed using systolic and diastolic pressure as dependent variables. The regression analyses were computed using persons in the detailed sample group since this was the only group for which both nutrition and relevant biochemistry data were available. Independent variables having significant, demonstrated associations with blood pressure were used. The independent measures included in the analyses were age, body mass index, serum cholesterol, serum urate, serum calcium/phosphate ratio, dietary sodium, sodium-potassium ratio, ethanol ounces per week, and smoking (pack years). Regressions were computed separately for the four sex-race groups.

Age and body mass index had the highest correlation with blood pressure as shown by standardized beta coefficients. These coefficients reflect the relative weighting of the independent variable with respect to its contribution to prediction of variance of the dependent variable. Age was found to be the best predictor, followed by body mass index when that measure was included in the two regression equations analyzed—one including BMI, the second excluding BMI (tables B and C). Other important predictors of both systolic and diastolic blood pressures include serum urate (for black persons only), the calcium/phosphate measure (all race-sex groups), ethanol ounces per week (white persons only), and smoking (white females only).

Table B. Standardized beta coefficient and standard error for systolic blood pressure, by race, sex, and selected variables for adults ages 25–74 years: United States, 1971–74

Independent variables	White[1]				Black[1]				White[2]				Black[2]			
	Male		Female		Male		Female		Male		Female		Male		Female	
	$r^2 = 0.21$, $n = 1{,}398$		$r^2 = 0.32$, $n = 1{,}440$		$r^2 = 0.33$, $n = 103$		$r^2 = 0.43$, $n = 162$		$r^2 = 0.17$, $n = 1{,}398$		$r^2 = 0.27$, $n = 1{,}440$		$r^2 = 0.30$, $n = 103$		$r^2 = 0.34$, $n = 162$	
	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta
Age	0.35	0.03	0.46	0.02	0.23	0.11	0.41	0.08	0.35	0.03	0.48	0.03	0.16	0.10	0.47	0.08
Body mass index	0.24	0.03	0.23	0.02	0.19	0.10	0.33	0.07								
Serum cholesterol	–0.03	0.02	0.01	0.02	–0.02	0.10	0.01	0.07	–0.01	0.03	0.02	0.03	0.00	0.10	0.01	0.08
Serum urate	0.02	0.03	0.03	0.02	0.35	0.10	0.10	0.07	0.10	0.02	0.11	0.02	0.42	0.10	0.19	0.07
Calcium-phosphate ratio	0.10	0.02	0.05	0.02	–0.17	0.10	0.23	0.06	0.10	0.02	0.05	0.02	–0.12	0.10	0.25	0.07
Dietary:																
Sodium	–0.02	0.03	0.03	0.03	–0.11	0.10	0.08	0.07	–0.02	0.03	0.01	0.03	–0.10	0.10	0.06	0.08
Sodium-potassium ratio	0.01	0.03	0.02	0.03	0.06	0.10	0.00	0.07	0.00	0.03	0.05	0.03	0.07	0.10	0.00	0.08
Ethanol ounces per week	0.05	0.02	–0.05	0.02	–0.02	0.09	–0.01	0.07	0.04	0.02	–0.06	0.02	–0.06	0.09	–0.07	0.07
Smoking (pack years)	0.05	0.03	–0.06	0.02	0.07	0.10	–0.05	0.07	0.04	0.03	–0.08	0.02	0.08	0.10	–0.06	0.07

[1] Values based on regression equations including body mass index.

[2] Values based on regression equations excluding body mass index.

NOTE: Analyses include only persons in the detailed sample who were not taking high blood pressure medication.

Table C. Standardized beta coefficient and standard error for diastolic blood pressure, by race, sex and selected variables for adults ages 25–74 years: United States, 1971–74

Independent variables	White[1]				Black[1]				White[2]				Black[2]			
	Male		Female		Male		Female		Male		Female		Male		Female	
	$r^2 = 0.14$ $n = 1,398$		$r^2 = 0.23$ $n = 1,440$		$r^2 = 0.90$ $n = 103$		$r^2 = 0.31$ $n = 162$		$r^2 = 0.07$ $n = 1,398$		$r^2 = 0.13$ $n = 1,440$		$r^2 = 0.07$ $n = 103$		$r^2 = 0.07$ $n = 162$	
	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta	Beta	Standard error of beta
Age	0.11	0.03	0.19	0.03	0.04	0.12	0.12	0.08	0.11	0.03	0.23	0.03	–0.04	0.12	0.22	0.09
Body mass index	0.29	0.03	0.36	0.03	0.21	0.11	0.54	0.07								
Serum cholesterol	0.03	0.03	0.03	0.03	0.00	0.11	–0.03	0.08	0.06	0.03	0.05	0.03	0.03	0.11	–0.03	0.09
Serum urate	0.07	0.03	0.07	0.03	0.12	0.11	0.03	0.07	0.16	0.03	0.20	0.03	0.20	0.11	0.18	0.08
Calcium-phosphate ratio	0.13	0.03	0.05	0.02	0.09	0.11	–0.03	0.07	0.14	0.03	0.05	0.02	0.14	0.11	0.00	0.08
Dietary:																
Sodium	–0.02	0.03	0.03	0.03	–0.14	0.11	0.01	0.08	–0.03	0.03	0.00	0.03	–0.14	0.11	–0.02	0.09
Sodium-potassium ratio	0.01	0.03	0.01	0.03	0.11	0.11	–0.05	0.08	–0.01	0.03	0.06	0.03	0.12	0.11	–0.04	0.09
Ethanol ounces per week	0.06	0.03	0.02	0.02	0.15	0.10	–0.03	0.07	0.04	0.03	0.01	0.03	0.11	0.10	–0.12	0.08
Smoking (pack years)	0.02	0.03	–0.06	0.02	0.18	0.11	0.03	0.07	0.01	0.03	–0.08	0.03	0.20	–0.11	0.00	0.08

[1]Values based on regression equations including body mass index.

[2]Values based on regression equations excluding body mass index.

NOTE: Analyses include only persons in the detailed sample who were not taking high blood pressure medication.

Discussion

Many significant and important relationships were found between nutritional variables and blood pressure. In general, these relationships from a nationally representative sample add to the previous findings from studies among more limited groups (geographically or otherwise) that demographic variables, age, sex, and race indicate important relationships with blood pressure in the U.S. population.[15,16]

Systolic and diastolic pressure levels in adults were consistently and significantly related to body mass index (weight/height^2) in this national survey. The relationship was direct; the greater the body mass, the higher the systolic and diastolic pressure. This relationship was generally present at all ages, for both sexes, and for both white and black groups. Moreover, the relationship of race and sex to blood pressure was independent of body mass. For example, black persons had consistently higher pressures than white persons within each strata of body mass. Males had consistently higher systolic pressure than females within these strata across age groups except the oldest (65–74 years). A consistent and strong relationship was also found for skinfold thickness (subcutaneous adiposity) and blood pressure. To provide a more representative sample of subcutaneous adiposity, skinfold measurements from the limb (triceps) and trunk (subscapular) were combined for analysis. For body mass, there were major trends with age in both white and black females, but no consistent age-related mean differences for males. White and black females had greater body mass indexes on the average in successively older groups, which reflected the increasing proportion of respondents with larger skinfold thickness at older ages. Males, on the other hand, had only slightly greater body mass at successively older ages, and there were no major differences between black and white males.

Relative adiposity may be assessed with several clinical measurements, and although none has a perfect correlation with complex research measurements, there is good internal agreement among the simple measures available to clinicians and epidemiologists. Skinfold measurements, which provide the most direct clinical assessment of subcutaneous adiposity, correlate relatively well with weight to height ratios.[20,22,24,25] Body mass index (weight/height^2) correlates well with skinfold measurements over a broad range of ages and body configurations for both men and women.[21–24,27–32] Development of weight for height ratios using powers of height other than 1, 2, or 3 deserves exploration, but use of an easily calculated ratio, such as weight/height^2, has the virtue of utility in the clinical setting and of considerable experience linking it to mortality and morbidity. Because of the availability, utility, and reliability of weight/height^2 and its validity as a health measure, it was used in these analyses to control for the effect of body size.[21] It should be appreciated that body mass is not synonymous with adiposity or skinfold thickness in the general U.S. population, although age trends of skinfold thickness and body mass index (BMI) are parallel and the changes of BMI with age generally represent increasing adipose mass in the general population. However, it is likely that the primary relationship of body mass to blood pressure represents a relationship between adiposity and blood pressure. The considerations reiterated above and the relationship of skinfolds to blood pressure support this inference.

Although adiposity (and BMI) was greater for successively older age groups, and blood pressure was also higher in older groups, weight is not the full explanation for the age-related increase in pressure. Mean blood pressure is higher at successively older ages for men, although body mass does not increase with age. Moreover, for both men and women, age was the most important predictor in a multiple regression analysis that controlled for the effect of body mass. Several studies of special groups and more restricted populations have shown body mass and skinfold thickness to be related to systolic and diastolic blood pressure.[2,3,27,28] In groups followed longitudinally, there is a clear relationship between weight gain and blood pressure increase,[26,27] and individuals who reduce their body weight experience a significant decrease in systolic and diastolic pressure.[3] However, most of these observations on body mass and blood pressure have been limited to relatively small numbers of individuals in select groups and have encompassed narrow age ranges.

Data from this survey dramatically emphasize the pervasive nature of the relationship between adiposity and blood pressure. The influence of adiposity is evident at every age and at all levels of weight and blood pressure. In this regard, the relative strength of the relationship between adiposity and blood pressure is greatest in the upper quartile or quintile strata of body mass or skinfold thickness. The relationship is most evident in the middle years (25–54 years), and in young adults (18–24 years). For older adults (65–74 years), the association is noted but is not as prominent. The apparent lesser influence of adiposity on blood pressure at the extremes of age may reflect fewer persons at the upper ranges of BMI or skinfolds. For younger persons, this suggests better weight control and for older persons, perhaps selective early mortality of the obese.

These survey data are also useful because of the information provided about blood pressure in older adults. Relatively little information has been available on blood pressure correlates in older persons and no other such broad-based observations had been obtained previously in a nationally representative population. Body mass and adiposity continue to have a significant association with systolic and diastolic pressure after 55 years of age and are significantly associated with both systolic-diastolic hypertension and isolated systolic hypertension, an entity limited generally to older Americans. Moreover, the representative nature of the NHANES I population affords the important observation that the influence of obesity is similar in white and black persons and males and females in the United States. The public health and medical implications for education and intervention regarding this factor are obvious, and action is overdue.

The relationship between blood pressure and dietary salt was less consistent and more complex than the relationship with adiposity. This complexity related at least partially to the contrasting age trends for blood pressure and for dietary salt ingestion and to the incomplete and imprecise assessment of total salt intake. Systolic and diastolic pressure levels were progressively higher in older groups until approximately 50 years of age when the diastolic pressure plateaued and then was lower for men, although it continued to be slightly higher for women. By contrast, use of table salt and ingestion of salty foods were highest in the younger groups and lowest in older groups. The divergent age trends of salt intake and blood pressure afforded an inverse relationship between these variables when the survey population was considered without respect to age. On the other hand, a small positive trend between salt intake and systolic and diastolic pressures was found when age was controlled. Body size further confounds this relationship because the larger individual consumes more food to remain isocaloric and the increased food intake affords greater salt intake. Because of these confounding features, particularly the strong age trends, the most robust analysis for an association with dietary sodium required control of age and of body size or caloric intake (i.e., BMI, or sodium intake per 1,000 calories). When age was controlled, there was a significant difference in systolic and diastolic pressure between those consuming high and low dietary sodium per 1,000 calories ($p < 0.01$). This relationship was significant for the total group, for females, and for white persons. No significant relationships were present when age and body mass were controlled simultaneously. When other measures of salt intake were examined, only the sodium-potassium (Na/K) content of food reported on the 24-hour recall had any consistent and significant associations with blood pressure. Other assessments such as reported use of table salt and frequent consumption of salty foods were not related to blood pressure. These findings do not support the notion that personal salt preference and taste sensitivity can differentiate persons with higher pressure.

The most provocative relationships between sodium and blood pressure emerged from analysis of Na/K food content ratios in the 24-hour dietary recall. A direct relationship between Na/K and systolic and diastolic pressure was found for all adults, for black adults, and for those ages 25–44 years ($p < 0.05$). Other reports[33–35] indicate that the ratio of dietary sodium to potassium may be more important than sodium in influencing blood pressure and, further, that potassium intake is particularly important when sodium intake is high. Most studies implicating Na/K as an important factor have utilized urine collections because this approach probably provides a more accurate and complete assessment than dietary histories. Several studies have suggested that racial differences in the Na/K intake provide an explanation for the consistent observation that black individuals have higher pressure in industrialized countries.[28–30] In several surveys, the sodium intake of white and black persons was found to be similar, but the potassium intake in black persons was less and there was a higher ratio of sodium to potassium. It has been inferred that the higher pressure in black persons is related to this difference.[33–35] The findings in NHANES I afford some support for this concept as Na/K was observed to be related to blood pressure in black but not white persons, and, when Na/K was controlled, the black-white differences in pressure were minimized or eliminated. Interestingly, this was the only nutritional stratification that partially removed the otherwise persistent blood pressure differential between black and white persons. Therefore, these results support other observations that the ratio of dietary Na/K has a direct relationship to systolic and diastolic pressure and may be related to racial differences.

Except for the suggestive nature of the association between dietary sodium and sodium-potassium, there were no other consistent relationships between blood pressure and dietary intake. Furthermore, no dietary relationships were as consistent as body mass and serum biochemistries in their associations. There are several reasons for this less robust relationship with diet, particularly as regards salt. In cross-sectional studies of relatively homogeneous populations, it has been difficult to find a consistent relationship between sodium intake and blood pressure. However, when populations having widely divergent sodium intakes are compared, significant and important differences in blood pressure can be related to dietary sodium.[1,36] Within particular populations or cultures, salt intake is relatively homogeneous, whether high or low, and broad variations in intake are difficult to find unless there has been an effort at manipulation of diet. In the United States, salt is pervasive, particularly in the snack and convenience foods that are favored by adolescents and young adults. Thus, in the general population survey there are few persons with a low salt intake.

A major concern in all population studies has been the reliability and representativeness of dietary interviews or diaries. A single 24-hour recall estimation of sodium intake correlates poorly with measurements of urinary sodium. Even the use of urine collections has problems of reliability and representativeness. It has been estimated that eleven 24-hour periods of dietary assessment and collections would be necessary to characterize individual sodium intake and produce agreement with urinary excretion data.[37] Urinary excretion was not measured in NHANES I, and complete assessment of sodium intake was not accomplished because there was no quantification of salt added in cooking and at the table. Therefore, the measures of salt and sodium used in these analyses cannot be compared directly with other studies of urinary excretion or total dietary intake. The relative consumption of sodium was, however, the basis for stratification, and the tests of blood pressure relationships were directed to differences between low and high subgroups of intake.

Moreover, current assessment of dietary intake affords no insight into previous dietary habits that may be more closely related to chronic disorders such as elevated blood pressure. All cross-sectional studies of diet and disease are marred by additional problems. The reliability of dietary measurement is critical, and this is related to measurement and biological variability. Repeat measurements or longitudinal measurements are helpful in minimizing and quantifying this effect. It can be shown that no correlation might be anticipated, even if a perfect correlation were actually present, if measurement and biological variability are sufficiently great.[38] The stronger relationships with more reliably measured variables such as weight, skinfolds, and serum biochemistries are, therefore, not surprising.

An additional problem in cross-sectional population studies concerns examinees who are on special diets or medications that alter the variable being studied. The NHANES I examinees on therapy were excluded from analysis, but the price for not including them is the loss of many individuals from the upper end of the distribution, which has the greatest medical interest, and a decreased potential for demonstrating significant relationships. Considering these problems, which are inherent in any survey, it is not surprising that more robust relationships were not found between blood pressure and nutritional variables.

Many other dietary constituents were examined to determine potential relationships with blood pressure. However, no common nutrients had a consistent or significant relationship when age and body mass were controlled. Frequently in these analyses, trends were found when the entire population was analyzed, but the opposite trend was found when subgroups were stratified by age, sex, or body mass. These conflicting trends were usually attributable to differences in dietary patterns for different age groups or for men or women, and generally reflected the different dietary preferences of young and old adults. For this reason, only relationships that remained consistent and statistically significant when age was controlled were felt to have importance. Using this criterion, the following dietary variables were not found to be related to blood pressure: total fat, linoleic/saturated fat, and dietary cholesterol (all from 24-hour dietary recall) and dietary fat, complex carbohydrate, fat/carbohydrate, foods containing sugar, and coffee/tea consumption. However, one caloric source, alcohol, was related to blood pressure.

Reported alcohol consumption was related to systolic and diastolic pressure in a nonlinear manner. Those who abstained from alcohol (approximately 30 percent of the adult U.S. population) had consistently higher systolic and diastolic pressure than those who reported ingestion of modest amounts of alcohol. Modest levels of alcohol intake were arbitrarily defined in this analysis as 1 ounce or less of absolute ethanol per week, regardless of the type of beverage. At the other end of the spectrum, greater intake of alcohol (7 or more ounces reported per week) was associated with higher pressure than modest ingestion, and for some groups, pressure that was higher than those of abstainers. This relationship was observed in systolic and diastolic pressures for males and females and for most age groups except the young adults (18–24 years) and the elderly (65–74 years). Although the association was significant for white persons, a similar trend in black persons was not significant. The relationship of alcohol to blood pressure appeared to be independent of body mass.

When alcohol intake was determined from the 24-hour dietary recall, a similar trend was confirmed for higher pressure among those consuming the most alcohol. Those consuming more than 250 calories per day from alcohol—an amount equivalent to more than two servings of alcoholic beverages—had significantly higher pressures. Several other studies [4,39–44] have noted the effect of chronic heavy alcohol ingestion on blood pressure and the apparent paradox that abstainers have higher pressures than light to moderate consumers of alcohol. While other studies have been confined to rather specific groups, NHANES I findings make it clear that the relationship is found in the entire population and is not dependent on age, sex, or adiposity and is unrelated to cigarette smoking and coffee use.[4] It is not clear whether the alcohol effect is a direct pharmacologic action on vascular hemodynamics or is related to some intervening variable. However, the relationship was similar when either chronic consumption or ingestion on the day prior to examination was used as an independent variable. This is compatible with a chronic pharmacologic effect.

In addition to dietary constituents, several other aspects of personal environment were examined in this survey. Tobacco use was not associated with significant differences in blood pressure, although there was a tendency for female cigarette smokers to have slightly lower pressures, an observation consistent with another large study.[4]

The use of oral contraceptive agents was associated with significantly higher systolic and diastolic pressure. This relationship was not affected by age, race, or body mass. A similar relationship has been reported in cross-sectional and longitudinal studies.[45,46] The blood-pressure-elevating effect of oral contraceptives appeared to be rapidly reversible because former users who had discontinued use in the 6 months preceding examination had pressure lower than those reporting no prior use.

Among the data obtained from the detailed examinees was the general well-being (GWB) information, an assessment of the individual's perception of his or her general status. Higher total scores indicated a positive perception of general health status (emotional and somatic). Systolic blood pressure tended to be higher for those scoring highest on the GWB scales than for those with lower GWB scores in the older male groups. However, when body mass index was controlled, there were no significant differences for females or in diastolic pressure for either males or females. For these analyses, individuals were excluded if they reported knowledge of hypertension or were receiving antihypertensive medications because these could alter perceived well-being. A more extensive analysis of subscales that measured tension, depression, and emotional problems failed to reveal any association between blood pressure and these measures of psychological status.[47] While these results do not preclude an association between psychological status and blood pressure, it would appear that such an association is not especially robust, and another study design, perhaps a prospective longitudinal assessment, might be a preferable approach.[47]

Hematologic and clinical biochemistry tests were performed on respondents, and these provided an opportunity to investigate their potential relationships with blood pressure. Some provocative and potentially important associations were found. Hemoglobin levels tended to be directly related to diastolic blood pressure for males and females, with the highest hemoglobin concentrations for each sex being associated with higher pressure. Females also had higher systolic pressure at the highest hemoglobin concentrations, but not males. These relationships persisted after controlling for body mass index. This adds to the importance of these observations because body mass index is an important confounding variable that is related to both hemoglobin concentration and blood pressure. The reason for the association is unclear but perhaps relates to the differences in rheologic properties of blood. Relatively higher viscosity would be associated with greater hemoglobin concentration, and this, in turn, would be associated with greater intravascular pressure at the same arteriolar caliber. This concept is compatible with the finding that diastolic rather than systolic pressure has a consistent relationship to hemoglobin.

Consistent and statistically significant relationships were found between blood pressure and serum calcium and inorganic phosphorus. Serum inorganic phosphorus was inversely related to systolic and diastolic pressure, while serum calcium in women, but not men, had a direct relationship. Moreover, the serum Ca/P ratio provided an even stronger direct relationship. These associations were independent of age, race, sex, and body mass index, and the relationship was linear throughout the ranges of both serum biochemistries. A relationship between hypercalcemia, hypophosphatemia, and blood pressure has been recognized in the presence of hyperparathyroidism, but until recently no association has been reported when these serum ions are within the range of normal values. In a Swedish survey of 2,000 men ages 49–50 years, Ljunghall and Hedstrand[48] found an inverse relationship between serum inorganic phosphorus and blood pressure but no relationship to serum calcium. They postulated that an elevation of blood pressure leads to an exaggerated urinary excretion of calcium ions in a manner analogous to the increased saluresis in hypertension. This would be followed by stimulation of parathyroid hormone that preserves the serum calcium level but at the expense of lowering serum phosphate concentration. In NHANES I, the more striking blood pressure relationship for serum inorganic phosphate than for serum calcium would be compatible with this hypothesized mechanism. An alternative explanation would be that lowered serum phosphate is the underlying event and that this causes changes in peripheral resistance. Both proposed mechanisms can be investigated and deserve further attention. Although the first explanation hypothesizes that the changes in serum calcium and phosphatase result from elevated blood pressure, the opposite sequence might occur, and this could have important implications for the study of the pathogenesis of hypertension. Recent physiologic investigation suggests that calcium plays a fundamental role in contraction of vascular smooth muscle and may have important interactions with sodium in the pathogenesis of hypertension.[44]

Other interesting blood pressure relationships were observed for serum glutamic oxalacetic transaminase (SGOT), serum cholesterol, and serum urate. A direct relationship between SGOT and systolic and diastolic pressure was found for females but only with diastolic pressure for males. The relationship was noted in both racial groups but was statistically significant only for white adults. The relationship was present at all ages and remained for most groups when body mass was controlled. The trend was noted throughout the normal range of values for SGOT, and this makes it unlikely that significant disease of the liver or other organs containing the enzyme was responsible for this finding. Moreover, the analysis excluded persons receiving antihypertensive medications that might have caused subtle hepatic damage and higher levels of SGOT. The use of alcoholic beverages affords a possible explanation. Alcohol ingestion in large amounts is associated with higher blood pressure, and chronic excessive alcohol intake can cause direct damage to the liver with release of SGOT and relatively higher serum levels of the enzyme.

Serum urate was consistently and directly related to systolic and diastolic blood pressure. A significant relationship was found irrespective of age, sex, or race, and the relationship persisted after controlling for body mass index. Moreover, serum urate added to explanation of blood pressure variance in all groups when multiple regression analysis was performed. This association between serum urate and blood pressure has been noted previously but has been attributed to their common association with adiposity or to impaired renal function related to vascular disease.[49] However, controlling for weight did not alter the underlying relationship in NHANES I. Moreover, the demonstration of a relationship that is independent of body mass and in a general population where the range of values is "normal" indicates that this relationship is a more general one and not related to overt loss of renal function. It should be noted that respondents on antihypertensive medications were excluded from analysis because of the known hyperuricemic effects of diuretics and, therefore, this does not explain the association. An interesting mechanism for the association between hyperuricemia and hypertension has been suggested by Messerle et al.[50] They have proposed that hyperuricemia (serum urate greater than 9 milligrams/deciliter) results in essential hypertension because there are subtle hypertensive vascular changes in the kidneys and a resultant decrease in renal blood flow and perhaps altered renal cortical medullary flow patterns. When this concept is tested on the results of a large population survey, one would expect a more pronounced association in older persons because of a greater likelihood of vascular disease than in younger persons. However, this was not observed in this National survey. Although the mechanism for an association remains unclear, it deserves further exploration.[50]

There are several considerations regarding achievement of statistical significance even with the relatively large number of individuals in the survey. First, the reliability and variability of dietary information must be appreciated. Although the questionnaire and interviews were administered in a standardized manner, which was monitored through tape recordings of interviews and visits by supervising personnel, reliability depends to a large degree on the recollection of the examinee and the examinee's bias regarding "acceptable" or "good" dietary habits. The lack of attention to food intake probably differs among age-sex-race groups and potentially for various food groups, including alcohol. Therefore, differential bias and differential reliability could result among the groups. When this source of variability is combined with relatively small numbers, many trends may not achieve statistical significance.

Second, the numbers of examinees deserve comment and clarification with regard to statistical considerations.[51–54] Although the general survey included a large number of examinees, analytical considerations often yielded groups in cells containing relatively small numbers, and the variance was increased by inflation of values to accommodate the sampling design used in the study. Two specific examples should be noted. One, some measurements were made only in the detailed survey, which comprised a national probability sample of 3,854 individuals ages 25–74 years, examined in 1971–74 for whom dietary data were also obtained. When this group was separated by age-sex-race, fewer than 10 individuals were found in particular cells. National estimates based on such small numbers were too unstable (excessively large sampling variability) for use in this analysis. Two, even when the general survey (20,749 persons ages 1–74 years) was analyzed, it was common to develop groups for analysis that contained relatively small numbers of examinees. This was a frequent occurrence in analysis of data for black persons who comprised only 11 percent of the U.S. civilian noninstitutionalized population but because of oversampling were represented by 19 percent (4,424) of the survey sample. Therefore, considering the variability of the dietary measurements and the small number of observations (and large sampling variance) that were available in some analytic groups, it is not surprising that many of the dietary relationships fail to achieve significance. However, these relationships are reported because a population survey should generate new hypotheses and provoke additional analyses and studies, as well as test existing hypotheses in a general population.

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List of detailed tables

Table 1. Body mass index for adults ages 18–74 years showing means, standard errors of means, and selected percentiles by sex, race, and age: United States, 1971–74

Sex, race, and age	*Mean*	*Standard error of the mean*	*Percentile*							*Number of examinees*	*Estimated population in thousands*
			5th	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*		
			Kilograms/meter²								
All races[1]											
Male											
Total[1]	25.5	0.08	19.3	20.5	22.5	25.1	27.6	30.5	32.4	5,179	60,311
White	25.5	0.09	19.5	20.6	22.7	25.2	27.6	30.4	32.1	4,334	54,565
18–24 years	23.8	0.18	18.7	19.7	21.2	23.3	25.9	28.9	30.8	622	10,250
25–34 years	25.5	0.17	20.2	21.1	22.5	24.8	27.5	30.2	32.8	670	11,601
35–44 years	26.2	0.20	20.4	21.5	23.4	25.9	28.2	30.6	31.9	570	9,501
45–54 years	26.1	0.16	19.4	21.0	23.4	25.9	28.2	31.0	32.8	631	10,096
55–64 years	25.8	0.18	19.4	21.2	23.5	26.0	28.2	31.2	32.6	498	8,169
65–74 years	25.5	0.11	19.0	20.6	22.9	25.5	27.7	30.3	31.9	1,343	4,948
Black	25.5	0.31	19.0	19.9	21.7	24.4	27.5	31.6	34.0	845	5,746
18–24 years	24.0	0.49	19.0	19.3	20.8	22.6	25.3	28.8	33.5	134	1,293
25–34 years	26.2	1.09	19.0	20.1	21.4	25.1	27.4	30.7	34.3	116	1,213
35–44 years	26.8	0.67	19.3	20.1	22.6	26.4	29.3	32.1	33.5	87	1,007
45–54 years	25.4	0.56	19.4	20.3	22.4	24.7	28.8	33.2	34.6	129	1,044
55–64 years	26.0	0.51	18.7	19.7	22.2	25.1	27.7	32.9	34.2	86	707
65–74 years	25.0	0.34	18.9	19.9	21.6	24.2	27.3	30.8	34.4	293	482
Female											
Total[1]	24.9	0.10	18.4	19.3	21.2	24.0	28.1	32.9	35.9	8,300	67,080
White	24.6	0.11	18.4	19.3	21.1	23.7	27.4	32.0	35.0	6,750	59,804
18–24 years	22.3	0.11	17.6	18.4	19.8	21.6	24.3	27.7	31.2	1,169	11,090
25–34 years	23.7	0.17	18.2	18.9	20.3	22.4	25.5	30.7	34.6	1,540	12,193
35–44 years	25.0	0.23	18.8	19.7	21.4	23.6	27.5	32.6	35.8	1,301	10,100
45–54 years	25.6	0.26	19.3	20.4	21.9	24.7	28.3	32.9	35.5	701	10,878
55–64 years	26.1	0.21	18.8	20.3	22.7	25.5	29.6	33.2	35.8	549	9,058
65–74 years	26.2	0.18	19.4	20.6	22.8	25.7	29.2	32.8	35.3	1,490	6,486
Black	27.0	0.27	18.4	19.4	22.3	26.1	30.8	35.7	38.9	1,550	7,276
18–24 years	23.7	0.44	17.5	18.4	20.3	22.8	25.8	31.8	35.4	327	1,582
25–34 years	25.8	0.48	17.9	19.2	21.5	24.9	29.7	34.3	38.4	333	1,623
35–44 years	28.0	0.41	19.4	20.5	23.7	27.6	31.8	37.6	40.3	333	1,314
45–54 years	29.1	0.80	19.0	20.8	24.1	28.5	32.6	37.6	42.2	126	1,256
55–64 years	30.2	0.99	18.7	20.8	25.8	28.8	33.5	37.0	43.9	118	872
65–74 years	27.7	0.65	18.9	20.6	23.9	27.4	31.9	35.9	38.8	313	629

[1] Excludes "other" racial groups.

Table 2. Blood pressure levels for adult males ages 18–74 years within body mass index strata showing means and standard errors of means by race and age: United States, 1971–74

Pressure, race, and age	*Body mass index (kilograms/meters^2)*														
	Less than 22.008			*22.008–24.194*			*24.195–26.246*			*26.247–28.512*			*28.513 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Systolic															
Total[1]	125.6	0.89	1,065	127.6	0.72	1,062	130.9	0.78	1,030	133.1	0.80	977	140.4	1.03	1,014
Race															
White	124.9	0.91	827	127.0	0.71	893	130.5	0.83	882	132.9	0.79	887	140.1	1.03	839
Black	130.5	2.60	238	133.3	1.80	169	135.1	2.62	148	136.2	2.60	110	143.3	2.48	175
Age															
18–24 years	119.2	1.16	266	122.5	1.09	205	126.3	1.11	121	125.9	1.72	77	134.0	2.28	86
25–34 years	120.4	1.15	158	122.2	0.80	181	126.0	1.14	158	126.5	1.61	139	132.8	1.52	149
35–44 years	125.3	1.41	88	124.1	1.41	123	122.9	1.35	135	128.7	1.55	157	135.6	1.52	150
45–54 years	128.4	2.44	125	132.5	1.94	135	133.1	1.85	160	135.2	1.62	165	145.0	2.63	170
55–64 years	137.5	4.05	95	135.0	2.02	100	138.4	1.79	125	139.7	2.05	138	148.0	2.10	131
65–74 years	140.8	1.14	329	147.2	2.22	316	146.1	1.73	330	146.8	1.80	320	153.6	1.75	325
Diastolic															
Total[1]	78.5	0.52	1,065	79.8	0.50	1,062	83.3	0.49	1,031	84.6	0.44	977	90.8	0.59	1,013
Race															
White	77.9	0.53	827	79.3	0.50	893	82.8	0.54	883	84.5	0.41	887	90.5	0.64	839
Black	82.6	1.49	238	84.2	1.42	169	88.4	1.92	148	85.9	2.10	110	93.2	1.27	174
Age															
18–24 years	73.8	0.68	266	75.3	0.80	205	76.9	1.00	121	79.0	0.89	77	83.7	1.55	86
25–34 years	77.0	1.09	158	77.6	0.69	181	82.1	0.99	158	81.4	0.87	139	87.2	0.95	148
35–44 years	80.4	1.29	88	81.8	0.87	1,233	82.2	0.99	136	85.1	0.93	157	91.6	1.06	150
45–54 years	83.4	1.52	125	83.8	1.18	135	86.4	1.10	160	88.0	1.00	165	95.8	1.40	170
55–64 years	84.8	2.25	95	83.8	1.20	100	87.2	1.50	125	85.2	0.88	138	93.2	1.26	131
65–74 years	80.6	0.76	329	84.5	0.99	316	85.1	1.06	330	86.7	0.90	320	89.7	0.86	326

[1] Excludes "other" racial groups.

Table 3. Blood pressure levels for adult females ages 18–74 years within body mass index strata showing means and standard errors by race and age: United States, 1971–74

Pressure, race, and age	Body mass index (kilograms/meters²) Less than 20.637 Mean	Standard error of mean	Number of examinees	20.637–22.815 Mean	Standard error of mean	Number of examinees	22.816–25.315 Mean	Standard error of mean	Number of examinees	25.316–29.317 Mean	Standard error of mean	Number of examinees	29.318 or more Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Systolic															
Total[1]	117.1	0.70	1,663	121.9	0.70	1,649	127.8	0.74	1,649	133.8	0.93	1,651	144.0	1.17	1,651
Race															
White	116.9	0.72	1,413	121.7	0.65	1,460	127.4	0.74	1,386	133.4	1.12	1,299	143.7	1.31	1,167
Black	118.8	2.51	250	123.4	5.42	189	131.4	2.72	263	136.6	3.28	352	145.2	2.43	484
Age															
18–24 years	110.8	0.83	530	114.4	0.90	375	116.1	1.12	278	118.5	1.28	171	128.6	1.93	133
25–34 years	112.2	0.72	504	113.6	0.56	436	116.0	0.74	359	120.5	1.12	269	129.0	1.13	293
35–44 years	114.9	1.11	264	119.5	0.97	354	122.1	0.97	327	123.9	1.06	330	137.5	1.66	354
45–54 years	123.0	2.38	101	126.6	2.20	155	131.3	1.87	171	135.6	2.45	204	144.1	2.70	193
55–64 years	136.3	2.89	74	136.2	2.87	83	140.3	1.91	139	144.5	2.51	168	153.2	2.40	196
65–74 years	145.7	1.63	189	147.7	1.84	245	149.2	1.93	374	151.5	1.46	506	161.2	1.41	479
Diastolic															
Total[1]	73.4	0.52	1,662	76.1	0.40	1,649	78.4	0.47	1,648	82.4	0.47	1,651	89.6	0.60	1,651
Race															
White	73.2	0.52	1,413	76.0	0.40	1,460	78.2	0.47	1,386	82.0	0.58	1,299	89.2	0.61	1,167
Black	75.4	1.50	249	77.7	2.06	189	81.4	1.49	262	84.7	1.27	352	91.3	1.44	484
Age															
18–24 years	68.9	0.81	529	71.0	0.58	375	73.0	0.81	278	72.5	0.76	171	80.2	1.73	133
25–34 years	72.1	0.54	504	73.2	0.45	436	73.8	0.66	359	76.6	0.72	269	84.2	0.75	293
35–44 years	74.1	0.71	264	76.8	0.72	354	78.1	0.61	327	81.7	0.80	330	90.6	0.96	354
45–54 years	77.3	1.61	101	79.9	1.22	155	80.7	1.08	171	85.3	1.26	204	92.0	1.19	193
55–64 years	84.5	1.22	74	82.6	1.46	83	82.6	0.81	139	86.8	1.12	168	92.2	1.43	196
65–74 years	80.9	1.00	189	82.4	1.06	245	84.9	1.02	373	85.4	0.72	506	91.2	0.86	479

[1] Excludes "other" racial groups.

Table 4. Systolic blood pressure levels for adult males ages 18–74 years within total skinfold thickness strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race and age	*Total skinfold thickness (millimeters)*														
	Less than 16.5			*16.5–22.9*			*23.0–28.9*			*29.0–36.4*			*36.5 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	126.0	0.99	1,025	128.4	0.59	1,145	13.8	0.93	1,011	132.8	0.70	968	138.0	0.91	1,008
Race															
White	124.8	1.02	745	127.9	0.62	975	131.6	0.94	901	132.4	0.73	842	137.8	0.88	855
Black	131.8	2.33	280	134.3	2.83	170	135.7	2.30	110	138.0	2.55	126	140.1	3.25	153
Age															
18–24 years	119.7	1.38	260	122.2	0.79	179	123.4	1.54	116	126.6	1.48	88	132.3	1.54	111
25–34 years	121.5	1.14	145	121.6	0.99	182	126.1	1.08	150	126.4	1.38	134	131.3	1.53	169
35–44 years	125.3	1.58	100	125.4	1.73	133	125.9	1.22	128	128.1	1.67	149	133.4	1.69	144
45–54 years	128.6	2.40	114	132.1	1.94	165	135.7	2.00	148	134.5	1.13	152	141.8	2.19	178
55–64 years	138.3	4.09	92	136.1	1.82	131	139.9	2.39	124	140.9	1.79	123	146.1	2.04	113
65–74 years	142.2	1.80	314	145.5	1.70	355	146.4	1.64	345	147.8	2.40	322	152.1	1.34	293

[1] Excludes "other" racial groups.

Table 5. Diastolic blood pressure levels for adult males ages 18–74 years within total skinfold thickness strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race and age	Total skinfold thickness (millimeters)														
	Less than 16.5			*16.5–22.9*			*23.0–28.9*			*29.0–36.4*			*36.5 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	78.8	0.57	1,025	81.4	0.51	1,145	83.4	0.53	1,012	84.6	0.53	968	88.2	0.44	1,007
Race															
White	78.0	0.60	745	80.9	0.54	975	83.2	0.54	902	84.2	0.49	842	88.1	0.51	855
Black	82.9	1.31	280	87.1	*1.86	170	87.4	2.07	110	90.0	2.19	126	89.3	1.67	152
Age															
18–24 years	73.6	0.63	260	76.1	0.82	179	75.7	1.01	116	78.4	1.31	88	81.8	1.23	111
25–34 years	78.2	1.05	145	77.7	0.91	182	81.7	0.79	150	81.7	0.96	134	85.3	1.02	168
35–44 years	81.1	1.36	100	83.4	1.50	133	83.6	1.14	129	85.3	1.15	149	89.4	1.07	144
45–54 years	83.4	1.60	114	85.6	1.07	165	87.4	1.16	148	87.3	1.08	152	92.8	1.14	178
55–64 years	85.0	2.23	92	85.7	1.18	131	86.2	1.18	124	88.1	1.32	123	89.3	1.49	113
65–74 years	82.0	0.66	314	84.4	1.03	355	85.7	0.83	345	86.0	1.15	322	88.6	0.67	293

[1] Excludes "other" racial groups.

Table 6. Systolic blood pressure levels for adult females ages 18–74 years within total skinfold thickness strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race and age	Total skinfold thickness (millimeters)														
	Less than 26.5			*26.5–34.9*			*35.0–44.4*			*44.5–56.9*			*57.0 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	118.8	0.63	1,644	123.3	0.77	1,711	127.1	0.65	1,609	132.6	0.93	1,665	140.9	1.05	1,621
Race															
White	118.7	0.59	1,359	123.2	0.82	1,490	126.7	0.66	1,398	132.6	0.99	1,333	139.7	1.20	1,139
Black	120.3	2.59	285	124.7	2.25	221	132.5	4.66	211	132.8	1.64	332	146.3	3.08	482
Age															
18–24 years	110.0	0.75	506	114.9	0.90	379	115.9	0.78	262	117.8	1.13	195	126.0	1.78	149
25–34 years	113.1	0.60	460	113.0	0.66	430	116.2	0.69	334	119.6	1.00	319	127.2	1.05	317
35–44 years	118.9	1.18	268	118.1	1.17	307	120.7	1.10	315	124.6	1.04	340	133.9	1.51	397
45–54 years	125.6	2.58	100	125.4	1.91	126	129.9	2.50	166	133.2	2.05	204	143.5	2.55	224
55–64 years	134.9	2.56	83	142.7	2.70	113	138.7	1.63	107	143.7	2.80	171	153.5	2.33	187
65–74 years	150.1	2.35	227	147.4	1.41	356	150.1	1.13	425	155.8	1.76	436	158.9	2.23	347

[1] Excludes "other" racial groups.

Table 7. Diastolic blood pressure levels for adult females ages 18–74 years within total skinfold thickness strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race and age	Total skinfold thickness (millimeters)														
	Less than 26.5			26.5–34.9			35.0–44.4			44.5–56.9			57.0 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	73.9	0.48	1,643	76.3	0.37	1,711	78.9	0.39	1,608	81.9	0.54	1,665	87.8	0.49	1,621
Race															
White	73.7	0.49	1,359	76.2	0.39	1,490	78.6	0.39	1,398	81.6	0.61	1,333	87.1	0.54	1,139
Black	76.0	1.48	284	77.5	1.12	221	82.3	1.66	210	84.1	1.22	332	91.0	1.22	482
Age															
18–24 years	68.3	0.69	505	70.8	0.55	379	72.6	0.49	262	73.6	0.65	195	78.4	1.50	149
25–34 years	71.7	0.54	460	73.0	0.54	430	74.9	0.48	334	76.2	0.83	319	83.0	0.63	317
35–44 years	75.5	0.85	268	76.5	0.75	307	78.3	0.63	315	81.4	0.70	340	87.9	0.91	397
45–54 years	78.3	1.43	100	78.6	1.51	126	81.6	1.34	166	84.1	1.08	204	90.0	1.01	224
55–64 years	84.8	1.20	83	84.0	1.01	113	83.8	1.25	107	85.6	1.60	171	92.2	1.29	187
65–74 years	83.5	0.97	277	83.3	0.90	356	85.1	0.96	424	87.8	0.82	436	89.4	1.16	347

[1] Excludes "other" racial groups.

Table 8. Systolic blood pressure levels for adult males ages 18–74 years within total 24-hour caloric intake strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Total dietary calories (per day)											
	Less than 1,451.0			1,451.0–2,226.9			2,227.0–3,430.8			3,430.9 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	133.8	1.61	465	132.3	0.91	1,082	128.1	0.78	1,080	125.2	0.70	464
Race												
White	133.0	1.74	360	132.1	0.93	921	127.9	0.73	953	125.0	0.68	416
Black	138.9	5.01	105	134.1	3.12	161	130.0	2.33	127	127.9	3.93	48
Age												
18–24 years	127.4	2.69	27	126.7	1.68	92	123.1	1.04	228	120.8	1.10	157
25–34 years	126.0	1.95	34	124.5	1.17	135	125.3	1.00	234	123.8	1.22	122
35–44 years	127.2	2.36	37	127.9	1.94	121	125.0	1.13	189	126.5	1.94	67
45–54 years	132.5	3.82	59	134.6	2.22	182	133.8	1.59	170	129.8	1.56	52
55–64 years	137.8	3.32	62	137.4	2.67	137	136.9	1.94	92	139.3	4.11	33
65–74 years	143.0	1.98	246	143.6	1.83	415	141.9	2.96	167	146.4	4.82	33
BMI												
1st quartile	131.4	3.46	117	126.0	1.89	255	123.7	1.29	259	119.3	1.29	143
2d quartile	131.1	2.19	103	130.6	1.82	240	126.3	0.98	302	125.1	1.21	129
3d quartile	130.1	1.86	109	130.8	1.37	284	130.9	1.19	275	128.0	1.07	104
4th quartile	140.2	3.35	136	139.0	1.74	303	131.9	1.46	244	131.3	2.10	88

[1] Excludes "other" racial groups.

Table 9. Diastolic blood pressure levels for adult males ages 18–74 years within total 24-hour caloric intake strata showing means and standard errors, by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Total dietary calories (per day)											
	Less than 1,451.0			1,451.0–2,226.9			2,227.0–3,430.8			3,430.9 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	84.2	0.90	465	83.0	0.66	1,081	81.6	0.49	1,081	80.0	0.66	464
Race												
White	83.5	0.83	360	83.0	0.70	921	81.6	0.48	954	79.8	0.70	416
Black	88.4	3.31	105	83.2	1.68	161	82.7	1.47	127	82.2	1.53	48
Age												
18–24 years	79.2	1.83	27	76.8	1.29	92	76.3	0.73	228	75.1	1.04	157
25–34 years	83.1	1.82	34	78.0	0.92	135	80.6	0.71	234	79.9	1.08	122
35–44 years	81.5	1.85	37	84.5	1.40	121	82.8	0.95	190	84.0	1.30	67
45–54 years	85.3	2.10	59	87.1	1.15	182	87.1	0.95	170	85.7	1.45	52
55–64 years	86.6	1.35	62	85.3	1.37	137	84.2	1.24	92	88.1	3.34	33
65–74 years	85.1	1.26	246	83.9	1.01	415	81.9	1.02	167	83.6	2.10	33
BMI												
1st quartile	81.5	2.27	117	78.3	1.05	255	77.7	0.93	259	75.1	1.00	143
2d quartile	82.1	1.67	103	80.4	1.10	240	79.8	0.63	302	79.0	1.21	129
3d quartile	81.7	1.02	109	83.9	0.84	284	84.1	0.83	276	82.1	1.00	104
4th quartile	89.4	0.93	136	87.3	1.08	303	85.7	0.91	244	86.9	1.39	88

[1] Excludes "other" racial groups.

Table 10. Systolic blood pressure levels for adult females ages 18–74 years within total 24-hour caloric intake strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Total dietary calories (per day): Less than 1,004.8			1,004.8–1,525.4			1,525.5–2,254.5			2,254.6 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	128.9	1.50	666	124.9	0.86	1,567	121.7	0.63	1,571	118.5	0.99	670
Race												
White	126.6	1.27	519	125.0	0.91	1,346	121.6	0.68	1,361	118.8	1.06	559
Black	142.3	6.13	147	122.9	1.82	221	123.2	1.61	210	115.6	2.53	111
Age												
18–24 years	113.5	1.96	94	113.4	0.87	295	114.4	0.80	356	113.8	1.50	215
25–34 years	116.7	1.25	138	116.1	0.80	373	116.0	0.75	440	114.5	1.34	202
35–44 years	124.5	2.19	141	121.1	1.07	338	119.4	1.28	365	118.9	1.52	129
45–54 years	134.2	5.29	91	130.4	1.76	166	127.1	1.63	146	123.9	2.72	68
55–64 years	143.6	4.87	54	139.1	2.13	119	133.7	2.23	84	132.0	4.59	21
65–74 years	150.0	2.50	148	144.5	2.10	276	144.5	1.86	180	146.2	3.39	35
Male												
18–24 years	125.7	2.28	52	123.1	1.19	178	121.6	1.29	182	125.0	1.35	92
25–34 years	123.4	1.67	56	124.1	1.25	226	126.1	1.30	168	124.9	2.09	75
35–44 years	122.5	2.16	41	127.8	1.86	138	125.9	1.48	169	126.3	1.98	66
45–54 years	129.8	2.11	44	134.3	2.03	162	134.0	1.66	177	133.0	2.79	80
55–64 years	135.9	5.06	47	140.5	2.23	95	136.9	2.64	123	134.9	2.46	59
65–74 years	140.8	2.84	112	140.8	1.90	301	144.8	2.06	318	148.1	3.69	130
Female												
18–24 years	113.1	1.25	147	114.9	1.02	292	111.6	0.90	322	116.5	1.19	199
25–34 years	113.0	1.20	181	115.4	0.82	397	116.6	0.68	411	118.4	1.49	164
35–44 years	117.7	1.67	152	120.6	1.16	361	121.5	1.02	335	122.0	2.82	126
45–54 years	126.3	2.08	110	126.0	1.54	166	135.3	2.80	143	126.6	2.66	52
55–64 years	138.5	3.71	56	130.7	2.17	106	140.8	2.68	94	144.2	4.57	22
65–74 years	143.2	2.79	138	143.3	1.69	228	149.9	2.17	206	147.5	2.75	67
BMI												
1st quartile	124.8	3.93	98	116.0	1.58	320	114.2	0.97	459	113.6	1.39	243
2d quartile	119.5	1.75	129	120.9	0.98	382	120.5	0.87	432	117.7	1.44	175
3d quartile	124.9	2.17	183	125.4	1.14	451	124.9	1.17	350	120.8	2.14	135
4th quartile	140.2	2.67	256	135.1	1.36	414	131.7	1.33	330	127.6	2.41	117

[1] Excludes "other" racial groups.

Table 11. Diastolic blood pressure levels for adult females ages 18–74 years within total 24-hour caloric intake strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Total dietary calories (per day): Less than 1,004.8			1,004.8–1,525.4			1,525.5–2,254.5			2,254.6 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	79.9	0.77	666	77.9	0.50	1,567	76.5	0.45	1,571	74.6	0.56	670
Race												
White	78.9	0.79	519	77.8	0.55	1,346	76.3	0.48	1,361	74.7	0.60	559
Black	85.8	1.77	147	78.9	0.94	221	79.3	1.10	210	73.2	1.48	111
Age												
18–24 years	72.5	1.18	94	70.5	0.68	295	70.7	0.81	356	70.4	0.96	215
25–34 years	76.3	1.15	138	74.6	0.60	373	74.5	0.57	440	73.1	0.91	202
35–44 years	80.4	1.26	141	78.2	0.63	338	77.4	0.71	365	77.0	0.86	129
45–54 years	82.3	2.04	91	81.7	1.28	166	79.6	1.19	146	79.0	1.67	68
55–64 years	84.8	1.60	54	84.3	0.94	119	83.6	1.54	84	79.6	2.05	21
65–74 years	84.9	1.51	148	82.7	1.00	276	82.6	0.91	180	84.2	2.33	35
Male												
18–24 years	77.6	2.30	52	75.7	0.83	178	75.0	0.99	182	78.1	0.85	92
25–34 years	79.9	0.83	56	79.9	0.81	226	79.7	0.79	168	80.2	1.37	75
35–44 years	81.8	2.00	41	82.5	1.34	138	84.2	1.02	170	83.9	1.96	66
45–54 years	84.3	1.50	44	86.9	1.01	162	87.3	1.07	177	86.6	1.89	80
55–64 years	85.4	2.39	47	87.1	1.17	95	85.6	1.47	123	82.6	1.61	59
65–74 years	83.4	1.25	112	82.6	0.77	301	84.0	1.24	318	86.9	1.95	130
Female												
18–24 years	70.8	0.86	147	70.8	0.73	292	69.8	0.81	322	72.3	0.86	199
25–34 years	72.8	0.78	181	73.7	0.48	397	75.4	0.51	411	76.1	1.19	164
35–44 years	77.5	1.27	152	77.9	0.71	361	78.0	0.62	335	79.2	1.62	126
45–54 years	79.7	1.64	110	80.1	1.30	166	82.7	1.10	143	79.3	2.05	52
55–64 years	85.1	1.64	56	81.7	0.92	106	84.9	1.66	94	86.0	2.35	22
65–74 years	82.2	1.50	138	82.9	0.89	228	84.3	1.05	206	83.3	2.21	67
BMI												
1st quartile	77.8	2.01	98	72.1	0.92	320	72.4	0.81	459	71.6	0.90	243
2d quartile	75.6	0.75	129	75.9	0.66	382	75.6	0.52	432	73.4	0.80	175
3d quartile	77.0	1.04	183	78.0	0.72	451	77.5	0.70	350	75.1	1.21	135
4th quartile	86.0	1.26	256	84.2	0.87	414	83.2	0.84	330	82.5	1.28	117

[1] Excludes "other" racial groups.

Table 12. Systolic blood pressure levels for adults ages 18–74 years within strata of weekly ethanol consumption showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Ethanol consumption (ounces/week)											
	Abstainers (0)			*Light (0.001–0.999)*			*Moderate (1.000–6.999)*			*Heavy (7.000 or more)*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	128.7	0.92	2,198	122.9	0.51	2,919	126.0	0.60	2,339	130.6	1.02	566
Sex												
Male	130.3	1.15	673	127.3	0.65	990	128.7	0.70	1,290	131.3	1.23	450
Female	127.9	1.00	1,525	119.6	0.62	1,929	121.2	0.85	1,049	126.3	3.35	116
Race												
White	128.6	0.93	1,784	122.8	0.54	2,477	125.4	0.58	2,003	130.2	1.11	479
Black	130.0	3.56	414	124.4	1.56	442	133.2	2.95	336	135.3	3.61	87
Age												
Total												
18–24 years	118.1	1.19	324	116.8	0.58	757	120.0	0.97	451	124.4	1.91	96
25–34 years	120.6	1.10	339	118.2	0.61	771	121.2	0.69	603	124.8	1.61	124
35–44 years	123.4	1.24	377	122.6	0.91	523	122.3	0.91	486	128.1	1.70	111
45–54 years	130.4	2.33	265	128.8	1.41	280	131.9	1.53	316	133.3	2.60	102
55–64 years	138.9	1.70	216	134.3	1.65	196	136.2	1.62	167	149.3	4.67	44
65–74 years	145.9	1.28	677	143.4	1.39	392	143.9	1.62	316	145.2	4.48	89
Male												
18–24 years	124.6	2.33	73	122.5	0.80	216	122.7	1.20	237	124.6	2.07	77
25–34 years	126.5	1.84	62	122.7	1.02	186	124.8	0.96	292	126.1	1.71	87
35–44 years	124.0	2.25	65	127.2	1.64	125	124.7	0.92	209	128.7	1.82	85
45–54 years	128.4	2.72	96	131.6	1.51	115	134.1	1.50	214	135.3	2.38	86
55–64 years	136.9	2.76	83	132.8	2.23	102	139.0	2.25	111	150.7	4.72	37
65–74 years	144.0	1.68	294	145.1	2.18	246	143.0	2.08	227	145.4	3.88	78
Female												
18–24 years	114.3	1.23	251	112.8	0.62	541	114.7	1.39	214	122.5	3.24	19
25–34 years	117.6	1.34	277	115.0	0.59	585	114.4	0.94	311	115.6	2.43	37
35–44 years	123.1	1.42	312	119.3	0.95	398	118.7	1.23	277	123.8	3.42	26
45–54 years	131.5	2.61	169	127.0	1.86	165	127.3	3.50	102	124.1	6.15	16
55–64 years	140.1	2.04	133	136.0	2.75	94	131.7	2.06	56	144.1	9.39	7
65–74 years	147.1	1.59	383	141.0	1.47	146	145.7	2.57	89	144.3	9.13	11
BMI												
Male												
1st quartile	125.2	2.22	191	121.1	1.27	278	123.9	0.93	349	128.8	1.79	142
2d quartile	128.1	1.46	168	126.4	0.99	258	127.9	1.45	378	126.2	1.47	109
3d quartile	130.9	1.73	160	128.1	1.14	250	131.2	0.93	304	133.4	1.52	105
4th quartile	139.1	2.19	154	136.0	1.59	204	132.7	1.22	259	139.0	2.45	94
Female												
1st quartile	119.9	1.33	370	113.4	0.90	678	115.2	1.08	372	117.9	4.13	34
2d quartile	126.6	2.12	379	117.7	0.80	545	118.9	0.98	305	120.9	3.52	35
3d quartile	129.8	1.25	402	123.5	0.94	419	127.8	2.97	235	129.4	3.94	30
4th quartile	137.1	1.75	374	132.8	1.66	287	135.2	2.82	137	144.4	10.80	17

[1] Excludes "other" racial groups.

Table 13. Diastolic blood pressure levels for adults ages 18–74 years within strata of weekly ethanol consumption showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	*Ethanol consumption (ounces/week)*											
	Abstainers (0)			*Light (0.001–0.999)*			*Moderate (1.000–6.999)*			*Heavy (7.000 or more)*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	80.2	0.49	2,198	77.7	0.38	2,919	80.3	0.35	2,339	83.4	0.62	566
Sex												
Male	82.1	0.83	673	80.6	0.44	991	82.3	0.43	1,290	83.9	0.80	450
Female	79.2	0.44	1,525	75.5	0.49	1,928	76.6	0.49	1,049	80.0	1.96	116
Race												
White	79.9	0.48	1,784	77.6	0.40	2,478	79.9	0.36	2,003	83.1	0.68	479
Black	82.4	1.64	414	78.9	0.92	441	84.4	1.29	336	86.0	2.01	87
Age												
Total												
18–24 years	72.7	0.83	324	72.1	0.51	756	74.4	0.50	451	77.9	1.06	96
25–34 years	78.0	0.63	339	75.8	0.46	771	77.8	0.48	603	80.9	1.26	124
35–44 years	81.0	0.66	377	79.4	0.63	524	81.2	0.58	486	84.6	1.52	111
45–54 years	82.8	1.10	265	82.4	0.92	280	85.4	0.89	316	85.0	1.55	102
55–64 years	84.6	1.02	216	84.7	0.87	176	83.8	0.90	167	92.2	2.80	44
65–74 years	83.3	0.88	677	84.3	0.81	392	84.0	0.87	316	85.9	1.63	89
Male												
18–24 years	75.7	1.63	73	75.3	0.72	216	76.2	0.77	237	78.1	1.14	–
25–34 years	81.1	1.43	62	79.0	0.66	186	80.1	0.57	292	81.7	1.44	87
35–44 years	82.0	1.78	65	82.7	1.21	126	83.8	0.77	209	85.3	1.61	85
45–54 years	84.6	1.73	96	85.1	0.90	115	87.6	0.89	214	86.8	1.32	86
55–64 years	85.4	1.62	83	84.7	1.36	102	84.4	1.19	111	91.8	3.00	37
65–74 years	84.4	1.13	294	85.4	0.96	246	84.5	1.15	227	85.0	1.60	78
Female												
18–24 years	70.9	0.72	251	69.9	0.62	540	70.9	0.79	214	75.4	1.38	19
25–34 years	76.5	0.73	277	73.6	0.53	585	73.4	0.75	311	75.2	1.48	37
35–44 years	80.5	0.86	312	77.0	0.71	398	77.4	0.74	277	79.8	3.00	26
45–54 years	81.9	1.19	169	80.6	1.21	165	80.6	1.51	102	76.7	3.95	16
55–64 years	84.1	1.10	133	84.8	1.09	94	82.8	1.05	56	93.5	4.47	7
65–74 years	82.8	1.05	383	82.8	1.11	146	83.0	1.03	89	89.5	4.41	11
BMI												
Male												
1st quartile	76.8	1.59	191	75.8	0.90	278	78.0	0.77	349	82.4	1.20	142
2d quartile	81.2	1.04	168	79.4	0.80	258	80.7	0.74	378	79.1	1.33	109
3d quartile	83.0	0.97	160	82.0	0.78	251	84.3	0.76	304	86.0	1.14	105
4th quartile	89.2	1.34	154	86.8	1.11	204	87.2	0.74	259	89.9	1.63	94
Female												
1st quartile	74.9	0.71	370	71.5	0.72	677	72.6	0.86	372	76.6	2.18	34
2d quartile	76.9	0.85	379	73.9	0.51	545	76.6	0.62	305	75.9	3.66	35
3d quartile	80.6	0.73	402	77.4	0.67	419	79.0	1.08	235	81.8	2.52	30
4th quartile	85.9	0.91	374	85.3	0.86	287	85.6	1.15	137	89.7	5.30	17

[1] Excludes "other" racial groups.

Table 14. Systolic blood pressure levels of adults ages 18–74 years within strata of daily alcoholic beverage consumption showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile strata	Calories from alcoholic beverages (per day)								
	Less than 1.0			1.0–249.9			250.0 or more		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	125.4	0.49	7,404	124.9	0.90	979	127.8	0.86	994
Sex									
Male	128.5	0.64	2,630	128.6	1.05	428	129.1	0.83	708
Female	122.9	0.53	4,774	120.6	1.27	551	122.2	1.81	286
Race									
White	125.0	0.54	6,140	124.7	0.83	871	127.6	0.86	853
Black	128.7	1.65	1,264	127.7	3.18	108	129.6	2.60	141
Age									
Total									
18–24 years	117.6	0.53	1,621	118.6	1.39	148	122.1	1.16	205
25–34 years	119.8	0.52	1,673	117.9	1.08	246	122.7	1.09	246
35–44 years	122.7	0.71	1,306	122.8	1.56	206	125.2	1.00	218
45–54 years	130.6	1.13	837	127.6	2.18	133	134.7	2.04	136
55–64 years	136.0	1.13	569	137.6	3.16	74	139.6	3.05	64
65–74 years	145.5	1.19	1,398	141.1	2.02	172	146.1	2.21	125
Male									
18–24 years	122.4	0.74	479	124.7	1.54	63	124.0	1.08	140
25–34 years	124.6	0.74	440	123.0	1.91	73	124.2	1.23	164
35–44 years	125.4	1.13	321	127.7	2.21	74	126.0	1.07	133
45–54 years	132.1	1.53	365	129.6	2.39	70	136.8	1.95	113
55–64 years	136.4	1.56	279	137.3	3.11	41	141.2	4.06	51
65–74 years	144.4	1.43	746	139.1	2.16	107	145.5	1.82	107
Female									
18–24 years	114.0	0.54	1,142	111.2	1.96	85	114.4	2.40	65
25–34 years	116.2	0.52	1,233	113.3	1.17	173	114.6	1.32	82
35–44 years	120.7	0.71	985	116.9	1.47	132	122.4	2.50	85
45–54 years	129.4	1.21	472	125.5	3.14	63	124.6	4.39	23
55–64 years	135.7	1.50	290	138.0	4.85	33	135.9	3.55	13
65–74 years	146.4	1.34	652	143.7	3.41	65	149.2	7.56	18
BMI									
Male									
1st quartile	122.8	1.07	676	125.1	2.46	105	126.2	1.54	161
2d quartile	126.7	0.83	643	126.2	1.36	113	125.7	1.05	186
3d quartile	129.3	1.08	655	128.7	1.71	103	130.5	1.30	183
4th quartile	135.3	1.14	655	133.7	1.71	107	134.2	1.68	178
Female									
1st quartile	115.2	0.81	1,142	113.3	1.70	181	115.8	3.31	82
2d quartile	119.5	0.73	1,181	117.6	1.72	145	122.6	1.96	75
3d quartile	124.2	0.81	1,208	123.8	2.33	129	121.1	4.26	68
4th quartile	133.2	0.97	1,243	133.6	2.60	96	132.4	3.52	61

[1] Excludes "other" racial groups.

Table 15. Diastolic blood pressure levels of adults ages 18–74 years within strata of daily alcoholic beverage consumption showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile strata	*Calories from alcoholic beverages (per day)*								
	Less than 1.0			*1.0–249.9*			*250.0 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	78.8	0.27	7,404	79.2	0.69	979	82.1	0.53	994
Sex									
Male	81.3	0.35	2,631	82.2	0.80	428	83.0	0.58	708
Female	77.0	0.35	4,773	75.8	0.93	551	78.4	1.05	286
Race									
White	78.5	0.30	6,141	79.0	0.65	871	82.1	0.56	853
Black	81.5	0.86	1,263	82.4	*1.80	108	82.1	1.30	141
Age									
Total									
18–24 years	72.7	0.37	1,620	74.1	1.36	148	76.7	0.95	205
25–34 years	76.7	0.32	1,673	74.7	0.66	246	81.4	0.72	246
35–44 years	80.5	0.42	1,307	80.7	0.84	206	81.5	0.82	218
45–54 years	83.1	0.63	837	82.5	1.62	133	87.4	1.21	136
55–64 years	84.3	0.63	569	84.3	1.89	74	85.1	2.04	64
65–74 years	83.6	0.64	1,398	83.5	1.04	172	85.1	1.16	125
Male									
18–24 years	75.2	0.50	479	78.7	1.41	63	77.6	1.10	140
25–34 years	79.3	0.66	440	77.7	1.32	73	82.6	0.75	164
35–44 years	83.9	0.80	322	83.8	1.29	74	82.2	0.96	133
45–54 years	85.5	0.73	365	85.5	1.85	70	89.2	1.10	113
55–64 years	85.4	0.93	279	85.3	2.03	41	84.0	2.58	51
65–74 years	84.1	0.72	746	83.5	1.41	107	85.4	1.18	107
Female									
18–24 years	70.7	0.46	1,141	68.5	1.69	85	73.2	1.56	65
25–34 years	74.7	0.41	1,233	72.0	0.90	173	74.9	0.86	82
35–44 years	78.0	0.52	985	77.0	1.13	132	79.3	1.56	85
45–54 years	81.3	0.76	472	79.2	1.98	63	78.7	2.76	23
55–64 years	83.2	0.77	290	82.9	2.41	33	87.6	1.99	13
65–74 years	83.1	0.73	652	83.4	1.43	65	83.4	2.47	18
BMI									
Male									
1st quartile	76.6	0.68	676	79.3	1.48	105	80.4	1.07	161
2d quartile	79.1	0.49	643	79.2	0.96	113	79.4	0.93	186
3d quartile	82.9	0.55	656	82.1	1.09	103	84.4	0.90	183
4th quartile	86.5	0.62	655	87.4	1.31	107	87.8	0.82	178
Female									
1st quartile	72.2	0.58	1,141	71.3	1.04	181	74.8	1.86	82
2d quartile	74.8	0.42	1,181	73.9	1.26	145	81.3	1.41	75
3d quartile	77.3	0.51	1,208	76.9	1.37	129	75.6	2.53	68
4th quartile	83.8	0.53	1,243	84.6	1.63	96	82.5	1.38	61

[1] Excludes "other" racial groups.

Table 16. Systolic blood pressure levels of adults ages 18–74 years within strata of table salt shaker use showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile strata	Table salt shaker use								
	Rarely/never			Occasionally/seldom			Frequently/always		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	127.8	0.60	3,547	126.0	0.69	2,121	124.8	0.40	3,248
Sex									
Male	131.0	0.75	1,096	129.6	0.80	853	126.2	0.47	1,832
Female	125.8	0.69	2,451	122.7	0.92	1,268	120.0	0.66	1,654
Race									
White	127.2	0.62	2,871	125.9	0.70	1,834	124.4	0.43	2,896
Black	132.0	1.97	676	127.6	1.77	287	128.2	2.47	451
Age									
Total									
18–24 years	117.8	0.88	473	118.8	1.09	353	118.4	0.60	706
25–34 years	120.0	0.74	758	118.3	0.95	475	120.8	0.55	930
35–44 years	121.8	0.82	696	123.3	1.04	418	124.2	0.87	618
45–54 years	131.4	1.44	458	130.9	1.50	264	130.0	1.28	379
55–64 years	137.7	1.49	340	136.7	1.88	166	135.1	1.87	202
65–74 years	145.6	1.33	822	143.8	1.56	445	144.8	1.65	427
Male									
18–24 years	123.5	1.85	100	123.0	1.73	107	123.0	0.86	266
25–34 years	126.7	1.21	166	120.7	1.39	144	124.6	0.70	365
35–44 years	124.3	1.25	134	127.4	1.48	122	126.2	0.98	274
45–54 years	133.2	2.01	168	136.4	2.35	120	131.0	1.11	256
55–64 years	138.6	1.97	141	137.4	1.95	94	135.9	2.30	136
65–74 years	143.6	1.94	387	142.6	2.08	266	121.7	1.09	541
Female									
18–24 years	114.4	0.66	373	115.0	1.08	246	113.0	1.00	440
25–34 years	115.8	0.74	592	116.3	0.83	331	115.4	1.81	565
35–44 years	120.5	0.90	562	119.9	1.28	296	120.5	1.22	344
45–54 years	130.5	1.60	290	125.5	1.80	144	127.8	2.85	123
55–64 years	137.1	1.89	199	135.9	3.53	72	133.4	2.88	66
65–74 years	147.1	1.70	435	145.1	2.06	179	144.6	3.21	120
BMI									
Male									
1st quartile	125.1	1.44	275	122.8	1.57	236	124.4	1.02	498
2d quartile	130.1	1.25	270	129.0	1.73	220	125.5	0.66	465
3d quartile	130.4	1.62	272	132.7	1.52	222	129.5	0.79	433
4th quartile	138.2	1.58	279	135.7	1.70	175	133.6	1.18	307
Female									
1st quartile	117.3	0.81	600	116.2	1.22	381	115.0	0.91	699
2d quartile	124.3	1.30	647	120.1	0.90	374	117.1	0.84	481
3d quartile	127.8	1.12	662	124.5	1.83	277	126.3	2.20	364
4th quartile	135.8	1.34	542	135.4	2.30	236	132.3	2.09	224

[1] Excludes "other" racial groups.

Table 17. Diastolic blood pressure levels of adults ages 18–74 years within strata of table salt shaker use showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile strata	Table salt shaker use: Rarely/never			Occasionally/seldom			Frequently/always		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	80.2	0.42	3,546	79.4	0.45	2,121	79.7	0.27	3,249
Sex									
Male	82.6	0.65	1,096	82.1	0.57	853	80.5	0.30	1,833
Female	78.8	0.44	2,450	76.8	0.54	1,268	75.9	0.43	1,654
Race									
White	79.8	0.43	2,871	79.3	0.48	1,834	79.3	0.30	2,897
Black	83.5	1.12	–	81.0	0.77	287	82.3	1.30	451
Age									
Total									
18–24 years	73.0	0.74	472	74.0	0.83	353	73.9	0.48	706
25–34 years	77.1	0.49	758	76.0	0.55	475	77.8	0.39	930
35–44 years	79.7	0.66	696	80.4	0.66	418	81.7	0.45	619
45–54 years	83.4	0.78	458	83.2	1.09	264	84.1	0.81	379
55–64 years	84.5	0.88	340	83.2	1.00	166	84.9	0.93	202
65–74 years	83.8	0.69	822	83.4	0.81	445	83.8	0.92	427
Male									
18–24 years	76.7	1.87	100	76.4	1.31	107	76.4	0.70	266
25–34 years	80.5	0.76	166	77.9	0.94	144	80.6	0.54	365
35–44 years	82.8	1.37	134	83.8	1.11	122	83.7	0.54	275
45–54 years	85.5	1.23	168	87.6	1.44	120	86.3	0.75	256
55–64 years	85.6	1.51	141	85.0	1.16	94	84.9	1.07	136
65–74 years	84.3	0.93	387	83.9	1.06	266	73.4	0.77	541
Female									
18–24 years	70.8	0.62	372	71.9	0.81	246	70.9	0.57	440
25–34 years	75.0	0.58	592	74.5	0.56	331	73.8	0.49	565
35–44 years	78.2	0.63	562	77.6	0.87	296	78.1	0.80	344
45–54 years	82.4	0.90	290	79.0	1.27	144	79.6	1.41	123
55–64 years	83.7	1.04	199	80.9	1.54	72	85.0	1.70	66
65–74 years	83.4	0.80	435	82.8	1.17	179	82.8	1.69	120
BMI									
Male									
1st quartile	76.9	1.29	275	76.8	0.91	236	78.7	0.53	498
2d quartile	82.0	0.87	270	81.3	0.90	220	79.3	0.61	465
3d quartile	83.2	0.66	272	84.2	0.79	222	83.4	0.52	434
4th quartile	88.4	1.20	279	88.1	0.98	175	87.2	0.76	307
Female									
1st quartile	74.1	0.61	599	72.7	0.59	381	72.6	0.63	699
2d quartile	77.1	0.66	647	75.4	0.61	374	74.1	0.64	481
3d quartile	79.6	0.67	662	78.0	0.86	277	78.4	0.89	364
4th quartile	85.8	0.75	542	84.4	1.09	236	85.3	1.08	224

[1] Excludes "other" racial groups.

Table 18. Systolic blood pressure levels of adult males ages 18–74 years within dietary sodium strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Dietary sodium (milligrams/day) Less than 982.6			982.6–1,883.9			1,884.0–3,436.7			3,436.8 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	131.5	1.13	495	131.0	0.73	1,098	128.8	0.84	1,048	126.7	0.80	438
Race												
White	131.5	1.18	381	130.9	0.79	928	128.5	0.86	929	126.7	0.81	401
Black	137.6	3.93	114	131.8	2.10	170	132.5	3.22	119	126.8	3.68	37
Age												
18–24 years	127.2	2.94	49	125.7	1.36	139	122.0	1.16	181	121.2	1.50	133
25–34 years	125.4	2.42	58	125.0	1.02	174	123.1	1.11	199	127.5	1.49	91
35–44 years	124.0	3.47	48	127.8	1.95	135	126.7	1.45	156	124.6	1.43	75
45–54 years	133.4	3.16	77	133.0	1.90	160	135.2	1.76	175	130.0	1.93	53
55–64 years	135.9	3.10	65	139.7	2.13	115	135.4	2.33	106	138.4	3.39	38
65–74 years	142.8	2.24	198	140.7	1.54	383	147.2	2.46	231	142.4	3.39	48
BMI												
1st quartile	127.5	2.69	119	126.9	1.67	249	122.5	1.25	282	121.4	1.21	122
2d quartile	128.3	1.85	110	128.1	1.55	280	127.7	0.93	263	126.2	1.49	119
3d quartile	129.8	1.86	109	131.1	1.35	291	129.9	1.31	267	129.6	1.16	104
4th quartile	138.4	2.36	157	136.2	1.33	282	136.3	1.62	236	130.4	1.87	93

[1] Excludes "other" racial groups.

Table 19. Systolic blood pressure levels of adult females ages 18–74 years within dietary sodium strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Dietary sodium (milligrams/day)											
	Less than 982.6			*982.6–1,883.9*			*1,884.0–3,436.7*			*3,436.8 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	124.6	1.26	710	124.1	0.71	1,588	122.4	0.77	1,527	121.6	0.92	647
Race												
White	124.2	1.22	557	123.3	0.75	1,313	122.5	0.81	1,347	121.9	0.92	566
Black	127.1	3.51	153	131.7	4.68	275	121.8	1.71	180	117.7	3.50	81
Age												
18–24 years	113.7	1.34	142	112.6	0.89	297	115.1	1.00	333	113.9	1.57	187
25–34 years	113.6	1.36	159	115.9	0.89	390	116.4	0.78	407	116.2	1.11	196
35–44 years	123.8	1.91	132	119.3	1.24	351	120.7	1.24	360	119.7	1.53	132
45–54 years	127.3	2.62	95	130.6	2.56	161	126.1	1.85	158	132.5	3.04	57
55–64 years	141.2	4.51	56	136.8	2.30	108	138.0	3.26	91	133.1	4.34	23
65–74 years	145.7	2.55	126	146.8	1.98	284	143.0	2.11	178	147.4	2.63	52
BMI												
1st quartile	117.9	2.61	118	114.2	1.29	369	116.1	1.36	428	114.9	1.69	204
2d quartile	120.5	1.32	158	119.3	1.01	389	120.1	1.11	393	120.8	1.29	179
3d quartile	124.9	2.47	201	126.4	1.25	412	122.8	1.18	366	122.8	2.19	140
4th quartile	132.1	2.20	233	136.8	1.85	419	133.1	1.90	340	132.6	1.97	124

[1] Excludes "other" racial groups.

Table 20. Diastolic blood pressure levels of adult males ages 18–74 years within dietary sodium strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Dietary sodium (milligrams/day)											
	Less than 982.6			982.6–1,883.9			1,884.0–3,436.7			3,436.8 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	83.2	0.61	495	82.5	0.53	1,098	81.8	0.49	1,048	80.9	0.60	439
Race												
White	82.7	0.66	381	82.5	0.56	928	81.5	0.51	929	81.0	0.61	402
Black	86.1	2.56	114	82.4	1.70	170	85.2	1.66	119	79.5	2.05	37
Age												
18–24 years	76.9	1.78	49	78.2	1.02	139	74.9	0.75	181	75.5	1.00	133
25–34 years	80.7	1.40	58	79.2	0.60	174	80.0	0.91	199	80.7	1.21	91
35–44 years	82.0	2.46	48	82.8	1.06	135	84.1	1.01	156	83.4	1.42	76
45–54 years	86.2	1.84	77	86.6	1.11	160	87.3	0.98	175	85.5	1.44	53
55–64 years	85.9	1.54	65	86.2	1.11	115	83.8	1.40	106	87.3	2.27	38
65–74 years	85.2	1.16	198	82.7	0.98	383	84.8	1.16	231	82.7	1.99	48
BMI												
1st quartile	80.3	1.90	119	78.4	1.29	249	77.2	1.11	282	75.5	0.82	122
2d quartile	80.1	1.10	110	80.2	0.68	280	79.7	0.96	263	80.1	1.07	119
3d quartile	82.7	1.04	109	83.8	0.96	291	84.0	0.73	267	82.0	1.21	105
4th quartile	88.0	1.51	157	86.0	0.77	282	87.5	0.80	236	86.7	1.44	93

[1] Excludes "other" racial groups.

Table 21. Diastolic blood pressure levels of adult females ages 18–74 years within dietary sodium strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Dietary sodium (milligrams/day)											
	Less than 982.6			982.6–1,883.9			1,884.0–3,436.7			3,436.8 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	78.0	0.72	710	77.6	0.48	1,588	76.8	0.42	1,527	75.9	0.75	647
Race												
White	77.6	0.79	557	77.1	0.53	1,313	76.8	0.44	1,347	75.9	0.76	566
Black	80.3	1.71	153	82.2	1.54	275	77.4	1.00	180	75.1	2.00	81
Age												
18–24 years	70.6	1.07	142	71.1	0.68	297	71.1	0.80	333	69.8	1.19	187
25–34 years	74.5	1.09	159	74.2	0.60	390	74.9	0.53	407	74.3	0.96	196
35–44 years	80.1	1.04	132	77.2	0.80	351	78.4	0.73	360	76.7	0.94	132
45–54 years	80.4	1.75	95	81.1	1.40	161	79.9	1.04	158	81.7	2.16	57
55–64 years	85.7	2.13	56	84.0	0.73	108	82.0	1.75	91	85.2	2.86	23
65–74 years	83.1	1.37	126	83.9	0.93	284	82.0	0.93	178	82.4	2.21	52
BMI												
1st quartile	73.6	1.81	118	72.1	0.80	369	72.9	0.77	428	72.2	1.22	204
2d quartile	76.6	1.10	158	75.4	0.63	389	75.1	0.54	393	74.4	0.87	179
3d quartile	76.8	1.14	201	78.3	0.80	412	77.0	0.64	366	76.0	1.34	140
4th quartile	83.2	1.36	233	84.7	0.93	419	83.8	0.82	340	84.0	1.33	124

[1] Excludes "other" racial groups.

Table 22. Systolic blood pressure levels of adults ages 18–74 years within strata of sodium intake per 1,000 calories showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Dietary sodium (milligrams/1,000 calories)											
	Less than 686.5			*686.5–1,081.1*			*1,081.2–1,675.8*			*1,675.9 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	123.8	0.60	1,135	126.1	0.65	2,645	127.7	0.63	2,654	126.4	0.60	1,132
Sex												
Male	126.9	0.89	419	129.8	0.84	1,088	131.0	0.86	1,109	127.8	0.90	475
Female	121.2	0.80	716	122.4	0.75	1,557	124.4	0.83	1,545	124.9	0.85	657
Race												
White	123.3	0.60	902	126.1	0.67	2,235	127.2	0.65	2,292	126.1	0.63	1,007
Black	128.1	2.07	233	126.3	1.60	410	133.2	3.86	362	132.2	2.84	125
Age												
Total												
18–24 years	118.0	1.26	268	118.7	0.96	476	118.2	0.60	514	118.3	1.02	206
25–34 years	118.2	1.25	271	120.5	0.84	615	121.0	0.80	548	120.6	0.96	244
35–44 years	121.8	1.39	193	123.6	1.17	498	123.7	0.93	472	123.0	1.09	225
45–54 years	128.3	1.90	141	131.0	1.23	345	133.1	1.95	321	130.7	1.69	127
55–64 years	136.8	3.28	82	135.0	1.81	192	140.0	1.61	229	136.6	2.19	99
65–74 years	142.9	2.18	180	143.1	1.39	519	145.4	1.36	570	146.6	2.16	231
Male												
18–24 years	122.3	2.07	78	124.5	1.31	185	123.2	1.17	167	121.6	1.48	74
25–34 years	122.8	1.67	94	124.9	1.20	194	126.0	1.28	170	124.1	1.80	67
35–44 years	125.9	2.57	59	127.0	1.89	143	126.6	1.34	138	124.9	1.58	74
45–54 years	131.7	2.71	55	134.3	1.71	180	134.8	1.88	168	130.1	2.36	60
55–64 years	136.2	4.59	39	137.3	2.92	100	139.3	2.28	130	134.0	2.70	55
65–74 years	140.8	3.14	94	141.7	1.73	286	144.5	2.09	336	145.2	2.61	145
Female												
18–24 years	114.5	0.87	190	112.9	0.90	291	114.1	0.94	347	114.4	1.46	132
25–34 years	113.1	1.09	177	115.8	0.91	421	116.3	0.98	378	117.8	0.74	177
35–44 years	118.3	1.52	134	120.7	1.18	355	121.1	1.23	334	120.8	1.58	151
45–54 years	126.1	2.09	86	127.2	1.75	165	131.2	3.09	153	131.3	2.20	67
55–64 years	137.3	3.72	43	132.5	2.44	92	141.0	2.91	99	139.8	3.61	44
65–74 years	144.7	2.89	86	144.6	2.05	233	146.4	1.52	234	148.4	3.53	86
BMI												
Male												
1st quartile	120.5	1.78	97	124.7	1.74	257	125.5	1.13	308	122.1	1.71	112
2d quartile	124.6	1.83	109	127.5	1.11	280	130.1	1.57	271	125.3	1.49	114
3d quartile	129.6	2.00	92	129.9	1.33	281	131.6	1.53	277	129.1	1.34	122
4th quartile	133.3	2.57	121	136.7	1.77	270	137.1	1.59	253	132.8	1.77	127
Female												
1st quartile	114.4	1.13	177	113.5	1.17	390	117.0	1.34	399	117.5	1.25	154
2d quartile	118.4	1.14	190	119.7	0.81	393	120.5	1.27	373	121.5	1.28	163
3d quartile	123.8	1.94	169	125.2	1.35	394	124.6	1.49	398	123.6	1.90	158
4th quartile	129.8	1.98	180	132.9	1.32	380	136.5	1.84	375	136.3	1.94	182

[1] Excludes "other" racial groups.

Table 23. Diastolic blood pressure levels of adults ages 18–74 years within strata of sodium intake per 1,000 calories showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Dietary sodium (milligrams/1,000 calories)											
	Less than 686.5			686.5–1,081.1			1,081.2–1,675.8			1,675.9 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	78.5	0.41	1,135	79.4	0.40	2,645	80.0	0.37	2,654	80.0	0.41	1,133
Sex												
Male	80.7	0.71	419	82.0	0.45	1,088	82.7	0.47	1,109	81.8	0.66	476
Female	76.7	0.51	716	76.7	0.52	1,557	77.4	0.45	1,545	78.1	0.62	657
Race												
White	78.2	0.45	902	79.3	0.41	1,235	79.7	0.39	2,292	79.9	0.41	1,008
Black	81.1	1.35	233	80.0	0.91	410	83.6	1.53	362	82.6	1.78	125
Age												
Total												
18–24 years	73.1	1.06	268	73.4	0.51	476	73.3	0.55	514	73.6	0.86	206
25–34 years	77.1	0.79	271	77.0	0.46	615	77.3	0.50	548	77.6	0.74	244
35–44 years	79.8	1.02	193	80.1	0.72	498	81.1	0.48	472	81.1	1.06	226
45–54 years	82.1	1.16	141	83.5	0.91	345	84.4	0.90	321	84.2	1.07	127
55–64 years	84.9	1.75	82	83.6	0.86	192	85.7	0.97	229	84.3	1.31	99
65–74 years	83.3	1.17	180	83.3	0.67	519	83.6	0.83	570	84.3	1.25	231
Male												
18–24 years	75.3	1.97	78	76.8	0.75	185	76.1	0.78	167	75.5	1.42	74
25–34 years	80.1	1.11	94	79.7	0.58	194	79.9	0.86	170	80.3	1.35	67
35–44 years	82.2	1.96	59	83.3	1.09	143	83.6	1.02	138	83.7	1.67	75
45–54 years	84.7	1.71	55	86.5	0.96	180	88.2	1.06	168	85.8	1.52	60
55–64 years	85.7	2.60	39	84.8	1.49	100	86.5	1.17	130	83.9	1.62	55
Female												
18–24 years	71.3	0.72	190	70.0	0.81	291	70.9	0.67	347	71.3	1.07	132
25–34 years	73.8	0.75	177	74.1	0.65	421	74.8	0.67	378	75.4	0.85	177
35–44 years	77.8	1.19	134	77.4	0.78	355	78.8	0.69	334	77.9	1.15	151
45–54 years	80.4	1.35	86	80.2	1.33	165	80.3	1.22	153	82.7	1.65	67
55–64 years	84.3	2.08	43	82.3	0.82	92	84.6	1.54	99	84.7	1.89	44
65–74 years	82.8	1.83	86	83.5	1.02	233	83.0	0.83	234	83.6	2.09	86
BMI												
Male												
1st quartile	76.1	1.49	97	78.5	0.85	257	77.5	0.82	308	77.2	1.03	112
2d quartile	78.3	1.25	109	79.3	0.62	280	82.0	0.91	271	78.6	1.25	114
3d quartile	82.7	1.25	92	83.1	0.79	281	84.2	0.72	277	83.0	1.07	123
4th quartile	86.1	1.89	121	86.7	0.93	270	87.6	1.00	253	86.9	1.04	127
Female												
1st quartile	72.5	0.77	177	71.5	0.80	390	73.4	0.86	399	73.3	0.81	154
2d quartile	75.6	0.82	190	75.0	0.65	393	75.0	0.69	373	76.2	0.92	163
3d quartile	77.0	1.24	169	77.2	0.83	394	77.7	0.61	398	76.8	1.04	158
4th quartile	82.5	1.30	180	84.3	0.83	380	83.8	0.92	375	85.6	1.06	182

[1] Excludes "other" racial groups.

Table 24. Systolic blood pressure levels of adults ages 18–74 years within strata of sodium-potassium intake ratio showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Dietary sodium-potassium ratio											
	Less than 0.535			0.535–0.956			0.957–1.630			1.631 or more		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	124.6	0.64	1,136	126.1	0.61	2,649	127.1	0.61	2,651	126.9	0.82	1,130
Sex												
Male	128.7	1.09	361	129.7	0.82	1,091	129.8	0.82	1,142	128.9	1.18	497
Female	122.2	0.79	775	122.5	0.64	1,558	124.2	0.84	1,509	124.3	1.10	663
Race												
White	124.5	0.64	990	126.1	0.63	2,325	126.6	0.62	2,255	126.1	0.88	866
Black	125.4	1.34	146	126.3	1.98	324	132.5	3.11	396	131.5	3.09	264
Age												
Total												
18–24 years	118.0	1.24	199	118.9	0.99	478	116.7	0.84	502	120.3	1.00	285
25–34 years	116.9	1.01	241	119.9	0.83	615	121.1	0.84	570	122.4	1.32	252
35–44 years	119.2	0.92	206	124.1	1.50	481	123.9	0.82	517	124.0	1.50	184
45–54 years	127.3	1.67	149	130.5	1.40	341	133.8	1.82	310	131.7	1.88	134
55–64 years	136.8	2.79	102	136.4	1.78	196	139.0	1.57	226	137.7	2.79	78
65–74 years	142.1	2.06	239	142.8	1.24	538	146.0	1.68	526	148.8	2.57	197
Male												
18–24 years	125.1	2.20	53	124.0	1.36	174	121.3	1.48	183	124.3	1.35	94
25–34 years	123.3	1.49	61	123.6	1.22	214	126.3	1.37	171	125.8	2.09	79
35–44 years	123.7	2.04	48	127.5	2.11	134	127.0	1.24	166	124.1	1.55	66
45–54 years	130.7	2.45	43	134.6	1.92	170	133.6	1.61	174	132.6	2.89	76
55–64 years	135.6	5.05	47	139.7	2.48	94	137.8	2.42	129	135.0	2.92	54
65–74 years	140.6	2.49	109	141.9	1.83	305	143.8	2.18	319	148.1	3.64	128
Female												
18–24 years	113.7	1.09	146	114.3	0.97	304	111.8	0.97	319	116.5	1.39	191
25–34 years	112.8	1.01	180	115.4	0.79	401	116.6	0.71	399	118.7	1.54	173
35–44 years	116.7	1.41	158	121.3	1.27	347	120.8	0.95	351	124.0	2.85	118
45–54 years	126.0	2.12	106	126.3	1.81	171	134.0	3.41	136	130.5	2.59	58
55–64 years	137.9	3.28	55	133.2	2.23	102	140.4	2.54	97	143.3	5.63	24
65–74 years	143.1	2.57	130	143.8	1.44	233	148.8	2.53	207	149.8	2.93	69
BMI												
Male												
1st quartile	124.5	4.06	74	125.3	1.44	266	123.6	1.14	306	122.2	1.92	128
2d quartile	125.1	1.45	95	126.4	1.25	280	129.0	1.35	274	128.8	1.44	125
3d quartile	128.1	1.37	91	130.4	1.29	277	131.5	1.26	281	129.0	1.74	123
4th quartile	136.3	2.28	101	136.5	1.62	268	134.9	1.51	281	135.2	2.32	121
Female												
1st quartile	113.5	1.49	174	114.9	1.23	386	115.4	1.39	393	119.0	2.06	167
2d quartile	119.8	1.23	193	120.6	1.05	428	119.6	1.19	346	119.3	1.21	152
3d quartile	123.1	1.80	199	125.7	1.29	394	124.6	1.12	384	123.4	2.29	142
4th quartile	131.5	1.60	209	131.6	1.36	350	137.7	2.11	386	135.3	2.07	172

[1] Excludes "other" racial groups.

Table 25. Diastolic blood pressure levels of adults ages 18–74 years within strata of sodium-potassium intake ratio showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Dietary sodium-potassium ratio											
	Less than 0.535			0.535–0.956			0.957–1.630			1,631 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	78.7	0.41	1,136	79.3	0.38	2,649	80.1	0.36	2,652	80.0	0.49	1,130
Sex												
Male	81.8	0.68	361	81.7	0.53	1,091	82.6	0.51	1,143	81.7	0.68	497
Female	76.9	0.54	775	76.8	0.42	1,558	77.3	0.49	1,509	77.8	0.83	633
Race												
White	78.6	0.43	990	79.2	0.40	2,325	79.8	0.38	2,256	79.4	0.53	866
Black	80.3	1.21	146	80.2	1.28	324	82.3	1.18	396	83.5	1.69	264
Age												
Total												
18–24 years	73.6	1.04	199	73.1	0.60	478	72.4	0.72	502	74.9	0.73	285
25–34 years	75.5	0.54	241	76.9	0.50	615	77.9	0.51	570	78.0	0.78	252
35–44 years	78.5	0.92	206	80.6	0.76	481	80.9	0.64	518	82.0	1.18	184
45–54 years	81.2	1.23	149	83.5	0.97	341	85.0	0.77	310	84.1	1.35	134
55–64 years	84.8	1.40	102	84.0	0.95	196	85.7	1.04	226	83.7	1.44	78
65–74 years	82.9	1.07	239	82.7	0.62	538	84.0	0.94	526	85.5	1.51	197
Male												
18–24 years	78.0	2.16	53	75.7	0.97	174	75.1	1.07	183	77.8	0.84	94
25–34 years	79.4	0.87	61	79.4	0.84	214	80.9	0.81	171	79.7	1.29	79
35–44 years	81.9	1.72	48	82.9	1.33	134	84.2	1.16	167	83.2	1.71	66
45–54 years	84.9	1.82	43	87.1	0.93	170	87.1	0.94	174	86.1	1.95	76
55–64 years	85.4	2.39	47	85.9	1.36	94	86.7	1.36	129	82.0	1.66	54
65–74 years	83.3	1.08	109	83.0	0.74	305	83.9	1.27	319	86.3	1.81	128
Female												
18–24 years	70.9	0.84	146	70.8	0.74	304	69.7	0.75	319	72.3	0.91	191
25–34 years	73.0	0.80	180	73.7	0.48	401	75.3	0.57	399	76.2	1.28	173
35–44 years	76.5	1.07	158	78.6	0.69	347	77.6	0.73	351	80.1	1.63	118
45–54 years	79.7	1.67	106	79.8	1.31	171	82.1	1.27	136	81.8	1.88	58
55–64 years	84.2	1.42	55	82.2	1.13	102	84.4	1.59	97	87.1	3.05	24
65–74 years	82.6	1.46	130	82.5	0.83	233	84.2	1.01	207	84.4	2.45	69
BMI												
Male												
1st quartile	77.4	2.39	74	78.7	0.99	266	77.1	0.87	306	76.5	1.44	128
2d quartile	80.0	1.03	95	78.7	0.75	280	80.7	0.80	274	80.9	1.04	125
3d quartile	80.4	0.87	91	83.7	0.82	277	85.4	0.94	282	80.3	1.12	123
4th quartile	88.6	1.71	101	85.7	0.93	268	86.8	0.77	281	88.6	1.29	121
Female												
1st quartile	71.4	0.81	174	72.4	0.81	386	72.4	0.85	393	74.8	1.44	167
2d quartile	75.8	0.86	193	75.7	0.57	428	74.7	0.76	346	74.6	0.82	152
3d quartile	76.3	1.11	199	77.6	0.77	394	78.2	0.70	384	75.2	1.15	142
4th quartile	83.6	1.12	209	83.3	0.83	350	84.2	0.87	386	85.9	1.35	172

[1] Excludes "other" racial groups.

Table 26. Systolic blood pressure levels of adults ages 18–74 years within strata of frequency of consumption of salty snacks showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Salty snacks consumption frequency (times/week)											
	Less than 1.00			1.00–1.98			1.99–6.98			6.99 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	127.9	0 62	4,188	123.5	0.52	1,743	124.1	0.52	2,603	123.8	1.02	711
Sex												
Male	131.3	0.78	1,699	126.6	0.65	656	127.4	0.60	1,045	126.9	1.36	305
Female	125.2	0.77	2,489	120.4	0.72	1,087	120.3	0.65	1,558	119.5	1.01	406
Race												
White	127.3	0.69	3,444	123.5	0.51	1,533	124.1	0.52	2,226	123.7	1.12	576
Black	133.7	2.06	744	123.5	2.43	210	123.8	1.48	377	124.5	3.10	135
Age												
Total												
18–24 years	115.6	0.62	524	117.9	0.95	409	119.6	0.61	790	119.9	1.35	233
25–34 years	118.9	0.65	732	119.0	0.99	478	121.2	0.72	713	121.0	1.09	220
35–44 years	122.8	0.84	712	121.3	0.83	339	123.7	0.98	556	125.9	2.59	104
45–54 years	130.6	1.39	591	131.4	1.69	195	130.7	1.57	238	130.9	2.95	66
55–64 years	136.4	1.49	452	134.4	2.35	104	140.1	2.06	111	138.2	4.48	28
65–74 years	145.8	1.11	1,177	143.9	1.94	218	140.1	2.09	195	141.1	4.67	60
Male												
18–24 years	121.3	1.25	139	121.9	1.23	130	124.3	0.92	303	122.7	1.74	103
25–34 years	124.6	1.02	207	122.7	1.65	130	125.0	0.85	251	124.9	1.53	84
35–44 years	126.0	1.24	203	123.9	1.43	96	126.1	1.17	184	129.1	3.43	37
45–54 years	133.7	1.57	267	133.7	2.36	104	131.2	2.00	131	132.0	4.81	35
55–64 years	136.6	2.18	227	132.4	2.69	57	142.1	2.43	63	148.6	5.31	14
65–74 years	144.9	1.22	656	142.0	2.55	139	139.3	2.92	113	143.3	6.87	32
Female												
18–24 years	112.0	0.85	385	114.2	0.88	279	114.7	0.85	487	115.8	1.68	130
25–34 years	114.4	0.74	525	115.8	0.94	348	117.0	0.82	462	115.1	1.17	136
35–44 years	120.1	1.02	509	118.9	1.07	243	121.1	1.09	372	121.7	2.71	67
45–54 years	128.2	1.79	324	128.2	2.92	91	130.1	2.37	107	129.5	3.60	31
55–64 years	136.1	1.96	225	136.8	4.42	47	137.3	3.78	48	124.9	3.95	14
65–74 years	146.7	1.47	521	146.4	2.88	79	141.4	2.62	82	139.2	5.11	28
BMI												
Male												
1st quartile	121.1	0.69	1,398	116.6	0.65	694	118.6	0.63	1,157	118.1	1.02	333
2d quartile	126.8	0.82	1,015	123.1	0.92	425	125.5	0.97	602	123.5	1.72	170
3d quartile	130.8	1.07	802	129.3	1.13	296	127.0	0.83	404	128.8	2.45	108
4th quartile	136.8	0.95	973	132.6	1.48	328	132.6	1.05	440	136.0	2.58	100
Female												
1st quartile	120.3	1.00	899	115.4	0.81	446	117.2	0.90	752	116.9	1.09	231
2d quartile	124.2	0.74	1,046	120.0	0.76	492	123.4	0.67	748	121.1	1.36	192
3d quartile	129.9	0.79	1,348	127.7	0.97	498	126.0	0.73	691	127.1	1.61	201
4th quartile	137.4	1.09	895	132.9	1.53	307	133.3	1.10	412	137.9	2.66	87

[1] Excludes "other" racial groups.

Table 27. Diastolic blood pressure levels of adults ages 18–74 years within strata of frequency of consumption of salty snacks showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Salty snacks consumption frequency (times/week)											
	Less than 1.00			1.00–1.98			1.99–6.98			6.99 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	80.4	0.41	4,188	78.3	0.32	1,743	78.6	0.32	2,603	78.6	0.65	711
Sex												
Male	83.1	0.44	1,699	80.8	0.47	656	81.1	0.40	1,046	80.9	0.76	305
Female	78.2	0.51	2,489	75.7	0.47	1,087	75.8	0.48	1,557	75.5	0.91	406
Race												
White	80.0	0.43	3,444	78.3	0.35	1,533	78.5	0.31	2,227	78.5	0.73	576
Black	84.3	1.06	744	78.1	1.48	210	79.8	1.18	376	79.4	1.45	135
Age												
Total												
18–24 years	71.7	0.62	524	72.4	0.53	409	74.2	0.48	789	75.0	0.94	233
25–34 years	77.0	0.56	732	76.4	0.65	478	77.4	0.45	713	78.3	0.74	220
35–44 years	80.9	0.54	712	79.6	0.57	339	81.3	0.47	557	79.8	1.56	104
45–54 years	83.5	0.89	591	84.5	0.82	195	83.2	1.08	238	85.2	1.45	66
55–64 years	83.6	0.80	452	84.3	1.35	104	87.6	1.07	111	87.1	2.67	28
65–74 years	84.2	0.66	1,177	84.5	0.93	218	80.5	1.22	195	80.6	2.77	60
Male												
18–24 years	74.9	0.86	139	74.4	0.82	130	76.8	0.90	303	77.1	1.14	103
25–34 years	80.5	0.71	207	79.4	1.08	130	79.5	0.70	251	80.9	1.19	84
35–44 years	83.7	1.02	203	82.3	0.88	96	84.3	0.62	185	81.5	2.07	37
45–54 years	87.1	0.88	267	87.2	1.27	104	84.5	1.52	131	87.3	2.03	35
55–64 years	84.1	1.15	227	83.4	1.63	57	90.1	1.58	63	91.3	4.26	14
65–74 years	84.9	0.68	656	84.6	1.29	139	80.8	1.81	113	84.1	4.09	32
Female												
18–24 years	69.6	0.75	385	70.5	0.63	279	71.4	0.56	486	71.9	1.36	130
25–34 years	74.2	0.64	525	73.7	0.68	348	75.0	0.52	462	74.3	0.73	136
35–44 years	78.5	0.63	509	77.1	0.78	243	78.0	0.66	372	77.5	1.71	67
45–54 years	80.8	1.17	324	80.5	1.46	91	81.4	1.46	107	82.7	2.06	31
55–64 years	83.1	1.02	225	85.4	1.81	47	84.1	1.81	48	81.8	2.21	14
65–74 years	83.6	0.82	521	84.3	1.27	79	80.0	1.20	82	77.6	2.94	28
BMI												
Male												
1st quartile	75.8	0.52	1,398	73.6	0.57	694	74.6	0.42	1,156	74.9	0.79	333
2d quartile	79.4	0.51	1,015	77.3	0.65	425	78.4	0.60	602	78.2	0.70	170
3d quartile	82.4	0.55	802	82.3	0.63	296	81.3	0.57	405	82.3	1.32	108
4th quartile	86.8	0.62	973	85.3	0.81	328	86.0	0.68	440	86.4	1.14	100
Female												
1st quartile	75.1	0.65	899	72.9	0.63	446	74.0	0.61	751	74.5	1.08	231
2d quartile	77.9	0.53	1,046	75.5	0.71	492	76.7	0.44	748	76.9	0.78	192
3d quartile	81.5	0.44	1,348	80.9	0.60	498	80.4	0.54	692	80.8	0.90	201
4th quartile	87.4	0.65	895	85.5	0.85	307	86.5	0.66	412	86.6	1.28	87

[1] Excludes "other" racial groups.

Table 28. Systolic blood pressure levels of adults ages 18–74 years within strata of complex carbohydrate intake frequency showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Complex carbohydrate intake frequency (times/week)											
	Less than 15.0			15.0–28.4			28.5–39.4			39.5 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	124.2	0.88	1,458	125.7	0.49	3,278	125.2	0.52	3,140	127.7	0.74	1,338
Sex												
Male	128.5	1.14	486	129.2	0.79	1,223	127.9	0.55	1,317	129.7	0.87	663
Female	121.1	1.13	972	122.8	0.48	2,055	122.2	0.73	1,823	124.8	1.13	675
Race												
White	123.7	0.88	1,121	125.3	0.47	2,728	125.0	0.56	2,722	127.6	0.76	1,183
Black	127.9	2.18	337	129.7	2.35	550	127.2	1.45	418	128.8	4.91	155
Age												
Total												
18–24 years	118.0	0.97	347	118.0	0.67	731	118.0	0.79	621	119.9	1.34	254
25–34 years	120.5	1.13	388	120.3	0.64	806	119.8	0.51	703	119.0	1.50	245
35–44 years	122.5	0.97	266	123.5	1.05	632	123.0	0.93	610	122.4	1.37	199
45–54 years	129.7	2.48	144	132.0	1.45	363	128.5	1.29	404	134.1	2.23	174
55–64 years	136.1	3.84	94	138.3	1.57	215	135.7	1.70	245	137.2	1.84	137
65–74 years	146.4	2.13	219	146.3	1.63	531	144.0	1.37	557	141.9	1.58	329
Male												
18–24 years	124.7	1.46	86	122.6	1.09	235	122.0	1.04	222	123.8	1.61	132
25–34 years	124.6	2.06	103	124.9	0.93	242	124.3	0.69	233	123.1	1.76	93
35–44 years	126.9	2.12	68	127.1	1.43	165	124.8	1.37	217	125.5	1.39	69
45–54 years	133.3	4.25	64	134.3	1.95	171	130.9	1.50	198	135.1	2.34	99
55–64 years	138.9	4.55	44	137.6	2.64	105	137.0	2.57	128	137.6	1.98	82
65–74 years	140.8	2.87	121	147.7	2.47	305	143.0	1.38	319	139.0	2.23	188
Female												
18–24 years	113.5	1.11	261	114.8	0.87	496	113.6	0.88	399	111.8	1.68	122
25–34 years	117.2	1.12	285	115.9	0.61	564	115.2	0.72	470	113.6	1.46	152
35–44 years	119.4	1.42	198	120.6	1.12	467	120.8	1.03	393	119.1	2.10	130
45–54 years	127.3	2.75	80	130.1	2.09	192	126.1	1.73	206	132.7	3.87	75
55–64 years	134.0	5.91	50	138.8	2.59	110	134.2	1.95	117	136.4	3.20	55
65–74 years	151.9	2.10	98	144.8	1.90	226	145.1	2.06	238	145.2	2.22	141
BMI												
Male												
1st quartile	124.1	1.88	131	124.4	1.47	321	122.3	0.97	366	124.7	1.55	220
2d quartile	127.2	1.90	118	127.3	1.17	327	126.6	1.04	342	128.4	1.26	184
3d quartile	131.2	2.29	116	129.3	1.21	294	129.8	1.14	348	132.3	1.86	150
4th quartile	132.2	2.27	121	136.0	1.59	281	135.1	1.44	261	137.7	2.06	109
Female												
1st quartile	114.3	1.33	270	115.2	0.84	625	115.8	1.04	599	115.9	1.85	219
2d quartile	119.5	1.44	258	119.2	0.78	593	120.9	0.95	469	126.0	2.62	211
3d quartile	123.3	1.93	230	128.1	1.59	463	125.9	1.13	461	126.4	2.17	138
4th quartile	130.9	2.63	214	136.3	1.38	374	132.9	1.89	294	138.0	2.54	107

[1] Excludes "other" racial groups.

Table 29. Diastolic blood pressure levels of adults ages 18–74 years within strata of complex carbohydrate intake frequency showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Complex carbohydrate intake frequency (times/week)											
	Less than 15.0			15.0–28.4			28.5–39.4			39.5 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	78.3	0.66	1,458	79.5	0.35	3,278	79.1	0.32	3,140	80.4	0.46	1,338
Sex												
Male	81.1	1.04	486	82.1	0.44	1,224	81.4	0.42	1,317	82.5	0.59	663
Female	76.2	0.72	972	77.3	0.43	2,054	76.6	0.45	1,823	77.4	0.54	675
Race												
White	77.8	0.64	1,121	79.2	0.34	2,729	79.0	0.37	2,722	80.3	0.42	1,183
Black	81.8	1.33	337	82.4	1.17	549	80.6	0.96	418	81.7	2.04	155
Age												
Total												
18–24 years	72.7	0.92	347	73.4	0.58	730	73.1	0.50	621	74.3	0.97	254
25–34 years	77.0	0.70	388	77.8	0.37	806	76.6	0.47	703	77.0	0.83	245
35–44 years	80.1	0.71	266	80.4	0.57	633	81.4	0.57	610	79.8	1.01	199
45–54 years	82.0	1.61	144	84.7	0.65	363	82.4	0.85	404	85.9	1.12	174
55–64 years	84.6	2.01	94	85.1	1.00	215	83.5	1.01	245	85.3	1.21	137
65–74 years	86.9	1.62	219	84.3	0.74	531	82.8	0.73	557	82.4	0.96	329
Male												
18–24 years	75.9	1.93	86	75.9	0.70	253	75.3	0.62	222	77.4	1.06	132
25–34 years	79.6	1.37	103	80.9	0.58	242	79.1	0.76	233	80.4	1.06	93
35–44 years	83.7	1.57	68	83.5	0.97	166	83.7	0.92	217	82.1	1.41	69
45–54 years	85.4	2.43	64	87.4	1.11	171	85.5	0.83	198	87.9	1.36	99
55–64 years	86.1	2.52	44	84.7	1.43	105	85.2	1.36	128	86.1	1.45	82
65–74 years	85.9	2.04	121	85.8	1.01	305	82.8	0.89	319	83.3	1.27	188
Female												
18–24 years	70.5	0.82	261	71.5	0.82	495	70.6	0.59	399	68.0	1.15	122
25–34 years	75.0	0.77	285	74.8	0.45	564	74.1	0.72	470	72.6	0.79	152
35–44 years	77.5	0.86	198	77.8	0.67	467	78.7	0.81	393	77.4	1.20	130
45–54 years	79.7	1.81	80	82.4	1.03	192	79.2	1.11	206	83.2	1.55	75
55–64 years	83.4	3.10	50	85.5	1.28	110	81.6	1.17	117	84.0	1.60	55
65–74 years	87.9	1.68	98	82.7	0.89	226	82.8	0.93	238	81.4	1.19	141
BMI												
Male												
1st quartile	77.5	2.24	131	78.7	0.96	321	76.3	0.73	366	78.1	1.02	220
2d quartile	80.3	1.47	118	79.4	0.77	327	79.9	0.75	342	81.7	0.99	184
3d quartile	82.5	1.69	116	82.7	0.74	295	84.0	0.61	348	84.0	1.00	150
4th quartile	84.7	1.44	121	87.8	0.87	281	87.2	0.79	261	89.9	1.44	109
Female												
1st quartile	72.0	0.87	270	72.7	0.77	624	72.7	0.69	599	72.8	0.91	219
2d quartile	75.8	0.96	258	75.0	0.54	593	75.5	0.63	469	76.6	1.31	211
3d quartile	77.2	1.16	230	80.0	0.79	463	78.5	0.62	461	78.5	1.16	138
4th quartile	82.1	1.50	214	86.7	0.55	374	84.6	0.93	294	86.6	1.25	107

[1] Excludes "other" racial groups.

Table 30. Systolic blood pressure levels of adult males ages 18–74 years within strata of fat-complex carbohydrate intake frequency showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	*Fat/complex carbohydrate frequency*								
	Low fat/high complex carbohydrate			*Medium fat/medium complex carbohydrate*			*High fat/low complex carbohydrate*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	131.6	1.77	188	128.5	0.51	3,297	129.8	1.38	190
Race									
White	131.0	1.77	158	128.1	0.50	2,803	130.2	1.38	173
Black	135.3	5.62	30	131.8	1.68	494	120.0	3.56	17
Age									
18–24 years	133.8	2.15	27	122.2	0.79	583	125.6	1.55	64
25–34 years	126.4	2.85	14	124.1	0.59	605	126.4	1.95	50
35–44 years	119.0	4.46	18	126.0	0.83	482	128.7	2.86	17
45–54 years	130.1	4.95	31	132.9	1.28	476	140.1	4.21	23
55–64 years	134.7	3.00	25	137.2	1.48	323	152.4	9.96	11
65–74 years	142.0	3.31	73	143.6	1.30	828	138.3	5.17	25
BMI									
1st quartile	125.4	4.03	48	123.5	0.78	823	127.4	5.12	41
2d quartile	131.3	2.17	44	126.1	0.72	818	124.2	1.90	54
3d quartile	126.8	3.46	48	129.6	0.88	825	131.5	1.86	55
4th quartile	144.6	3.34	48	134.4	1.01	830	136.5	2.74	40

[1] Excludes "other" racial groups.

Table 31. Systolic blood pressure levels of adult females ages 18–74 years within strata of fat-complex carbohydrate intake frequency showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Fat/complex carbohydrate frequency								
	Low fat/high complex carbohydrate			Medium fat/medium complex carbohydrate			High fat/low complex carbohydrate		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	126.2	2.18	280	122.5	0.50	4,925	118.1	1.26	304
Race									
White	124.1	1.37	227	122.4	0.57	4,107	118.4	1.30	269
Black	139.0	10.28	53	124.4	1.80	818	113.4	2.30	35
Age									
18–24 years	109.7	2.52	37	144.0	0.55	1,131	114.2	1.58	108
25–34 years	118.8	1.80	66	115.6	0.49	1,305	114.3	1.33	98
35–44 years	123.0	2.18	63	120.1	0.71	1,067	119.9	1.87	56
45–54 years	131.9	6.49	40	128.4	1.20	489	124.8	6.71	22
55–64 years	135.3	3.18	25	136.0	1.43	297	139.2	13.44	6
65–74 years	144.6	4.25	49	145.8	1.34	636	149.3	3.57	14
BMI									
1st quartile	116.3	2.81	52	115.2	0.86	1,231	112.0	1.01	102
2d quartile	127.6	6.21	65	119.1	0.61	1,240	117.7	2.25	79
3d quartile	122.6	2.26	78	124.0	0.70	1,232	122.2	3.36	70
4th quartile	135.6	2.11	85	133.0	0.95	1,222	127.8	3.37	53

[1] Excludes "other" racial groups.

Table 32. Diastolic blood pressure levels of adult males ages 18–74 years within strata of fat-complex carbohydrate intake frequency showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Fat/complex carbohydrate frequency								
	Low fat/high complex carbohydrate			Medium fat/medium complex carbohydrate			High fat/low complex carbohydrate		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	83.2	1.09	188	81.7	0.33	3,298	81.2	0.88	190
Race									
White	82.6	1.07	158	81.5	0.33	2,804	81.4	0.92	173
Black	87.5	3.95	30	83.8	1.14	494	76.7	2.52	17
Age									
18–24 years	78.8	1.84	27	75.7	0.49	583	76.8	1.18	64
25–34 years	79.4	1.85	14	79.8	0.47	605	82.2	1.52	50
35–44 years	79.6	3.40	18	83.5	0.57	483	85.8	1.39	17
45–54 years	84.9	1.67	31	86.6	0.68	476	87.9	1.77	23
55–64 years	88.1	2.03	25	85.1	0.87	323	88.7	4.66	11
65–74 years	83.2	2.72	73	84.4	0.69	828	79.4	2.17	25
BMI									
1st quartile	79.5	2.89	48	77.5	0.57	823	79.1	2.61	41
2d quartile	81.4	1.55	44	79.2	0.53	818	77.4	1.10	54
3d quartile	84.3	2.03	48	83.3	0.46	826	81.6	1.83	55
4th quartile	88.4	2.10	48	86.8	0.55	830	87.2	1.97	40

[1] Excludes "other" racial groups.

Table 33. Diastolic blood pressure levels of adult females ages 18–74 years within strata of fat-complex carbohydrate intake frequency showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Fat/complex carbohydrate frequency								
	Low fat/high complex carbohydrate			Medium fat/medium complex carbohydrate			High fat/low complex carbohydrate		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	78.0	1.18	280	76.9	0.34	4,925	74.8	0.81	303
Race									
White	77.1	0.97	227	76.7	0.37	4,107	74.8	0.77	269
Black	83.3	4.25	53	79.3	0.80	818	75.4	3.53	34
Age									
18–24 years	67.4	2.28	37	70.7	0.51	1,131	72.3	1.15	107
25–34 years	76.5	1.67	66	74.4	0.33	1,305	72.0	1.13	98
35–44 years	78.9	1.74	63	78.0	0.47	1,067	77.5	1.80	56
45–54 years	81.1	3.15	40	80.8	0.81	489	80.8	2.70	22
55–64 years	80.6	1.67	25	83.7	0.77	297	84.6	6.50	6
65–74 years	83.0	1.44	49	83.0	0.74	636	82.2	2.19	14
BMI									
1st quartile	72.9	1.83	52	72.3	0.55	1,231	72.2	1.25	101
2d quartile	76.8	3.11	65	75.0	0.40	1,240	75.0	1.01	79
3d quartile	77.0	1.53	78	77.2	0.44	1,232	76.0	2.08	70
4th quartile	83.6	1.47	85	84.0	0.55	1,222	78.7	1.59	53

[1] Excludes "other" racial groups.

Table 34. Systolic blood pressure levels of adult males ages 18–74 years within strata of fat intake showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Total dietary fat (grams/day)											
	Less than 52.51			*52.51–91.56*			*91.57–152.00*			*152.01 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	134.2	1.45	464	130.7	0.90	1,081	128.7	0.76	1,081	126.1	0.77	464
Race												
White	133.0	1.45	363	130.2	0.90	930	128.7	0.75	944	126.1	0.81	412
Black	142.3	4.82	101	134.7	3.06	151	128.7	2.35	137	126.3	3.45	52
Age												
18–24 years	126.5	2.43	32	124.2	1.52	121	123.7	1.06	206	121.1	1.23	145
25–34 years	126.9	2.55	40	123.8	1.38	137	124.8	1.09	234	125.0	1.45	114
35–44 years	127.8	2.89	43	125.5	1.51	126	126.2	1.44	175	126.9	1.88	70
45–54 years	135.7	4.04	61	133.3	2.28	168	133.8	1.27	177	131.0	2.06	57
55–64 years	139.1	2.53	60	137.5	2.12	133	136.7	3.27	93	137.5	4.26	38
65–74 years	143.9	1.58	228	142.1	1.89	396	144.1	2.86	196	146.3	4.33	40
BMI												
1st quartile	131.1	4.09	109	125.3	1.51	259	123.9	1.35	266	120.1	1.45	139
2d quartile	129.8	1.89	107	130.7	1.53	258	125.3	0.94	281	126.4	1.40	128
3d quartile	132.0	2.31	105	129.2	1.23	284	131.5	1.18	286	127.9	1.34	97
4th quartile	140.1	2.94	143	136.2	1.56	280	134.4	1.55	248	132.4	2.13	100

[1] Excludes "other" racial groups.

Table 35. Diastolic blood pressure levels of adult males ages 18–74 years within strata of fat intake showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Total dietary fat (grams/day): Less than 52.51			52.51–91.56			91.57–152.00			152.01 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	84.0	0.83	464	82.9	0.53	1,081	81.5	0.49	1,082	80.5	0.52	464
Race												
White	83.5	0.84	363	82.6	0.52	930	81.5	0.49	945	80.4	0.57	412
Black	87.5	2.72	101	84.9	1.80	151	81.4	1.50	137	81.6	1.33	52
Age												
18–24 years	75.2	2.12	32	78.2	1.18	121	75.3	0.63	206	75.6	0.93	145
25–34 years	79.4	2.40	40	89.9	0.73	137	80.4	0.66	234	80.1	1.25	114
35–44 years	83.0	2.28	43	84.2	1.46	126	82.0	0.87	176	85.4	1.23	70
45–54 years	88.0	2.28	61	86.3	1.09	168	87.1	0.95	177	85.6	1.18	57
55–64 years	88.1	1.49	60	84.8	1.01	133	85.3	1.53	93	84.9	3.07	38
65–74 years	85.3	1.21	228	84.0	1.08	396	81.8	1.18	196	83.7	2.13	40
BMI												
1st quartile	80.8	2.94	109	78.7	0.99	259	77.0	0.84	266	76.0	0.83	139
2d quartile	79.0	1.27	107	82.2	0.90	258	78.7	0.68	281	79.6	0.98	128
3d quartile	84.2	1.35	105	82.8	0.69	284	84.2	0.85	287	81.9	1.04	97
4th quartile	89.0	1.37	143	86.7	0.85	280	86.3	0.75	248	86.8	1.42	100

[1] Excludes "other" racial groups.

Table 36. Systolic blood pressure levels of adult males ages 18–74 years within strata of fat intake showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Total dietary fat (grams/day)											
	Less than 35.94			*35.94–60.77*			*60.78–97.00*			*97.01 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	129.3	1.16	669	123.8	0.88	1,569	122.3	0.78	1,566	118.7	1.00	671
Race												
White	127.8	1.17	518	123.6	0.91	1,342	122.3	0.79	1,366	118.9	1.08	560
Black	138.2	6.08	151	125.7	2.45	227	122.4	1.56	200	116.4	2.41	111
Age												
18–24 years	112.5	1.33	115	113.5	0.84	303	114.7	0.93	351	113.8	1.49	191
25–34 years	117.9	1.04	143	115.8	0.93	376	115.4	0.83	425	115.4	1.35	209
35–44 years	126.7	2.74	133	119.6	1.01	347	120.4	1.21	354	117.5	1.41	140
45–54 years	135.9	5.04	79	130.1	1.81	169	126.3	1.77	156	125.2	2.75	67
55–64 years	143.1	4.37	58	137.4	2.30	114	136.6	2.50	84	126.1	3.84	22
65–74 years	150.5	2.93	141	143.0	1.83	260	146.2	1.85	196	145.7	2.99	42
BMI												
1st quartile	122.9	3.44	112	115.0	1.23	329	114.9	1.06	445	113.6	1.29	234
2d quartile	122.5	2.02	134	120.2	1.11	382	120.3	1.16	421	117.2	1.13	182
3d quartile	126.8	1.91	182	124.5	1.14	432	125.3	1.39	367	119.8	2.32	138
4th quartile	139.1	2.38	241	134.4	1.50	426	132.1	1.51	333	130.5	2.42	117

[1] Excludes "other" racial groups.

Table 37. Diastolic blood pressure levels of adult females ages 18–74 years within strata of fat intake showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Total dietary fat (grams/day)											
	Less than 35.94			35.94–60.77			60.78–97.00			97.01 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	80.0	0.66	669	77.5	0.54	1,569	76.7	0.49	1,566	74.7	0.72	671
Race												
White	79.3	0.78	518	77.2	0.61	1,342	76.6	0.49	1,366	74.7	0.77	560
Black	83.9	1.54	151	80.1	1.29	227	78.5	1.10	200	74.3	1.51	111
Age												
18–24 years	71.3	1.25	115	70.5	0.78	303	70.8	0.77	351	70.8	1.00	191
25–34 years	76.5	0.91	143	74.6	0.55	376	74.3	0.57	425	73.6	0.95	209
35–44 years	81.8	1.55	133	77.2	0.53	347	78.2	0.74	354	75.9	0.98	140
45–54 years	83.2	1.68	79	81.8	1.22	169	79.2	1.20	156	76.8	2.11	67
55–64 years	84.6	1.61	58	84.5	0.89	114	83.9	1.37	84	76.3	2.21	22
65–74 years	85.5	1.40	141	82.0	0.91	260	83.0	1.03	196	84.4	2.68	42
BMI												
1st quartile	76.0	2.14	112	72.4	0.77	329	72.3	0.75	445	71.9	0.90	234
2d quartile	77.4	1.06	134	75.4	0.60	382	75.4	0.68	421	73.5	0.82	182
3d quartile	77.8	0.88	182	77.8	0.83	432	77.6	0.62	367	74.2	1.30	138
4th quartile	85.5	1.09	241	83.6	0.83	426	84.0	0.84	333	83.2	1.43	117

[1] Excludes "other" racial groups

Table 38. Systolic blood pressure levels of adults ages 18–74 years within strata of frequency of consumption of foods containing sugar showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Frequency of consumption of foods containing sugar (times/week)											
	Less than 3.0			*3.0–8.9*			*9.0–19.9*			*20.0 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	129.0	0.95	1,502	125.5	0.55	3,176	125.1	0.55	3,197	123.3	0.68	1,352
Sex												
Male	132.9	1.05	635	129.1	0.70	1,190	127.9	0.75	1,314	126.3	0.86	560
Female	125.8	1.29	867	122.5	0.63	1,986	122.1	0.69	1,883	119.7	0.91	792
Race												
White	127.7	1.02	1,291	125.3	0.58	2,747	125.0	0.58	2,677	123.3	0.71	1,051
Black	144.9	4.51	211	128.4	2.15	429	125.9	1.25	520	123.1	1.85	301
Age												
Total												
18–24 years	115.1	1.65	147	117.7	0.83	541	119.0	0.70	783	118.8	0.83	484
25–34 years	119.5	1.07	258	118.8	0.52	709	120.4	0.67	805	121.8	1.03	370
35–44 years	124.9	1.64	292	122.1	1.16	622	123.1	0.60	598	122.6	0.95	195
45–54 years	132.4	2.47	208	129.6	1.26	418	131.4	1.50	343	128.9	1.85	116
55–64 years	138.0	2.34	151	137.4	2.01	255	136.4	1.46	210	133.8	2.41	77
65–74 years	145.3	1.58	446	143.5	1.15	631	144.4	1.54	458	148.9	4.32	110
Male												
18–24 years	121.1	2.02	43	123.5	1.24	153	123.0	1.05	282	122.9	1.20	197
25–34 years	124.6	1.67	64	123.6	0.85	196	124.3	0.87	285	126.0	1.37	127
35–44 years	129.2	2.26	84	124.8	1.61	179	126.0	0.99	188	124.5	1.45	68
45–54 years	135.2	2.36	99	132.7	1.65	192	132.4	2.13	184	131.3	2.95	58
55–64 years	139.4	2.58	75	138.3	2.83	130	136.2	1.90	116	134.9	2.92	40
65–74 years	144.6	1.68	270	142.8	1.62	340	143.6	1.99	259	143.2	4.01	70
Female												
18–24 years	110.9	1.66	104	113.7	0.87	388	115.0	0.83	501	113.5	0.94	287
25–34 years	116.0	1.17	194	114.9	0.70	513	115.6	0.65	520	117.2	1.16	243
35–44 years	121.6	1.65	208	119.6	0.91	443	120.2	0.76	410	120.1	1.28	127
45–54 years	130.0	3.97	109	126.9	1.68	226	130.2	2.32	159	126.4	2.36	58
55–64 years	136.6	3.50	76	136.4	2.68	125	136.8	2.28	94	132.5	3.78	37
65–74 years	146.1	2.24	176	144.1	1.43	291	145.4	1.83	199	156.2	6.25	40
BMI												
Male												
1st quartile	128.6	1.70	158	124.0	1.53	320	123.5	1.15	362	120.3	0.96	200
2d quartile	127.9	1.24	156	127.5	1.17	302	127.4	1.30	376	125.6	1.38	144
3d quartile	135.3	1.41	149	130.7	1.34	304	128.1	0.86	323	129.2	1.59	131
4th quartile	138.5	2.33	172	135.1	1.51	264	134.1	1.27	253	136.1	2.16	85
Female												
1st quartile	117.8	1.72	219	114.8	1.07	558	115.0	1.00	618	115.4	1.07	321
2d quartile	121.6	2.45	231	121.0	0.85	576	120.8	0.76	526	118.4	1.66	199
3d quartile	130.1	3.09	226	124.9	1.08	487	126.7	1.02	429	123.4	2.08	152
4th quartile	137.5	1.97	191	134.6	1.83	365	133.5	1.68	310	130.9	2.30	120

[1] Excludes "other" racial groups.

Table 39. Diastolic blood pressure levels of adults ages 18–74 years within strata of frequency of consumption of foods containing sugar showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Frequency of consumption of foods containing sugar (times/week)											
	Less than 3.0			3.0–8.9			9.0–19.9			20.0 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	81.4	0.65	1,502	79.3	0.31	3,177	79.1	0.31	3,197	77.7	0.41	1,351
Sex												
Male	84.2	0.89	635	82.1	0.41	1,191	81.7	0.33	1,314	79.6	0.62	560
Female	79.0	0.70	867	77.0	0.36	1,986	76.2	0.48	1,883	75.5	0.60	791
Race												
White	80.7	0.65	1,291	79.1	0.34	2,748	79.0	0.36	2,677	77.5	0.40	1,051
Black	88.7	1.66	211	82.1	1.29	429	80.3	0.85	520	79.3	1.22	300
Age												
Total												
18–24 years	72.0	1.50	147	73.0	0.46	541	73.6	0.50	783	73.5	0.65	483
25–34 years	77.3	0.82	258	76.2	0.37	709	77.7	0.45	805	77.8	0.75	370
35–44 years	81.6	1.05	292	80.3	0.56	623	80.6	0.61	598	80.6	0.61	195
45–54 years	85.3	1.20	208	82.9	0.86	418	83.7	0.79	343	83.3	1.29	116
55–64 years	84.6	1.35	151	84.4	1.16	255	85.0	0.75	210	83.1	1.23	77
65–74 years	84.0	0.83	446	83.8	0.82	631	83.0	0.87	458	84.2	1.38	110
Male												
18–24 years	75.3	2.65	43	76.1	0.97	153	76.2	0.58	282	75.7	1.06	197
25–34 years	80.6	1.43	64	79.2	0.76	196	80.5	0.62	285	80.0	1.23	127
35–44 years	85.2	1.79	84	82.7	0.87	180	83.9	0.87	188	82.3	0.95	68
45–54 years	87.7	1.25	99	86.4	0.88	192	86.4	0.92	184	85.5	2.20	58
55–64 years	86.7	1.64	75	85.1	1.58	130	85.3	1.18	116	83.9	1.96	40
65–74 years	84.3	0.75	270	84.5	0.90	340	84.0	1.03	259	83.6	1.87	70
Female												
18–24 years	69.6	1.14	104	70.8	0.62	388	71.1	0.76	501	70.6	0.82	286
25–34 years	75.1	0.93	194	73.7	0.43	513	74.2	0.47	520	75.3	0.89	243
35–44 years	78.9	0.82	208	78.0	0.59	443	77.3	0.66	410	78.3	0.89	127
45–54 years	83.2	1.76	109	79.9	1.10	226	80.4	1.18	159	81.0	1.62	58
55–64 years	82.6	1.90	76	83.7	1.43	125	84.6	1.04	94	82.1	2.07	37
65–74 years	83.7	1.34	176	83.2	1.06	291	81.7	0.99	199	85.0	1.80	40
BMI												
Male												
1st quartile	80.4	1.76	158	77.4	0.86	320	77.6	0.60	362	75.9	0.76	200
2d quartile	81.3	1.08	156	80.1	1.00	302	80.7	0.68	376	78.3	0.98	144
3d quartile	85.6	1.16	149	83.8	0.69	305	82.6	0.56	323	82.4	1.24	131
4th quartile	88.7	1.49	172	87.7	0.84	264	87.4	0.90	253	85.9	1.38	85
Female												
1st quartile	74.4	0.85	219	72.6	0.65	558	72.0	0.75	618	72.5	0.83	320
2d quartile	77.1	1.27	231	75.4	0.49	576	75.3	0.62	526	74.0	1.09	199
3d quartile	79.9	1.13	226	78.4	0.65	487	78.6	0.70	429	78.0	0.84	152
4th quartile	86.9	1.28	191	85.2	1.01	365	84.1	0.91	310	84.4	1.48	120

[1] Excludes "other" racial groups.

Table 40. Systolic blood pressure levels of adult males ages 18–74 years within strata of consumption of cholesterol showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	*Dietary cholesterol (milligrams/day)*											
	Less than 180.9			*180.9–414.8*			*414.9–835.7*			*835.8 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	130.3	1.35	461	130.2	0.83	1,071	129.6	0.69	1,071	127.3	1.04	488
Race												
White	129.5	1.51	387	129.9	0.78	939	129.3	0.76	918	126.9	1.06	406
Black	137.5	2.84	74	133.3	3.59	132	132.2	1.88	153	129.9	3.82	82
Age												
18–24 years	127.3	2.34	65	123.7	1.29	180	122.6	1.23	158	121.0	1.41	101
25–34 years	122.1	2.08	62	125.5	1.06	178	124.3	0.99	179	125.8	1.65	106
35–44 years	127.0	1.90	33	126.6	1.73	137	126.1	1.36	147	125.9	1.96	97
45–54 years	131.9	2.74	63	133.9	2.01	165	133.0	1.51	161	135.4	2.57	74
55–64 years	136.6	2.87	48	139.8	2.25	102	137.4	2.51	131	132.4	3.83	43
65–74 years	141.6	2.06	190	143.6	1.97	309	143.2	1.92	295	146.9	5.49	67
BMI												
1st quartile	122.8	2.40	122	124.6	1.67	241	125.4	1.27	271	121.9	1.58	140
2d quartile	132.0	2.01	98	128.3	1.44	288	128.3	1.32	269	122.4	1.55	119
3d quartile	129.2	1.79	110	130.8	1.45	271	130.3	1.14	273	130.1	1.25	118
4th quartile	136.3	2.36	131	135.8	1.61	271	134.8	1.25	258	136.5	2.44	111

[1] Excludes "other" racial groups.

Table 41. Diastolic blood pressure levels of adult males ages 18–74 years within strata of consumption of cholesterol showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Dietary cholesterol (milligrams/day)											
	Less than 180.9			180.9–414.8			414.9–835.7			835.8 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	82.0	0.80	461	82.5	0.49	1,072	81.9	0.38	1,071	81.4	0.81	488
Race												
White	81.6	0.87	387	82.5	0.49	940	81.6	0.41	918	81.2	0.86	406
Black	85.6	2.10	74	82.8	2.12	132	84.1	1.34	153	83.1	1.97	82
Age												
18–24 years	78.1	1.68	65	76.7	0.92	180	75.2	0.90	158	75.4	0.93	101
25–34 years	78.9	1.10	62	80.8	0.77	178	79.6	0.69	179	79.3	1.50	106
35–44 years	82.3	1.97	33	83.4	1.27	138	82.6	0.75	147	84.8	1.65	97
45–54 years	85.0	1.83	63	87.0	1.31	165	86.9	0.93	161	87.3	1.42	74
55–64 years	84.9	1.56	48	86.1	1.29	102	85.4	1.21	131	85.1	2.95	43
65–74 years	84.7	1.18	190	83.6	0.81	309	83.3	1.13	295	84.5	2.00	67
BMI												
1st quartile	77.3	1.61	122	77.6	1.31	241	78.1	0.79	271	77.0	1.01	140
2d quartile	80.0	1.58	98	80.9	0.74	288	80.1	0.68	269	77.8	1.64	119
3d quartile	81.7	1.19	110	83.5	0.92	272	84.1	0.49	273	83.0	0.90	118
4th quartile	87.4	1.26	131	87.0	0.77	271	85.3	0.66	258	89.4	1.51	111

[1] Excludes "other" racial groups.

Table 42. Systolic blood pressure levels of adult females ages 18–74 years within strata of consumption of cholesterol showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Dietary cholesterol (milligrams/day)											
	Less than 107.7			107.7–243.1			243.2–571.0			571.1 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	124.7	1.25	669	122.2	0.73	1,562	124.2	0.70	1,565	122.2	1.21	679
Race												
White	124.4	1.31	564	122.1	0.79	1,340	123.9	0.78	1,339	121.4	1.40	543
Black	127.4	2.80	105	122.6	1.69	222	127.6	3.13	226	129.5	8.29	136
Age												
18–24 years	113.7	0.79	152	114.6	0.88	349	114.2	1.12	311	111.4	1.60	148
25–34 years	117.8	1.32	157	114.5	0.68	407	116.3	0.80	389	116.3	1.05	200
35–44 years	123.3	1.81	133	118.9	0.91	332	122.4	1.47	362	117.0	1.62	147
45–54 years	131.0	3.70	59	127.9	2.07	154	127.2	1.65	171	132.3	3.91	87
55–64 years	137.0	4.95	53	136.0	2.28	93	140.0	3.33	88	136.5	3.52	44
65–74 years	144.8	3.24	115	144.7	1.43	227	147.3	2.37	244	145.0	3.80	53
BMI												
1st quartile	120.7	2.83	135	113.0	1.06	383	116.5	0.94	437	114.8	2.21	165
2d quartile	119.1	1.13	150	119.1	0.88	418	122.4	1.44	383	117.8	1.07	168
3d quartile	124.5	2.09	188	124.9	1.28	400	124.7	1.34	361	123.4	2.46	170
4th quartile	133.6	2.04	196	133.8	1.52	361	134.8	1.64	384	134.5	3.71	176

[1] Excludes "other" racial groups.

Table 43. Diastolic blood pressure levels of adult females ages 18–74 years within strata of consumption of cholesterol showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Dietary cholesterol (milligrams/day)											
	Less than 107.7			107.7–243.1			243.2–571.0			571.1 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	77.8	0.67	669	76.5	0.48	1,562	77.8	0.42	1,565	76.3	0.56	679
Race												
White	77.6	0.74	564	76.4	0.55	1,340	77.6	0.46	1,339	75.8	0.66	543
Black	79.9	1.57	105	78.2	1.15	222	80.5	1.63	226	80.5	2.43	136
Age												
8–24 years	71.0	0.62	152	70.3	0.51	349	72.0	0.80	311	69.1	0.98	148
25–34 years	75.9	0.92	157	73.8	0.51	407	74.7	0.56	389	74.7	0.91	200
35–44 years	80.2	1.32	133	77.0	0.62	332	78.7	0.96	362	76.4	0.87	147
45–54 years	82.8	1.87	59	80.1	1.49	154	80.7	0.99	171	80.3	1.54	87
55–64 years	82.1	1.71	53	84.7	0.93	93	83.7	1.54	88	84.2	2.08	44
65–74 years	82.0	1.51	115	83.2	0.94	227	84.0	1.04	244	82.2	1.56	53
BMI												
1st quartile	74.5	1.28	135	71.2	0.82	383	73.3	0.64	437	72.6	1.29	165
2d quartile	75.2	1.01	150	74.5	0.55	418	76.8	0.79	383	73.8	0.77	168
3d quartile	77.0	0.97	188	77.3	0.83	400	77.5	0.81	361	76.9	0.87	170
4th quartile	83.6	1.44	196	84.3	0.78	361	84.6	0.81	384	82.7	1.30	176

[1] Excludes "other" racial groups.

Table 44. Systolic blood pressure levels of adults ages 18–74 years within strata of weekly coffee/tea consumption frequency showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Coffee/tea consumption frequency (times/week)											
	Less than 2.0			2.0–13.9			14.0–27.0			27.1 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	122.0	0.64	1,237	125.5	0.60	2,951	127.3	0.55	3,464	124.7	0.65	1,590
Sex												
Male	125.2	0.86	474	129.2	0.83	1,118	130.5	0.67	1,434	127.1	0.88	676
Female	118.8	0.84	763	122.0	0.71	1,833	124.4	0.71	2,030	121.9	0.93	914
Race												
White	121.8	0.72	859	124.4	0.61	2,224	127.3	0.54	3,163	124.7	0.65	1,529
Black	122.7	1.28	378	131.4	2.18	727	128.7	2.35	301	124.0	3.47	61
Age												
Total												
18–24 years	118.2	0.80	631	119.1	0.67	798	116.8	0.71	413	119.2	1.19	113
25–34 years	120.0	0.67	278	119.3	0.71	747	120.1	0.78	710	120.9	0.85	410
35–44 years	127.7	1.55	108	123.4	1.08	445	123.7	0.93	677	120.9	0.85	478
45–54 years	124.9	3.13	57	136.4	2.72	264	129.9	1.12	492	128.6	1.26	274
55–64 years	142.7	3.49	38	139.2	1.82	190	137.4	0.99	333	131.4	2.48	134
65–74 years	147.6	2.27	125	143.7	1.68	507	145.0	1.40	839	143.8	3.33	181
Male												
18–24 years	122.2	1.09	232	123.6	1.04	278	122.4	1.18	127	123.7	2.58	38
25–34 years	123.3	1.25	78	123.9	0.98	209	124.4	1.23	232	125.2	1.00	152
35–44 years	129.3	2.22	33	127.0	1.57	124	127.0	1.34	210	122.9	1.46	153
45–54 years	123.5	3.81	28	139.1	2.60	130	132.3	1.62	244	130.8	1.61	132
55–64 years	140.0	4.97	24	139.3	2.86	95	140.2	1.60	161	129.4	2.36	81
65–74 years	146.9	3.20	79	144.4	1.95	282	142.8	1.61	460	143.6	4.97	120
Female												
18–24 years	114.1	0.90	399	114.5	0.69	520	112.7	0.89	286	114.2	2.59	75
25–34 years	117.1	1.17	200	115.5	0.76	538	115.7	0.75	478	115.0	0.81	258
35–44 years	125.8	2.70	75	120.5	1.26	321	120.5	0.97	467	118.8	0.74	325
45–54 years	126.1	4.55	29	133.9	3.97	134	127.5	1.43	248	126.4	1.62	142
55–64 years	147.0	5.36	14	139.1	2.84	95	134.7	1.59	172	133.7	4.45	53
65–74 years	148.6	3.22	46	143.0	2.09	225	147.1	1.76	379	114.4	2.78	61
BMI												
Male												
1st quartile	113.4	0.87	258	118.7	0.96	551	123.5	1.20	387	123.9	1.47	156
2d quartile	121.2	1.72	85	125.5	1.08	336	128.8	1.32	336	124.0	1.05	196
3d quartile	122.5	2.05	58	129.9	1.82	302	131.0	0.90	383	127.7	1.55	182
4th quartile	131.0	1.98	55	136.0	1.34	293	135.9	1.54	392	133.1	1.82	145
Female												
1st quartile	110.4	1.06	232	112.6	0.85	672	115.4	0.90	517	115.1	1.22	218
2d quartile	116.7	1.51	131	118.6	1.21	493	120.4	0.99	536	118.4	1.02	250
3d quartile	117.2	1.20	100	122.1	1.23	496	126.0	1.12	536	122.3	1.20	256
4th quartile	131.6	2.76	90	130.9	1.58	5,232	134.7	1.53	508	131.6	2.20	198

[1] Excludes "other" racial groups.

Table 45. Diastolic blood pressure levels of adults ages 18–74 years within strata of weekly coffee/tea consumption frequency showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Sex, race, age, and body mass index quartile stratum	Coffee/tea consumption frequency (times/week)											
	Less than 2.0			2.0–13.9			14.0–27.0			27.1 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	76.9	0.47	1,237	79.1	0.35	2,950	80.2	0.29	3,465	79.5	0.47	1,590
Sex												
Male	79.1	0.65	474	81.7	0.51	1,118	82.7	0.40	1,435	81.9	0.65	676
Female	74.7	0.59	763	76.6	0.48	1,832	77.9	0.41	2,030	76.7	0.68	914
Race												
White	76.5	0.51	859	78.3	0.37	2,224	80.2	0.29	3,164	79.4	0.48	1,529
Black	78.8	0.94	378	83.1	1.08	726	81.1	1.35	301	82.5	2.87	61
Age												
Total												
18–24 years	72.8	0.53	631	73.9	0.50	797	72.6	0.65	413	74.4	1.01	113
25–34 years	78.6	0.65	278	76.2	0.53	747	77.1	0.42	710	77.9	0.61	410
35–44 years	85.3	0.89	108	81.1	0.84	445	81.0	0.49	678	79.0	0.64	478
45–54 years	84.5	1.98	57	86.1	1.36	264	83.4	0.61	492	82.2	0.94	274
55–64 years	88.1	2.08	38	88.1	1.13	190	83.9	0.61	333	80.9	1.41	134
65–74 years	84.8	1.65	125	83.1	0.92	507	83.8	0.74	839	83.7	1.54	181
Male												
18–24 years	74.8	0.67	232	76.7	0.83	278	76.0	0.96	127	77.0	1.97	38
25–34 years	82.1	1.39	78	79.1	0.70	209	79.5	0.73	232	80.9	1.03	152
35–44 years	86.9	1.53	33	83.7	1.27	124	84.1	0.72	211	81.7	0.98	153
45–54 years	84.5	2.94	28	89.7	1.33	130	86.0	0.80	244	85.2	1.09	132
55–64 years	88.4	3.04	24	88.8	1.44	95	85.3	0.87	161	80.8	1.49	81
65–74 years	85.9	2.04	79	84.4	1.21	282	83.8	0.77	460	84.5	1.83	120
Female												
18–24 years	70.8	0.76	399	71.1	0.62	519	70.1	0.87	286	71.5	1.08	75
25–34 years	75.6	0.71	200	73.8	0.58	538	74.8	0.47	478	73.8	0.67	258
35–44 years	83.3	1.81	75	79.0	1.02	321	77.9	0.59	467	76.1	0.64	325
45–54 years	84.5	2.44	29	82.7	1.88	134	80.7	0.91	248	79.3	1.34	142
55–64 years	87.6	2.21	14	87.2	1.48	95	82.5	0.75	172	81.0	2.30	53
65–74 years	83.5	2.13	46	81.8	1.31	225	83.7	0.90	379	82.1	1.86	61
BMI												
Male												
1st quartile	69.7	0.84	258	73.9	0.64	551	76.7	0.64	387	79.2	1.26	156
2d quartile	73.5	1.25	85	78.4	0.72	336	80.6	0.86	336	78.8	0.79	196
3d quartile	79.0	1.35	58	82.1	0.86	302	84.0	0.56	384	82.8	0.94	182
4th quartile	83.7	1.93	55	86.2	0.94	293	87.2	0.86	392	87.2	1.11	145
Female												
1st quartile	110.4	1.06	232	112.6	0.84	672	115.4	0.90	517	115.1	1.22	218
2d quartile	116.7	1.51	131	118.6	1.21	493	120.4	0.99	536	118.4	1.02	250
3d quartile	117.2	1.20	100	122.1	1.23	496	126.0	1.12	536	122.3	1.20	256
4th quartile	131.6	2.76	90	130.9	1.58	522	134.7	1.53	568	131.6	2.20	198

[1] Excludes "other" racial groups.

Table 46. Systolic blood pressure levels of adult males ages 18–74 years within strata of smoking frequency showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	*Smoking status*											
	None			*Cigar/pipe*			*Cigarettes*			*Mixed*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	131.3	0.63	1,239	132.3	1.24	289	130.0	0.78	1,210	131.1	0.93	415
Race												
White	130.8	0.69	1,129	131.9	1.28	261	129.1	0.74	1,038	130.4	1.00	364
Black	139.3	2.70	110	138.7	3.10	28	137.8	2.18	172	137.4	2.62	51
Age												
25–34 years	123.3	0.95	247	128.2	1.90	55	124.0	1.03	340	126.8	1.67	105
35–44 years	125.9	1.28	206	129.4	1.45	49	127.1	1.54	230	127.7	1.16	71
45–54 years	132.1	1.38	278	134.1	3.31	60	132.6	1.36	319	131.3	1.87	111
55–64 years	139.5	1.60	235	133.5	2.36	68	137.1	1.66	188	137.1	2.37	70
65–74 years	144.0	1.42	273	140.3	3.72	57	147.9	2.71	133	143.4	3.92	58
BMI												
1st quartile	124.6	1.14	229	124.8	2.25	57	127.2	1.15	400	129.2	1.87	118
2d quartile	128.3	0.95	330	131.9	2.27	71	128.5	1.25	283	130.3	1.99	100
3d quartile	132.1	1.14	327	132.5	2.34	83	130.5	1.38	273	132.5	1.62	102
4th quartile	138.1	1.29	351	136.8	2.64	78	135.3	1.77	253	132.9	2.05	95

[1] Excludes "other" racial groups.

Table 47. Diastolic blood pressure levels of adult males ages 18–74 years within strata of smoking frequency showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	Smoking status											
	None			Cigar/pipe			Cigarettes			Mixed		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	84.8	0.39	1,239	85.3	0.84	289	83.8	0.50	1,209	85.3	0.66	415
Race												
White	84.5	0.42	1,129	84.7	0.76	261	83.0	0.54	1,038	84.4	0.63	364
Black	89.4	1.43	110	93.8	2.76	28	90.3	1.46	171	93.2	2.54	51
Age												
25–34 years	81.1	0.75	247	84.2	1.58	55	80.8	0.77	339	82.4	1.46	105
35–44 years	84.8	0.91	206	86.7	1.46	49	84.9	0.90	230	87.3	1.28	71
45–54 years	88.1	0.94	278	87.7	2.14	60	85.7	0.65	319	86.1	1.19	111
55–64 years	87.0	0.82	235	85.1	1.87	68	85.8	1.20	188	86.8	1.68	70
65–74 years	83.8	0.75	273	81.6	1.91	57	83.8	1.51	133	85.3	2.03	58
BMI												
1st quartile	79.3	0.78	229	81.7	1.84	57	80.7	0.82	400	82.2	1.26	118
2d quartile	82.9	0.56	330	81.6	1.16	71	83.2	0.79	283	84.1	1.53	100
3d quartile	85.4	0.67	327	85.0	1.97	83	84.8	0.78	273	85.9	1.25	102
4th quartile	90.0	0.75	351	90.5	1.78	78	87.6	1.10	252	89.5	1.33	95

[1] Excludes "other" racial groups.

Table 48. Systolic blood pressure levels of adult females ages 18–74 years within strata of smoking frequency showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	Smoking status: Nonsmoking — Mean	Nonsmoking — Standard error of mean	Nonsmoking — Number of examinees	Smokes cigarettes — Mean	Smokes cigarettes — Standard error of mean	Smokes cigarettes — Number of examinees
	Millimeters of mercury			Millimeters of mercury		
Total[1]	127.9	0.67	1,996	122.5	1.22	1,072
Race						
White	127.9	0.69	1,798	121.6	1.30	914
Black	132.7	2.08	198	128.0	2.30	158
Age						
25–34 years	115.3	0.70	488	115.2	0.89	356
35–44 years	121.0	1.18	373	118.2	1.64	244
45–54 years	129.7	1.30	446	124.8	1.38	277
55–64 years	138.0	1.43	342	138.3	4.20	145
65–74 years	147.3	1.60	347	144.4	4.06	50
BMI						
1st quartile	119.7	1.20	418	116.2	1.27	348
2d quartile	122.6	1.17	508	118.7	2.12	259
3d quartile	130.7	1.36	525	124.5	1.40	242
4th quartile	137.1	1.37	542	135.3	2.46	223

[1] Excludes "other" racial groups.

Table 49. Diastolic blood pressure levels of adult females ages 18–74 years within strata of smoking frequency showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	Smoking status: Nonsmoking — Mean	Nonsmoking — Standard error of mean	Nonsmoking — Number of examinees	Smokes cigarettes — Mean	Smokes cigarettes — Standard error of mean	Smokes cigarettes — Number of examinees
	Millimeters of mercury			Millimeters of mercury		
Total[1]	80.9	0.35	1,995	78.8	0.69	1,071
Race						
White	80.5	0.39	1,798	77.9	0.75	913
Black	84.8	1.23	197	84.6	1.83	158
Age						
25–34 years	75.6	0.52	488	75.3	0.72	356
35–44 years	80.0	0.79	373	78.6	1.28	244
45–54 years	83.2	0.73	446	80.2	1.01	277
55–64 years	83.8	0.78	341	84.2	2.32	144
65–74 years	84.8	0.97	347	81.7	1.86	50
BMI						
1st quartile	76.3	0.65	418	74.8	0.66	348
2d quartile	77.1	0.51	508	75.5	1.12	259
3d quartile	81.3	0.61	525	79.4	0.94	241
4th quartile	87.8	0.78	541	88.6	1.59	223

[1] Excludes "other" racial groups.

Table 50. Systolic blood pressure levels of adult females ages 18-44 years among non-users, past users, and current users of oral contraceptive agents showing means and standard errors by race, age, and body mass index (BMI): United States, 1971-74

Race,[1] age, and body mass index quartile stratum	*Use of contraceptive agents*								
	Not used in past 6 months			*Used in past 6 months, but not now*			*Use now*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Whites									
Total	117.2	0.43	2,820	113.2	0.96	212	118.6	0.85	882
Age									
18-24 years	114.3	0.73	714	112.6	1.34	76	116.7	1.02	372
25-34 years	115.8	0.52	1,030	112.1	1.24	106	118.1	0.79	378
35-44 years	121.2	0.70	1,076	118.9	2.62	30	126.2	3.00	132
Black									
Total	120.9	1.20	663	113.7	2.35	55	118.1	1.56	191
Age									
18-24 years	111.8	1.44	180	111.0	1.57	27	114.6	1.36	110
25-34 years	121.7	1.47	229	115.0	4.30	24	123.0	2.82	59
35-44 years	128.5	1.75	254	128.6	4.96	4	120.6	2.68	22
BMI									
All ages									
1st quartile	110.9	0.71	784	109.3	1.58	86	115.7	0.89	354
2d quartile	114.3	0.52	865	111.2	1.56	68	117.2	1.04	300
3d quartile	118.1	0.49	906	115.4	1.50	68	117.2	1.02	253
4th quartile	127.3	0.86	985	121.6	1.75	50	130.0	2.51	181

[1] Excludes "other" racial groups.

Table 51. Diastolic blood pressure levels of adult females ages 18–44 years among non-users, past users, and current users of oral contraceptive agents showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race,[1] age, and body mass index quartile stratum	Use of contraceptive agents								
	Not used in past 6 months			*Used in past 6 months, but not now*			*Use now*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
White									
Total	74.6	0.34	2,820	73.5	0.73	212	74.8	0.45	882
Age									
18–24 years	70.4	0.58	714	71.4	1.15	76	72.4	0.63	372
25–34 years	74.4	0.37	1,030	72.9	0.97	106	75.5	0.52	378
35–44 years	78.3	0.56	1,076	80.7	1.59	30	80.7	1.43	132
Black									
Total	78.7	1.00	662	73.8	1.66	55	76.5	0.99	191
Age									
18–24 years	71.4	1.55	179	70.9	2.47	27	73.9	1.07	110
25–34 years	78.4	1.48	229	75.3	2.06	24	78.5	1.71	59
35–44 years	85.7	1.32	254	90.3	3.87	4	81.9	2.50	22
BMI									
All ages									
1st quartile	69.8	0.58	783	70.3	1.06	86	73.9	0.69	354
2d quartile	72.9	0.38	865	73.8	1.08	68	73.6	0.65	300
3d quartile	74.8	0.37	906	74.4	1.33	68	74.1	0.78	253
4th quartile	82.7	0.57	985	78.6	1.90	50	82.1	1.29	181

[1] Excludes "other" racial groups.

Table 52. Systolic blood pressure levels of adult males ages 25–74 years within general well-being strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	*Total general well-being score*											
	Less than 66.00			*66.00–86.00*			*86.01–100.00*			*100.00 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	131.2	1.17	439	131.1	0.69	1,115	133.2	0.63	1,109	136.2	0.98	424
Race												
White	130.3	1.29	353	130.3	0.70	986	132.6	0.66	1,004	135.3	1.07	364
Black	137.0	2.05	86	139.1	2.94	129	140.8	2.85	105	144.8	4.08	60
Age												
25–34 years	123.8	1.40	78	123.8	0.89	264	125.0	1.05	238	124.9	1.93	79
35–44 years	127.3	2.40	67	125.3	1.32	190	129.9	1.34	194	125.9	1.72	60
45–54 years	130.0	2.23	118	134.8	1.34	261	135.2	1.61	268	135.8	2.32	90
55–64 years	141.1	2.73	103	137.2	1.84	211	139.0	1.68	203	149.6	2.91	81
65–74 years	137.4	3.44	73	147.7	1.87	189	146.3	2.26	206	148.2	2.48	114
BMI												
1st quartile	127.3	2.40	135	123.8	1.11	273	130.2	1.19	255	134.3	2.49	107
2d quartile	128.4	1.65	83	128.7	1.22	286	131.4	1.24	300	132.3	2.39	104
3d quartile	132.4	1.75	103	132.8	1.30	276	132.0	1.09	291	134.7	2.10	99
4th quartile	137.0	2.43	117	139.3	1.66	280	139.3	1.44	262	142.6	2.35	113

[1] Excludes "other" racial groups.

Table 53. Diastolic blood pressure levels of adult males ages 25–74 years within general well-being strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	*Total well-being score*											
	Less than 66.00			*66.00–86.00*			*86.01–100.00*			*100.01 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	85.6	0.76	438	85.4	0.43	1,115	85.2	0.46	1,109	85.3	0.63	424
Race												
White	84.9	0.81	353	84.7	0.45	986	84.8	0.48	1,004	84.7	0.59	364
Black	90.2	1.65	85	92.4	2.12	129	90.0	1.77	105	91.7	2.13	60
Age												
25–34 years	82.8	1.20	77	81.8	0.78	264	80.6	0.86	238	81.7	1.11	79
35–44 years	86.0	1.78	67	84.9	0.83	190	86.0	1.01	194	84.0	1.50	60
45–54 years	86.0	1.56	118	88.9	0.83	261	88.3	1.07	268	89.0	1.18	90
55–64 years	88.7	1.82	103	87.3	1.22	211	87.3	0.86	203	89.7	1.41	81
65–74 years	82.7	1.91	73	85.9	0.97	189	85.7	1.24	206	82.8	1.58	114
BMI												
1st quartile	81.7	1.57	135	79.3	0.88	273	81.9	0.85	255	83.5	1.20	107
2d quartile	82.5	0.91	83	83.7	0.81	286	84.1	0.84	300	83.1	0.91	104
3d quartile	87.2	1.29	103	87.4	0.66	276	84.2	0.71	291	84.7	1.32	99
4th quartile	91.3	1.83	116	91.0	0.83	280	90.9	1.00	262	89.4	1.33	113

[1] Excludes "other" racial groups.

Table 54. Systolic blood pressure levels of adult females ages 25–74 years within general well-being strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	Total well-being score											
	Less than 59.00			*59.00–80.00*			*80.01–96.00*			*96.01 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	129.2	1.62	545	129.4	1.05	1,290	129.8	0.80	1,276	130.1	1.19	542
Race												
White	127.8	1.78	421	128.8	1.04	1,107	128.8	0.83	1,158	129.5	1.22	494
Black	134.8	2.88	124	134.3	3.73	183	143.0	3.02	118	137.8	4.47	48
Age												
25–34 years	117.5	1.68	125	115.5	1.01	320	114.9	0.90	317	115.1	1.32	106
35–44 years	120.2	1.92	108	121.0	1.51	241	122.1	1.50	246	118.8	1.66	77
45–54 years	132.6	3.66	128	131.1	1.66	288	131.5	1.35	298	129.5	2.26	139
55–64 years	140.7	2.89	94	142.4	2.54	233	143.8	2.01	204	140.5	1.94	113
65–74 years	151.4	3.43	90	151.2	2.47	208	151.8	2.17	211	149.0	2.57	107
BMI												
1st quartile	115.9	2.37	113	119.2	1.48	322	120.3	1.43	337	121.8	1.99	143
2d quartile	123.1	1.73	121	124.4	1.42	300	126.6	1.49	356	125.1	1.73	142
3d quartile	133.8	2.78	127	131.5	2.05	312	133.0	1.36	320	133.4	1.90	151
4th quartile	141.5	2.44	183	141.9	2.07	354	143.8	1.96	263	143.4	2.92	106

[1] Excludes "other" racial groups.

Table 55. Diastolic blood pressure levels of adult females ages 25–74 years within general well-being strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	Total well-being score: Less than 59.00			59.00–80.00			80.01–96.00			96.01 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	82.2	1.00	544	82.1	0.59	1,289	81.2	0.41	1,276	80.9	0.80	542
Race												
White	81.0	1.15	421	81.4	0.56	1,106	80.7	0.43	1,158	80.4	0.87	494
Black	87.2	1.70	123	87.3	2.45	183	87.3	1.59	118	86.7	2.03	48
Age												
25–34 years	79.0	1.47	125	75.6	0.81	320	75.0	0.72	317	74.5	1.05	106
35–44 years	79.1	1.56	108	81.8	1.22	241	80.2	0.93	246	77.2	1.20	77
45–54 years	84.6	1.89	128	83.8	1.03	288	83.7	0.83	298	83.1	1.67	139
55–64 years	85.6	1.85	93	86.4	1.40	232	86.3	0.89	204	83.8	1.07	113
65–74 years	86.3	2.15	90	87.9	1.41	208	84.9	0.96	211	85.6	1.37	107
BMI												
1st quartile	74.6	1.57	113	76.6	0.84	322	77.1	0.63	337	76.6	1.04	143
2d quartile	78.6	1.58	121	77.8	0.70	300	79.3	0.72	356	76.3	0.83	142
3d quartile	83.0	1.53	127	82.5	1.08	311	82.3	0.77	320	83.0	0.95	151
4th quartile	90.9	1.57	182	90.9	1.37	354	88.4	0.85	263	90.2	1.56	106

[1] Excludes "other" racial groups.

Table 56. Systolic blood pressure levels of adult males ages 18-74 years within hemoglobin level strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971-74

Race, age, and body mass index quartile stratum	Hemoglobin concentration (grams/deciliter)											
	Less than 14.35			14.35-15.64			15.65-16.74			16.75 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	130.4	1.03	725	130.4	0.70	1,645	129.5	0.74	1,440	131.0	1.17	630
Race												
White	129.3	1.07	519	129.8	0.74	1,354	129.5	0.76	1,320	130.6	1.11	585
Black	135.7	3.09	206	135.3	1.65	291	130.9	3.43	120	139.3	6.02	45
Age												
18-24 years	124.0	1.82	60	122.7	1.02	255	124.3	0.94	282	123.7	1.15	112
25-34 years	122.5	1.51	87	125.1	0.96	255	126.3	1.14	277	124.6	1.82	117
35-44 years	125.9	2.70	65	126.2	1.29	254	128.8	1.56	195	127.4	1.49	82
45-54 years	134.5	2.90	101	135.6	2.09	237	132.4	1.60	219	136.6	2.37	109
55-64 years	132.2	2.69	88	141.4	1.90	186	136.7	1.82	136	143.4	2.44	63
65-74 years	144.6	1.63	324	144.8	1.53	458	142.9	1.86	331	145.7	2.50	147
BMI												
1st quartile	127.8	1.70	271	124.2	1.06	394	124.1	1.00	319	124.4	1.42	113
2d quartile	129.1	1.73	179	128.7	1.06	421	126.8	1.31	359	126.6	2.10	161
3d quartile	131.3	2.04	143	131.1	1.22	440	130.8	1.01	357	131.1	1.87	172
4th quartile	135.2	3.27	132	137.4	1.53	390	135.7	1.09	405	139.7	2.45	184

[1] Excludes "other" racial groups.

Table 57. Diastolic blood pressure levels of adult males ages 18–74 years within hemoglobin level strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Hemoglobin concentration (grams/deciliter)											
	Less than 14.35			14.35–15.64			15.65–16.74			16.75 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	81.6	0.72	725	82.2	0.38	1,645	82.5	0.50	1,440	84.2	0.77	630
Race												
White	80.7	0.74	520	81.5	0.43	1,354	82.5	0.50	1,320	84.0	0.76	585
Black	85.6	1.73	205	87.1	1.35	291	83.5	1.89	120	90.0	3.34	45
Age												
18–24 years	76.7	1.63	60	75.1	0.77	255	76.2	0.73	282	78.8	1.00	112
25–34 years	78.4	1.56	86	80.9	0.56	255	81.1	0.74	277	80.8	1.33	117
35–44 years	83.5	1.98	66	82.7	0.89	254	86.0	1.10	195	86.3	1.14	82
45–54 years	85.5	1.84	101	86.1	1.07	237	87.8	1.34	219	88.2	1.55	109
55–64 years	82.3	2.04	88	86.3	1.35	186	85.7	0.98	136	89.8	1.69	63
65–74 years	82.3	0.75	324	85.2	0.78	458	83.4	0.86	331	85.5	1.49	147
BMI												
1st quartile	79.5	0.94	271	76.8	0.79	394	77.3	0.79	319	79.6	0.96	113
2d quartile	78.5	1.03	179	80.5	0.81	421	80.2	0.77	359	81.4	1.46	161
3d quartile	82.3	1.61	144	83.8	0.61	440	83.8	0.72	357	85.2	1.11	172
4th quartile	87.5	1.98	131	87.1	0.50	390	88.1	0.82	405	89.2	1.77	184

[1] Excludes "other" racial groups.

Table 58. Systolic blood pressure levels of adult females ages 18–74 years within hemoglobin level strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Hemoglobin concentration (grams/deciliter)											
	Less than 12.65			12.65–13.74			13.75–14.94			14.95 or more		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	122.7	0.61	1,208	124.3	0.81	2,316	125.2	0.72	2,456	130.7	1.22	925
Race												
White	121.5	0.71	795	123.7	0.91	1,931	124.6	0.72	2,170	130.8	1.22	859
Black	126.4	1.44	413	129.3	2.98	385	132.9	4.15	286	126.8	3.79	66
Age												
18–24 years	114.5	1.05	281	113.9	0.78	534	114.6	0.87	463	115.0	1.73	115
25–34 years	115.8	1.09	313	116.2	0.89	600	116.4	0.56	616	118.5	1.40	200
35–44 years	122.4	1.40	269	121.0	0.87	503	121.6	1.07	493	124.6	1.93	183
45–54 years	130.7	2.15	109	130.8	2.46	204	130.0	1.83	255	134.1	2.25	115
55–64 years	135.3	3.36	54	141.9	2.80	139	138.7	2.07	191	142.7	3.02	107
65–74 years	146.7	2.37	182	149.7	2.26	336	146.8	1.63	438	153.0	2.26	205
BMI												
1st quartile	115.2	1.17	307	115.1	1.04	624	117.1	1.19	585	120.8	1.52	209
2d quartile	120.2	0.91	321	120.9	1.44	613	120.9	0.94	630	125.9	1.40	179
3d quartile	125.1	1.40	316	129.2	1.78	563	125.2	1.02	623	131.3	2.27	243
4th quartile	133.3	1.49	264	136.1	2.10	516	137.8	1.48	618	141.5	2.05	294

[1] Excludes "other" racial groups.

Table 59. Diastolic blood pressure levels of adult females ages 18–74 years within hemoglobin level strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Hemoglobin concentration (grams/deciliter): Less than 12.65			12.65–13.74			13.75–14.94			14.95 or more		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	75.9	0.45	1,208	77.1	0.45	2,315	78.6	0.50	2,456	81.5	0.72	925
Race												
White	75.1	0.54	795	76.5	0.50	1,931	78.2	0.53	2,170	81.6	0.70	859
Black	78.7	1.20	413	82.1	1.34	384	83.5	1.61	286	80.7	2.32	66
Age												
18–24 years	69.5	0.96	281	70.6	0.70	533	71.8	0.51	463	72.8	0.98	115
25–34 years	73.3	0.87	313	74.0	0.57	600	75.8	0.46	616	75.9	0.97	200
35–44 years	79.2	1.23	269	78.5	0.49	503	79.5	0.75	493	79.5	1.27	183
45–54 years	80.9	1.20	109	81.9	1.12	204	80.9	1.05	255	85.3	1.45	115
55–64 years	82.6	1.18	54	82.9	1.28	139	85.1	1.31	191	87.8	0.97	107
65–74 years	80.5	0.93	182	84.9	1.01	336	84.3	0.88	438	86.7	1.38	205
BMI												
1st quartile	71.3	1.03	307	71.8	0.69	623	74.6	0.78	585	75.0	0.95	209
2d quartile	73.5	0.56	321	75.4	0.56	613	75.3	0.60	630	79.4	1.06	179
3d quartile	76.2	0.91	316	78.9	0.75	563	78.6	0.76	623	81.3	1.21	243
4th quartile	85.3	1.14	264	84.7	0.88	516	86.2	0.72	618	88.5	1.03	294

[1] Excludes "other" racial groups.

Table 60. Systolic blood pressure levels of adults ages 18–74 years within serum cholesterol level strata showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Serum cholesterol (milligrams/deciliter): Less than 163.05			163.05–206.04			206.05–260.04			260.05 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	121.3	0.72	1,801	124.9	0.54	4,174	130.6	0.62	4,182	134.7	0.80	1,777
Sex												
Male	125.8	0.88	622	128.4	0.71	1,595	132.6	0.68	1,746	133.7	0.85	688
Female	117.4	0.88	1,179	121.7	0.62	2,579	128.6	0.85	2,436	135.5	1.15	1,089
Race												
White	121.2	0.77	1,475	124.5	0.58	3,447	130.1	0.65	3,517	134.3	0.84	1,509
Black	122.8	1.89	326	128.8	1.45	727	136.7	2.77	665	138.6	1.69	268
Age												
18–24 years	117.6	0.68	743	119.4	0.65	956	119.8	0.88	463	121.0	2.62	65
25–34 years	119.9	0.80	531	119.4	0.51	1,176	122.6	0.81	724	124.8	1.16	167
35–44 years	123.1	1.76	251	123.4	0.80	857	125.1	0.88	803	128.7	1.52	239
45–54 years	128.1	2.65	90	130.6	1.54	402	134.1	1.40	623	132.5	1.59	297
55–64 years	141.4	5.79	44	142.2	2.51	212	138.9	1.29	469	137.9	1.35	284
65–74 years	145.9	2.24	142	145.6	1.45	571	146.4	1.06	1,100	147.9	1.42	725
BMI												
Male												
1st quartile	120.7	1.34	280	123.6	1.04	495	129.0	1.28	352	129.2	3.31	106
2d quartile	127.0	1.58	157	125.6	0.85	411	129.9	0.87	470	131.9	2.36	165
3d quartile	127.3	1.78	97	130.7	1.32	370	132.8	1.06	475	131.3	1.34	195
4th quartile	139.1	2.48	88	136.1	1.37	319	137.6	1.31	449	138.6	1.45	222
Female												
1st quartile	110.9	0.89	479	114.5	0.82	818	121.7	1.19	532	127.3	2.36	149
2d quartile	117.7	1.43	346	119.4	0.85	707	125.0	1.30	619	130.0	1.73	235
3d quartile	122.9	1.61	202	125.3	1.37	557	129.3	1.45	665	135.6	1.55	355
4th quartile	133.4	2.01	152	135.3	1.65	497	138.6	1.63	619	143.1	2.42	350

[1] Excludes "other" racial groups.

Table 61. Diastolic blood pressure levels of adults ages 18–74 years within serum cholesterol level strata showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–74

Race, age, and body mass index quartile stratum	Serum cholesterol (milligrams/deciliter)											
	Less than 163.05			163.05–206.04			206.05–260.04			260.05 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	75.6	0.46	1,801	79.2	0.32	4,174	82.3	0.34	4,181	84.2	0.56	1,777
Sex												
Male	78.3	0.57	623	81.6	0.49	1,595	84.4	0.37	1,745	85.7	0.75	688
Female	73.3	0.53	1,178	76.9	0.32	2,579	80.1	0.50	2,436	82.8	0.76	1,089
Race												
White	75.4	0.49	1,476	78.8	0.36	3,447	81.9	0.37	3,517	83.8	0.57	1,509
Black	78.1	1.11	325	82.5	0.91	727	85.6	1.32	664	88.0	1.38	268
Age												
18–24 years	72.1	0.57	742	74.2	0.44	956	75.1	0.65	463	75.1	1.51	65
25–34 years	76.5	0.60	531	77.1	0.39	1,176	79.1	0.46	723	79.9	0.90	167
35–44 years	79.2	0.92	252	80.9	0.70	857	82.4	0.47	803	85.9	1.04	239
45–54 years	81.8	1.40	90	84.1	0.69	402	84.8	0.83	623	85.3	0.94	297
55–64 years	85.0	2.08	44	86.1	0.94	212	85.5	0.56	469	84.7	1.09	284
65–74 years	83.0	1.48	142	84.0	0.76	571	84.6	0.45	1,100	84.5	0.88	725
BMI												
Male												
Ist quartile	74.7	0.71	280	77.5	0.62	495	80.8	0.81	352	80.5	1.94	106
2d quartile	78.5	1.04	157	80.2	0.74	411	81.6	0.53	470	83.7	1.48	165
3d quartile	82.4	1.00	98	83.1	0.80	370	84.6	0.49	475	85.1	0.96	195
4th quartile	86.2	1.27	88	87.6	1.13	319	89.5	0.71	448	89.5	1.26	222
Female												
Ist quartile	68.9	0.79	478	72.8	0.48	818	75.9	0.76	532	78.8	1.38	149
2d quartile	73.6	0.64	346	74.9	0.38	707	77.7	0.77	619	78.8	0.82	235
3d quartile	76.7	1.08	202	78.1	0.69	557	79.9	0.67	665	82.6	0.82	355
4th quartile	84.5	1.06	152	86.6	0.76	497	87.0	0.75	619	87.7	1.39	350

[1] Excludes "other" racial groups.

Table 62. Systolic blood pressure levels of adult males ages 25–74 years within serum urate level strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	Serum urate (milligrams/deciliter)											
	Less than 4.95			*4.95–6.14*			*6.15–7.54*			*7.55 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	129.0	0.99	403	129.7	0.80	957	130.3	0.66	932	135.9	1.51	448
Race												
White	129.0	1.04	360	129.0	0.81	858	130.0	0.73	835	134.3	1.35	377
Black	130.4	2.49	43	137.3	2.27	99	134.7	2.53	97	146.3	4.03	71
Age												
25–34 years	123.7	1.39	71	124.0	1.33	243	123.0	1.08	233	127.2	1.99	95
35–44 years	123.3	2.08	65	126.5	1.93	177	127.1	1.27	165	130.3	2.72	78
45–54 years	128.2	1.87	103	131.3	1.36	213	132.2	1.34	221	138.2	2.95	120
55–64 years	133.0	2.39	81	137.9	1.94	172	137.1	1.49	167	143.5	2.37	72
65–74 years	144.6	3.15	83	141.7	2.27	152	144.5	2.31	146	150.1	2.91	83
BMI												
Ist quartile	127.1	1.42	168	124.9	1.11	270	126.2	1.60	175	128.4	2.99	73
2d quartile	131.0	1.87	110	128.4	1.24	276	126.9	1.25	219	133.1	2.11	79
3d quartile	127.4	1.92	87	131.2	1.33	221	130.8	1.30	259	137.7	2.13	118
4th quartile	135.7	3.01	38	136.4	2.10	188	135.7	1.01	278	138.9	2.01	178

[1] Excludes "other" racial groups.

Table 63. Diastolic blood pressure levels of adult males ages 25–74 years within serum urate level strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	Serum urate (milligrams/deciliter)											
	Less than 4.95			4.95–6.14			6.15–7.54			7.55 or more		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	82.7	0.62	403	83.1	0.51	957	84.7	0.42	931	87.9	0.93	448
Race												
White	82.7	0.61	360	82.5	0.49	858	84.4	0.48	835	86.6	0.91	377
Black	81.9	2.02	43	89.6	1.89	99	88.7	2.06	96	95.7	1.44	71
Age												
25–34 years	79.5	1.22	71	80.1	0.96	243	81.6	0.61	232	84.3	1.20	95
35–44 years	83.8	1.62	65	83.1	0.93	177	85.6	1.02	165	89.4	1.94	78
45–54 years	83.8	1.38	103	86.1	0.76	213	87.6	1.02	221	89.4	1.96	120
55–64 years	83.8	1.12	81	85.3	1.37	172	86.5	0.93	167	90.1	1.87	72
65–74 years	82.2	1.36	83	83.1	1.08	152	83.1	1.10	146	86.3	1.99	83
BMI												
1st quartile	80.6	1.00	168	79.9	0.87	270	80.1	0.96	175	81.3	1.85	73
2d quartile	83.1	1.27	110	82.3	0.76	276	82.8	0.67	219	85.0	1.66	79
3d quartile	83.6	1.09	87	84.2	0.76	221	85.0	0.91	259	88.7	1.36	118
4th quartile	87.6	1.61	38	87.1	1.53	188	89.3	0.71	277	91.1	1.28	178

[1] Excludes "other" racial groups.

Table 64. Systolic blood pressure levels of adult females ages 25–74 years within serum urate level strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	Serum urate (milligrams/deciliter)											
	Less than 3.65			3.65–4.64			4.65–5.94			5.95 or more		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	121.1	0.93	474	122.9	0.93	1,066	126.9	0.83	1,003	135.0	1.57	530
Race												
White	120.5	0.97	429	122.8	0.97	965	126.5	0.93	892	134.2	1.72	430
Black	126.8	3.66	45	123.8	2.03	101	131.3	2.35	111	140.7	3.80	100
Age												
25–34 years	115.3	1.15	164	114.0	0.95	326	114.3	1.04	262	121.8	1.35	95
35–44 years	117.6	2.31	104	117.2	1.09	238	121.1	1.64	192	126.4	2.87	83
45–54 years	123.0	2.20	111	124.8	1.52	269	131.7	1.66	228	132.1	2.26	116
55–64 years	132.7	2.71	54	138.2	2.35	137	135.6	1.84	176	144.7	5.22	120
65–74 years	140.0	3.72	41	149.6	2.81	96	145.2	1.64	145	149.6	3.25	116
BMI												
Ist quartile	117.5	1.51	187	116.5	1.02	326	120.2	2.04	207	121.2	3.37	48
2d quartile	118.6	1.72	135	121.4	1.32	323	118.5	1.36	225	133.0	4.02	84
3d quartile	125.3	1.79	107	127.0	1.93	247	128.9	1.32	265	133.4	2.38	150
4th quartile	133.4	3.73	45	133.2	2.01	168	136.8	1.50	305	139.1	2.03	248

[1] Excludes "other" racial groups.

Table 65. Diastolic blood pressure levels of adult females ages 25–74 years within serum urate level strata showing means and standard errors by race, age, and body mass index (BMI): United States, 1971–75

Race, age, and body mass index quartile stratum	*Serum urate (milligrams/deciliter)*											
	Less than 3.65			*3.65–4.64*			*4.65–5.94*			*5.95 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	76.7	0.69	474	78.4	0.46	1,066	81.1	0.57	1,002	84.9	0.95	529
Race												
White	76.1	0.66	429	78.0	0.49	965	80.7	0.59	892	84.3	1.00	429
Black	82.4	2.97	45	82.3	1.66	101	85.1	1.88	110	89.0	2.04	100
Age												
25–34 years	73.9	1.10	164	74.8	0.66	326	75.5	0.91	262	80.7	1.45	95
35–44 years	76.5	1.35	104	77.5	0.75	238	80.7	1.14	192	85.0	2.26	83
45–54 years	79.3	1.17	111	80.1	0.93	269	84.6	0.95	228	84.6	1.26	116
55–64 years	79.5	1.40	54	82.6	1.27	137	83.5	0.90	175	88.6	2.41	119
65–74 years	79.7	2.27	41	84.9	1.67	96	84.9	1.32	145	85.1	1.43	116
BMI												
Ist quartile	75.4	0.92	187	75.0	0.53	326	76.4	1.16	207	76.9	2.02	48
2d quartile	74.5	0.87	135	77.1	0.63	323	75.6	0.92	225	80.9	1.37	84
3d quartile	77.9	1.62	107	79.6	1.00	247	81.7	0.71	265	82.4	1.33	149
4th quartile	85.9	1.91	45	86.2	1.17	168	88.4	0.90	304	89.2	1.52	248

[1] Excludes "other" racial groups.

Table 66. Systolic blood pressure levels of adults ages 25–74 years within strata of serum glutamic oxalacetic transaminase (SGOT) levels showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–75

Sex, race, age, and body mass index quartile stratum	SGOT (units/milliliter)											
	Less than 16.25			16.25–21.74			21.75–29.74			29.75 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	123.9	0.90	811	126.5	0.70	1,858	130.0	0.70	1,840	133.1	1.09	767
Sex												
Male	129.6	1.57	210	128.5	0.71	715	131.1	0.76	1,011	133.6	1.28	536
Female	122.0	1.04	601	125.1	1.01	1,143	128.7	1.03	829	131.7	1.72	231
Race												
White	123.1	0.90	710	126.0	0.72	1,687	129.8	0.70	1,650	131.9	0.99	658
Black	132.8	3.10	101	132.4	2.57	171	132.2	1.93	190	141.7	3.56	109
Age												
Total												
25–34 years	116.2	0.90	265	118.5	0.80	551	120.7	0.80	378	123.3	1.32	174
35–44 years	121.0	1.57	192	120.8	1.08	363	123.9	1.16	309	129.8	1.53	133
45–54 years	123.8	1.62	159	129.6	1.38	393	131.0	1.03	480	134.0	1.63	209
55–64 years	140.1	2.98	103	135.7	1.38	302	139.3	2.02	352	140.3	1.73	139
65–74 years	147.0	3.48	92	143.4	1.76	249	144.7	1.58	321	150.2	2.95	112
Male												
25–34 years	125.4	1.94	48	122.3	0.91	193	123.9	0.89	214	125.2	1.67	131
35–44 years	126.2	3.57	41	121.9	1.39	121	127.3	1.56	179	131.8	1.90	95
45–54 years	129.0	2.64	42	131.1	1.73	137	132.8	1.18	259	134.9	1.75	145
55–64 years	130.2	3.45	35	136.8	1.58	142	138.3	2.35	181	142.1	2.64	93
65–74 years	147.3	4.49	44	140.5	1.95	122	142.7	1.83	178	149.9	3.63	72
Female												
25–34 years	113.8	0.94	217	115.8	0.98	358	115.5	1.16	164	115.5	2.17	43
35–44 years	119.3	1.91	151	119.9	1.62	242	118.8	2.23	130	124.7	2.90	38
45–54 years	122.1	1.93	117	128.7	1.73	256	128.4	1.52	221	132.0	3.04	64
55–64 years	144.4	3.55	68	134.7	2.28	160	140.3	3.23	171	137.9	2.70	46
65–74 years	146.7	4.66	48	145.7	2.78	127	146.5	2.36	143	150.9	4.76	40
BMI												
Male												
Ist quartile	123.7	2.14	65	124.1	1.49	193	126.3	1.32	247	129.3	2.39	112
2d quartile	127.8	2.58	53	126.9	1.17	199	128.3	1.08	266	131.7	2.13	105
3d quartile	132.8	4.14	49	130.2	1.52	180	132.1	1.24	235	131.3	1.47	137
4th quartile	135.1	3.43	43	134.1	1.67	142	136.8	1.31	261	139.1	2.26	182
Female												
Ist quartile	116.8	1.92	154	117.0	1.42	301	119.1	1.81	198	127.9	4.82	46
2d quartile	118.5	1.50	181	118.9	1.22	272	125.5	1.58	210	125.8	2.57	47
3d quartile	124.7	2.47	141	129.6	1.93	293	128.7	1.99	204	132.3	3.12	60
4th quartile	132.6	2.15	125	135.5	1.83	276	140.5	1.50	215	136.7	2.31	78

[1] Excludes "other" racial groups.

Table 67. Diastolic blood pressure levels of adults ages 25–74 years within strata of serum glutamic oxalacetic transaminase (SGOT) levels showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–75

Sex, race, age, and body mass index quartile stratum	SGOT (units/milliliter)											
	Less than 16.25			16.25–21.74			21.75–29.74			29.75 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	78.9	0.54	810	81.1	0.43	1,858	83.1	0.43	1,839	86.1	0.55	766
Sex												
Male	83.3	1.08	210	82.7	0.56	715	84.4	0.51	1,011	87.2	0.67	535
Female	77.5	0.64	600	80.0	0.50	1,143	81.4	0.59	828	83.4	0.90	231
Race												
White	78.2	0.54	709	80.7	0.40	1,687	82.7	0.45	1,650	85.3	0.53	658
Black	86.3	2.15	101	85.5	1.67	171	86.6	1.26	189	91.7	2.09	108
Age												
Total												
25–34 years	75.0	0.79	265	77.1	0.55	551	79.3	0.61	378	83.3	1.00	173
35–44 years	80.2	0.87	192	80.6	0.86	363	82.6	0.86	309	87.4	0.96	133
45–54 years	80.5	1.22	159	84.1	0.66	393	85.3	0.70	480	86.3	0.83	209
55–64 years	83.4	1.51	102	83.8	0.72	302	85.1	1.07	351	89.6	1.35	139
65–74 years	83.4	2.10	92	84.1	1.22	249	84.3	0.75	321	84.2	1.63	112
Male												
25–34 years	82.0	2.25	48	78.7	0.98	193	80.9	0.78	214	84.8	1.02	130
35–44 years	84.6	2.72	41	82.0	1.04	121	85.1	1.11	179	88.7	1.02	95
45–54 years	85.3	1.91	42	86.3	1.21	137	87.3	0.74	259	87.7	0.96	145
55–64 years	80.5	2.34	35	86.1	1.13	142	85.3	1.19	181	91.5	2.04	93
65–74 years	84.4	2.60	44	82.7	1.37	122	83.8	0.85	178	83.6	2.14	72
Female												
25–34 years	73.2	0.85	217	75.9	0.62	358	76.8	1.07	164	76.7	1.91	43
35–44 years	78.8	1.01	151	79.7	1.24	242	78.9	1.51	130	84.0	1.89	38
45–54 years	79.0	1.38	117	82.8	0.75	256	82.6	1.03	221	83.2	1.67	64
55–64 years	84.7	1.77	67	81.7	0.95	160	84.9	1.68	170	87.1	1.67	46
65–74 years	82.8	2.74	48	85.3	1.73	127	84.9	1.18	143	85.2	2.36	40
BMI												
Male												
Ist quartile	79.4	1.59	65	80.1	1.02	193	79.8	0.75	247	81.8	1.60	112
2d quartile	81.0	1.62	53	80.4	0.67	199	83.2	0.66	266	86.4	1.30	105
3d quartile	85.1	2.33	49	84.0	1.00	180	85.6	1.02	235	86.2	0.94	137
4th quartile	88.6	2.92	43	87.6	1.77	142	88.3	0.87	261	91.7	1.01	181
Female												
Ist quartile	74.5	0.93	154	75.9	0.66	301	76.0	0.93	198	78.9	2.50	46
2d quartile	74.5	0.75	181	76.2	0.65	272	78.2	0.93	210	78.5	1.54	47
3d quartile	78.0	1.51	140	80.8	0.79	293	81.6	1.11	204	82.6	1.73	60
4th quartile	86.4	1.39	125	87.6	1.05	276	89.2	1.11	214	89.6	1.76	73

[1] Excludes "other" racial groups.

Table 68. Systolic blood pressure levels of adults ages 25–74 years within serum calcium level strata showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–75

Sex, race, age, and body mass index quartile stratum	Serum calcium (milligrams/deciliter): Less than 16.25			16.25–21.74			21.75–29.74			29.75 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	127.2	1.03	813	128.3	0.62	2,275	127.7	0.70	1,557	129.6	1.18	616
Sex												
Male	132.6	1.32	323	131.3	0.74	1,050	129.6	0.81	773	129.9	1.22	342
Female	123.8	1.30	490	125.5	0.78	1,225	125.7	1.06	784	129.1	1.76	274
Race												
White	126.6	1.14	731	128.0	0.67	2,042	126.7	0.65	1,358	129.0	1.23	528
Black	132.9	3.90	82	131.9	2.14	233	136.6	2.46	199	133.4	3.58	88
Age												
Total												
25–34 years	115.5	1.05	181	119.0	0.85	550	120.6	0.86	435	120.5	1.37	187
35–44 years	119.4	1.65	162	121.7	1.13	417	124.3	1.18	301	129.2	2.43	119
45–54 years	125.5	1.27	183	131.5	0.98	554	129.0	1.33	377	130.1	1.68	140
55–64 years	140.5	3.70	138	136.9	1.61	404	137.2	1.68	245	140.7	1.70	109
65–74 years	147.7	2.48	149	145.3	1.51	350	144.4	1.97	199	148.7	4.87	61
Male												
25–34 years	123.8	1.82	37	125.0	1.27	203	124.0	1.05	221	123.2	1.57	127
35–44 years	122.8	2.08	43	125.0	1.54	176	128.1	1.98	160	134.3	2.18	63
45–54 years	127.7	1.58	66	133.9	1.19	258	131.9	1.67	181	131.0	1.98	68
55–64 years	139.5	3.04	75	137.5	2.09	218	135.6	1.92	117	139.5	2.59	48
65–74 years	147.6	3.05	82	143.0	2.12	195	145.8	2.78	94	142.8	4.03	36
Female												
25–34 years	113.0	0.97	144	114.7	0.97	347	116.0	1.25	214	113.7	1.84	60
35–44 years	118.1	2.06	119	118.4	1.46	241	119.7	1.21	141	123.8	3.81	56
45–54 years	123.6	2.20	97	129.1	1.43	296	126.3	1.94	196	129.0	2.49	72
55–64 years	141.6	7.69	63	136.4	2.16	186	138.5	2.87	128	141.6	2.28	61
65–74 years	147.8	3.87	67	147.6	2.14	155	143.4	2.65	105	154.5	7.42	25
BMI												
Male												
1st quartile	131.5	2.32	86	124.9	1.25	272	123.3	1.24	164	129.4	2.58	96
2d quartile	132.7	2.76	72	130.1	1.14	247	126.6	1.44	220	126.8	2.10	91
3d quartile	130.2	2.32	92	131.4	1.27	264	132.6	1.49	191	129.0	2.12	72
4th quartile	137.0	2.95	73	138.5	1.63	266	135.0	1.89	196	134.7	1.99	83
Female												
Ist quartile	113.9	2.03	112	117.9	1.62	303	119.9	1.29	207	120.2	2.83	75
2d quartile	118.2	1.39	153	120.6	1.25	288	120.2	1.68	196	123.3	2.95	65
3d quartile	125.6	2.80	106	128.5	1.66	323	129.3	2.63	189	131.9	4.10	61
4th quartile	137.6	3.03	119	135.2	1.59	310	136.2	2.13	190	142.6	2.46	73

[1] Excludes "other" racial groups.

Table 69. Diastolic blood pressure levels of adults ages 25–74 years within serum calcium level strata showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–75

Sex, race, age, and body mass index quartile stratum	Serum calcium (milligrams/deciliter)											
	Less than 9.25			*9.25–9.74*			*9.75–10.14*			*10.15 or more*		
	Mean	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*	*Mean*	*Standard error of mean*	*Number of examinees*
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	80.8	0.51	813	82.0	0.33	2,274	82.3	0.43	1,557	83.8	0.70	615
Sex												
Male	84.4	0.65	323	84.2	0.38	1,050	84.2	0.55	773	84.9	0.89	341
Female	78.6	0.72	490	79.9	0.47	1,224	80.2	0.69	784	82.3	1.00	274
Race												
White	80.3	0.58	731	81.6	0.37	2,041	81.6	0.43	1,358	83.4	0.64	528
Black	86.1	1.68	82	87.1	1.46	233	88.3	1.38	199	85.9	2.86	87
Age												
Total												
25–34 years	75.8	0.81	181	77.7	0.54	550	79.2	0.66	435	78.9	0.83	186
35–44 years	79.9	1.09	162	81.4	0.65	417	82.8	0.73	301	85.8	1.83	119
45–54 years	81.8	0.87	183	84.9	0.58	554	83.9	0.79	377	86.5	1.27	140
55–64 years	85.8	1.79	138	84.4	0.74	403	84.3	0.96	245	86.6	1.13	109
65–74 years	83.0	1.12	149	84.1	0.95	350	84.6	1.15	199	86.6	2.02	61
Male												
25–34 years	83.3	1.39	37	81.0	0.91	203	81.5	0.82	221	80.1	1.09	126
35–44 years	82.9	1.19	43	84.2	0.78	176	85.3	1.19	160	89.8	1.66	63
45–54 years	85.1	1.20	86	87.4	0.74	258	86.0	1.12	181	88.3	1.36	68
55–64 years	86.7	1.49	75	85.1	0.97	218	85.8	1.38	117	88.0	1.75	48
65–74 years	81.7	1.85	82	83.2	1.12	195	85.9	1.42	94	86.5	2.68	36
Female												
25–34 years	73.6	0.88	144	75.3	0.73	347	76.2	0.91	214	75.9	1.47	60
35–44 years	78.8	1.40	119	78.7	1.00	241	79.7	0.89	141	81.5	3.13	56
45–54 years	79.0	1.42	97	82.4	0.91	296	82.1	1.13	196	84.5	1.94	72
55–64 years	84.7	3.90	63	83.7	1.07	185	83.0	1.43	128	85.6	1.49	61
65–74 years	84.3	1.70	67	85.0	1.48	155	83.7	1.53	105	86.7	2.98	25
BMI												
Male												
1st quartile	81.5	1.82	86	79.7	0.79	272	79.0	0.86	164	84.2	1.67	96
2d quartile	82.3	1.19	72	83.5	0.73	247	83.2	1.02	220	81.5	1.26	91
3d quartile	85.1	1.12	92	85.0	0.76	264	85.5	1.00	191	83.8	1.85	72
4th quartile	89.1	1.19	73	88.5	1.12	266	88.2	1.05	196	90.5	1.18	82
Female												
1st quartile	74.0	0.98	112	75.8	0.94	303	76.0	0.78	207	76.1	1.60	75
2d quartile	74.5	0.87	153	76.1	0.63	288	76.9	0.96	196	78.5	1.02	65
3d quartile	78.1	1.19	106	80.9	0.82	322	81.7	1.30	189	83.2	1.87	61
4th quartile	87.7	1.71	119	87.1	0.88	310	88.3	1.43	190	92.2	2.44	73

[1] Excludes "other" racial groups.

Table 70. Systolic blood pressure levels of adults ages 25–74 years within serum phosphate level strata showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–75

Sex, race, age, and body mass index quartile stratum	Serum phosphate (milligrams/deciliter)											
	Less than 2.8			2.8–3.2			3.3–3.8			3.9 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	132.0	0.83	824	129.7	0.66	1,903	126.7	0.70	1,855	123.6	0.88	541
Sex												
Male	135.5	0.83	507	132.6	0.85	913	128.5	0.71	755	124.9	1.44	250
Female	126.9	1.31	317	126.9	0.92	990	125.3	1.01	1,100	122.2	1.51	291
Race												
White	131.8	0.87	738	128.8	0.69	1,665	126.4	0.79	1,632	122.7	0.92	477
Black	134.2	2.76	86	138.3	2.08	238	130.1	2.15	223	130.5	4.04	64
Age												
Total												
25–34 years	122.9	1.37	164	120.1	0.78	431	118.5	0.67	525	118.5	1.23	195
35–44 years	126.3	1.23	147	123.6	0.97	392	121.1	1.10	333	121.4	2.40	100
45–54 years	134.3	1.41	201	131.3	1.13	475	127.7	1.14	423	125.5	2.19	126
55–64 years	139.3	1.99	156	138.7	1.29	318	136.9	1.97	316	134.6	3.41	72
65–74 years	146.4	2.05	156	148.9	1.80	287	144.2	1.45	258	137.1	2.73	48
Male												
25–34 years	126.9	1.80	67	124.7	1.10	186	123.5	1.03	214	122.0	1.68	109
35–44 years	129.3	1.53	73	128.2	1.68	166	123.9	1.79	140	126.7	2.31	51
45–54 years	136.5	1.73	120	133.8	1.38	225	130.4	1.45	178	128.3	3.24	54
55–64 years	138.9	1.97	112	140.1	2.20	176	136.5	1.40	128	126.6	4.36	22
65–74 years	147.0	2.31	135	145.3	1.91	160	143.2	2.61	95	135.6	6.05	14
Female												
25–34 years	119.8	1.52	97	115.3	1.08	245	114.2	0.84	311	113.3	1.59	86
35–44 years	122.6	1.84	74	119.7	1.43	226	118.5	1.56	193	115.7	4.13	49
45–54 years	131.1	1.94	81	128.9	1.60	250	125.4	1.83	245	123.5	2.18	72
55–64 years	140.2	4.86	44	137.1	2.26	142	137.2	3.13	188	137.4	4.23	50
65–74 years	143.3	3.79	21	152.8	2.82	127	144.7	2.10	163	137.7	3.45	34
BMI												
Male												
1st quartile	132.9	1.94	118	126.3	1.55	212	123.7	1.20	202	121.9	2.52	67
2d quartile	131.2	1.78	126	130.6	1.10	227	128.0	1.43	188	119.9	2.22	64
3d quartile	136.8	1.54	128	131.7	1.51	242	129.0	1.32	192	128.0	1.86	46
4th quartile	140.7	1.59	134	140.3	1.49	232	134.0	1.77	171	129.9	2.99	73
Female												
1st quartile	118.0	1.99	65	118.6	1.70	239	119.4	1.58	277	115.3	3.04	86
2d quartile	125.5	1.87	89	121.8	1.43	257	117.5	1.30	264	125.0	4.02	69
3d quartile	128.1	2.24	72	129.8	1.84	234	129.1	1.94	281	120.1	1.44	79
4th quartile	135.9	2.79	91	137.6	1.92	259	135.1	1.97	277	134.1	2.54	56

[1] Excludes "other" racial groups.

Table 71. Diastolic blood pressure levels of adults ages 25-74 years within serum phosphate level strata showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971-75

Sex, race, age, and body mass index quartile stratum	Serum phosphate (milligrams/deciliter)											
	Less than 2.8			2.8–3.2			3.3–3.8			3.9 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	83.9	0.59	824	82.8	0.41	1,903	81.8	0.38	1,854	79.4	0.53	539
Sex												
Male	86.2	0.71	507	85.3	0.46	913	84.0	0.56	755	80.8	0.90	249
Female	80.5	0.92	317	80.4	0.56	990	80.2	0.55	1,099	78.0	0.89	290
Race												
White	83.5	0.56	738	82.3	0.42	1,665	81.3	0.44	1,632	78.9	0.68	476
Black	87.7	2.19	86	88.3	1.64	238	87.0	1.62	222	83.4	2.65	63
Age												
25–34 years	79.8	1.13	164	79.2	0.64	431	77.9	0.55	523	76.6	0.71	194
35–44 years	83.3	1.21	147	82.3	0.58	392	81.7	0.74	333	81.2	2.04	100
45–54 years	87.2	1.18	201	84.6	0.70	475	83.9	0.60	423	81.9	1.12	126
55–64 years	85.9	1.25	156	85.2	0.77	318	84.8	0.84	315	83.0	1.06	71
65–74 years	84.2	1.24	156	84.8	0.98	287	85.2	0.91	258	77.3	1.50	48
BMI												
Male												
1st quartile	81.9	1.35	118	81.3	1.00	212	80.4	0.92	202	78.2	1.69	67
2d quartile	83.9	1.13	126	83.1	0.72	227	84.0	0.97	188	78.0	1.11	64
3d quartile	87.8	1.12	128	85.3	0.75	242	83.8	0.81	192	81.2	1.99	46
4th quartile	90.7	1.49	134	90.5	0.68	232	88.3	1.30	171	85.4	1.91	72
Female												
1st quartile	76.2	1.64	65	75.3	0.83	239	76.7	0.81	277	74.6	1.96	86
2d quartile	76.3	1.16	89	77.5	0.86	257	75.6	0.57	264	76.4	1.55	69
3d quartile	82.2	2.10	72	80.8	0.99	234	80.6	0.90	281	76.9	1.19	78
4th quartile	87.6	1.44	91	87.8	1.07	259	87.9	1.35	276	87.4	2.02	56

[1] Excludes "other" racial groups.

Table 72. Systolic blood pressure levels of adults ages 25–74 years within strata of serum calcium to serum phosphate ratio showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–75

Sex, race, age, and body mass index quartile stratum	Serum calcium-phosphate ratio: Less than 2.444			2.444–2.833			2.834–3.413			3.414 or more		
	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees	Mean	Standard error of mean	Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	123.9	0.92	716	127.1	0.72	1,674	129.6	0.60	1,681	132.2	0.93	702
Sex												
Male	125.7	1.30	290	129.5	0.88	680	132.0	0.87	852	134.9	0.91	440
Female	122.5	1.24	426	125.2	1.08	994	127.1	0.90	829	128.1	1.54	262
Race												
White	123.2	0.91	641	126.9	0.83	1,469	128.5	0.65	1,461	132.1	0.97	624
Black	131.3	3.95	75	128.6	2.30	205	139.9	2.20	220	132.8	2.88	78
Age												
Total												
25–34 years	118.3	1.10	235	118.3	0.83	473	120.1	0.74	372	123.3	1.44	150
35–44 years	119.3	1.85	134	120.8	1.24	314	124.5	1.08	340	126.3	1.49	121
45–54 years	124.4	1.92	164	129.2	1.34	387	129.9	1.06	417	135.8	1.66	172
55–64 years	136.0	2.95	99	136.4	2.34	273	139.9	1.30	307	138.8	2.51	125
65–74 years	140.4	2.07	84	147.9	1.71	227	146.5	1.94	245	147.4	1.94	134
Male												
25–34 years	122.7	1.49	110	124.1	1.23	186	123.6	1.05	170	126.9	1.79	74
35–44 years	123.3	1.31	56	125.0	2.28	127	128.6	1.79	155	129.7	1.93	65
45–54 years	130.6	2.80	69	131.1	1.64	165	132.0	1.46	200	137.4	1.96	103
55–64 years	130.7	3.57	32	137.0	1.66	117	140.4	2.17	182	136.5	2.16	83
65–74 years	138.0	4.85	23	146.1	2.85	85	143.9	2.22	145	147.9	2.16	115
Female												
25–34 years	113.2	1.26	125	113.2	0.88	287	116.2	1.06	202	119.5	1.77	76
35–44 years	116.1	2.94	78	117.4	1.50	187	120.5	1.54	185	121.8	2.15	56
45–54 years	120.0	1.84	95	127.5	2.10	222	128.1	1.62	217	133.5	2.21	69
55–64 years	138.3	3.83	67	136.0	3.67	156	139.2	2.29	125	143.3	5.38	42
65–74 years	141.2	2.81	61	148.9	2.46	142	149.4	3.17	100	144.9	5.33	19
BMI												
Male												
Ist quartile	121.4	2.42	81	124.7	1.28	178	126.4	1.75	197	132.2	2.09	104
2d quartile	121.9	1.29	71	127.4	1.80	163	130.4	1.15	226	131.0	1.93	113
3d quartile	128.8	1.73	60	130.3	1.42	183	131.4	1.52	214	136.1	1.78	104
4th quartile	130.7	3.02	78	136.0	2.10	154	138.9	1.60	214	139.9	1.72	119
Female												
Ist quartile	114.8	2.87	112	118.8	1.81	250	120.1	1.60	207	118.3	2.19	53
2d quartile	121.9	3.34	101	116.7	1.23	255	121.9	1.46	207	127.2	2.54	75
3d quartile	123.2	2.34	115	130.2	2.34	246	129.2	2.07	196	128.2	2.83	55
4th quartile	132.0	2.35	97	136.0	2.63	242	137.6	1.96	218	137.5	3.08	79

[1] Excludes "other" racial groups.

Table 73. Diastolic blood pressure levels of adults ages 25–74 years within strata of serum calcium to serum phosphate ratio showing means and standard errors by sex, race, age, and body mass index (BMI): United States, 1971–75

Sex, race, age, and body mass index quartile stratum	Serum calcium-phosphate ratio: Less than 2.444, Mean	Less than 2.444, Standard error of mean	Less than 2.444, Number of examinees	2.444–2.833, Mean	2.444–2.833, Standard error of mean	2.444–2.833, Number of examinees	2.834–3.413, Mean	2.834–3.413, Standard error of mean	2.834–3.413, Number of examinees	3.414 or more, Mean	3.414 or more, Standard error of mean	3.414 or more, Number of examinees
	Millimeters of mercury			Millimeters of mercury			Millimeters of mercury			Millimeters of mercury		
Total[1]	79.6	0.55	715	81.7	0.37	1,673	82.9	0.47	1,681	84.2	0.57	702
Sex												
Male	81.1	0.75	290	84.0	0.63	679	85.1	0.51	852	86.1	0.67	440
Female	78.5	0.78	425	79.9	0.54	994	80.6	0.62	829	81.3	0.95	262
Race												
White	79.2	0.65	640	81.3	0.44	1,469	82.2	0.45	1,461	84.0	0.54	624
Black	84.4	2.32	75	85.7	1.77	204	89.4	1.70	220	86.7	2.45	78
Age												
Total												
25–34 years	76.8	0.73	235	77.6	0.60	472	79.0	0.59	372	80.8	1.17	150
35–44 years	80.5	1.52	134	81.1	0.69	314	83.0	0.75	340	83.5	1.07	121
45–54 years	81.4	1.06	164	84.3	0.67	387	84.4	0.74	417	87.5	1.19	172
55–64 years	82.7	0.83	98	84.6	0.98	273	85.4	0.79	307	85.5	1.33	125
65–74 years	81.1	1.66	84	85.6	1.20	227	84.2	1.02	245	85.6	1.23	134
Male												
25–34 years	78.7	1.12	110	80.9	0.94	185	82.1	0.72	170	82.0	1.31	74
35–44 years	83.4	1.26	56	83.8	1.31	127	86.7	0.97	155	86.2	1.31	65
45–54 years	85.0	1.85	69	86.6	1.06	165	86.4	0.94	200	89.9	1.24	103
55–64 years	80.0	1.16	32	86.5	1.48	117	86.4	0.98	182	86.9	1.56	83
65–74 years	78.5	2.85	23	85.0	1.71	85	83.5	1.27	145	85.5	1.37	115
Female												
25–34 years	74.5	1.16	125	74.7	0.66	287	75.7	0.79	202	79.5	1.82	76
35–44 years	78.1	2.31	78	78.9	1.21	187	79.3	1.02	185	79.8	1.66	56
45–54 years	78.8	1.23	95	82.2	0.90	222	82.5	1.13	217	83.7	1.94	69
55–64 years	83.9	1.15	66	83.4	1.90	156	84.3	0.98	125	82.7	2.03	42
65–74 years	81.9	2.13	61	85.9	1.44	142	85.0	1.79	100	86.0	3.91	19
BMI												
Male												
Ist quartile	77.9	1.39	81	80.8	0.96	178	81.1	1.09	197	82.1	1.46	104
2d quartile	79.2	1.06	71	83.0	1.07	163	83.5	0.77	226	84.1	0.83	113
3d quartile	81.8	1.47	60	84.3	0.87	183	85.5	0.81	214	87.2	1.30	104
4th quartile	85.2	1.84	78	88.2	1.48	153	89.8	0.87	214	90.6	1.38	119
Female												
Ist quartile	74.9	1.79	112	76.1	0.84	250	75.9	0.99	207	75.8	1.47	53
2d quartile	76.0	1.39	101	75.2	0.60	255	77.1	0.80	207	77.6	1.45	75
3d quartile	78.1	1.36	114	80.8	1.01	246	81.3	1.31	196	84.3	2.51	55
4th quartile	86.1	1.60	97	88.1	1.48	242	88.2	1.15	218	87.7	1.53	79

[1] Excludes "other" racial groups.

Appendixes

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Appendix I. Statistical notes

Survey design

The sample design for the first National Health and Nutrition Examination Survey (NHANES I) is basically a three-stage, stratified probability sample of loose clusters of persons in land-based segments. The sample was designed to be representative of the civilian noninstitutionalized population within designated age ranges in the coterminous United States, excluding persons residing on lands set aside for the use of American Indians. Successive elements dealt with in the process of sampling were the primary sampling unit (PSU), census enumeration district (ED), segment (a cluster of households), household, eligible person, and finally sample person.

For the period April, 1971 through June, 1974, the design provided for selection of a representative sample of the target population 1–74 years of age to be given the nutrition-related health interview and examination. A subsample of adults 25–74 years of age would also receive a more detailed examination focused on other aspects of health and health care needs. To increase the size for this subsampling and consequently the usefulness of the data obtained, the design further provided for the selection of an additional nationally representative sample of adults 25–74 years of age between July, 1974 and September, 1975, to be given the detailed examination. This extension of NHANES I is referred to as the "augmentation survey."

The estimated civilian noninstitutionalized U.S. population ages 1–74 years is shown in table I by sex, race, and age at the time of examination. The estimates closely approximate the U.S. population as estimated by the U.S. Bureau of the Census as of the midpoint of the survey. The figures in table I may differ slightly from the census estimates because the latter are based on the ages of sample persons at the time they were examined, whereas the poststratification was based on the ages at interview. Because certain analyses must be done on the basis of age at examination, the population estimates have also been based on age at examination for the sake of consistency.

Table I. NHANES I population estimates for examination locations 1–65, by sex, race, and age at examination.

Age at examination	Estimated population						
	Total	Male			Female		
		All races	*White*	*Black*	*All races*	*White*	*Black*
Total	193,976,381	94,239,866	82,740,899	10,413,986	99,736,515	86,867,546	11,999,935
1 year	3,313,458	1,693,074	1,401,508	280,212	1,620,384	1,327,657	257,289
2–3 years	6,963,162	3,553,765	2,997,107	479,362	3,409,397	2,872,581	505,442
4–5 years	6,672,346	3,378,503	2,866,374	485,872	3,293,843	2,755,016	511,134
6–7 years	7,193,663	3,652,322	3,060,888	573,867	3,541,341	2,951,927	576,578
8–9 years	7,696,597	3,880,396	3,279,649	586,419	3,816,201	3,257,936	539,855
10–11 years	8,465,793	4,381,730	3,732,593	563,823	4,084,063	3,424,070	617,793
12–14 years	12,335,321	6,312,591	5,397,061	879,377	6,022,802	5,122,189	836,252
15–17 years	12,318,434	6,312,519	5,311,596	812,321	6,111,265	5,233,091	853,294
18–19 years	7,352,200	3,673,321	3,206,467	404,045	3,678,879	3,158,930	504,417
20–24 years	17,325,038	8,109,775	7,094,036	866,201	9,215,263	7,972,486	1,073,358
25–34 years	26,936,001	13,002,514	11,594,115	1,231,793	13,933,487	12,160,578	1,646,337
35–44 years	22,268,477	10,675,731	9,515,530	1,004,953	11,592,746	10,111,458	1,318,050
45–54 years	23,313,316	11,150,110	10,039,124	1,056,837	12,163,206	10,879,167	1,237,459
55–64 years	19,049,001	9,072,586	8,274,948	702,647	9,976,415	9,037,157	871,098
65–74 years	12,773,574	5,496,351	4,969,903	486,257	7,277,223	6,603,303	651,579

The starting points in the first stage of this design were the 1960 decennial census lists of addresses and the nearly 1,900 primary sampling units (PSU's) into which the entire United States was divided. Each PSU is either a standard metropolitan statistical area (SMSA), a county, or two or three contiguous counties. The PSU's were grouped into 357 strata, as they were for use in the National Health Interview Survey during 1963–72, and subsequently collapsed into 40 superstrata for use in NHANES I.

During the April, 1971–June, 1974 period, 15 of the 40 superstrata that contained a single large metropolitan area of more than 2 million population were chosen in the sample with certainty. The remaining 25 noncertainty strata were classified into 4 broad geographic regions of approximately equal population (when the large metropolitan areas selected with certainty were included) and cross-classified into 4 broad population density groups in each region. Then a modified Goodman-Kish controlled-selection technique was used to select 2 PSU's from each of the 25 noncertainty superstrata, with the probability of selection of a PSU proportionate to its 1960 population, and so that proportionate representation of specified State groups and rate of population change classes were maintained in the sample. In this manner a total first-stage sample of 65 PSU's was selected. These 65 sample PSU's are the areas within which a cluster sample of persons was selected for examination at the particular examination location designated within each area. The mobile examination units were moved from one location to the next during this 39-month period (1971–74) to permit administering those single-time examinations to the cross-sectional sample of the target population.

Although the 1970 census data were used as the frame for selecting the sample within the PSU when they became available, the calendar of operations required that the 1960 census data be used for the first 44 locations in the sample. The 1970 census data were then used for the final 21 stands of the sample and for the augmentation survey.

Beginning with the use of the 1970 census data, the segment size was changed from an expected 6 housing units selected from compact clusters of 18 housing units to an expected compact cluster of 8 housing units. This change was implemented because of operational advantages and results of research by the U.S. Bureau of the Census indicating that precision of estimates would not be appreciably affected by such a modification. For large enumeration districts the segments were clusters of addresses from the 1960 Census Listing Books (later the corresponding books for 1970). For other ED's area sampling was employed and consequently some variation in the segment size occurred. To make the sample representative of the then current population of the United States, the address or list segments were supplemented by a sample of housing units that had been constructed since 1960.

Within each PSU a systematic sample of segments was selected. The enumeration districts selected for the sample were coded into one of two economic classes. The first class, identified as the "poverty stratum," was composed of "current poverty areas" that had been identified by the Bureau of the Census in 1970 (pre-1970 Census), plus other ED's in the PSU with a mean income of less than $3,000 in 1959 (based on 1960 Census). The second economic class, the "nonpoverty stratum," included all ED's not designated as belonging to the "poverty stratum." All sample segments classified as being in the poverty stratum were retained in the sample. For those sample segments in nonpoverty stratum ED's, the selected segments were divided into eight random subgroups and one of the subgroups was chosen to remain in the NHANES I sample. Continuing research indicated that efficiency of estimates could be increased (sampling variance decreased) by changing the ratio of poverty to nonpoverty segments from 8:1 to 2:1. Therefore, in the later stands (44–65) the selected segments in the nonpoverty-stratum ED's were divided into two random subgroups, and one of the subgroups was chosen to remain in the sample. This procedure permits separate analyses, with adequate reliability, of those classified as being below the poverty level and those classified as being above the poverty level.

After identifying the sample segments, a list of all current addresses within the segment boundaries was made, and the households were interviewed to determine the age and sex of each household member, as well as other demographic and socioeconomic information required for the survey. If no one was at home after repeated calls or if the household members refused to be interviewed, the interviewer tried to determine the household composition from questioning neighbors.

To select the persons in the sample segments to be examined in NHANES I, all household members ages 1–74 years in each segment were listed on a sample selection worksheet, with each household in the segment listed serially. The number of household members in each of the six age-sex groups shown in table II were listed on the worksheet under the appropriate age-sex group column. The sample selection worksheets were then put in segment number order, and a systematic random sample of persons in each age-sex group was selected to be examined using the sampling rates displayed in table II. This sampling strategy in the 65 stands of the general sample of NHANES I resulted in the selection of 28,043 sample persons 1–74 years of age, a sample that can be regarded as representative of the target population displayed in table I.

A subsample of those adults 25–74 years of age in the total or "nutrition" sample was then selected to also receive the detailed health examination at the first 65 stands of NHANES I. This "detailed" sample was chosen systematically after a random start, using the sampling rates shown in table III. Consequently, adults 45–74 years of age in the first 65 PSU's were subsampled for the detailed examination at a somewhat higher rate than those 25–44 years of age.

During the augmentation period, July, 1974 through September, 1975, the sample of adults 25–74 years of age selected for examination in locations 66–100 constituted a national probability sample of the target population. Also, when considered jointly with those selected for the NHANES I detailed examination in locations 1–65, the entire 100-PSU sample is also nationally representative of the target population at that time.

The starting point for the selection of the augmentation sample was the 1970 decennial census list of addresses and PSU's. The sampling methods for establishing the sample frame were generally similar to those used in the first 65 PSU's. However, only 5 of the 15 superstrata composed of only one very large metropolitan area of more than 2 million population were drawn into the sample for locations 66–100 with certainty. The remaining 10 of these superstrata were collapsed into 5 groups of 2 each, only one of which was chosen for the augmentation survey with a probability of selection of 0.5. When these latter 5 locations are considered a part of the 100-PSU design, they are selected with certainty.

In this augmentation survey there was no economic axis of stratification and no oversampling among special groups. One of every two eligible persons within sample households (using a random start among those 25–74 years of age) was selected for participation in this survey.

Table II. Sampling rates by age-sex groups for the NHANES I general sample

Age and sex	*Sampling rate*
1–5 years	1/2
6–19 years	1/4
20–44 years (men)	1/4
20–44 years (women)	1/2
45–64 years	1/4
65–74 years	1

Table III. Subsampling rates by age-sex groups for the NHANES I detailed sample

Age and sex	*Subsampling rate*
25–44 years (men)	2/5
25–44 years (women)	1/5
45–64 years	3/5
65–74 years	1/4

Nonresponse

In any health examination survey, after the sample is identified and the sample persons are requested to participate in the examination, the survey meets one of its more severe problems. Usually a sizable number of sample persons who are willing to complete the household questionnaire and possibly some of the medical history will not participate in the examination. Individual participation is determined by many factors, some of them uncontrollable. Therefore, participation may be treated as a random event with a particular probability of occurrence.

In this situation, the effect of nonparticipation would only reduce the sample size, thereby increasing the sampling variability of the examination findings. In practice, however, a potential for bias due to nonresponse exists if nonparticipation is not a random event and if nonparticipants differ from participants. Because of the possibility of bias, intensive efforts were made in NHANES I to develop and implement procedures and inducements that would reduce the number of nonrespondents and thereby reduce the potential of bias due to nonresponse. These procedures are discussed elsewhere.[6]

Also during the early stages of NHANES I, when it became apparent that the response rate for the examinations was lower than in the preceding health examination surveys, a study of the effect of remuneration on response in NHANES I was undertaken. The findings[51] were considered sufficient to include remuneration as a routine procedure in NHANES I starting with the 21st and 22d examination locations.

Despite response rates at the household interview stage of over 96 percent and these intensive efforts of persuasion, only 20,749 (74 percent) of the sample persons from the first 65 stands were examined. When adjustments are made for differential sampling for high-risk groups, the response rate becomes 75.2 percent. Consequently, the potential for a sizable bias does exist in the estimates in this publication. However, from what is known about the nonrespondents and the nature of nonresponse, the likelihood of sizable bias is believed to be small. For instance, only a small proportion of sample persons from the first 65 examination locations gave reasons for nonparticipation that would lead to the belief that they would never agree to participate in examination surveys and that they may differ from examined persons with respect to the characteristics under examination. Only 15 percent of nonrespondents gave the following reasons for nonparticipation: personal illness, physical inability, pregnancy, antidoctor feelings, or a fear of finding something wrong. Typical among the reasons given by the other nonrespondents were the following: inability to take time off from work, school, or household duties;

NOTE: A list of references follows the text.

suspicion or skepticism about the program; uninterested in participating; and considered their private medical care sufficient, or they had just visited a doctor.

An analysis of the medical history data obtained for most nonexaminees as well as examinees also supports the belief that the likelihood of sizable bias due to nonresponse is small. No large differences were found between the examined group and the nonexamined group for the statistics compared. For example, the percent of persons examined who reported ever being told by a doctor that they had arthritis was 20 percent; the percent for high blood pressure was 18 percent; and for diabetes, 4 percent. The corresponding percents for nonexamined persons were as follows: arthritis, 17 percent; high blood pressure, 21 percent; and diabetes, 4 percent.

A procedure (similar to that used in previous National Health Examination Surveys) was used in which the reciprocal of the probability of selection of the sample persons is multiplied by a factor that brings estimates based on examined persons up to a level that would have been attained if all sample persons had been examined. This factor is the ratio of the sum of sample weights for all sample persons with a relatively homogeneous class defined by age, sex, and five income groups (under \$3,000; \$3,000–\$6,999; \$7,000–\$9,999; \$10,000–\$14,999; and \$15,000 or more) within each stand, to the sum of sampling weights for all responding sample persons within the same homogeneous class for the same stand. The poststratified ratio adjustment makes the final sample estimates of the population agree approximately with independent controls prepared by the U.S. Bureau of the Census for the noninstitutionalized population of the United States as of November 1, 1972 (approximately midsurvey point), by race, sex, and age as shown in table I.

To the degree that homogeneous groups can be defined that are also homogeneous with respect to the characteristics under study, this weighting procedure can be effective in reducing the potential bias from nonresponse. For the 65-stand sample of NHANES I, the percent distribution of the nonresponse adjustment factors used for the 325 cells (determined by the cross-classification of the 5 income groups by the 65 stands) is shown in table IV. Overall, the extent of the adjustment for nonresponse among the detailed examinees was 1.45 during the 1971–74 period and 1.40 in the augmentation survey of 1974–75.

Table IV. Percent distribution of nonresponse adjustment factors: National Health and Nutrition Examination Survey, 1971–74

Size of nonresponse adjustment factor	*Number of cells*	*Percent distribution*
Total (1.00–3.03)	325	100.0
1.00–1.24	106	32.6
1.25–1.49	125	38.4
1.50–1.74	59	18.2
1.75–1.99	24	7.4
2.00–2.49	9	2.8
2.50–2.99	1	0.3
3.00–3.03	1	0.3

Missing data and imputation

Examination surveys are subject to the loss of information not only through failure to examine all sample persons but also from the failure to obtain and record all items of information for examined persons. When data are found to be missing for some of the examinees, imputation for these values becomes necessary in order to minimize the effect on population estimates.

Among the 13,671 examinees ages 18–74 years in the total or nutrition sample of 1971–74, there were 76 examinees (0.6 percent) missing the single measurement of systolic or diastolic blood pressure or both. Of the 6,913 examinees ages 25–74 years in the detailed and augmentation samples, only 28 (0.4 percent) were missing measurements of either systolic or diastolic blood pressure or both in the first sitting position. For the recumbent position, 59 (0.9 percent) were missing measurements of either systolic or diastolic blood pressure or both, while for the second sitting position, 64 (0.9 percent) were missing measurements of either or both blood pressures. In no case was a diastolic measurement present without an accompanying systolic measurement.

In the statistical analysis of the blood pressure variables reported in other *Vital and Health Statistics* publications,[15,16] replacement values for the less than 2 percent with missing systolic and diastolic blood pressure were assigned on the basis of matched examinees of the same age, sex, and race, with similar arm girth, weight, and height. However, to simplify the analysis discussed in this report, examinees with such missing data were excluded since such exclusion was found not to seriously alter the findings with respect to the hypotheses being tested.

Design considerations for examined persons

Although the sample design for this survey is described in extensive detail in the previous sections and in other documents,[6,55] the aspects of the design pertaining to data analysis considerations are discussed further in this section. All 20,749 examined persons ages 1–74 years received a specifically designed nutrition-related examination. In addition, approximately a 20-percent subsample (3,854 persons) of those ages 25–74 years received a more detailed examination

NOTE: A list of references follows the text.

focused on other aspects of health and health care needs. An additional 3,059 persons ages 25–74 years from the augmentation survey were examined to increase the size of the sample and, hence, the reliability of the estimates from the data collected during this detailed survey (including the augmentation portion). The data collection forms for the entire (nutrition) sample, together with the additional forms for the detailed and augmentation sample are contained elsewhere.[6,7]

Although the sample design for this survey was fairly complex, the essential feature is the selection of primary sample units (PSU's) consisting of counties or groups of counties from each of the defined strata. In particular, the NHANES I design for the 1971–74 period involved the selection with certainty of the PSU's in the 15 large standard metropolitan statistical areas with more than 2 million population, referred to as "certainty strata" (each PSU consists of a large number of enumeration districts), and the selection of exactly 2 PSU's from each of the remaining 25 strata. The design was modified for the 1974–75 period by collapsing 10 of the certainty PSU's into 5 strata of 2 PSU's each, retaining the remaining strata, and then sampling one PSU per strata. The augmentation sample thus included 10 of the certainty PSU's from the original design and one additional PSU from each of the 25 noncertainty PSU's. The data tapes from the National Center for Health Statistics reflect the indexing of the certainty strata used in the augmentation sample. The number of PSU's and the corresponding number of examined persons in each of these strata are summarized in table V. Thus, for analytic purposes, this design can be described as having the following characteristics:

1. 10 (redefined) strata with multiple selection of PSU's.
2. 25 strata with paired selections of PSU's for the general and detailed samples and with a single PSU for the augmentation sample.

Another important aspect of the NHANES I design is the need to adjust for the oversampling of the following subgroups thought to be at high risk of malnutrition as outlined in table II:

1. Persons with low income.
2. Preschool children.
3. Women of childbearing age.
4. Elderly persons.

Adjusted sampling weights that reflect the selection probabilities and poststratification adjustments were computed.

An additional design complication arises because at the first 65 sites of the nutrition survey a subset of the sample persons ages 25–74 years received a more detailed health examination. No particular oversampling of subgroups of the population remained in this subsample; for example, women of childbearing age were not oversampled as they were for the major nutrition component of NHANES I. However, some slight oversampling remained among the elderly. The total number of persons given this detailed examination is 3,854 persons ages 25–74 years, for which separate adjusted sampling weights were available.

Moreover, the augmentation survey (fully discussed elsewhere[7]) poses additional complications for analysis. The 3,059 examined persons selected for this survey represent a national probability sample of the target population when used as a separate 35-stand sample as well as when combined with the 65-stand detailed sample to form a 100-stand (PSU) national probability sample, in which the combined number of

NOTE: A list of references follows the text.

Table V. Number of primary sampling units (PSU's) and number of examined persons for the general, detailed, and augmentation surveys, by stratum number for the NHANES I design.

Stratum number	Number of PSU's		Number of examined persons		
	General and detailed	Augmentation	General and detailed	Detailed only	Augmentation
Total	1,263	236	20,749	3,854	3,059
1–10	1,213	211	4,514	853	701
1	169	21	621	112	55
2	106	17	367	80	63
3	125	18	482	87	59
4	156	21	737	129	60
5	197	24	741	143	97
6	83	22	250	48	82
7	108	23	395	71	72
8	61	21	188	42	80
9	89	21	304	57	64
10	119	23	429	84	69
11–35	50	25	16,235	3,001	2,358

examined persons is 6,913. Ten of the PSU's were included in both the augmentation and initial surveys. There was no oversampling of specific groups in either the initial detailed sample group or the augmentation sample group.

Consequently, when computing estimates of analytic statistics and their estimated variance-covariance structure, the appropriate sampling weights need to be utilized in the weighted analyses. Thus, hypotheses involving variables from the initial detailed sample of persons ages 25–74 years in stands 1–65 were investigated using the adjusted sampling weights associated with the detailed sample persons (sampling weight on tape location 170–175). Analyses involving the augmentation detailed sample (stands 66–100) used the adjusted sampling weights for this group (tape location 182–187). When hypotheses were investigated across the combined detailed sample groups (stands 1–100), adjusted sampling weights were used for the combined groups (tape location 188–193). Otherwise, hypotheses involving variables from the entire initial sample (stands 1–65) utilized the adjusted sampling weights for the entire initial sample (tape location 176–181).

Analytical strategies

Because of the complexities in the sample design, each analysis could be performed one of three different ways depending on whether the sampling weights were included and/or whether the design structure was incorporated in the calculations. For simplicity, these three options are as follows:

Option	*Inclusion of sampling*	
	Weights	*Design*
1	No	No
2	Yes	No
3	Yes	Yes

Most hypotheses initially were investigated under option 1 to minimize cost and time. Relationships found to be statistically significant at this stage were then subjected to more definitive analyses under option 3 utilizing the sample weights and the survey design effects. Consequently, the estimated covariance structure for the sample estimators based on the complexities of the survey design was utilized in all final models and inferential conclusions.

In survey research, the design effect is commonly defined to be the ratio of the actual variance for a statistic from a complex sample to the corresponding variance from a simple random sample. Increasingly, design effects are being used to adjust estimates and statistics computed under simple random sampling assumptions for the effects of the complexities in the sample design on measures of precision. Given the importance of these effects to those who design and analyze surveys, simple but useful models have been sought for design effects. An extensive literature review of these design effect considerations and analytical strategies for survey data from complex sample designs is presented by Lepkowski.[52] A comprehensive evaluation of the design effects and analytic strategies specifically for the NHANES I survey has been published.[55]

All analyses under option 1 were performed quite simply and inexpensively using standard statistical software. In this option sampling weights and design effects were totally ignored. Thus, the data were regarded as coming from a simple random sample with equal representation and probability of selection. On the other hand, analyses under option 2 incorporated the adjusted sampling weights in estimating the analytic statistics, but simple random sampling computations were still utilized for the variance estimates. These calculations were performed within the OSIRIS IV software package.[53] Finally, analyses under option 3 utilized both the adjusted sampling weights and the sampling design in calculating the estimated variance-covariance structure of analytic statistics. In particular, the computer program &PSALMS was used for estimating ratio means and the program &REPEEE was utilized to fit regression models. Both of these routines are available within the OSIRIS IV library, and are described in more detail by Vinter.[54] Briefly, for relatively simple statistics, such as ratio means, differences of such ratios, and totals, the &PSALMS routine approximates the complex sample variance of these estimators using a linearized Taylor Series expansion. For more complex statistics, such as regression coefficients, several replicated variance estimation procedures are available. In particular, the balanced repeated replication (BRR) option within the &REPEEE routine was utilized to fit multiple regression models.

The estimation procedure to implement option 3 can be extremely time consuming and expensive, particularly in fitting regression models by the balanced half-sample approach, because of the multiple sampling error computing units within the certainty strata 1–10. To alleviate some of these difficulties, the multiple sampling error computing unit identification codes were randomly allocated into 2 "pseudoreplicates" for each of these 10 strata. Consequently, the paired selection computations then could be utilized for all 35 strata. The effects of randomly assigning the multiple sampling error computing units to 2 paired pseudoreplicates was investigated by the comparative analysis of standard errors and design effects for systolic blood pressure and calories within the selected age groups shown in table VI. The means and standard errors were computed both under the multiple sampling error computing unit classification as well as under the paired sampling error computing unit groupings. At least for these variables, it is apparent

NOTE: A list of references follows the text.

Table VI. Comparative analyses of standard errors and design effects for the multiple and paired sampling error computing units (SECU's) within certainty strata for systolic blood pressure and calories, by age for NHANES I data, 1971–74.

Age	Number of examined persons	Mean	Multiple SECU's: Standard error of mean	Multiple SECU's: Square root of design effect[1]	Paired SECU's: Standard error of mean	Paired SECU's: Square root of design effect[1]
			Systolic blood pressure			
6–74 years	17,658	123.95	0.424	2.292	0.409	2.21
6–17 years	4,085	108.24	0.492	2.207	0.498	2.23
18–24 years	2,290	118.89	0.466	1.573	0.441	1.48
25–34 years	2,675	120.93	0.445	1.534	0.440	1.51
35–44 years	2,317	125.64	0.580	1.479	0.603	1.53
45–54 years	1,589	134.14	1.015	1.746	1.037	1.78
55–64 years	1,255	142.11	0.826	1.214	0.804	1.16
65–74 years	3,447	150.01	0.793	1.820	0.734	1.79
			Calories			
1–74 years	20,749	2,000.0	17.80	2.923	17.88	2.93
1–17 years	7,104	2,011.0	20.75	2.106	20.03	2.03
18–24 years	2,297	2,294.8	37.02	1.660	35.32	1.58
25–34 years	2,694	2,177.5	27.66	1,479	29.44	1.57
35–44 years	2,327	2,042.9	28.33	1.545	28.94	1.57
45–54 years	1,599	1,897.3	31.76	1.515	30.41	1.45
55–64 years	1,262	1,723.2	33.06	1.418	33.45	1.43
65–74 years	3,466	1,518.9	20.68	1.870	19.99	1.80

[1] Ratio of standard error of mean from SECU's to standard error of mean from simple random sampling.

that the random allocation of sampling error computing units in the certainty strata to form a complete paired design has not substantially altered the estimates of variances or the corresponding design effects.

As a result of this pairing for the 10 certainty strata, all variance-covariance computations could be obtained directly as appropriate sums of squares and cross-products of differences across the 35 strata, and thus, 70 sampling error computing units. Thus, all the analyses under option 3 for the data from the general and detailed surveys were performed assuming this paired selection design. On the other hand, the analyses under option 3 for the combined data from the detailed and augmentation surveys required the multiple selection model because the design could not be paired for the 25 noncertainty strata.

Continuous variables: Means

The relative effects of the sampling weights and the sampling design are displayed in table VII for three variables of primary interest in these analyses, namely, systolic blood pressure, calories, and age. Note that for the total sample, the unweighted and weighted analyses (options 1 and 2) for these variables are quite similar, both for the means and variances. However, under option 3, the complex sample design introduces a considerable increase in the estimated variance of the mean. In particular, the ratio of the standard error of the mean under option 3 to that obtained under option 1 in the last column in table VII ranges from 1.498 to 2.937. Consequently, the design effects for these three variables range from 2.24 to 8.63.

In view of the fact that age was a crucial variable in the oversampling aspects of the 1971–74 design, one might expect the design effects to be less important when stratifying by age. To investigate this possibility, means and standard deviations of these same variables were computed within age groups as shown in table VIII. Even though the design effects are somewhat reduced, they are certainly not negligible, ranging from 1.39 to 4.99.

Subgroup comparisons: Means

Most of the hypotheses tested in this report involve the comparison of two subgroup means. Because of the clustered design and the sampling weights, the difference between the mean response for each subgroup was computed as the difference between two weighted ratio means within the context of the &PSALMS routine described in Vinter[54] and other basic sampling texts.

In order to assess the effects of the sampling weights and the complex sample design on the magnitude of the t-statistics associated with the tests for these differences, a representative analysis was investigated in detail under options 1–3. In particular, the mean systolic blood pressure was compared for two

NOTE: A list of references follows the text.

Table VII. Number of examined persons, estimated means, standard deviations, standard errors of the means, and design effects for systolic blood pressure, calories, and age, under analysis options 1–3 for NHANES I data: 1971–74

Option number	Inclusion of sampling: Weights	Inclusion of sampling: Design	Number of examined persons	Mean	Standard deviation	Standard error of mean	Square root of design effect
				Systolic blood pressure			
1	No	No	17,658	126.91	24.585	0.185	...
2	Yes	No	17,658	123.95	22.262	0.168	...
3	Yes	Yes	17,658	123.95	54.347	0.409	2.211
				Calories			
1	No	No	20,749	1,827.5	877.00	6.088	...
2	Yes	No	20,749	2,000.0	944.91	6.560	...
3	Yes	Yes	20,749	2,000.0	2,575.9	17.883	2.937
				Age			
1	No	No	20,749	32.23	22.972	0.159	...
2	Yes	No	20,749	30.61	20.120	0.140	...
3	Yes	Yes	20,749	30.61	34.417	0.239	1.498

subclasses determined by the lowest 15th percentile and highest 15th percentile of skinfold thickness in selected age-race subgroups. These results are displayed in table IX under each of the three analysis options. In all subgroups, the simple random sample estimates for the unweighted and weighted analyses are quite similar, both for the means and variances. However, under option 3, the complex sample design introduces a considerable increase in the estimated variance of the difference in the means between the two subclasses. Specifically, the ratio of the standard error of the difference of the mean under option 3 to that obtained under option 1 in the last column in table IX ranges from 1.1 to 2.0. Thus, the design effects for these t-statistics range from 1.2 to 4.0.

Continuous variables: Multiple regression models

One of the statistical models used for the analyses in this report is the following multiple regression model:

$$Y_i = B_1 + B_2X_{2i} + B_3X_{3i} + \ldots + B_kX_{ki} + E_i$$

where Y_i denotes the ith observation of the dependent variable, X_i denotes the ith observation of each independent or explanatory variable; and E_i is the random variation of the ith observation of Y. The subscripts 1, 2, ..., k identify the specific explanatory variables. B_1 is the mean of Y_i when each of the explanatory variables is equal to zero: and B_k is the change in the expected value of Y_i corresponding to a unit change in the kth explanatory variable, holding all other explanatory variables constant. B_2, B_3, ..., B_k are often referred to as the regression slopes or (partial) regression coefficients.

Also presented in the regression results tables are beta coefficients. The beta coefficients are the result of linear regression in which each variable is "normalized" by subtracting its mean and dividing by its estimated standard deviation. In other words, the beta coefficient adjusts the estimated slope parameter by the ratio of the standard deviation of the independent variable to the standard deviation of the dependent variable. A beta coefficient of 0.3 may be interpreted to mean that a standard deviation change of 1.0 in the independent variable will lead to a 0.3 standard deviation change in the dependent variable. Beta coefficients are also used to make statements about the relative importance of the X variables in the model.

Assumptions of the multiple regression model

The classical assumptions associated with the regression model are as follows:

1. The model specification is correct.
2. The X's are nonstochastic. In addition, no exact linear relationship exists among two or more of the independent variables.
3. The random variation has zero expected value and constant variance for all observations.
4. Random variations corresponding to different observations are uncorrelated.
5. The random variation term is normally distributed.

Any set of real data is unlikely to meet all these assumptions, particularly one utilizing a complex sample design such as that in the NHANES I survey. However, certain violations of these assumptions may not seriously affect statistical inferences. For example, under simple random sampling theory, it is straightfor-

Table VIII. Number of examined persons, estimated means, standard deviations, standard errors of the means, and design effects for systolic blood pressure and calories within age groups, under analysis options 1–3 for NHANES I data: 1971–74

Age	Number of examined persons	Option 1			Option 2			Option 3			Square root of design effect
		Mean	Standard deviation	Standard error of mean	Mean	Standard deviation	Standard error of mean	Mean	Standard deviation	Standard error of mean	
					Systolic blood pressure						
6–74 years	17,658	126.91	24.585	0.1850	123.95	22.262	0.1675	123.95	54.347	0.4090	2.211
6–17 years	4,005	108.67	14.245	0.2229	108.24	14.132	0.2211	108.24	31.829	0.4980	2.234
18–24 years	2,290	117.96	14.166	0.2960	118.89	13.794	0.2883	118.89	21.089	0.4407	1.489
25–34 years	2,675	119.90	15.006	0.2901	120.93	14.710	0.2844	120.93	22.739	0.4397	1.515
35–44 years	2,317	125.76	18.885	0.3923	125.64	17.665	0.3670	125.64	29.008	0.6026	1.536
45–54 years	1,589	135.10	23.176	0.5814	134.14	22.782	0.5715	134.14	41.317	1.0365	1.783
55–64 years	1,255	143.13	24.126	0.6810	142.11	23.453	0.6620	142.11	28.482	0.8040	1.181
65–74 years	3,447	151.02	25.580	0.4357	150.01	25.056	0.4268	150.01	46.027	0.7840	1.799
					Calories						
1–74 years	20,749	1,827.5	877.00	6.008	2,000.0	944.91	6.560	2,000.0	2,575.9	17.883	2.937
1–17 years	7,104	1,000.4	830.42	9.8525	2,011.0	874.24	10.372	2,011.0	1,688.5	20.033	2.033
18–24 years	2,297	2,084.6	1,068.70	22.298	2,294.0	1,136.6	23.715	2,294.8	1,692.6	35.317	1.584
25–34 years	2,694	1,954.5	971.00	18.700	2,177.5	1,050.1	20.232	2,177.5	1,527.8	29.435	1.573
35–44 years	2,327	1,829.0	884.65	18.339	2,042.9	966.51	20.036	2,042.9	1,395.8	28.935	1.578
45–54 years	1,599	1,840.4	838.33	20.965	1,897.3	816.17	20.411	1,897.3	1,216.0	30.410	1.451
55–64 years	1,262	1,679.2	828.08	23.310	1,723.2	814.02	22.914	1,723.2	1,188.5	33.454	1.435
65–74 years	3,466	1,497.2	651.06	11.059	1,518.9	649.50	11.032	1,518.9	1,176.9	19.991	1.808

Table IX. Number of examined persons in subclasses determined by lowest 15th percentile and highest 15th percentile of skinfold thickness, means, standard errors, test statistics, and design effects for systolic blood pressure: NHANES I, 1971-74

Option	Low skinfold percentile (P_{15}) Number of examined persons	Mean	Standard error	High skinfold percentile (P_{85}) Number of examined persons	Mean	Standard error	t-statistic	Square root of design effect
				All males				
1	1,025	130.6	0.70	1,008	141.7	0.73	11.0	...
2	1,025	126.0	0.58	1,008	138.0	0.65	13.6	...
3	1,025	126.0	0.99	1,008	138.0	0.91	9.2	1.3
				Black males				
1	280	137.5	1.60	153	148.7	2.40	4.0	...
2	280	131.8	1.32	153	140.1	2.06	3.6	...
3	280	131.8	2.33	153	140.1	3.25	1.9	1.6
				White males				
1	745	127.9	0.73	855	140.4	0.73	12.0	...
2	745	124.8	0.65	855	137.8	0.69	13.5	...
3	745	124.8	1.02	855	137.8	0.88	9.2	1.4
				All females				
1	1,644	120.7	0.55	1,621	141.9	0.66	24.7	...
2	1,644	118.9	0.50	1,621	140.9	0.65	27.1	...
3	1,644	118.9	0.63	1,621	140.9	1.05	19.7	1.3
				Black females				
1	285	121.2	1.48	482	145.3	1.35	11.5	...
2	285	120.3	1.52	482	146.3	1.41	12.1	...
3	285	120.3	2.59	482	146.3	3.08	6.2	2.0
				White females				
1	1,359	120.6	0.59	1,139	140.5	0.75	21.2	...
2	1,359	118.7	1.16	1,139	139.7	0.74	23.7	...
3	1,359	118.7	0.59	1,139	139.7	1.20	19.8	1.1

ward to show that the least squares estimators of the regression coefficients retain their desirable asymptotic properties (unbiased, consistent, and efficient), provided that the explanatory variables are each distributed independently of the true errors in the model. See, for example, Kmenta.[56] More detailed discussions of the properties of the regression model estimates from complex sample surveys can be found in Holt, Smith, and Winters[57]

Empirical results for regression models

In order to investigate predictive relationships among continuous variables, multiple regression models also can be fitted under option 1, 2, or 3. Specifically, the effects of the sampling weights and complex design on the precision of regression coefficients was investigated under options 1-3 for systolic blood pressure and calories on age as summarized in table X. First, it can be observed in the corresponding entries under options 1 and 2 that the results are quite similar, particularly for systolic blood pressure on age, which has a significant linear relationship in all the race-sex subclasses. However, for calories on age, which has extremely small R^2 values for all subgroups, the estimate of the slope is quite different for some subclasses; in fact, for the "other males" category there is a 12-fold increase in the slope under option 2 compared with option 1, and for the "other females" category it differs by a factor of nearly 3. Of course, in both of these subclasses the sample size is relatively small.

Otherwise, note in table X that the results under option 3 are only reported for the white subgroups, even though the number of black persons examined appears to be reasonably large. This omission is due to the failure of the balanced half-sample routine in the weighted regression program in OSIRIS IV resulting from entire strata with no data for these subclasses as shown in table XI. Modification of this routine or use of another sampling error program could still be used to obtain these estimates for the other subclasses. This problem of missing sampling error computing units is even more pronounced within the more restrictive detailed examination as displayed in table XII. Conse-

NOTE: A list of references follows the text.

Table X. Summary of simple regression models for systolic blood pressure and calories on age under analysis options 1–3, by race and sex for NHANES I data, 1971–74

Sex, race, and age	Number of examinees	Unweighted design (Option 1)				Weighted design						
								(Option 2)		(Option 3)		Square root of design effect
		R^2	Slope	Standard error	t-statistic	R^2	Slope	Standard error	t-statistic	Standard error	t-statistic	
Total						Systolic blood pressure on age						
6–74 years	17,650	0.40	0.730	0.0060	107.45	0.35	0.696	0.0071	98.11	0.0131	53.14	1.93
White males	5,054	0.36	0.605	0.0106	57.24	0.33	0.610	0.0115	53.14	0.0113	54.06	1.07
Black males	1,326	0.46	0.815	0.0240	33.91	0.43	0.040	0.0269	31.53	---	---	---
Other males	89	0.35	0.762	0.1118	6.81	0.14	0.401	0.1064	3.77	---	---	---
White females	8,243	0.41	0.767	0.0102	75.57	0.38	0.734	0.0104	70.39	0.0100	39.03	1.85
Black females	2,037	0.47	0.979	0.0230	42.55	0.44	1.008	0.0252	40.05	---	---	---
Other females	109	0.40	0.920	0.1086	8.47	0.37	0.018	0.1040	7.87	---	---	---
Total						Calories on age						
1–74 years	20,749	0.02	–4.90	0.2629	–10.64	0.01	–5.50	0.3230	–16.99	0.3171	17.35	1.21
White males	7,004	0.01	–3.39	0.4873	–6.95	0.00	–3.52	0.6102	–5.70	0.6314	–5.58	1.30
Black males	1,707	0.01	–3.74	0.9217	–4.05	0.00	–1.08	1.212	–0.89	---	---	---
Other males	109	0.00	1.00	3.598	0.28	0.05	12.50	5.101	2.45	---	---	---
White females	9,347	0.04	–5.09	0.3034	–19.41	0.04	–6.44	0.3315	–19.43	0.4339	–14.05	1.43
Black females	2,456	0.06	–0.39	0.6578	–12.75	0.06	–9.45	0.7420	–12.74	---	---	---
Other females	126	0.00	–1.23	3.474	–0.35	0.01	–3.35	3.899	–0.86	---	---	---

quently, due to the sparse design across strata, only the white and black race data were used in many of the analyses.

In addition to simple linear regression models, multiple regression models can also be fitted within this same framework. Table XIII summarizes the results of systolic blood pressure regressed jointly on age, race, sex, and Quetelet's index for 13,573 cases ages 18–74 years. Here again, the design effects for the regression coefficients range from 2.22 to 4.41.

These empirical results, as expressed in terms of estimated design effects, demonstrate the critical importance of incorporating the sampling weights and the survey design adjustments into all definitive subgroup comparisons and multiple regression models.

Table XI. Number of examined persons ages 1–74 years, by race, sex, and stratum number in the NHANES I design, 1971–74.

Stratum number	*Total*	*Number of examined persons by race and sex*					
		White males	*Black males*	*Other males*	*White females*	*Black females*	*Other females*
Total	20,749	7,004	1,707	109	9,347	2,456	126
1	621	169	88	2	220	138	4
2	367	146	24	0	157	38	2
3	482	123	85	1	171	102	0
4	737	198	102	11	255	162	9
5	741	232	65	13	328	88	15
6	580	67	35	2	85	57	4
7	395	85	90	0	93	127	0
8	188	67	16	0	79	26	0
9	304	109	13	1	149	32	0
10	429	138	32	13	190	37	19
11	481	205	4	0	267	3	2
12	517	198	14	0	286	17	2
13	531	232	2	2	290	4	1
14	701	273	15	2	396	14	1
15	486	185	20	4	226	43	8
16	563	178	68	5	211	98	3
17	594	235	6	0	346	6	1
18	505	176	39	2	224	62	2
19	585	237	12	4	317	14	1
20	446	171	13	1	246	14	1
21	790	344	0	0	446	0	0
22	551	114	107	3	141	185	1
23	619	167	85	0	249	116	2
24	449	131	73	0	170	122	3
25	728	225	73	0	311	119	0
26	887	232	156	0	305	194	0
27	684	262	23	1	379	17	2
28	1,001	259	174	0	327	241	0
29	634	222	51	1	292	68	0
30	868	284	84	1	371	124	4
31	651	221	34	5	334	52	5
32	691	250	22	3	367	32	12
33	619	222	3	21	345	10	18
34	545	236	5	5	295	1	3
35	1,059	411	74	1	479	93	1

Table XII. Number of examined persons ages 25–74 years, by race, sex, and stratum number in the NHANES I design for the detailed sample, 1971–74

Stratum number	Total	Number of examined persons by race and sex					
		White males	Black males	Other males	White females	Black females	Other females
Total	3,854	1,541	277	21	1,667	335	13
1	112	37	13	1	34	27	0
2	80	38	4	0	27	11	0
3	87	23	18	0	29	17	0
4	129	46	15	1	43	23	1
5	143	60	11	4	55	12	1
6	48	17	7	1	12	11	0
7	71	16	18	0	17	20	0
8	42	19	0	0	18	5	0
9	57	25	1	0	27	5	0
10	84	34	8	4	30	5	3
11	100	45	0	0	53	1	1
12	93	40	3	0	49	0	1
13	92	45	1	0	46	0	0
14	129	54	1	0	70	4	0
15	78	43	2	1	27	5	0
16	101	29	13	0	41	18	0
17	107	52	1	0	54	0	0
18	81	41	4	1	28	7	0
19	109	45	2	1	59	2	0
20	81	34	2	0	44	1	0
21	162	72	0	0	90	0	0
22	89	28	17	1	23	20	0
23	112	33	16	0	48	15	0
24	81	28	8	0	30	15	0
25	156	67	8	0	67	14	0
26	150	45	22	0	65	18	0
27	141	65	6	0	68	1	1
28	182	57	26	0	64	35	0
29	126	50	10	0	58	8	0
30	152	63	14	0	64	11	0
31	113	49	3	1	51	8	1
32	123	51	2	2	61	6	1
33	119	45	0	2	69	0	3
34	100	46	2	0	52	0	0
35	224	99	19	1	94	11	0

Table XIII. Summary of multiple regression models for systolic blood pressure on age, race, sex, and Quetelet's index for 13,573 examined persons ages 18–74 years, under analysis options 1–3: NHANES I, 1971–74

Variable	Regression coefficient	Standard error of coefficient	t-statistic	Square root of design effect
		Unweighted SRS design (option 1)		
Age	0.677	0.0096	69.44	---
Race	3.896	0.3938	9.89	---
Sex	–1.135	0.0335	33.88	---
Quetelet's index	1.135	0.0335	33.88	---
		Weighted SRS design (option 2)		
Age	0.584	0.0102	57.49	---
Race	2.908	0.4422	6.58	---
Sex	–2.871	0.3162	–9.08	---
Quetelet's index	1.177	0.0331	35.56	---
		Weighted complex sampling design (option 3)		
Age	0.584	0.0177	32.92	1.85
Race	2.908	0.8366	3.52	2.10
Sex	–2.871	0.5206	–5.52	1.49
Quetelet's index	1.177	0.0630	18.69	1.88

Appendix II. Comparison of single and paired blood pressure readings

The dependent measures used in this study include blood pressure readings taken for the participants in the NHANES I sample. The initial blood pressure reading, which was taken on all sampled examined persons, was used in most analyses to determine relationships between blood pressure and nutritional and other physiologic characteristics. However, it is important to determine the reliability of the blood pressure readings.

In addition to the sitting blood pressures taken initially on all 23,808 persons in the NHANES I survey, a second sitting blood pressure reading was obtained from the 6,913 individuals comprising the detailed and augmented survey groups. Comparisons were made between these paired readings in order to determine the reliability of the NHANES I blood pressure measurements.

Weighted means of the two blood pressure readings for all individuals as well as by race and sex groups are presented in table XIV. The two sets of blood pressure readings were similar. The readings for the subsequent mean systolic and diastolic pressure were slightly higher than initial pressure for all participants, although this difference was not significant. This trend was also reflected in the individual race-sex groups, except for black males, whose subsequent average pressures were 1–2 millimeters of mercury lower than the initial reading. Again, these differences were not significant.

The systolic pressure was categorized into three levels (normotensive, borderline, and hypertensive) using the following cutoff points: <140, 140–159, and ≥ 160 millimeters of mercury. The three levels were also derived for diastolic pressure by using cutoff points of <90, 90–94, and ≥ 95 millimeters of mercury.

From these categorizations, tables were generated by crossing the initial with the second readings for both diastolic and systolic levels. In tables XV and XVI, three-by-three tables of unweighted data for both diastolic and systolic pressure for the entire sample and by race-sex groups are shown. Column and row marginal probabilities indicate a high degree of symmetry over the levels of both diastolic and systolic pressure in the total and in the race-sex specific tables. Therefore at the population level, both initial and subsequent blood pressure readings detected nearly identical prevalence of the normotensive, borderline, and hypertensive classifications in the population.

Within the body of the three-by-three tables, there is movement of individuals in and out of the categories from the initial to the subsequent reading. Summing the cells along the principal diagonal of the table for the entire sample and dividing by the total number of persons represented in the table yielded an agreement of 81.0 percent and 77.1 percent for systolic and diastolic pressures, respectively. Over race-sex groups, percent agreement ranged from 73.7 percent to 83.4 percent for the diastolic and systolic tables with white females having the highest diagonal agreement for both blood pressure types.

Individuals moved off the principal diagonal almost exclusively to adjacent categories. Borderline and hypertensive categories from the initial to the subsequent readings exhibited the greatest lability. With respect to diastolic pressure, 639 of the 1,021 persons initially determined to be borderline in the first reading shifted to adjacent categories as a result of the second reading, yielding a lability of 63.9 percent. The greatest percentage of these (39.6 percent) switched to the normotensive category. Those persons with diastolic pressures initially categorized as hypertensive on the initial reading demonstrated 28.9 percent lability to the lower pressure categories, with the majority of this number, 18.3 percent, subsequently diagnosed as borderline. Persons initially categorized as normotensives were most stable, with an 11.4 percent lability in the total group. This pattern of category change was similarly reflected in the race-sex strata.

Changes in systolic pressure categories were similar to those for diastolic pressure with labilities in the total group, normotensives, borderline, and hyperten-

Table XIV. Weighted mean, standard error, and number of examinees with the two sitting systolic and diastolic blood pressure readings, by race and sex for adults ages 25–74 years: NHANES I detailed and augmented samples, 1971–75

Blood pressure measurement	*Total*	*White*		*Black*	
		Male	*Female*	*Male*	*Female*
Systolic					
Initial					
Mean (millimeters of mercury)	131.0	131.8	128.8	139.8	136.9
Standard error of mean (millimeters of mercury)	0.27	0.36	0.41	1.26	1.37
Number of examinees	6,817	2,736	3,213	388	480
Subsequent					
Mean (millimeters of mercury)	132.0	133.0	130.0	138.6	136.9
Standard error of mean (millimeters of mercury)	0.26	0.37	0.41	1.24	1.24
Number of examinees	6,781	2,723	3,198	385	475
Diastolic					
Initial					
Mean (millimeters of mercury)	83.4	84.8	81.0	91.0	87.2
Standard error of mean (millimeters of mercury)	0.15	0.22	0.22	0.77	0.73
Number of examinees	6,814	2,736	3,212	387	479
Subsequent					
Mean (millimeters of mercury)	83.8	85.3	81.4	89.9	87.6
Standard error of mean (millimeters of mercury)	0.15	0.22	0.22	0.76	0.69
Number of examinees	6,777	2,722	3,197	384	474

sives, of 10.0 percent, 43.8 percent, and 25.3 percent, respectively. Individuals with systolic borderline pressures changed more frequently to normotensives (29.7 percent) than to hypertensives (14.6 percent) on the second reading. Initial systolic hypertensives demonstrated greatest movement to the borderline level (22.2 percent).

The most detailed and sensitive evaluation of the lability of blood pressure categories was performed by crossing the three-level groupings of the diastolic and systolic pressure readings to yield a nine-cell table for both of the blood pressure readings (unweighted) as shown in table XVII. Each cell or combination of several cells can be regarded as a clinical category. For example, an isolated systolic hypertensive condition ($\geq 160 < 90$ millimeters of mercury) would be comparable to cell 3 of this table. These nine categories of the initial blood pressure measurement were then crossed with the nine categories of the subsequent measurement to yield the nine-by-nine table shown in table XVIII. This table allows the blood pressure condition frequency detected by the initial blood pressure reading to be compared with those conditions categorized by the subsequent blood pressure reading.

The marginal frequencies (unweighted) probabilities in table XVIII demonstrated a high degree of marginal symmetry. Therefore, both initial and subsequent blood pressure readings detected a similar prevalence of the nine blood pressure condition categories in the total survey.

Comparison of the principal axis with the initial marginal totals indicates that there were substantial changes in blood pressure category between the two blood pressure readings. The percent agreement is 65.7 percent. Movement of cases from the initially defined condition was generally directed toward adjacent pressure categories one level above or below the original diastolic and/or systolic categorization. In only one category was there movement beyond an adjacent cell. The exception was the initially defined condition of isolated diastolic hypertension (column 7 of table XVIII), where 18 percent of the people were categorized as systolic/diastolic normotensive in the second reading, in addition to large numbers of persons being rediagnosed as normal systolic/borderline diastolic (24 percent) and borderline systolic/hypertensive diastolic (16 percent).

These analyses indicate that with respect to summary statistics, such as means or marginal probabilities, the initial and subsequent blood pressure measurements yielded essentially the same information. However, with categorization of blood pressures into levels or conditions, there was substantial casewise movement between categories with second blood pressure readings.

Table XV. Comparison of systolic blood pressure groups between initial and subsequent measurements for adults ages 25–74 years: NHANES I detailed and augmented samples, 1971–75

Subsequent measurement (millimeters of mercury), race and sex	Initial measurement (millimeters of mercury)								Diagonal agreement
	Total		Less than 140		140–159		≥ 160		
	Number of examinees	Percent	Number of examinees	Percent	Number of examinees	Percent	Number of examinees	Percent	Percent
All subjects									
Total	6,778	100.0	4,447	65.7	1,391	20.5	940	13.8	81.0
140	4,434	65.5	3,999	59.1	406	6.0	29	0.4	...
140–159	1,403	20.6	411	6.0	782	11.5	210	3.1	...
160	941	13.9	37	0.6	203	3.0	701	10.3	...
White males									
Total	2,723	100.0	1,798	66.0	629	23.1	296	10.9	78.3
140	1,780	65.3	1,589	58.4	180	6.6	11	0.4	...
140–159	628	23.1	293	7.1	347	12.7	88	3.2	...
160	315	11.6	16	0.6	102	3.7	197	7.2	...
White females									
Total	3,196	100.0	2,207	69.1	581	18.2	408	12.8	83.4
140	2,199	68.8	2,017	63.1	170	5.3	12	0.4	...
140–159	591	18.5	172	5.4	336	10.5	83	2.6	...
160	406	12.7	18	0.6	75	2.3	313	9.8	...
Black males									
Total	385	100.0	196	50.9	98	25.5	91	23.6	78.4
140	200	51.9	172	44.7	27	7.0	1	0.3	...
140–159	93	24.2	23	6.0	55	14.3	15	3.9	...
160	92	23.9	1	0.3	16	4.2	75	19.5	...
Black females									
Total	474	100.0	246	51.9	83	17.5	145	30.6	80.4
140	255	53.8	221	46.6	29	6.1	5	1.1	...
140–159	91	19.2	23	4.9	44	9.3	24	5.1	...
160	128	27.0	2	0.4	10	2.1	116	24.5	...

Table XVI. Comparison of diastolic blood pressure groups between initial and subsequent measurements for adults ages 25–74 years: NHANES I detailed and augmented samples, 1971–75

Subsequent pressure measurement (millimeters of mercury), race and sex	*Initial pressure measurement (millimeters of mercury)*								*Diagonal agreement*
	Total		*Less than 140*		*140–159*		*≥ 160*		
	Number of examinees	*Percent*	*Number of examinees*	*Percent*	*Number of examinees*	*Percent*	*Number of examinees*	*Percent*	*Percent*
All subjects									
Total	6,775	100.0	4,511	66.6	1,014	14.9	1,250	18.5	77.1
140	4,491	66.3	3,955	58.4	402	5.9	134	2.0	...
140–159	1,043	15.4	435	6.5	378	5.6	230	3.4	...
160	1,241	18.3	121	1.8	234	3.4	886	13.2	...
White males									
Total	2,722	100.0	1,715	63.0	488	17.9	519	19.1	79.2
140	1,727	63.5	1,473	54.1	195	7.2	59	2.2	...
140–159	464	17.0	186	6.8	182	6.7	96	3.5	...
160	531	19.5	56	2.1	111	4.1	364	13.4	...
White females									
Total	3,196	100.0	2,359	73.8	401	12.5	436	13.6	80.2
140	2,332	73.0	2,123	66.4	159	5.0	50	1.6	...
140–159	421	13.2	184	5.8	145	4.5	92	2.9	...
160	443	13.8	52	1.6	97	3.0	294	9.2	...
Black males									
Total	384	100.0	179	46.6	59	15.4	146	38.0	73.7
140	180	46.9	146	38.0	19	4.9	15	3.9	...
140–159	66	17.2	24	6.3	24	6.3	18	4.7	...
160	138	35.9	9	2.3	16	4.2	113	29.4	...
Black females									
Total	473	100.0	258	54.5	66	14.0	149	31.5	75.1
140	252	53.2	213	45.0	29	6.1	10	2.1	...
140–159	92	19.5	41	8.7	27	5.7	24	5.1	...
160	129	27.3	4	0.8	10	2.1	115	24.3	...

Table XVII. Construction of the nine-cell blood pressure condition variable for adults ages 25–74 years: NHANES I detailed and augmented sample, 1971–75[1]

Diastolic pressure (millimeters of mercury)	*Systolic pressure (millimeters of mercury)*		
	< 140	*140–159*	*≥ 160*
90	Normal systolic, normal diastolic	Borderline systolic, normal diastolic	High systolic, normal diastolic
90–95	Normal systolic, borderline diastolic	Borderline systolic, borderline diastolic	High systolic, borderline diastolic
≥ 95	Normal systolic, high diastolic	Borderline systolic, high diastolic	High systolic, high diastolic

[1]Diagonal agreement = 4,501/6,847 = 65.7 percent

Table XVIII. Cross-tabulation of the initial and subsequent nine-level blood pressure condition categorizations for adults ages 25–74 years: NHANES I detailed and augmented samples, 1971–75[1]

Subsequent pressure measurement (millimeters of mercury)	Initial pressure measurement (millimeters of mercury)										
	Number of examinees	Percent distribution	NS/ND	BS/ND	HS/ND	NS/BD	BS/BD	HS/BD	NS/HD	BS/HD	HS/HD
Number of examinees	6,847	...	3,806	576	180	502	373	146	190	453	621
(Percent distribution)	(...)	(100.0)	(56.0)	(8.0)	(3.0)	(7.0)	(5.0)	(2.0)	(3.0)	(7.0)	(9.0)
NS/ND	3,787	55.0	3,259	174	13	202	63	2	34	36	4
BS/ND	585	9.0	166	223	43	19	71	18	5	23	17
HS/ND	164	2.0	12	37	71	2	7	20	1	1	13
NS/BD	500	7.0	221	18	1	150	34	1	45	25	5
BS/BD	365	5.0	68	70	8	35	82	12	15	54	21
HS/BD	190	3.0	8	20	28	2	27	39	0	11	55
NS/HD	199	3.0	39	3	0	42	19	0	56	37	3
BS/HD	460	7.0	30	25	1	43	48	16	31	192	74
HS/HD	597	9.0	3	6	15	7	22	38	3	74	429

[1] Diagonal agreement = 4,501/6,847 = 65.7 percent

NOTES:

NS = Normal systolic (less than 140 millimeters of mercury)
BS = Borderline systolic (140–159 millimeters of mercury)
HS = High systolic (greater than or equal to 160 millimeters of mercury)
ND = Normal diastolic (less than 90 millimeters of mercury)
BD = Borderline diastolic (90–94 millimeters of mercury)
HD = High diastolic (greater than or equal to 95 millimeters of mercury)

Appendix III. Definitions of selected terms

Demographic and socioeconomic terms

Age

Two ages were recorded for each examinee: age at last birthday at the time of the examination and age at the time of the census interview. The age criterion for inclusion in the sample used in this survey was defined as age at the time of the census interview. The adjustment and weighting procedures used to produce national estimates were based on the age at interview. Data in the detailed tables and text of the report are shown by age at the time of the examination, except that those few who became 75 years of age by the time of the examination are included in the 65–74-year age group.

Race

Race was recorded as "white," "Negro," or "other." "Other" includes Japanese, Chinese, American Indian, Korean, Eskimo, and all races other than white or black. Mexicans were included with "white" unless definitely known to be American Indian or of a race other than white. Black persons and those of mixed black and other parentage were recorded as "Negro." When a person of mixed racial background was uncertain about his or her race, the race of the father was recorded.

Geographic region

The 48 contiguous States and the District of Columbia, excluding Alaska and Hawaii, were stratified into four broad geographic regions, each of about the same population size. With a few exceptions, the compositions of the regions are as follows:

Region	States included
Northeast	Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania.
Midwest	Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri.
South	Delaware, Maryland, Virginia, West Virginia, Kentucky, Arkansas, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, District of Columbia.
West	Washington, Oregon, Idaho, Montana, Wyoming, Colorado, Utah, Nevada, California, Arizona, New Mexico, Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota.

In a few instances the actual boundaries of the regions did not follow State lines. Some strata in the Midwest and South include PSU's actually located in the West. Similarly, some strata in the West contain PSU's located in the Midwest and South.

Family income

The income recorded was the total income received by the head of the household and all other household members related to the head during the 12 months prior to the interview. This income was the gross cash income (excluding pay in kind) except in the case of a family with its own farm or business. In that instance net income was recorded. Also included was the income of a member of the Armed Forces who lived at home with the family (even though he or she was not considered a household member). If the person was not living at home, allotments and other money received by the family from him or her were included in the family income figure.

Population density

The classification of urban-rural areas was that used in the 1960 census. According to the 1960 definition, those areas considered urban are (1) places of 2,500 inhabitants or more that are incorporated as cities, boroughs, villages, and towns (except towns in New England, New York, and Wisconsin); (2) the densely settled urban fringe, whether incorporated or unincorporated, of urbanized areas; (3) towns in New England and townships in New Jersey and Pennsylvania that contain no incorporated municipalities as subdivisions and have either 2,500 inhabitants or more, or a population of 2,500 to 25,000 and a density of 1,500 persons per square mile; (4) counties in States other than the New England States, New Jersey, and Pennsylvania that have no incorporated municipalities within their boundaries and have a density of 1,500 persons or more per square mile; and (5) unincorporated places of 2,500 inhabitants or more that are not included in any urban fringe. The remaining population is classified as rural.

Using the first digit of the identification code on the household questionnaire, the urban and rural population was divided into the following categories according to population size: (1) urban, 3,000,000 or more; (2) urban, 1,000,000–2,999,999; (3) urban, 250,000–999,999; (4) urban, under 250,000; (5) urban, not in urbanized area, 25,000 or more; (6) urban, not in urbanized area, 10,000–24,999; (7) urban, not in urbanized area, 2,500–9,999; and (8) rural.

Statistical terms

Regression coefficient *(B)*

The estimated additive effect on the dependent variable for each unit of change in the independent variable within the multiple regression model for which all the other independent variables are held constant.

Sigma *(B)*

The model-based estimated standard error of the regression coefficient (*B*).

Standardized coefficient (Beta)

The estimated additive effect on the dependent variable for each unit of change in the independent variable which has been standardized to have mean zero and variance unity, within the multiple regression model in which all the other independent variables have been standardized and held constant.

Sigma (Beta)

The model-based estimated standard error of the standardized coefficient (Beta).

Partial r

The estimated correlation coefficient between the dependent variable and the independent variable within the multiple regression model for which all the other independent variables are held constant.

t-statistic

The test criterion obtained as the ratio of the regression coefficient (*B*) to its estimated standard error, Sigma (*B*), to test the hypothesis that *B* is zero.

Dietary terms

Caloric or total energy intake

Total caloric intake computation for food items listed in the 24-hour recall.

Ethanol (alcohol) consumption

For each examinee, the average number of ethanol ounces per week was calculated in the following way:

(1) Assigning a factor approximating the average amount of ethanol in a typical serving (0.48 for beer, 0.6 for wine, and 0.45 for liquor), based on the usual type of alcohol consumed by the individual.

(2) Assigning a factor to approximate the average number of drinking occasions per week for each individual as follows:

How often do you usually drink?

Every day	7.0
Almost every day	5.5
2 to 3 times per week	2.5
1 to 4 times per month	0.625
4 to 12 times per year	0.163
Never	0.0

(3) Multiplying the alcohol content by the weekly frequency and then multiplying the result by the usual number of drinks per drinking occasion.

Thus, ethanol ounces per week equals average alcohol content of usual alcoholic beverage consumed times frequency of individual drinks times number of drinks individual usually consumes per drinking occasion.

This continuous variable was categorized into abstainers (less than 0.0001 ethanol ounces per week), light drinkers (0.0001 to 0.9999 ethanol ounces per week), moderate drinkers (1.000 to 6.9999 ethanol ounces per week), and heavy drinkers (7.000 ethanol ounces or more per week).

The second alcohol variable, calories from alcoholic beverages, was derived from the 24-hour dietary recall by summing calories from all foods coded as "alcoholic beverages food group." This variable was categorized into none (less than 1 calorie), light/moderate (1 to 250 calories), and heavy (250 calories or more). The two data sources agreed with respect to alcohol abstinence for 98.7 percent of the abstainers on the medical history questionnaire who reported no alcohol intake in the 24-hour recall.

Salt and salty food intake

The frequency of use of the table salt shaker and estimated sodium content in food items listed on the 24-hour recall, assuming a ratio of one gram of salt to 400 milligrams of sodium from grain products, milk and milk products, mixed protein dishes, soups, meats, fruit and vegetables, fats and oils, and other foods.[12] The sodium content of food is incomplete because the values cover only naturally occurring sodium in foods and sodium added by processors. Table salt used is not included in these data.

Sodium intake, combined

A twelve-cell table was constructed from the table-salt-use responses and the dietary sodium content of food reported on the 24-hour recall as follows:

Frequency of salt shaker use	*Dietary sodium intake (24-hour recall)* Under 982.6 milligrams	982.6–1,883.9 milligrams	1,884.0–3,436.7 milligrams	3,436.8 milligrams and over
	Cell number			
Rarely	[a]1	[a]2	[b]3	[b]4
Occasionally	[a]5	[b]6	[b]7	[c]8
Frequently	[b]9	[b]10	[c]11	[c]12

[a] Low salt users.
[b] Moderate salt users.
[c] Heavy salt users.

In the analyses, individuals in cells 1, 2, and 5 were classified as having low salt intake; those in cells 3, 4, 6, 7, and 9 had moderate intake; and those in cells 8, 11, and 12 were considered to have heavy salt intake.

Fat and complex carbohydrate intake

For the combined intake of fat and complex carbohydrates, the distribution of the examinees by their frequency of intake of foods high in fats (cheese, milk, eggs, butter or margarine, and meat or poultry) and their frequency of intake of complex carbohydrate foods (cereals, grains, fruits, vegetables, beans, and peas) were each divided into three groups using as cutoff points the 33d and 66th percentiles. The three levels of each of the two variables were arrayed in a three-by-three table yielding nine cells. The two extreme cells represented low fat/high complex carbohydrate and high fat/low complex carbohydrate intake, respectively. The remaining seven cells of the three-by three table were pooled. The first level of the combined fat/complex carbohydrate variable is the high complex carbohydrate/low fat extreme cell, which contains approximately 5 percent of the examinees. The second level is composed of the seven intermediate cells, representing 90 percent of the total. The third level, containing the remaining 5 percent of the total, is the extreme cell, representing the low complex carbohydrate and high fat intake.

NOTE: A list of references follows the text.

Coffee and tea consumption

Derived from the food frequency dietary history.

Linoleic fatty acid

Estimated content in foods (from the 24-hour recall) including fats and oils, salty snacks, fruits and vegetables, meats, desserts and sweets, grain products, poultry, and others.[12]

Oleic (unsaturated fat)

Estimated content in foods (from the 24-hour recall) including meats, milk and milk products, fats and oils, desserts and sweets, grain products, mixed protein dishes, and others.[12]

Dietary cholesterol

Estimated content in foods (from the 24-hour recall) including eggs, meats, milk and milk products, desserts and sweets, fats and oils, and others.[12]

Medical and biochemical terms

Hypertensive status

Includes the following four categories:

Normotension.—Systolic pressure less than 140 mm Hg and diastolic pressure less than 90 mm Hg.

Borderline.—Systolic pressure less than 160 mm Hg or diastolic less than 95 mm Hg *but not both* systolic less than 140 mm Hg and diastolic less than 90 mm Hg.

Hypertension (definite).—Systolic pressure greater than or equal to 160 mm Hg and/or diastolic pressure greater than or equal to 95 mm Hg.

Systolic hypertension.—Systolic pressure greater than or equal to 160 mm Hg and diastolic pressure less than 90 mm Hg.

Hemoglobin concentration

As determinbed from the examinees' blood samples on the Coulter Hemoglobinometer in the mobile examination centers.[14]

Serum cholesterol

As determined from the examinees' blood samples at the Lipid Standardization Laboratory of the Centers for Disease Control (Atlanta, Ga.) using a modified ferric-chloride technique.[14]

Serum urate

As determined from the examinees' blood samples at the Centers for Disease Control, Bureau of Laboratories, using the Sobrinho-Simoes method.[14]

Serum glutamic oxalacetic transaminase (SGOT)

As determined from the examinees' blood samples at the Centers for Disease Control, Bureau of Laboratories, using the method of Henry et al.[14]

Serum calcium

As determined from the examinees' blood samples at the Centers for Disease Control, Bureau of Laboratories, using the method of Kessler and Wolfman.[14]

Serum inorganic phosphate

As determined from the examinees' blood samples at the Centers for Disease Control, Bureau of Laboratories, using an adaptation of the methods of Hurst and Kraml.[14]

Serum magnesium

As determined from the examinees' blood samples at the Centers for Disease Control, Bureau of Laboratories, using the method of Hansen and Freier.[14]

NOTE: A list of references follows the text.

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