ANTHROPOMETRIC AND CLINICAL FINDINGS

PRELIMINARY FINDINGS OF THE FIRST HEALTH AND NUTRITION EXAMINATION SURVEY, U.S., 1971-72

NATIONAL CENTER FOR HEALTH STATISTICS

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Preliminary Findings of the

FIRST HEALTH AND NUTRITION EXAMINATION SURVEY, UNITED STATES, 1971-72

Anthropometric and Clinical Findings

Presents preliminary findings of the Health and Nutrition Examination Survey collected on a probability sample of the U.S. population, by age, sex, race, and income level, 1971-1972. Data are presented on selected anthropometric measurements of children 1-17 years of age, obesity in adults 20-74 years of age, and clinical signs of possible nutritional deficiency for persons 1-74 years of age.

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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COOPERATION OF THE BUREAU OF THE CENSUS

In accordance with specifications established by the National Health Survey, the Bureau of the Census, under a contractual agreement, participated in the design and selection of the sample, and carried out the first stage of the field interviewing and certain parts of the statistical processing.

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PREFACE

This report is characterized as preliminary because the data pertain to only about half of the total sample group being studied and represent results of only part of the multifaceted approach used to measure nutritional status. The report does, however, present anthropometric measurements and clinical findings from a sample that is representative of the total U.S. population.

In the review and analysis of these preliminary data as in the planning and conduct of the survey, we have had the benefit of assistance from many experts in the area of nutrition. It is not practicable to list all of those to whom we are indebted and grateful, but special mention must be made of the advice received from Drs. Alex F. Roche, Josef Brozek, Robert M. Malina, and Jean-Pierre Habicht. None of these persons, however, bears final responsibility for the content of this report. Responsibility for its accuracy and its conclusions rests with the authors and with Mr. Arthur J. McDowell who has directed the study from its inception. Finally, important contributions were made by Miss Margaret D. Carroll, Mr. Clifford L. Johnson, and Mr. Matthew F. Najjar, all members of our staff.

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PRELIMINARY FINDINGS OF THE FIRST HEALTH AND NUTRITION EXAMINATION SURVEY, UNITED STATES, 1971-1972:

Anthropometric and Clinical Findings

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INTRODUCTION

This is the second preliminary report on the nutritional status of the U.S. population of ages 1-74 years from the Health and Nutrition Examination Survey (HANES). The first preliminary report, "Dietary Intake and Biochemical Findings," by Abraham, Lowenstein, and Johnson, analyzed and discussed data on dietary intake and biochemical tests by age, race, sex, and income levels.[1] This second report continues the analysis and discussion of nutritional status by considering anthropometric measurements and clinical signs with regard to similar variables.

For the convenience of readers, this second preliminary report and subsequent reports interpreting the HANES data will contain some of the discussion presented in the first preliminary report.

This second preliminary report of HANES data presents the findings from anthropometric measurements of children and of adult obesity and from clinical examinations for signs of possible nutritional deficiencies.

In the final report the four anthropometric measurements presented in this preliminary report will be supplemented by measurements of other parts of the body: bitrochanteric breadth, elbow breadth, upper arm girth, sitting height for the population 1-74 years, and head and chest circumference of children of ages 1-7 years. Additional analyses will be presented on the mean age of eruption of permanent teeth, which is an index of dental maturation, and on the mean age of appearance of individual ossification (bone growth) centers, which relates to skeletal maturation.

The HANES Program

The HANES program was undertaken by the National Center for Health Statistics in response to a directive from the Secretary, Department of Health, Education, and Welfare to establish a continuing national nutrition surveillance system under the authority of the National Health Survey Act of 1956. This system has as its purposes the measuring of nutritional status for the U.S. population and monitoring the changes in this status over time. Such a system should permit the use of health data as an objective test of programs to improve nutritional status and should provide an improved basis for allocation of scarce program resources.

The HANES is the first program to collect measures of nutritional status for a scientifically designed sample representative of the U.S. civilian, noninstitutionalized population in a broad range of ages, 1-74 years. Other earlier nutrition surveys, such as the Ten State Nutrition Survey,[2] have had more limited objectives. The probability sample design permits estimates to be made for the total population, while at the same time permitting more detailed analysis of data for certain groups at high risk of malnutrition—the poor, preschool children, women of childbearing ages, and the elderly.[a,3] This is made possible through use of differential sampling of these high risk groups and appropriate weighting of the data.

The first HANES program began data collection in April 1971 and was in full operation by August. A detailed description of the specific content and plan of operation, including the sample design, has been published,[4] and only the general characteristics are mentioned here. The Bureau of the Census cooperated in the sample design and in the initial visits to and interviewing at selected eligible households in the 65 primary sampling units (PSU's) throughout the United States. Additional household visiting, interviewing, history taking, and explaining the examination portion of the program were performed by members of the field teams of the center. These teams traveled to the various locations and included professional and paraprofessional medical and dental examiners along with technicians, interviewers, and other staff. The selected sample persons for whom an appointment could be made were brought into the specially constructed mobile examination centers which were moved into a central location in each area.

The Subsample for Preliminary Findings

The sample design provided that data from a representative subsample would become available after the first year and a half of data collection in order to provide some preliminary findings before the total survey had been completed. More detailed reports will be forthcoming.

These preliminary findings are based on the examination of 10,126 persons aged 1-74 years in a representative subset of 35 of the 65 PSU's making up the total sample. A sample of 14,147 persons was selected to be examined at these 35 locations which were visited between April 1971 and October 1972. These 14,147 sample persons are a probability sample of the total U.S. population; if a high proportion of them had been examined, the examined group could also have been regarded as a probability sample of the total population. However, despite intensive efforts, the program succeeded in examining only 10,126 of these sample persons. This represents 72.8 percent of the sample persons when adjustments are made for the differential sampling rates for the age, sex, and income defined population subgroups. (The unadjusted overall response rate was 71.6 percent.)

Surveys of the National Center for Health Statistics, including all earlier programs of the Health Examination Surveys, have achieved higher levels of response than have been reached for the 35-stand subsample in this first HANES. The 72.8 percent response rate fails to meet fully the requirements of the original probability design. It should be noted that a policy of remuneration of participants was adopted after the completion of 20 PSU's, and there has been a significant increase in participation.

Estimates in this report are based on weighted observations; i.e., the data obtained for each examined person are inflated to the level of the total population. The estimates have been calculated as though the examined persons in each of several age, sex, and income classes are a random subsample of the sample persons in the same class. While there is evidence from earlier examination surveys and medical history data from HANES that this is not an unreasonable approximation, it is clear that some estimates are subject to considerable risk of bias, when typically more than one-quarter of the sample persons in an age-sex-income class were not examined. Even so, the resulting estimates are much more closely representative of the civilian noninstitutionalized population of the United States than estimates from any previous survey on nutrition.

The size of the sample for these preliminary findings precludes analysis of various inter-

[a]The poor, for obvious economic reason of lessened ability to obtain needed foods but also perhaps by related lack of knowledge of what constitutes desirable diets, are vulnerable to nutritional deficiencies or imbalances. The relatively high vulnerability of children and pregnant and lactating women results from increased requirements for calories and essential nutrients, such as protein and calcium, in relation to their weight. In children, this is because they are growing; in pregnant and lactating women, because they have to feed an additional being, first the fetus in utero and after birth the newborn infant. Nutrient requirements of the elderly, on the other hand, usually are decreased due to lower basal metabolism and decreased physical activity. Their greater vulnerability may result from such factors as the effects of increased physical disabilities and health problems on their ability to utilize nutrients. It is also conditioned to a larger extent than in younger adults by socioeconomic and psychological factors, including food shopping problems and degree of interest in food preparation.

relationships and even of some of the detailed subclassifications of data such as region, urbanization, ethnic group, and educational achievement, matters which will be included in the reports prepared when the total survey is complete. These preliminary reports do examine the data by age, sex, race (white and Negro), and income level (above and below poverty level, see appendix II). Special emphasis is also placed on the age-sex groups oversampled because they are considered to be at higher risk of malnutrition (appendix I).

Measures of Nutritional Status

Nutrition is a major factor in the environment affecting life and health. Adequate intake of essential nutrients is a basic requirement for good health. Utilization of these nutrients under physiological conditions of work and rest through ingestion, digestion, and metabolism is another requirement. Under-nutrition and over-nutrition are both part of malnutrition as both affect health. Primary malnutrition is that due to lack (or excess) of food; secondary malnutrition is that due to faulty utilization of food. A combination of primary and secondary malnutrition can occur.

The HANES is designed to provide data to assess how adequately these two requirements for good health of the American people are met, i.e., the adequacy of dietary intake and the utilization of this food under ordinary living conditions in relation to the health status of the people.

The early signs of malnutrition may be retarded or accelerated growth, low or extremely high blood and urinary levels of certain nutrients, and less efficient performance. Continued malnutrition, in particular under-nutrition, may manifest itself in the appearance of certain physical changes of the skin, hair, eyes, mouth, and tongue; but only prolonged severe malnutrition will lead to the appearance of the classical deficiency diseases, such as scurvy or pellagra. The latter have become rare or nonexistent in our affluent society. The design of the HANES study was predicated on the assumption that the evidence of malnutrition encountered would be mainly early subclinical malnutrition with or without any physical signs.

The measurement methods to assess nutritional status in HANES were intended not only to detect overt signs and symptoms of malnutrition, but also to detect early "risk" signals. The approach taken was the usual one of obtaining four different kinds of data, each of which gives a "sighting" on nutritional status. These are: (1) information on the person's dietary intake (kind and quantity of food consumed and its nutritional value), (2) results of a variety of biochemical tests made on samples of blood and urine to determine the levels of various nutrients, (3) findings of clinical examinations by doctors and dentists alerted to detect stigmata of malnutrition and signs or conditions indicative of nutritional problems, and (4) various body measurements which would permit detection of abnormal growth patterns as well as obesity. Not one of these measures is, in itself, sufficient to characterize nutritional status. Theoretically, some synthesis of the several separate sightings would provide the best measurement and, hopefully, a method for such synthesis ultimately may be developed. At present, however, in the absence of a definitive method of combining the separate measures, it is necessary to present the findings separately from each methodology.

METHODS

Anthropometric Measurements

The examinees changed from their street clothing into disposable paper examination uniforms and foam rubber slippers designed to facilitate and standardize various elements of the examination. Body measurements were made at various times throughout the day at each examination center and in different seasons of the year, and thus body measurements were not standardized with regard to diurnal and seasonal variations. Weights vary between winter and summer and may differ depending upon recency of food and water intake.

The anthropometric battery for this report included measurements of height and weight, as well as measurements of the triceps and subscapular skinfolds of children of ages 1-17 years.

Body measurements depend in part on the supply of nutrients and thus provide one method of assessing nutritional status. Heights and weights are informative though limited in the analysis of body weight unless viewed in terms of body composition. Body weight is influenced by many factors. A weight gain can indicate fat, bone, or muscle growth. Skinfold measurements indicate the fat content of the subcutaneous tissues, which correlates well with the total fat content of the body. They also correlate, though less well, with body weight in children of ages 1-17 years.

Body measurements serve a limited role in the interpretation of nutritional status because in addition to nutrition there are other factors such as genetic and endocrine mechanisms that influence height and, perhaps to a lesser degree, weight.

Cross sectional data on height, weight, and skinfold measurements during the growing period by age are less valuable than longitudinal data since it is the velocity of growth which may be most affected by nutrition.[5] However, in comparisons of different groups of known genetic background, as in HANES, cross sectional data provide useful information.

Although growth charts or standards are usually employed as a frame of reference for comparisons with survey body measurement data,[5] they were not used in this preliminary report. The approach here is to compare data for population subgroups in HANES with one another. The analysis tests the significance of the differences between heights, weights, and skinfold measurements of subgroups by the nonparametric procedure known as "the sign test," with the emphasis on noting the direction of differences rather than the magnitude of differences. Consistency in the direction of change is the important factor to be tested. The analytical technique is described in appendix I.[6]

Height.—For persons aged 3-74 years height was measured in disposable foam rubber slippers with feet together, back and heels against the upright bar of the height scale, head approximately in the Frankfort horizontal plane ("look straight ahead"), and standing erect ("stand up tall" or "stand up real straight" with some assistance and demonstration when necessary). However, upward pressure was not exerted by the examiner on the subjects' mastoid processes to purposefully "stretch everyone in a standard manner," as is recommended by some.

The equipment consisted of a level platform to which was attached a vertical bar with a steel tape. Attached to the vertical bar perpendicularly was a horizontal bar which was brought down snugly on the examinee's head. Attached to another bar in the same plane as the horizontal measuring bar was a Polaroid camera which recorded the subject's identification number next to the pointer on the scale giving a precise reading. The camera not only gave a permanent record minimizing observer and recording error but, by sliding up and down with a horizontal bar and always being in the same plane, also completely eliminated parallax. That is, if the pointer had been in the space in front of the scale, it would have been read too high if the observer had looked up at the scale from below or too low if read down from above.

The heights of children 1-2 years of age were taken on the children's measuring board. The recorder assisted in this measurement. The child was kept flat on the board on his back with his legs perfectly straight and head against the left block which was stationary. The right block was moved in to touch the bottom of the child's feet. The measurement was read from the tape measure on a board and recorded to the nearest 0.5 cm.

A measuring board equipped with a digital readout was obtained later in the survey. The procedure for height measurement with this board was the same as before with the exception that instead of reading the height from the tape on the board the attached digital device designated the height and the measurement was recorded to the nearest 0.1 cm.

Weight.—A Toledo self-balancing scale that mechanically printed the weight to one-quarter of a pound directly onto the permanent record was used. This direct printing was used to minimize observer and recording errors. The scale was calibrated with a set of known weights, and any necessary fine adjustments were made at the beginning of each new trailer location, i.e., approximately every month. The recorded weight was later transferred to a punched card to the nearest 0.25 pound (lb.). The total weights of all clothing worn ranged from 0.20 to 0.62 lb.; this was not deducted from weights presented in this report. (The weights then are 0.20 to 0.62 lb. above nude weight recorded to the nearest 0.25 lb.) The examination clothing used was the same throughout the year so there is no seasonal variation in the weight of clothing.

Skinfolds. --Skinfold measurements were taken with a Lange skinfold caliper calibrated to exert a pressure of 10 gm. per square millimeter of jaw surface as suggested by the Recommendations Concerning Body Measurements for the Characterization of Nutritional Status.[7] The precision of the caliper was tested daily against metal standards of known widths.

> *Triceps:* With the skinfold caliper measure to the nearest millimeter the thickness of a fold of skin plus subcutaneous tissue, but no muscle, was taken over the right midtriceps at the level previously marked. The crest of the fold was parallel to the long axis of the arm. The calipers were applied about 1 mm. below thumb and forefinger. The fingers were not released when taking this and any other skinfold measurements. A second measurement was taken, and if the two measurements disagreed more than 1 mm. they were repeated until they agreed to within 1 mm.
>
> *Subscapular:* The thickness of a fold was taken just below the angle of the right scapula with shoulder and arm relaxed and was recorded to the nearest millimeter. The fold was parallel to the natural cleavage lines of the skin. This is often a line about 45 degrees from the horizontal extending medially upward. As previously, two measures were taken until two were obtained that agreed to within 1 mm.

Obesity in adults.—Estimates were made of the prevalence of obesity in adults of ages 20-74 years. Sufficient numbers were available to present two age groups: 20-44 and 45-74 years. Both age groups are shown by sex, race, and income levels.

Obesity is estimated by examining the relative contribution of the adipose tissue to the total body weight. Since a large proportion of the body's adipose tissue is located under the skin, the individual's leanness-fatness may be estimated by measuring the thickness of the skin. The validity of skinfold measurements as a measure of obesity was previously reported in *PHS Publication No. 1000, Series 11, No. 120,* Skinfold Thickness of Children, 6-11 Years, October 1972.[8] For the general population, the Committee on Nutritional Anthropometry has recommended the triceps and subscapular skinfolds as good indices of the individual's overall fatness.[7] The summing of subscapular and triceps values according to Garn et al., "conveys no real advantage, at least on a group basis."[9]

Clinical Signs

In the physical examination, the physician looked for a number of signs which may be indicative of deficiencies of one or more nutrients. There are various combinations of signs which may be found in relation to the deficiency (ies) they may indicate.

Sufficient numbers were available for presenting the findings of the clinical examination for six age groups by race and income levels. These groupings include 1-5, 6-11, 12-17, 18-44, 45-59, and 60 years and over. The sample size did not allow further breakdown of age groups. The age group 18-44 years has sufficient numbers in each sex group to present a cross-classification by sex as well as by race and income levels. The major clinical signs of nutrient deficiency are listed below, according to the nutrient.

Protein.—Edema either localized or generalized in association with changes of the hair (dyspigmented, easily pluckable, and change in texture), hepatomegaly, skin changes, and marked apathy or hyperirritability in a young child may indicate protein deficiency, particularly if the weight for age is low.

Vitamin B complex: riboflavin.—A magenta colored tongue and angular lesions or scars of the lips at any age are indicative of riboflavin (vitamin B_2) deficiency. Cracks in other parts of the body, e.g., at angles of eyelids as well as nasolabial seborrhea and circumcorneal injection of the eyes may be present.

Vitamin B complex: thiamine, niacin.— A beefy red tongue with atrophy of the papillae, either smooth or fissured, may indicate niacin and/or thiamine deficiencies. In chronic thiamine deficiency knee and/or ankle jerks may be absent. In chronic niacin deficiency typical skin lesions in the form of pigmented eczema-like lesions on sun-exposed parts (pellagrous dermatitis) may be present.

Vitamin D.—Vitamin D deficiency is suspected in a young child if beading of the ribs and/or epiphyseal enlargement of the wrists are seen. In persons of any age bossing of the frontal or parietal bones of the skull and/or bowed legs or knock knees may be signs of previous rickets.

Vitamin A.—The main physical changes to be found in vitamin A deficiency are xerosis of the conjunctiva and Bitot's spots of the sclera of the eye. In more advanced cases, xerophthalmia and keratomalacia may be found which can lead to destruction of the cornea and thus to blindness.

Skin changes may also exist in vitamin A deficiency (xerosis and/or follicular hyperkeratosis of the upper arms and back) but they are not specific and may also be found in essential fatty acid deficiency.

Vitamin C.—Signs of capillary bleeding in the skin (perifolliculosis) and the mucosae (gums) may indicate vitamin C deficiency.

Minerals: iodine.—Enlargement of the thyroid gland, either palpable or both palpable and visible may be an indicator of iodine deficiency or excess.

Minerals: calcium.—Chvostek's sign (contraction of the perioral muscles on tapping the malar process) indicates a hyperirritability of the neuromuscular system as found in tetany due to calcium deficiency or calcium-phosphorus imbalance.

Definitions of Variables

Age.—The age recorded is the age attained at the last birthday. The mean age of each category, therefore, approximates the midpoint of the whole year, e.g., the 5-year-old male group consists of a 1-year cohort whose mean age is 5.53 years, while the corresponding female sample averages 5.55 years.

Race.—Race was recorded as white, Negro, and other races. Whites were 72.6 percent of the total sample size of 10,126 persons; Negroes were 26.3 percent, which reflected the sampling design to overrepresent them in HANES. There were too few numbers for other races, only 1 percent, and therefore, no data are presented separately for them. Other races are included only when the total subjects are used but are not included in the white-Negro breakdown.

Family income.—Income status is another population characteristic considered in this report because nutritional data have been known to be associated with the level of income. The income status for each examined person is expressed by the Poverty Income Ratio (PIR) (see appendix II). One major limitation to the PIR is that the differences in cost of living in different sectors of the country are not considered.

For the analysis, two groups of income levels are presented: income below poverty level, a ratio of less than one; and income at and above poverty level, a ratio of one or more. Small numbers preclude the analysis of data by gradation of income in both income groups. Of the total persons examined, income was unknown for 4.7 percent. These persons were excluded from the two income groups but included in the total group.

Standards of adult obesity.—Obesity in adults was defined as triceps skinfold measurement greater than the 85th percentile of such measurement for men and women of ages 20-29 years, excluding pregnant women.[10,11] This follows the principle of "ideal weights" that the increase in body weight in adulthood with age is undesirable,[12] and is based on the concept that after the twenties an individual should not gain weight, presumably fat, with each year of age. The standard, although not exactly ideal for some persons in the age group 20-29 years, minimizes the observed increase in fat in men and women during maturity. Actual triceps skinfold defining obesity in males was 17.6 mm. and for females 29.7 mm.

Clinical signs; risk categories.—Many of the clinical signs listed previously vary in their sensitivity and specificity to serve as diagnostic tools. Some of the signs with a high degree of specificity were never seen in the half sample examined, others only rarely. We report only those found in more than 0.1 percent of the persons examined in any of the subgroups; see appendix III, table VI for clinical signs with a prevalence rate of less than 0.1 percent. To bring some order into this collection of signs, we assigned a risk value to each sign based on the degree of sensitivity and specificity to diagnose a certain deficiency. We differentiated three different risk categories—high, moderate, and low (see appendix III, table V).[b] Signs in the high-risk category are considered highly sensitive and specific for a certain deficiency, e.g., beefy red tongue with marked atrophy of the papillae (smooth) for vitamin B complex deficiency. A person presenting this sign is considered at a high risk of either having or developing this deficiency.

ANTHROPOMETRIC FINDINGS

Tables 1-4 present the basic anthropometric data for examined children by age, sex, and race. In addition to listing the number of children examined, their mean age, and the estimated number in the United States population, the tables include means and medians for the basic measurements (height, weight, and skinfolds) and standard errors of the means as defined through replication, which is discussed in appendix I, "Standard Errors."

The mean heights and weights and the median skinfolds are also presented in tables 5, 7, 9, and 10 and figures 1, 3, 5, and 6, along with differences of such values for each age by sex and race groups. The analysis in this report uses means for heights and weights and the medians for skinfolds. As discussed in the report on skinfolds from Cycle II and III,[8,13] the marked skewness of skinfold distributions suggests the use of the median as the best measure of central tendency. The mean and its standard error are presented mainly for the information of those investigators who continue to use them.

Tables 13-16 present the basic information on body measurements for boys and girls by income levels. Race is omitted because of sample size considerations. Therefore, instead of three variable cross-classifications by sex, race, and income level for each age, data are presented by sex and income level. The age comparisons of differences of average body measurements by sex and income level are presented in tables 6, 8, 11, and 12 and figures 2, 4, 7, and 8.

[b]A similar terminology has been used by the Nutrition Canada National Survey in their recent publication *Nutrition Canada.* This development was simultaneous without our knowledge prior to that publication.[14]

The prevalence of obesity in the adult population of ages 20-74 years is presented in table 17 and figure 9. These data are presented by sex, race, and income level for two age groups, 20-44 and 45-74 years. A larger sample than was available for the preliminary report would be required to present the prevalence of obesity by smaller age groups.

Differences in Height

Race and sex.—Table 5 and figure 1 show that from ages 1-5 Negro boys are, on the average, 0.1 cm. (0.04 in.)[c] taller than white boys. At ages 1 and 3 white boys are, respectively, 1.6 cm. (0.63 in.) and 0.3 cm. (0.12 in.) taller than Negro boys. Negro boys are taller at ages 2, 4, and 5. At all ages 6 through 11 years, Negro boys are taller, on the average, than white boys. The largest differences for mean heights are at ages 10 and 11, when Negro boys are taller by 2.9 cm. (1.14 in.) and 3.7 cm. (1.46 in.), respectively. At ages 12 through 17, except ages 14 and 15, white boys are taller, on the average, than Negro boys. The biggest difference occurs at age 13. At this age white boys are 6.0 cm. taller: 161.4 cm. (63.5 in.) for white boys in comparison to 155.4 cm. (61.2 in.) for Negro boys.

The mean heights for white boys increased from 83.9 cm. (33.0 in.) at age 1 to 178.0 cm. (70.1 in.) at age 17, an increase in mean height of 94.1 cm. (37.0 in.). The mean heights for Negro boys increased from 82.3 cm. (32.4 in.) at age 1 to 176.8 cm. (69.6 in.) at age 17, an increase in mean height of 94.5 cm. (37.2 in.). The difference in increase in mean height between white and Negro boys is 0.4 cm. (0.16 in.).

Negro boys are, on the average, taller in 11 of 17 age comparisons. There are no significant differences in age comparisons, using the sign test, at the 0.05 level.

Table 5 and figure 1 show that from ages 1-5 Negro preschool girls are, on the average, 1.1 cm.

[c]For comparative uses and for ease of data handling, the metric system is used throughout this report. Except when unwieldy, inches and pounds are included parenthetically. Equivalents are as follows: 1 inch (in.) = 2.54 centimeters (cm.); 1 cm. = 0.3937 in.; 1 kilogram (kg.) = 2.2 pounds (lb.); 1 lb. = 0.45 kg.

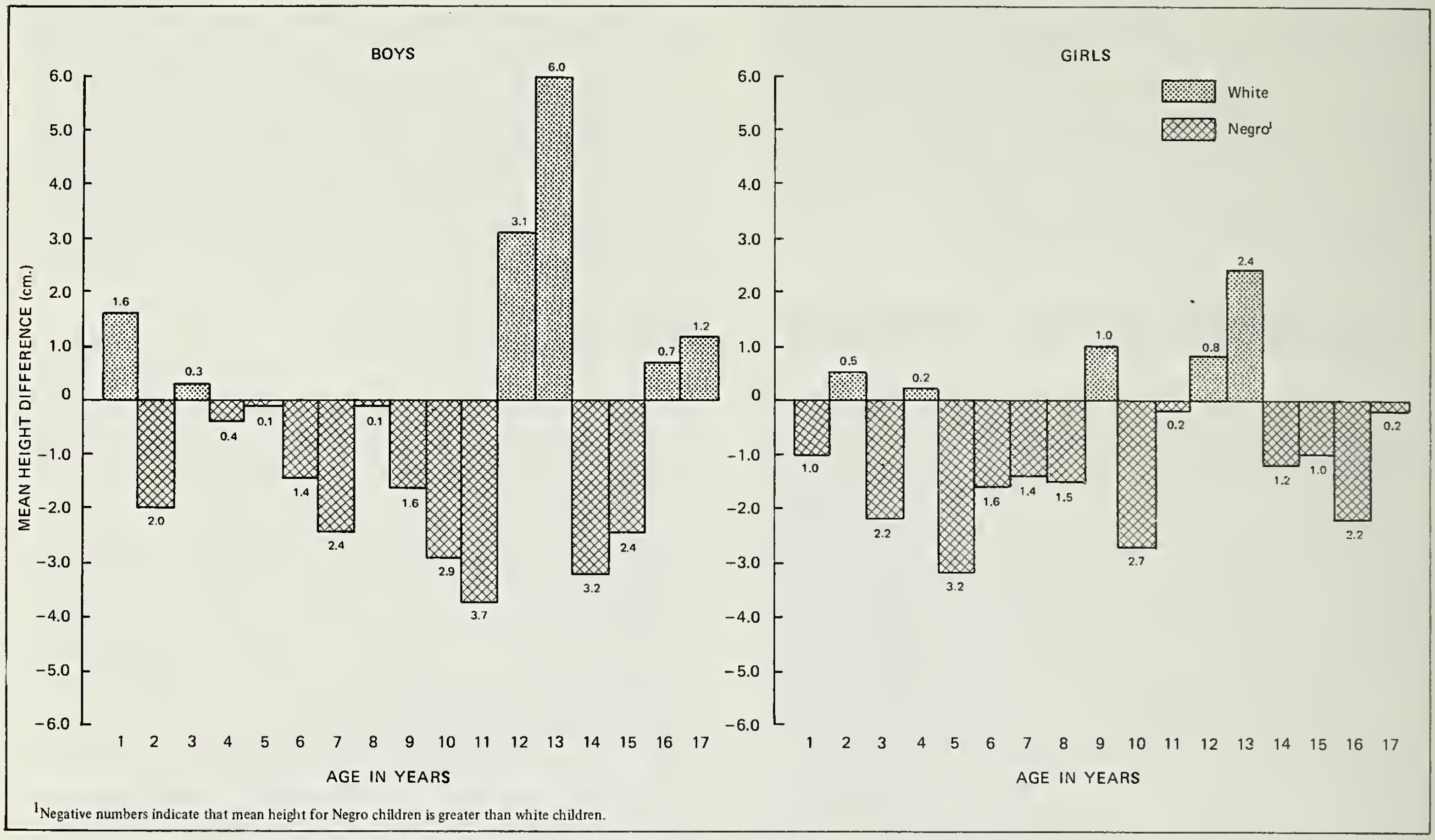


Figure 1. Mean difference in height of white and Negro children by age and sex: United States, 1971-72 (HANES Preliminary)

(0.43 in.) taller than white girls. At ages 2 and 4, white girls are, respectively, 0.5 cm. (0.20 in.) and 0.2 cm. (0.08 in.) taller than Negro girls. Negro girls are taller at ages 1, 3, and 5. At all ages 6 through 11 years, except age 9, Negro girls are taller than white girls. At age 9 white girls are 1.0 cm. (0.39 in.) taller than Negro girls. Differences at other ages between the two groups range from 0.2 cm. (0.08 in.) to 2.7 cm. (1.06 in.). At ages 12-17, except for ages 12 and 13, Negro girls are taller than white girls. The biggest difference for mean height occurs at age 13 when the difference is 2.4 cm. (0.94 in.).

Overall, the mean heights for white girls increased from 80.7 cm. (31.8 in.) at age 1 to 164.3 cm. (64.7 in.) at age 15. The peak in mean height occurs at age 15 and declines thereafter to 160.7 cm. (63.3 in.). The same pattern occurs in Negro girls. The mean heights increased from 81.7 cm. (32.2 in.) at age 1 to 165.3 cm. (65.1 in.) at age 15. The peak in mean height also occurs at age 15 and declines to 160.9 cm. (63.3 in.). There are no differences in increase in mean height between white and Negro girls from ages 1 through 15.

Negro girls are, on the average, taller in 12 of 17 age comparisons. There are no significant differences in the age comparisons, using the sign test, at the 0.05 level.

Income level and sex.—Table 6 and figure 2 show that from ages 1-5 boys in the income group above poverty level are, on the average, 0.7 cm. (0.28 in.) taller than boys in the income group below poverty level. This direction is also evident for the age groups 6-11 and 12-17 years. In these two age groups boys in the income group above poverty level are, respectively, 3.0 cm. (1.2 in.) and 3.3 cm. (1.3 in.) taller than boys in the group below poverty level. Boys in the income group below poverty level are taller at ages 2, 5, and 15 years. The differences in mean heights between boys in the two income groups range from 0.4 cm. (0.16 in.) to 6.3 cm. (2.5 in.).

The mean heights for boys in the income group below poverty level increased from 82.7 cm. (32.6 in.) at age 1 to 173.9 cm. (68.5 in.) at age

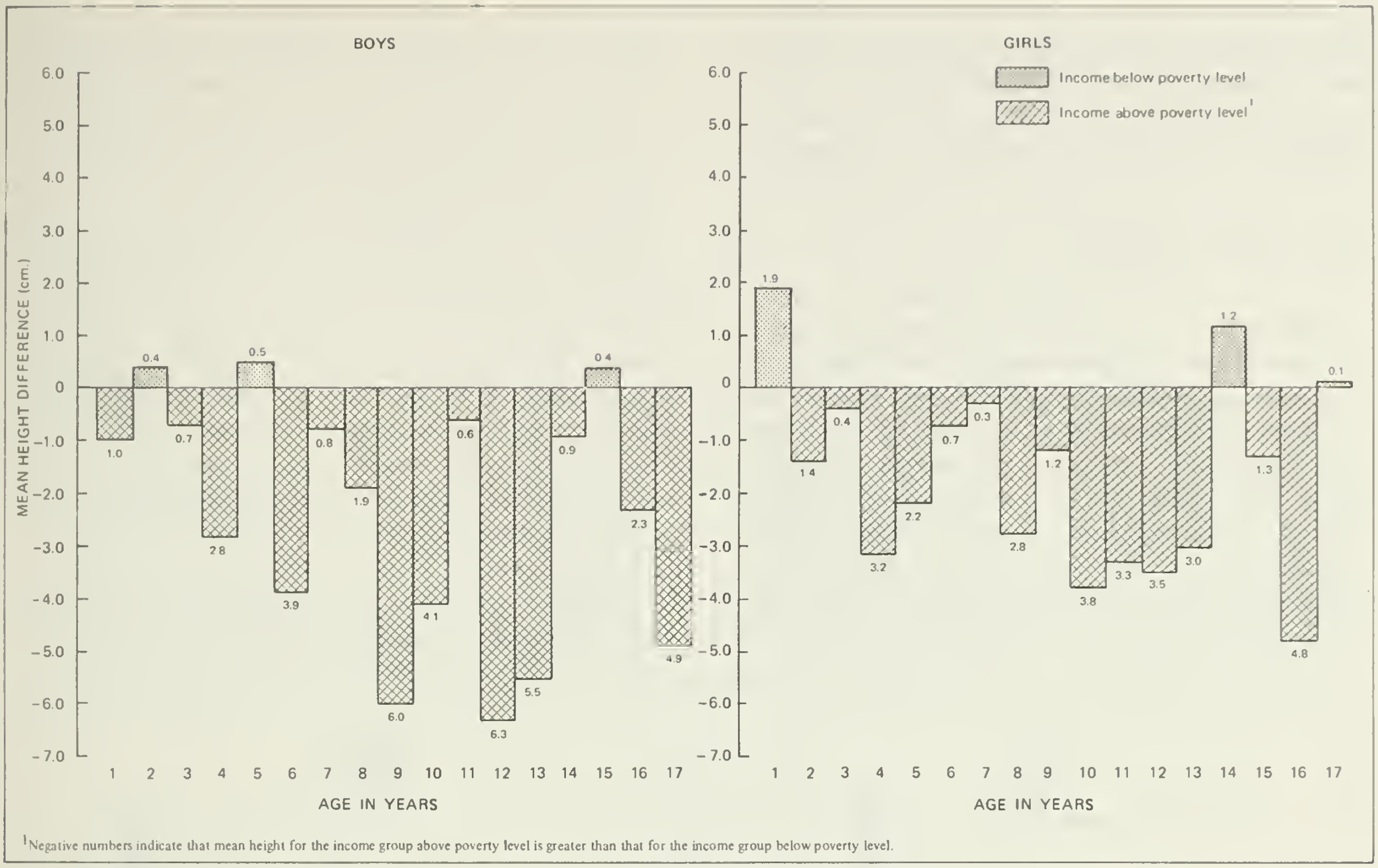


Figure 2. Mean difference in height of children by age, sex, and income levels: United States, 1971-72 (HANES Preliminary)

17, an increase in mean height of 91.2 cm. (35.9 in.). The mean heights for boys in the income group above poverty level increased from 83.7 cm. (33.0 in.) at age 1 to 178.8 cm. (70.4 in.) at age 17, an increase in mean height of 95.1 cm. (37.4 in.). The difference in increase in mean height between males in the two income groups is 3.9 cm. (1.5 in.).

Boys in the income group above poverty level are, on the average, taller in 14 of 17 age comparisons. This is statistically significant, using the sign test, at the 0.05 level.

Table 6 and figure 2 show that from ages 1-5 preschool girls in the income group above poverty level, on the average, are 1.1 cm. (0.43 in.) taller than those in the lower income group. At age 1, the mean height for girls in the income group below poverty level is 1.9 cm. (0.75 in.) greater than that for girls in the income group above poverty level. Girls in the latter income group are taller at ages 2 through 5. At all ages 6 through 11 years, girls in the income group above poverty level had greater mean heights than girls in the lower income group. Differences in heights between the two income groups range from 0.3 cm. (0.12 in.) to 3.8 cm. (1.5 in.).

At ages 12-17 years, except for ages 14 and 17, the girls in the income group above poverty level are taller than those in the lower income group. The biggest differences in heights at these ages occur at age 16.

The mean heights for girls in the below poverty level income group increased from 82.5 cm. (32.5 in.) at age 1 to 164.4 cm. (64.7 in.) at age 15. The peak in mean height occurs at age 15 and declines to a low of 157.2 cm. (61.9 in.) at age 16 and then increases to 161.3 cm. (63.5 in.) at age 17. A similar pattern occurs in mean heights for those in the income group above poverty level. The mean heights increased from 80.6 cm. (31.7 in.) at age 1 to 165.7 cm. (65.2 in.) at age 15. The peak in mean height also occurs at age 15 but declines to 161.2 cm. (63.5 in.) at age 17. The difference in increase in mean height between ages 1-15 for girls in both income groups is 3.2 cm. (1.3 in.). Girls in the income group above poverty level are, on the average, taller in 14 of 17 age comparisons. There is a statistical significance in the age comparisons, using the sign test, at the 0.05 level.

Differences in Weight

Race and sex.—Table 7 and figure 3 show that from ages 1-5 Negro preschool boys are, on the average, 0.3 kg. (0.66 lb.) heavier than white boys, however, the differences are so small as to be negligible. Weights are, on the average, slightly heavier in white boys at age 1 and 3 and in Negro boys at age 2, 4, and 5. This pattern persists in age 6 through 11 years. The biggest differences for mean weights are at age 8, 27.6 kg. (60.7 lb.) for Negro boys and 26.0 kg. (57.2 lb.) for white boys. From age 12 through 17 years, white boys are, on the average, 1.6 kg. (3.5 lb.) heavier than Negro boys. The largest difference in average weights occurred at age 13 for white boys and at age 15 for Negro boys, 7.1 kg. (15.6 lb.) and 6.4 kg. (14.1 lb.), respectively.

The mean weights for white boys increase irregularly each year from 12.0 kg. (26.4 lb.) at age 1 to 69.7 kg. (153.3 lb.) at age 17, an increase in mean weight of 57.7 kg. (126.9 lb.). The increase in mean weights between similar ages for Negro boys is slightly more, 59.1 kg. (130.0 lb.). The difference in increase of mean weight between white and Negro boys is 1.4 kg. (3.1 lb.).

Negro boys are, on the average, heavier in 9 of 17 age comparisons, which is not significant at the 0.05 level.

Table 7 and figure 3 show that from ages 1-3 white girls are, on the average, heavier than

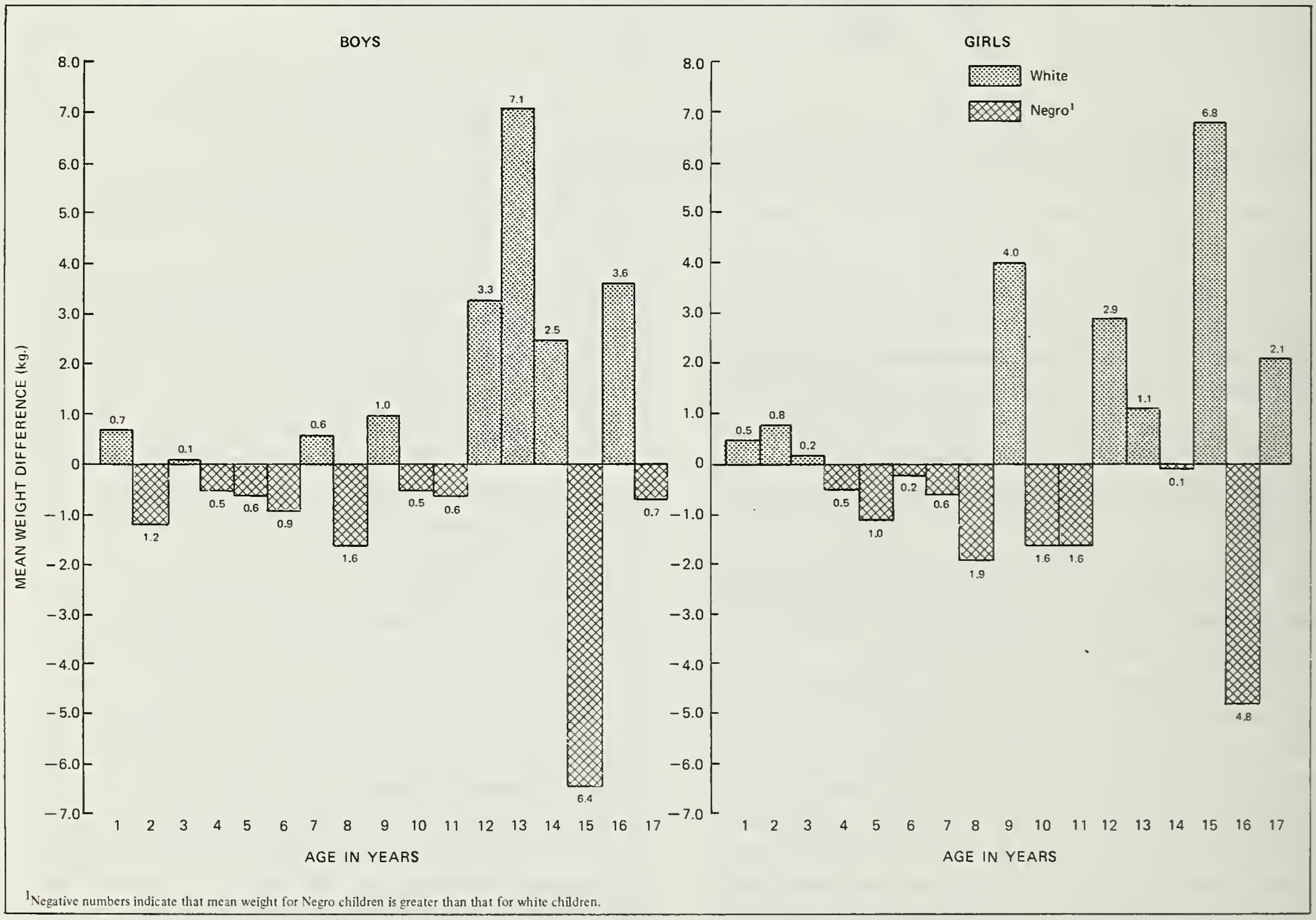


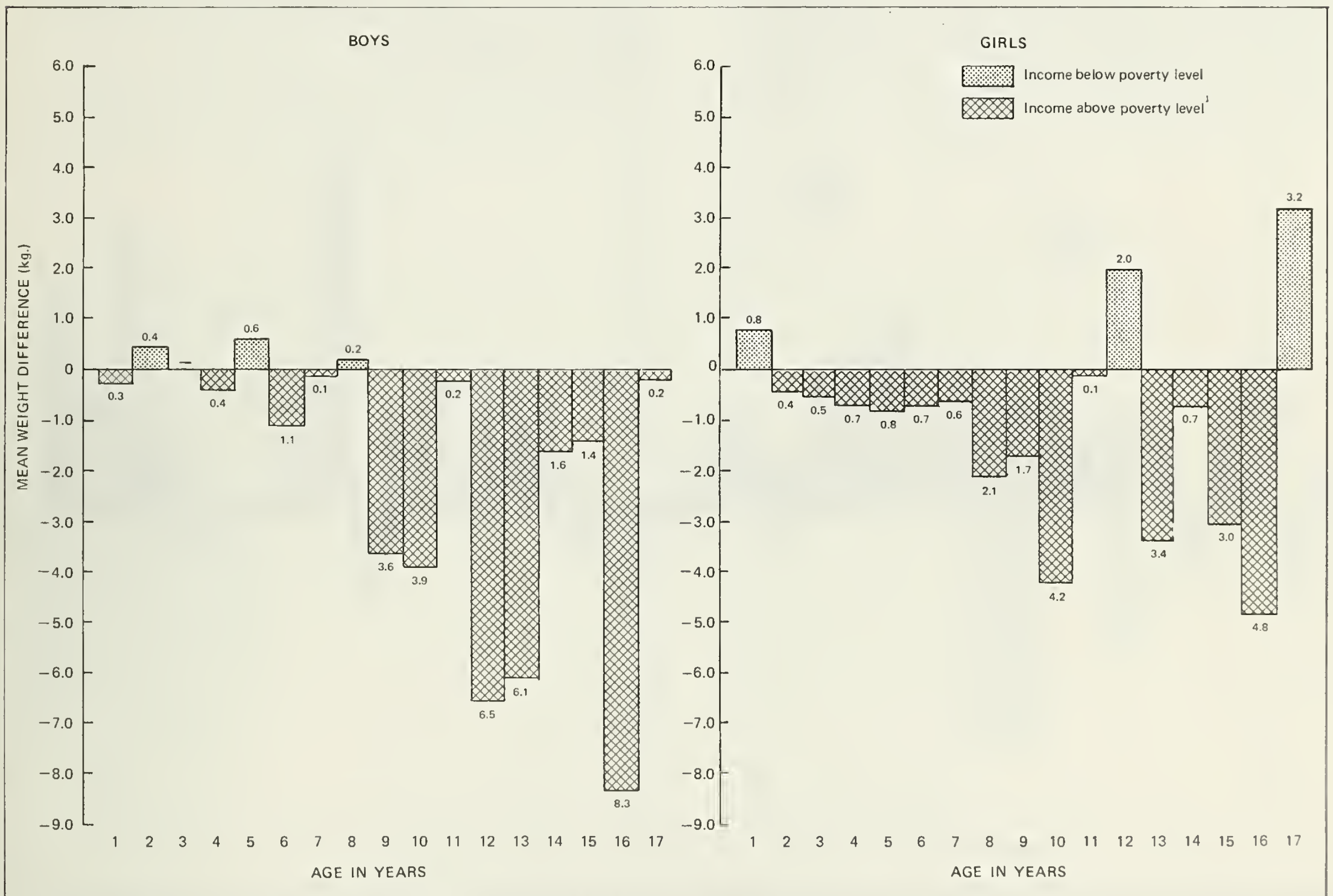
Figure 3. Mean weight difference of white and Negro children by age and sex: United States, 1971-72 (HANES Preliminary)

Negro girls. From ages 4 through 8 years Negro girls are, on the average, heavier. There is no consistent pattern in comparing the weights of white and Negro girls from ages 9 through 17. In 5 of the 9 age comparisons white girls are, on the average, heavier than Negro girls. For white girls the mean weights increase from 11.8 kg. (26.0 lb.) at age 1 to a peak of 59.7 kg. (131.3 lb.) at age 15, an increase of 47.9 kg. (105.4 lb.). For Negro girls the mean weights increase from 11.3 kg. (24.9 lb.) at age 1 to a peak of 59.7 kg. (131.3 lb.) at age 16, an increase of 48.4 kg. (106.5 lb.). There is an unexplained drop in the mean weight for white girls at age 16 and at age 15 for Negro girls. In both instances this could possibly be explained by sampling variability.

Overall, Negro girls are, on the average, heavier than white girls in 9 of 17 age comparisons, which, by the sign test, could be attributed to chance at the significance level of 0.05.

Income level and sex.—Table 8 and figure 4 show that from ages 1-5 the average difference in mean weights between boys in both income groups is 0.1 kg. (0.22 lb.). The differences at each age are so small as to be negligible. Mean weights are heavier in the below income group at ages 2 and 5 and slightly heavier in the income group above poverty level for ages 1 and 4 years. At age 3, the mean weights for boys in both income groups are equal. From ages 6 through 17 years, boys in the income group above poverty level are, on the average, heavier than those in the lower income group. The only exception occurs at age 8 when the lower income group shows a higher mean weight of 0.2 kg. (0.44 lb.).

Income level is more associated with weight in the older age groups. From ages 6 through 11 years, boys in the income group above poverty level are, on the average, 1.5 kg. (3.3 lb.) heavier than those in the lower income group. This weight



[1]Negative numbers indicate that mean weight for the income group above poverty level is greater than that for the income group below poverty level.

Figure 4. Mean difference in weight of children by age, sex, and income levels: United States, 1971-72 (HANES Preliminary)

pattern persists in the age group 12-17, with the average weight of the income group above poverty level 4.1 kg. (9.0 lb.) greater than that of the lower income group.

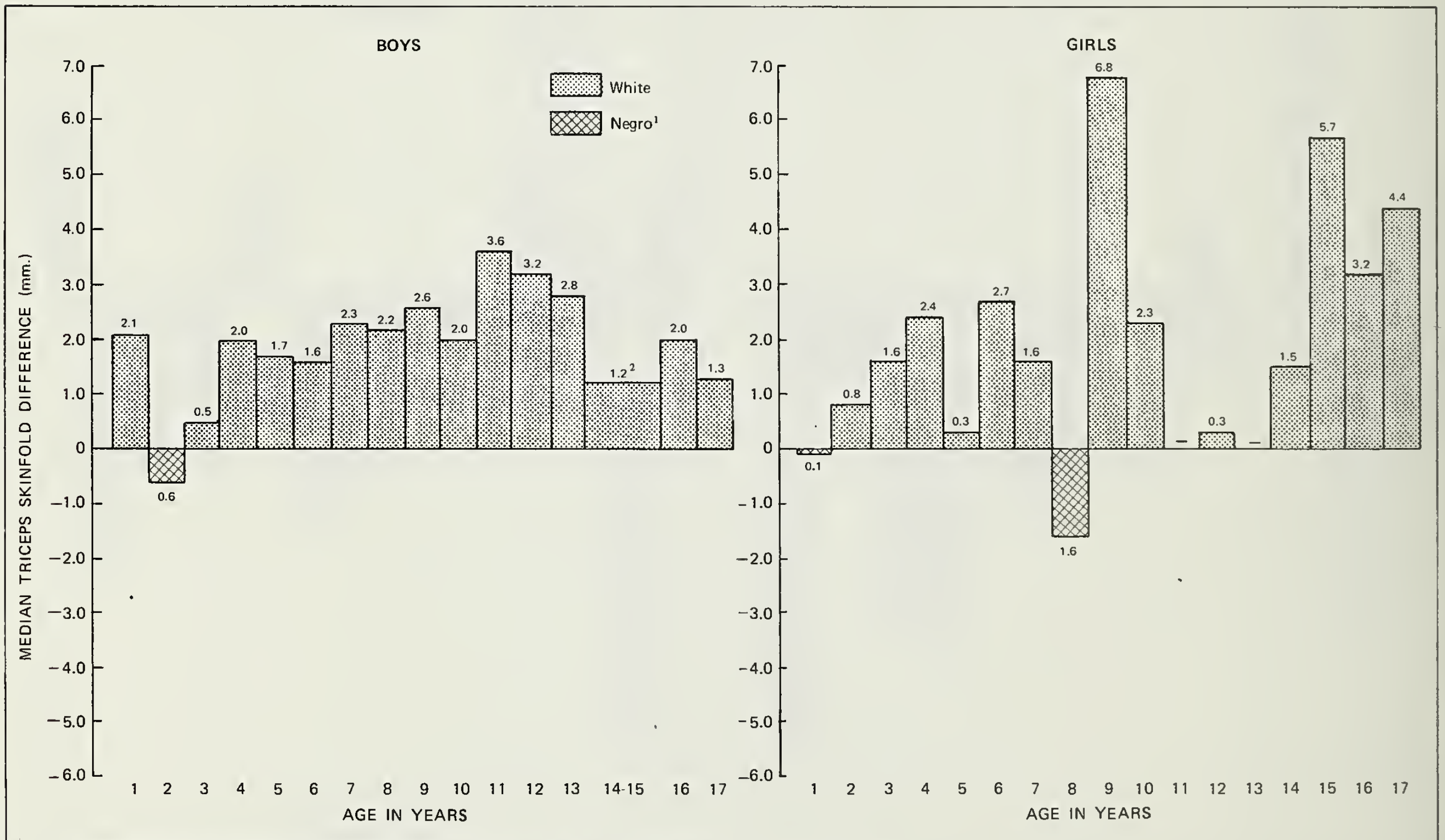
Overall, the mean weights for boys in the lower income group increase from 11.6 kg. (25.5 lb.) at age 1 to 69.8 kg. (153.6 lb.) at age 17, an increase in mean weight of 58.2 kg. (128.0 lb.). The increase in mean weights between similar age groups for the income group above poverty level is slightly less, 58.1 kg. (127.7 lb.). The difference in increase of mean weight between the two income groups is 0.1 kg. (0.22 lb.).

Boys in the income group above poverty level are, on the average, heavier in 13 of 16 age comparisons, which is statistically significant, using the sign test, at the 0.05 level.

Table 8 and figure 4 show that from ages 1-11 girls in the income group above poverty level are, on the average, heavier than those in the lower income group. The sole exception is at age 1. At age 1 the lower income group is 0.8 kg. (1.8 lb.) heavier than the other income group. In the 1-5 and 6-11 year age groups girls in the upper income group are, on the average, 0.3 kg. (0.66 lb.) and 1.6 kg. (3.5 lb.) heavier than girls in the lower income group. From ages 12-17 years, girls in the income group above poverty level are, on the average, 1.1 kg. (2.4 lb.) heavier than girls in the lower income group. Girls in the lower income group show larger mean weights only at ages 12 and 17.

The mean weights for girls in the income group below poverty level increase from 11.5 kg. (25.3 lb.) at age 1 to a peak of 56.1 kg. (123.4 lb.) at age 14, declining slightly and then increasing to 61.5 kg. (135.3 lb.) at age 17. The mean weights for girls in the income group above poverty level also increase with age but in a slightly different pattern. The peak is at age 15 and then their weight levels off.

Girls in the income group above poverty level are, on the average, heavier in 14 of 17 age comparisons, which is significant, using the sign test, at the 0.05 level.



[1]Negative numbers indicate that median triceps skinfold for Negro children is greater than that for white children.
[2]A pooled value necessitated by unreliable estimates computed from smaller groupings (see "Standard of Reliability and Precision" in appendix I).

Figure 5. Median difference in Triceps skinfold of white and Negro children by age and sex: United States, 1971-72 (HANES Preliminary)

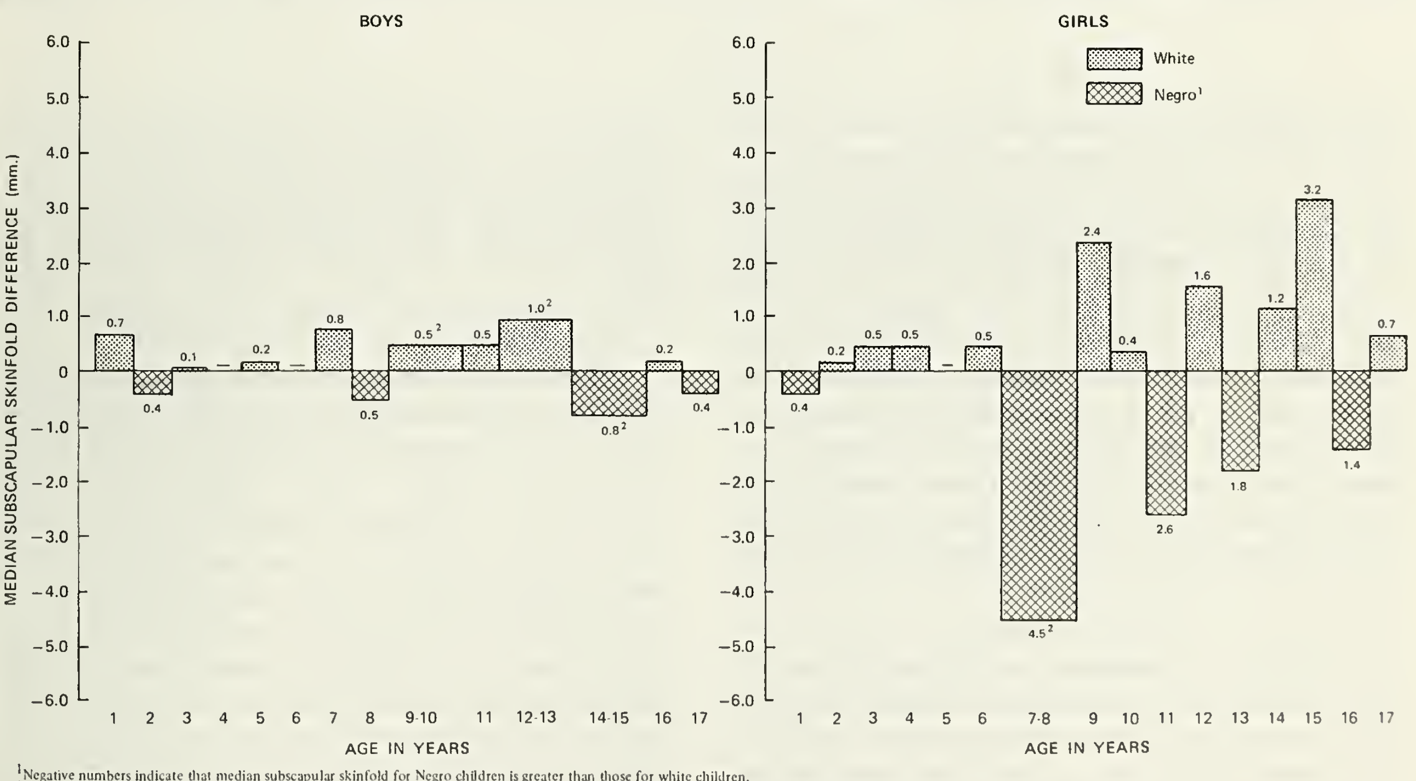
Differences in Skinfolds

Race and sex.—Tables 9, 10 and figures 5, 6 show that from ages 1 through 17 years, white boys and girls show higher median skinfolds than Negro boys and girls, especially at the triceps site. At the latter site, white males have medians which are larger in 15 of the 16 age comparisons, except at age 2. At age 2, the Negro boys have medians that exceed those of white boys by 0.6 mm. A similar pattern is observed for white girls as compared to Negro girls. In 13 of 15 age comparisons, white girls have higher medians than those for Negro girls. The median triceps skinfolds are the same for ages 11 and 13. Negro girls have medians which exceed those of white girls at age 1 and 8 with the differences in medians of 0.1 mm. and 1.6 mm., respectively. The differences in skinfolds by age comparisons, using the sign test, are significant at the 0.05 level.

At the subscapular site, white boys and girls also generally show larger medians than Negro boys and girls. However, fewer of the medians of the white boys and girls exceed those of the Negroes. White boys have medians which are larger in 8 of 12 comparisons. The exceptions occur in ages 2, 8, 14-15, and 17. The values are the same at ages 4 and 6. White girls exceed the median values of Negro girls in 10 of the 15 age comparisons. The exceptions are ages 1, 7-8, 11, 13, and 16 throughout the age range of 1 through 17 without any clearcut pattern. The median values are the same at age 5. The age comparisons for both whites and Negroes, using the sign test, are not significant at the 0.05 level.

Income level and sex.—Tables 11, 12 and figures 7, 8 show that there is an association of income level with skinfold measures. The income group above poverty level tends to have higher median skinfolds than do those in the lower income group. This is more pronounced for the triceps skinfold than for the subscapular skinfold. At the triceps site, boys in the income group above poverty level have medians which are larger in 13 of the 17 age comparisons.

At ages 4, 5, and 15, the differences in the medians for the triceps skinfold range from 0.1 mm. to 0.6 mm. At age 17, boys in the lower



[1]Negative numbers indicate that median subscapular skinfold for Negro children is greater than those for white children.
[2]A pooled value necessitated by unreliable estimates computed from smaller groupings (see "Standard of Reliability and Precision" in appendix I).

Figure 6. Median difference in subscapular skinfold of white and Negro children by age and sex: United States, 1971-72 (HANES Preliminary)

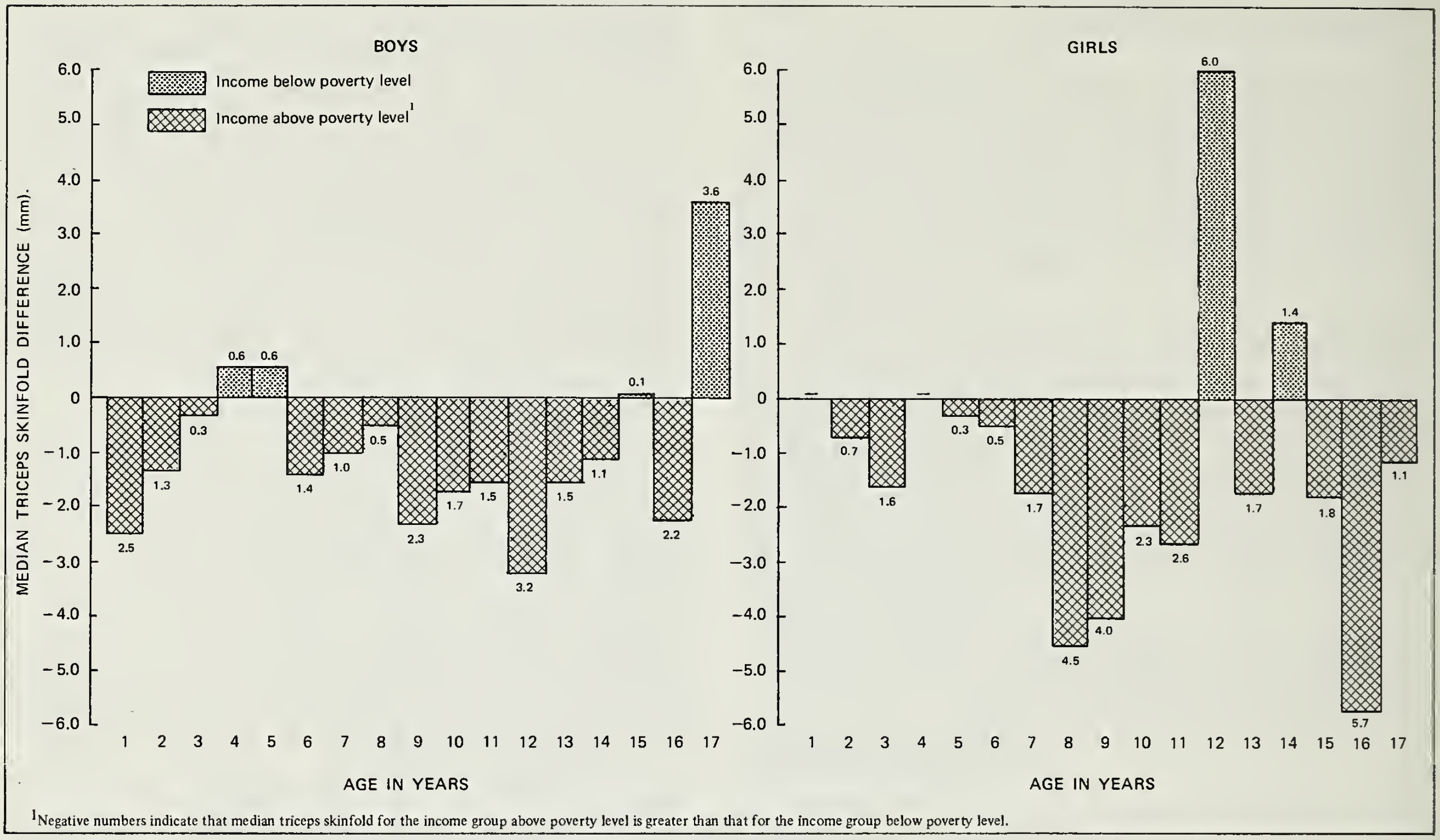


Figure 7. Median difference in triceps skinfold of children by age, sex, and income levels: United States, 1971-72 (HANES Preliminary)

income group have a median triceps that exceeds that for the income group above poverty level by 3.6 mm. A similar pattern is evident for girls in comparing the two income groups. In 13 of the 15 age comparisons, girls in the income group above poverty level have larger medians than do those in the lower income group. The medians for the triceps skinfold are the same at ages 1 and 4, but at ages 12 and 14, girls in the lower income group have medians which are larger than those of girls in the income group above poverty level. These differences for both boys and girls by age are significant at the 0.05 level.

A similar evaluation was made of the effect of income on subscapular skinfolds. Higher income affects the subscapular skinfold less than was observed for the triceps skinfold. Boys in the income group above poverty level have median subscapular skinfolds which are larger in 10 of the 15 age comparisons. The smallest of these differences was 0.1 mm. at ages 1 and 2 and the largest was 1.9 mm. at age 9. In the preschool age group at ages 3, 4, and 5, boys in the lower income group have higher medians. The lower income group also shows higher medians for ages 8 and 15. The largest of all these differences for the boys in the lower income group was 0.7 mm. At age 6, the values are equal.

Girls in the income group above poverty level exceed the median values of girls in the lower income group in 11 of 17 age comparisons. These differences range in value from 0.2 mm. at age 5 to 1.8 mm. at age 16. At six ages, girls in the lower income group have median values that exceed those of girls in the income group above poverty level. These differences in the direction of the lower income group are dispersed through the age range of 1-17. At age 1, 6, 7, and 13 the differences in median values are small and range from 0.2 mm. to 0.5 mm. The biggest differences occur at ages 12 and 17. At these ages the differences in median values are 10.5 mm. and 4.8 mm., respectively.

Figure 8. Median difference in subscapular skinfold of children by age, sex, and income levels: United States, 1971-72 (HANES Preliminary)

The differences of medians of subscapular by age comparisons are not statistically significant, by the sign test, at the 0.05 level.

Differences in Adult Obesity

Race and sex.—Table 17 and figure 9 show that white men in both age groups (20-44 years and 45-74 years) have higher prevalences of obesity than Negro men do. In the younger age group, the rates were 16.0 percent for white men as compared to 10.6 percent for Negro men. The corresponding rates in the older age group were 13.4 percent and 7.7 percent, respectively. White and Negro men have higher prevalence rates in the younger age group than their counterparts in the older age group.

Women have a different prevalence pattern than that presented for men. Negro women in both age groups have higher prevalence rates of obesity than white women do. In the older age group, the prevalence rate for Negro women was 32.4 percent compared to the rate of 24.7 percent for white women. The prevalence rate for Negro women in the younger age group was 29.2 percent and for white women, 18.9 percent. Negro women in the older age group had the highest prevalence rate of 32.4 percent.

Income level, race, and sex.—The effect of income is usually considered when obesity data

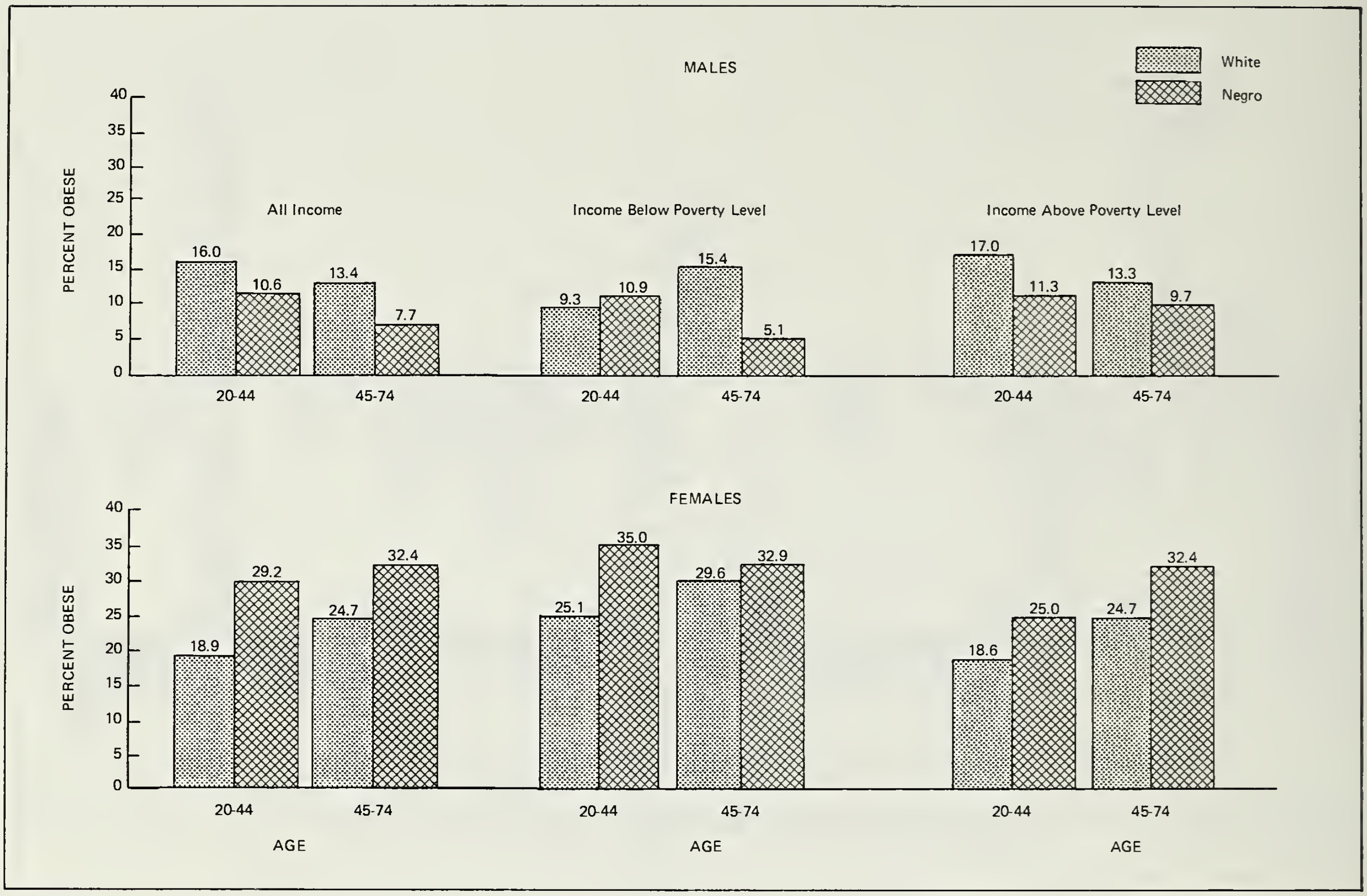


Figure 9. Percent of persons obese by age, sex, race, and income levels: United States, 1971-72 (HANES Preliminary)

are compared by population groups because differences in obesity prevalence may be accounted for by differences in income level. For both age groups, Negro men in the income group above poverty level are more obese than those in the lower income group though the magnitude of the difference of percentage of obesity for Negro men in the younger age group is small, 11.3 compared to 10.9 percent. White men in the younger age group also show an association of higher prevalence of obesity with the income group above poverty level. This association is not evident for white men in the older age group. Here, white men in the income group below poverty level have a higher prevalence than white men in the income group above poverty level (15.4 percent vs. 13.3 percent).

For both white and Negro women in both age groups the higher prevalence of obesity was associated with lower income. In the younger age group, white women had a rate of 25.1 percent for the lower income group and 18.6 percent for the income group above poverty level. The corresponding rates for Negro women were 35.0 percent and 25.0 percent, respectively. In the older age group, with lower income, the percentage of obesity was 29.6 percent for white women and 32.9 percent for Negro women. Corresponding percentages for white and Negro women in the income group above poverty level were 24.7 and 32.4 percent, respectively.

In the younger age group with income above poverty level, white men had a higher obesity percentage (17.0) than Negro men (11.3). A similar direction was observed in comparing whites and Negroes in the older age group for both income levels. In the lower income group white men had 15.4 percent while Negro men had 5.1 percent. In the income group above poverty level the percentages were 13.3 and 9.7 percent for whites and Negroes, respectively. An exception was found in the younger age group of the lower income level. Here, Negro men are more obese than white men, 10.9 percent compared to 9.3 percent.

Negro women had a higher obesity percentage than did white women in all age groups regardless of income level. The prevalence rates for both white and Negro women were high, with 25 percent or more of them obese, except for white women in the income group above poverty level with a percentage of 18.6 percent. For the younger age group the prevalence rate of obesity in the income group below poverty level was 35.0 percent for Negro women and 25.1 percent for white women. For the older age group, in the income group below poverty level, the corresponding rates were 32.9 and 29.6 percent, respectively. A similar pattern was noted in the income group above poverty level for both age groups. In the younger age group the rates were 25.0 percent for Negro women and 13.6 percent for white women. Corresponding percentages for Negro and white women in the older age group were 32.4 and 24.7 percent.

CLINICAL SIGN RESULTS

Tables 18-24 present the clinical findings of signs suggestive of certain nutrient deficiencies of examined persons by age for sex, race, and income groups. In addition to listing the number of persons examined and the estimated number in the United States population, the tables include the percent of clinical findings with low, moderate, and high risk for a particular nutrient deficiency. The percent of examined persons with clinical findings with high risk of nutrient deficiency observed in the subgroups shown in tables 18-24 are graphically presented in figures 10 and 11. Table A contains all those signs found in 0.1 percent or more of any subgroup according to degree of risk for the various deficiencies. Estimates of

Table A. Clinical signs of various deficiencies found in 0.1 percent or more of any subgroup in three risk categories

Nutrient deficiency	High risk	Moderate risk	Low risk
Protein		Hepatomegaly Potbelly	
Riboflavin	Angular lesions of lips Angular scars of lips Magenta tongue	Cheilosis Nasolabial seborrhea	Conjunctival injection, eyes
Niacin	Filiform papillary atrophy of tongue Scarlet beefy tongue	Fungiform papillary hypertrophy of tongue Fissures of tongue	Serrations or swelling of tongue
Thiamine		Absent knee jerks Absent ankle jerks	
Vitamin D[1]		Bowed legs Knock knees	
Vitamin A		Follicular hyperkeratosis, arm	Follicular hyperkeratosis, upper back Dry, scaling skin (Xerosis)
Vitamin C		Bleeding and swollen gums	Diffuse marginal inflammation Swollen red papillae of gingivae
Iodine	Thyroid enlargement, Groups II	Thyroid enlargement, Group I	
Calcium		Positive Chvostek's sign	

[1]The clinical signs listed here would indicate a moderate risk of having had the deficiency.

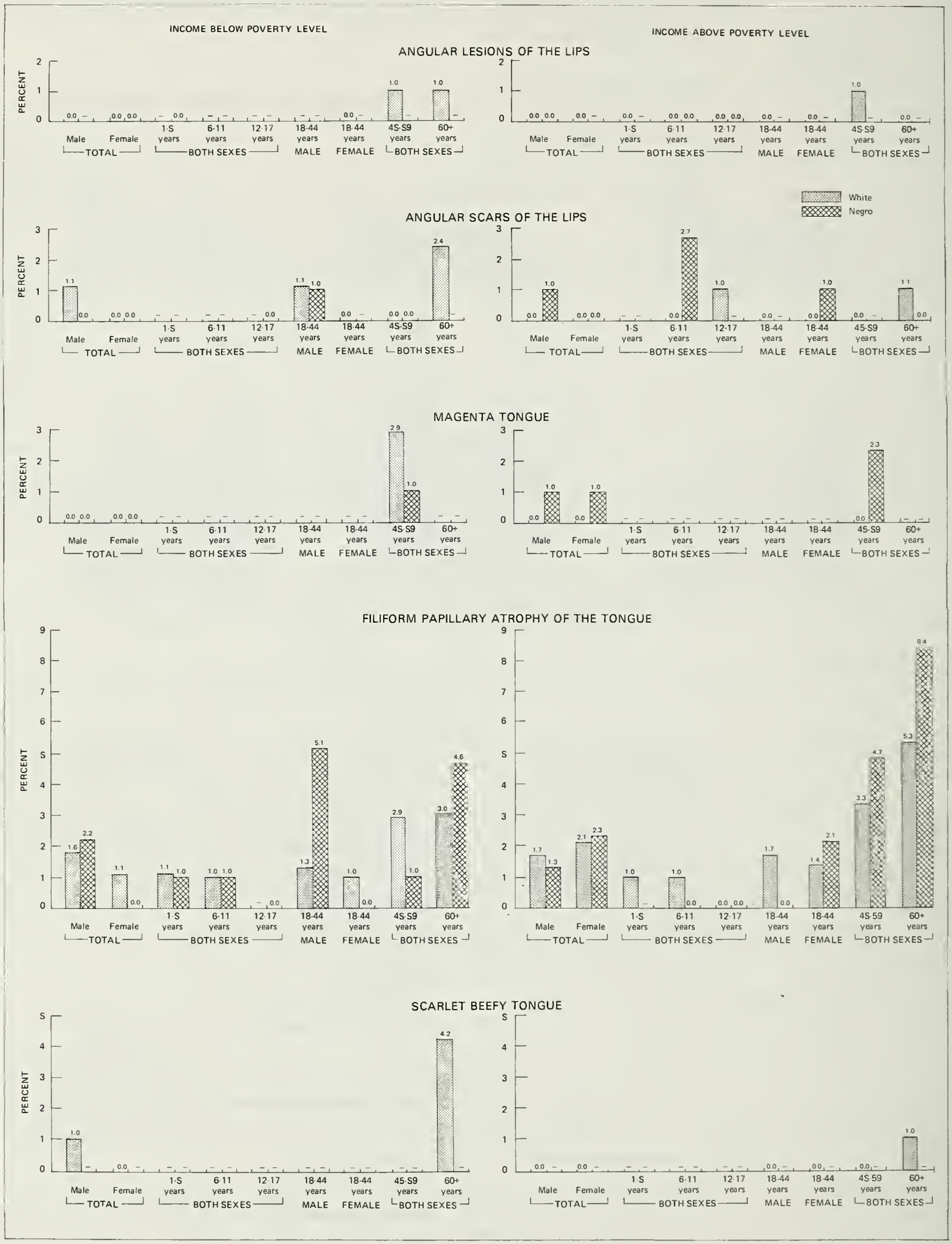


Figure 10. Percent of persons with clinical signs (of high risk) suggestive of nutrient deficiency by age, sex, race, and income levels: United States, 1971-72 (HANES Preliminary)

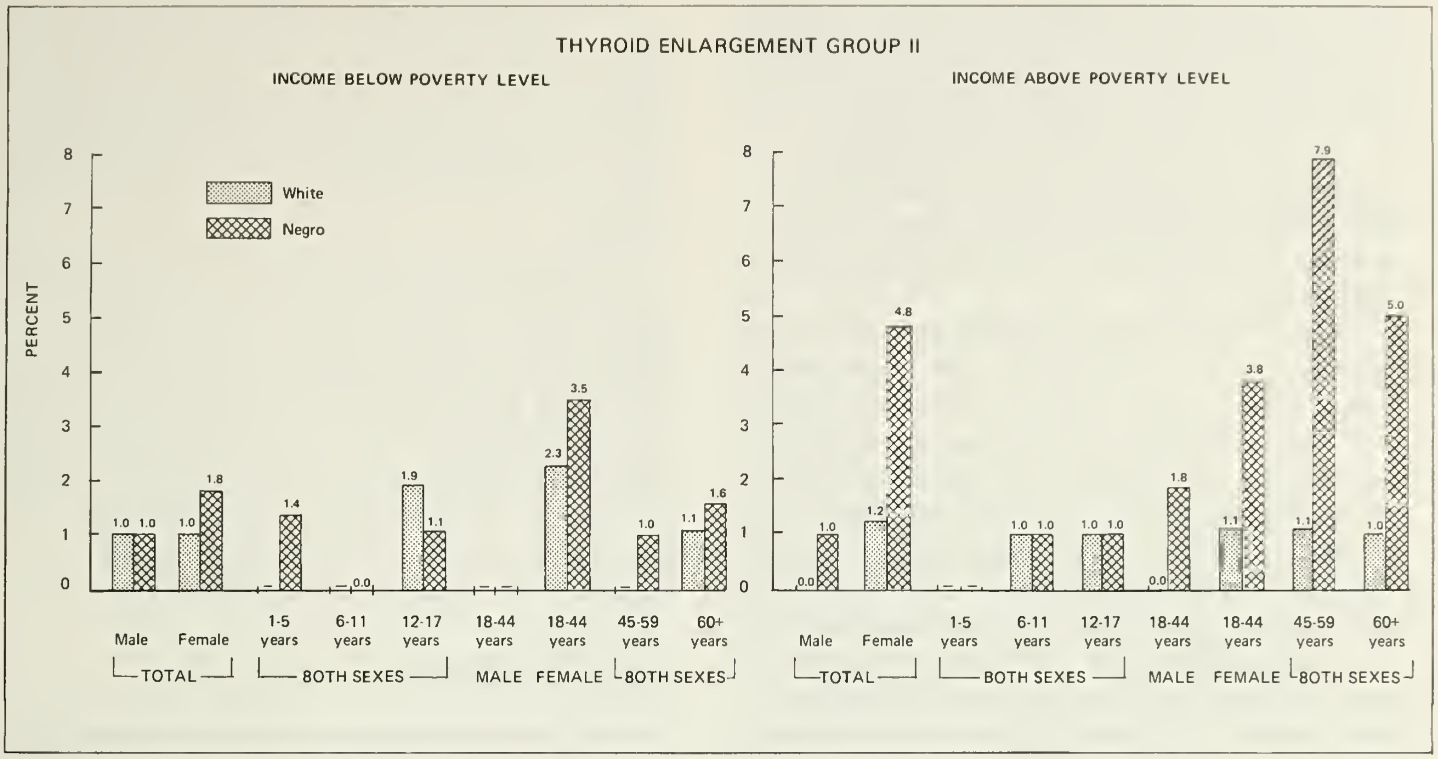


Figure 11. Percent of persons with clinical signs (of high risk) for Thyroid Enlargement Group II by age, sex, race, and income levels: United States, 1971-72 (HANES Preliminary)

standard errors are presented in appendix I, tables II and III.

Protein Deficiency

Hepatomegaly (moderate risk).—The highest percent prevalence of hepatomegaly occurs in the age group 45 years and over (tables 23 and 24). Lower prevalence was found in the age groups 18-44 years (table 22). Below age 18, the prevalence was negligible (tables 19, 20, and 21).

In the 45-59 year age group, Negroes in the lower income group had a much higher prevalence than did whites. Whereas Negroes had 8.0 percent, whites had 1.0 percent. In the income group above poverty level for the same age group, whites had a slightly higher rate than did Negroes. Table 23 shows that whites had a rate of 3.5 percent, and Negroes had 2.5 percent.

In the age group 60 years and over, a similar pattern was not observed. Negroes in the lower income group had a slightly higher prevalence than did whites. The prevalence was 2.8 percent for Negroes and 2.5 percent for whites. The largest absolute difference occurred in the income group above poverty level in which whites had a rate of 4.4 percent and Negroes had 1.8 percent (table 24).

Potbelly (moderate risk).—Potbelly was found primarily among Negroes of ages 1-5 years. The overall prevalence was 1.2 percent. The rates in the lower income and income group above poverty level were 1.6 and 1.0 percent, respectively (table 19).

Riboflavin Deficiency

Angular scars of the lips (high risk).—The highest prevalences for angular scars of the lips were 2.7 percent for Negroes of ages 6-11 years in the income group above poverty level and 2.4 percent for whites aged 60 years and over in the lower income group (tables 20 and 24).

Angular lesions of the lips (high risk).—Angular lesions of the lips were found mainly in white adults of ages 45 years and over. No prevalence exceeded 1.0 percent for this clinical sign (tables 23 and 24).

Magenta tongue (high risk).—Magenta tongue was found only in adults of ages 45-59 years. In the lower income group, whites had a rate of 2.9 percent and Negroes a rate of 1.0 percent. Negroes in the income group above poverty level had a rate of 2.3 percent (table 23).

Cheilosis (moderate risk).— The highest prevalence for cheilosis was 5.3 percent for Negro males ages 18-44 years in the lower income group (table 22). In the 6-11 year age group, Negroes in the income group above poverty level had a prevalence of 4.0 percent; whites in the lower income group had a rate of 2.5 percent (table 20). Little or no cheilosis was found among persons 45 years and over and children 1-5 years old.

Nasolabial seborrhea (moderate risk).— Whites of ages 12-17 years had the highest rates of nasolabial seborrhea. In the lower income group the prevalence was 6.8 percent and in the income group above poverty level the rate was 2.4 percent (table 21). In both income groups Negroes were least affected. Negroes of ages 45-59 years in the lower income group had a prevalence of 2.2 percent (table 23). All other rates of nasolabial seborrhea for whites and Negroes did not exceed 1.5 percent.

Thiamine Deficiency

Absent knee jerks and absent ankle jerks (moderate risk).—The prevalence for the above signs was very low for persons below the ages of 18 years. Negroes aged 1-5 years in the income group above poverty level had a rate of 1.4 percent for absent knee and ankle jerks (table 19). In the age groups 18 years and over, with one exception, Negroes in both income groups had higher prevalences than whites of corresponding income levels and age groups.

The highest rates for absent knee jerks were found for Negro males of ages 18-44 years in the lower income group and for Negroes of ages 60 and over in the income group above poverty level, 6.1 and 7.7 percent, respectively (tables 22 and 24). The rates were below 5.0 percent for other subgroups.

Prevalence of absent ankle jerks was 3.6 percent for Negro females 18-44 years in the lower income group (table 22). This was not exceeded by any other group below age 45. Negroes in the age group 45-59 years and 60 years and over of both income groups had higher rates than whites of comparable income groups. The rates for Negroes varied from 6.2 to 17.3 percent. The corresponding rates for whites ranged from 1.5 percent to 6.4 percent (tables 23 and 24).

Niacin Deficiency

Filiform papillary atrophy of the tongue (high risk).— Adults of ages 45 years and over had the highest percent of filiform papillary atrophy of the tongue. Children of ages 1-17 had low rates not exceeding 1.1 percent (tables 19, 20, and 21).

In age groups 45 years and over, persons in the income group above poverty level had higher rates than those in the lower income group. At ages 45-59 years in the income group below poverty level, the prevalence was 1.0 and 2.9 percent for Negroes and whites, respectively. Negroes and whites in the income group above poverty level had rates of 4.7 and 3.3 percent, respectively (table 23). In the age group 60 years and over the prevalence for Negroes and whites in the lower income group were 4.6 and 3.0 percent, respectively. The corresponding rates in the income group above poverty level were 8.4 and 5.3 percent (tables 23 and 24).

Scarlet beefy tongue (high risk).—No scarlet beefy tongue was found in persons under 18 years of age. Scarlet beefy tongue was present primarily among whites of ages 60 years and over. In the lower income group the prevalence was 4.2 percent, whereas, the rate was 1.0 percent in the income group above poverty level (table 24).

Fungiform papillary hypertrophy of the tongue (moderate risk).—The highest prevalences for fungiform papillary hypertrophy of the tongue were found in the 12-17 and 18-44 year age groups. The prevalence was 18.6 percent for 12-17 year old Negroes in the lower income group. In the income group above poverty level, 12-17 year old Negroes had a rate of 10.4 percent (table 21). Except for men in the lower income groups, 18-44 year old Negro men and women had prevalence of fungiform papillary hypertrophy of the tongue that exceeded 10.0 percent (table 22). The only other group to have a rate greater than 10.0 percent was 6-11 year old Negroes in the income group above poverty level. They had a rate of 11.0 percent (table 20). Both Negroes and whites had lower percent for persons in the age groups 45 years and over.

Fissures of the tongue (moderate risk).—The highest prevalence for fissures of the tongue was found in older adults. Children of ages 1-17 years had lower rates which did not exceed 3.2 percent (tables 19-21).

Negro men aged 18-44 years had higher prevalence than whites in both income groups. In the lower income group, Negro men had a rate of 7.3 percent and white men 2.2 percent. Corresponding rates in the income group above poverty level were 4.9 and 3.2 percent, respectively (table 22).

Negroes aged 60 years and over in the income group above poverty level had the highest prevalence, 18.2 percent (table 24). Whites of the same age and income group had a rate of 13.0 percent. Adults 60 years and over in the lower income group had rates of 11.8 percent for whites and 12.2 percent for Negroes. The prevalence for fissures of the tongue generally increased with age.

Vitamin C Deficiency

Bleeding and swollen gums (moderate risk).—The prevalence for clinical signs of bleeding and swollen gums was at a minimum at ages under 12 years. White children of ages 6-11 years in the income group above poverty level had a rate of 1.0 percent (table 20). The rates were higher in the age group 12-17 years for Negroes of both income groups than for whites: table 21 shows that the rate in the income group below poverty level was 3.0 percent for whites and 5.1 percent for Negroes; in the income group above poverty level, the rate was 1.0 percent for whites and 4.5 percent for Negroes.

A similar pattern is evident for Negro men in the age group 18-44 years. Negroes of both income groups had a much higher percent than whites did. This is not true for women at these ages. In both income groups, white women had slightly higher percentages than did Negro women (table 22).

In the age group 45-59 years the rates were considerably higher for Negroes in both income groups than for whites, about 4 times greater in the lower income group and 6 times greater in the income group above poverty level (table 23). Negroes of this age group had the highest prevalence for any age group regardless of income level.

In the age group 60 years and over, the prevalence diminishes for Negroes of both income groups and exceeds that for whites only in the income group above poverty level. Whites in the lower income group had slightly higher rates than Negroes: whites had a rate of 9.5 percent, and Negroes had a rate of 8.5 percent (table 24).

Vitamin D Deficiency

Bowed legs (moderate risk), suggestive of past rickets.—Among youths 1-17 years Negroes 12-17 years in the income group above poverty level had the highest prevalence for bowed legs, 7.8 percent (table 21). With one exception, Negroes aged 1-17 had higher percent prevalence than whites for both income groups (tables 19, 20, and 21).

Of all age groups, the highest prevalence for bowed legs was 28.6 percent for Negro men aged 18-44 years in the lower income group (table 22).

In the age groups 45 years and over, Negroes aged 45-59 years in the income group above poverty level had the highest prevalence, 11.4 percent (tables 23 and 24). With the exception of this group, for all income groups whites aged 45 years and over had higher prevalences than Negroes.

Knock knees (moderate risk), suggestive of past rickets.—Negroes aged 45-59 years in the income group below poverty level had the highest prevalence for knock knees, 6.7 percent (table 23). The highest rate for persons aged 1-17 years was 6.0 percent for 1-5 year old Negroes in the income group below poverty level. The prevalence for whites of the same ages and income level was 5.7 percent.

Except for Negro men aged 18-44 years, Negroes had higher prevalences than whites for all age groups and both income levels. There were no clinical signs of knock knees for Negro or white men aged 18-44 years (table 22). Among youths 12-17 years of age, the prevalence for knock knees was much lower than that for bowed legs. In the 1-5 and 6-11 year age groups the rates were higher for knock knees (tables 19-20).

Vitamin A Deficiency

Follicular hyperkeratosis, arms (moderate risk).—Very few eye signs characteristic of vitamin A deficiency were seen. Skin signs that may suggest vitamin A deficiency were follicular hyperkeratosis of the arms and back and xerosis of the skin (dry and scaling skin).

For ages under 18 years persons in the income group below poverty level had higher rates for follicular hyperkeratosis of the arms than persons in the income group above poverty level. In the age group 12-17 years, whites in both income groups had higher rates than Negroes in corresponding income groups. In the age group 1-5 years, the rates between races were about equal within each income group. In the age group 6-11 years, the highest rates were in the lower income group, with Negroes having a rate of 14.6 percent and whites a rate of 7.9 percent. In the income group above poverty level whites had a rate of 5.9 percent and Negroes, 2.6 percent (tables 19, 20, and 21).

In the age group 18-44 years, white women of both income groups had higher prevalences than did Negro women. In the lower income group the rate for white women was approximately twice that for Negro women. There were no signs seen for white men in the lower income group. Compared to persons in other age groupings, the percent for adults of ages 45-59 years was low. The highest rate at these ages was for Negroes in the income group above poverty level who had a rate of 2.1 percent (table 23).

The low rate persisted in the age group 60 years and over with the exception of Negroes in the income group above poverty level. Here, the rate was 8.9 percent (table 24).

Calcium-Phosphorus Imbalance

Positive Chvostek's sign (moderate risk).—The prevalence for positive Chvostek's sign generally increased with age through the 18-44 year age group. Persons of ages 12-17 years in the income group below poverty level had the highest prevalence—whites 14.8 percent and Negroes 18.9 percent (table 21). Corresponding percentages for whites and Negroes at the same ages in the income group above poverty level were 12.5 and 12.4, respectively.

Table 22 shows that women aged 18-44 years also had high prevalences. The rates were generally higher for Negro women regardless of income. A similar pattern is observed for men aged 18-44 years, although the rates are lower than for women, with Negroes in both income groups having higher prevalences than whites.

In the 45-59 and 60 years and over age groups the prevalences were low, but for Negroes at ages 45-59 years they did reach as high as 8.0 percent in the lower income group and 9.4 percent in the income group above poverty level (table 23).

Iodine Deficiency or Excess

Group I enlargement of the thyroid (moderate risk).—The highest prevalence for group I enlargement of the thyroid was 11.0 percent for Negroes of ages 12-17 years in the income group above poverty level (table 21). In adults the highest prevalence was 10.1 percent for Negro women of ages 18-44 years. In this age group Negro women had higher rates than white women for both income groups. Negro men aged 18-44 years had no group I enlargement of the thyroid for either income group (table 22). The highest rate among adults

60 years and over was 4.4 percent for Negroes in the income group below poverty level (table 24).

Group II enlargement of the thyroid (high risk).—The highest rate of group II enlargement of the thyroid for youths 1-17 was 1.9 percent for whites aged 12-17 years in the lower income group (tables 19, 20, and 21). In adults the highest prevalence, 7.9 percent, was found for Negroes of ages 45-59 years in the income group above poverty level (table 23). In the age group 60 years and over, Negroes in the income group above poverty level had a prevalence of 5.0 percent (table 24). Adult Negroes had rates of group II enlargement of the thyroid that were equal to or higher than those for whites for each age and income group.

DISCUSSION

Anthropometric Measurements

The assessment of growth is an important component in the nutritional evaluation of children. Mean heights and weights and median thickness of the triceps and subscapular skinfolds of children ages 1-17 years were presented and analyzed by sex, race,and income and by sex and income levels. The cross sectional data on body measurements of children were obtained on different age cohorts and then arranged chronologically from ages 1 through 17 years. The increments are shown by the averages of groups of children by year of age. Individual children vary in their rates of growth, and the limitations of cross sectional data are recognized in considering yearly age changes. It is also evident that the analysis does not account for secular or generational trends evident for Negroes and whites.

Height differences.—Negro children tend to be taller than white children. For Negro boys this is observed from ages 1 through 15 years with exception of ages 1, 3, 12, and 13. However, differences between age specific means of Negro and white boys are small. The Negro boys on the average range from less than one-half inch to about 1.5 inches taller than white boys. The difference in mean heights examined over ages 1-17 years between white and Negro boys is less than one-half inch.

Negro girls are also taller than white girls except at ages 2, 4, 9, 12, and 13. The differences range from 0.2 cm. (0.08 in.) to 3.2 cm. (1.3 in.). The difference in mean heights attained over ages 1-17 years between white and Negro girls is less than one-half inch.

No statement can be made at this time on the possible role of nutrition in explaining these differences.

Weight differences.—Negro boys weigh more than white boys at ages 1 through 11 years, with exceptions occurring at 1, 3, 7, and 9 years. The differences in mean weights are small, ranging from 0.5 kg. (1.1 lb.) to 1.6 kg. (3.5 lb.). Thus Negro boys are taller and heavier than white boys at most of the ages from 1 through 11 years. Small differences such as these could easily arise through sampling error, and there seems to be no justification for stating that there is any difference in height and weight between Negro and white boys 1-11 years of age in the United States.

From ages 12-17 years, Negro boys weigh less than white boys, the differences being considerably greater at 12, 13, 14, and 16 years. For these four ages, the differences in the means ranged from 2.5 kg. (5.5 lb.) to 7.1 kg. (15.6 lb.). It is at ages 12, 13, and 16 that white boys are taller and heavier than Negro boys.

Negro girls are taller than white girls and generally weigh the same in the age group 1-7 years; for these ages the mean weights differed from 0.20 to 1.0 kg. (0.44 to 2.2 lb.). Negro girls weigh more than white girls at every age from 4 through 8 years, the difference being considerably greater only at 8 years; for this age, the means differed by 1.9 kg. (4.2 lb.). From ages 9 through 17, white girls were more often but not consistently heavier than Negro girls. The largest differences were at ages 9, 12, 15, and 17. For these ages, the means differed from 1.1 to 6.8 kg. (2.4 to 15.0 lb.).

Again it cannot be said at this time what role, if any, nutrition may play in explaining these differences.

Skinfold differences.—In general, whites have larger triceps skinfolds for both sexes; differences range from 0.5 mm. to 3.6 mm. for boys and from 0.3 mm. to 6.8 mm. for girls. Only one exception occurs for boys (age 2) and two for girls (ages 1 and 8), where Negroes have greater values. In girls aged 11 and 13 there are no differences.

The subscapular skinfolds show less difference between races, though in general whites show greater values. Differences range from 0.1 mm. to 1.0 mm. in boys and from 0.2 mm. to 3.2 mm. in girls. The exceptions for boys are at ages 2, 8, 14-15, and 17 and for girls at ages 1, 7-8, 11, 13, and 16 when blacks have greater values. Boys at ages 4 and 6 show no differences, girls at age 5 show no differences. Skinfold measurements seem to indicate that white children have more fat in most age groups or, less lean body mass, assuming that the water content in both races is similar.

Whether these differences are due to differences in nutrition between the two racial groups cannot be said at this time.

Dietary data show consistently higher mean and median caloric intakes in white children than in Negro children. These differences may, in part, account for the higher skinfold measurements found in white children.

Sex and income.—Income levels are associated with height, weight, and limb skinfold (triceps) meaures without regard to sex. Children in the income group above poverty level were generally taller, heavier, and had larger median skinfolds than those in the income group below poverty level. The association was less evident for trunk skinfold (subscapular) meaures. No further analysis was made to control the effect of income level on the selected body measurements by sex and race because of the small sample numbers. It should be noted, however that the direction of the differences found in the comparisons of height, weight, and skinfolds by race were such that the observed income level differences could not represent a concealed race effect; on the contrary, the differences are necessarily understated by not taking all of these variables (sex-race-income) into account simultaneously.

The mean heights show a significant statistical difference when the children are compared by income levels. Those in the group above poverty level were taller, the range of differences reaching as high as 6.3 cm. (2.5 in.) for boys at age 12 and 4.8 cm. (1.9 in.) for girls at age 16. However, the differences were found to be less than 2.5 cm. (1 in.) in 10 of the 17 age comparisons for both boys and girls.

The income effect on heights does not follow that observed in weights and triceps skinfolds. Here differences in average values also show a significant statistical difference, but they are of a larger magnitude. For boys of ages 9-16, differences in mean weights between the two income groups, except for age 11, range from 1.4 kg. (3.1 lb.) to 8.3 kg. (18.3 lb.). For girls of ages 8-17, except for ages 11 and 14, the range is from 1.7 kg. (3.7 lb.) to 4.8 kg. (10.6 lb.).

For boys, the differences of median triceps skinfolds by income levels show a value as high as 3.6 mm. with only five age groups having values less than 1.0 mm.

For girls, the greatest differences between income groups occurred at ages 12 and 16, 6.0 mm. and 5.7 mm., respectively. There were only three ages with values less than 1.0 mm.

Despite the higher skinfold values at the triceps for children of the income group above poverty level, the subscapular skinfolds of children of the income group above poverty level were not consistently greater than those in the lower income group. For boys, the largest difference was 1.9 mm. at age 9. The remainder of the differences ranged from 0.1 mm. to 0.8 mm., except for the 6-year-old group, for whom the subscapular skinfolds were the same. For girls the range of differences was also found to be in terms of fractions of a millimeter, with the unexplained exceptions at ages 12 and 17 when the differences were 10.5 mm. and 4.8 mm., respectively. The dietary intake data in the age groups 6-17[1] show consistently lower mean intakes for calories and protein in the lower income groups regardless of race. These could explain, in part, these findings.

Adult Obesity

Data are presented on the prevalence of obesity of the HANES adult population of ages 20-74 years. Interest in this estimate stems from the findings of life insurance[15,16] and epidemiologic studies[17,18] relating excess body weight status to unfavorable mortality and morbidity experiences. There is no current estimate of the prevalence of adult obesity which is representative of the general U.S. population. Such data as are available are taken from selected segments of the population and special study groups.[2,19-21] Such estimates cannot be generalized to the U.S. population. The largest collection of data is taken from life insurance studies of insured persons.[22,23] Because of the composition of such populations, the data do not represent a true cross section of the country. Data on height, weight, and selected body measurements have been published by the National Center for Health Statistics, HEW.[24] Although the data are representative and descriptive of the U.S. population, they are not evaluated in terms of obesity status.

The earliest and most commonly used method for measuring overweight is to compare the height and weight of persons with tables showing average or standard weight. The life insurance studies determined excess body weight status by using this method, which is defined as the deviation of actual weight for a given sex, age, and height from the average weight tables, times 100, obtained initially from the Medico-Actuarial Investigations (1912)[24] and later from the Build and Blood Pressure Study (1959).[23] Other studies such as the Framingham Heart Study defined obesity as a relative weight of 20 percent or more above the median weight for a given height, age, and sex.[20]

Since it is recognized that height and weight alone are incomplete indications of obesity, "desirable" weight tables taking into consideration measurements of body build have been developed by the Metropolitan Life Insurance Co.[25-27] These tables for adults, 25 years and over, show ranges of weights for given heights. This was in answer to the criticism of height-weight tables that they ignored the disadvantages of the increase in body weight with advancing years as well as variations in body build that influence the weight of individuals. The average weights in the tables are for categories of body frame in which the determination of size of frame is not specified or defined in terms of a body measure. This calls for the exercise of clinical judgement by the user as to type of body frame.

Largely by necessity, life insurance mortality studies have been limited to height and weight as measures of body fat. It has been recognized from the first, however, that such data are not satisfactory for studying the influence of obesity on mortality. The very consideration of height as well as weight is an indication of this awareness. Obesity, or an excess accumulation of fat, therefore, is used interchangeably with overweight or excess body weight above standard weight. Total body weight is a measure of bone, muscle, and fat, and departure from average weight may be due to one or another or a combination of these body components. Overweight prevention and control is directed against overweight due to fat, primarily attributed to excess food intake over the energy demands of the individual. This is the major form of overweight in the United States. While direct anatomical and chemical methods for estimation of body fat are not suitable for large-scale epidemiologic surveys, the indirect method, such as the measurement of skinfold thickness, meets the need for a simple test of relative fatness to estimate prevalence of obesity.

To estimate the prevalence of obesity in the United States, HANES data were used to define obesity. Obesity in adults was defined from triceps skinfold measurements greater than 85th percentile for young white and Negro adults, aged 20-29 years.

White men in both age groups are more obese than Negro men. White and Negro men in the younger age group are more obese than their counterparts in the older age group. A different pattern is observed for women, Negro women in both age groups are more obese than white women.

Income levels appear to be associated with the prevalence of obesity. With one exception, in the subgroups studied men in the income group above poverty level had a higher percentage of obesity than those in the lower income group. This holds true for Negro men, all age groups, and white men in the younger age group but not for white men in the upper age group in which a lower prevalence of obesity was associated with income above poverty level. For both white and Negro women, in all age groups, lower income levels were associated with higher prevalence of obesity.

For women, race was clearly an important variable affecting the prevalence of obesity without regard to income. Negro women regardless of income level in both age groups were more obese than white women. For men, except for white men in the younger age group with income below poverty level, white men were more obese than Negro men in both age groups regardless of income level.

Clinical Signs

Protein.—Potbelly and hepatomegaly were the only signs which were found in a fair percentage of examinees. In view of the fact that few other signs of protein deficiency were found from any of the other parameters (dietary, biochemical, and anthropometric), one has to be guarded in the interpretation of potbelly and hepatomegaly. If we knew the prevalence of edema in those with potbelly and/or hepatomegaly, it would help us also to interpret these two signs better, but these figures are not available at this time. All one can say is that besides possible protein deficiency, potbelly in young children may be due to parasites, and the hepatomegaly—prevalent mainly in older people—is probably related to chronic alcohol abuse and/or infection.

Vitamin A.—The only signs suggesting possible vitamin A deficiency found to any significant extent were follicular hyperkeratosis of arms and upper back and xerosis of the skin. The prevalence of eye signs in the form of xerosis of the conjunctiva was negligible. Taking into account that there was little evidence of biochemical vitamin A deficiency in those age-sex groups with a greater prevalence of these signs,[1] the interpretation of the prevalence of the two skin signs, follicular hyperkeratosis and xerosis, has to be made with great caution. Follicular hyperkeratosis, found more frequently in the lower income group, may be due to a deficiency of either vitamin A or essential fatty acids. Xerosis of the skin was more prevalent in the older age group (60 years and over), for whom the skin is normally drier because of age. It is not possible at this time to make a more precise statement.

Thiamine.—The prevalence of absent knee and/or ankle jerks was fairly high, particularly in Negro males in the older age groups. In view of the fact that these signs have not been related at this time to other possible signs of thiamine deficiency, such as edema or cardiac enlargement, it would be premature to ascribe the prevalence of these two signs to possible thiamine deficiency.

Riboflavin.—Most signs suggestive of this deficiency were found more frequently in Negroes and in the income group below poverty level. This may be explained by the generally lower dietary intake of good sources of riboflavin, such as milk. The prevalence of signs for this deficiency was low in general.

Niacin.—Niacin on the other hand shows a higher prevalence of high and moderate risk signs that are more specific than riboflavin. This makes interpretation easier. Generally, Negroes seem to have higher prevalences of both moderate and high risk signs. Most of these signs were more prevalent in the older age groups indicating possible chronic niacin deficiency. Why this is so is not known at this time.

Vitamin C.—Bleeding and swollen gums were more frequent in Negroes of almost all ages regardless of income. However, in view of the almost complete absence of other signs of possible vitamin C deficiencies, such as purpura, petechiae, or perifolliculosis of the skin, the interpretation of the prevalence of gum signs has to be guarded at this time. A correlation between these signs and dietary and biochemical data will be done later and may throw more light on the above findings.

Vitamin D.—The clinical signs most prevalent are considered indicators of past rickets due to vitamin D deficiency. That they are generally more prevalent in Negroes regardless of income may indicate a greater lack of vitamin D rich foods (fortified milk and dairy foods, liver) in the diet of young Negro children. In Negroes less absorption of the ultraviolet rays of the sun due to the greater pigment (melanin) content of the skin may also play a role. The ultraviolet rays are needed for the formation of vitamin D_2 under the skin.

Calcium-phosphorus (Ca-P) imbalance.—The positive Chvostek's sign has never been tested in an epidemiological survey as a possible sign of Ca-P imbalance (hypotetanic state) indicating a deficit of calcium and a relative excess of phosphorus in the blood. From the generally greater prevalence of this sign in Negroes and those with lower income one may conclude that these subgroups are at greater risk of being subject to calcium-phosphorus imbalance. The dietary intake data seem to be in accordance by showing consistently lower calcium intakes in these same subgroups.

Thyroid.—Group I enlargement showed that the prevalence of thyroid enlargement was 10 percent or less in all but 2 of the 28 age-sex by race and income groups. The exceptions were Negroes aged 12-17 years in the income group above poverty level (11.0 percent), and the Negro women aged 18-44 years in the income group above poverty level (10.1 percent). Except for two older subgroups, group II enlargements were less than 5.0 percent among all subgroups. Negroes in the income group above poverty level had 7.9 percent for those 45-59 years of age and 5.0 percent for those 60 years and over. The interpretation of these findings has to await the results of the urinary iodine excretion; these may indicate whether iodine deficiency or, possibly, excess were associated with the thyroid enlargement.

SUMMARY

Preliminary findings of growth of children, 1-17 years of age, of adult obesity at ages 20-74 years, and of clinical findings among individuals 1-74 years of age in the noninstitutionalized population of the United States as obtained in the Health and Nutrition Examination Survey of 1971-1972 are presented and analyzed in this report. Analyses of data for certain groups at high risk of malnutrition—the poor, preschool children, women of childbearing ages, and the elderly—are included.

These preliminary data allow only very limited conclusions regarding the nutritional status of the U. S. population. Income comparisons within the body measurement data reveal that children of the income group above poverty level were taller, heavier, and had greater median triceps skinfold thickness than those in the lower income group of corresponding age and sex. No consistent differences were noted for subscapular skinfolds. The anthropometric data in children and youth show very small differences in height and weight between white and Negro groups, but larger differences in the two skinfold measurements. The skinfold data indicate relatively greater leanness in Negro children and youth.

The prevalence of adult obesity based on the criteria used is high and is relatively higher for women, particularly for Negro women. However, the interpretation of these findings must await the collection of more data and the correlation with dietary and other parameters.

The clinical data show in general a fairly low prevalence of high and moderate risk signs for most nutritional deficiencies. There were a few exceptions, however, where the percent prevalence exceeds 10 percent. This is the case for follicular hyperkeratosis (vitamin A) in Negro children aged 6-11 years below poverty level, grade 1 goiter (iodine) in Negro youths aged 12-17 years above poverty level, a positive Chvostek's sign (calcium) in both racial and income groups of the same ages, and fungiform papillary hypertrophy of the tongue (niacin) for all Negroes; bowed legs (vitamin D) in Negro males aged 18-44 years below poverty level and a positive Chvostek's sign (calcium) in the same group; and fungiform papillary hypertrophy of the tongue (niacin) for Negroes in the income group above poverty level and group I goiter in Negro females aged 18-44 years above poverty level, fungiform papillary hypertrophy of the tongue for Negroes in both income groups and a positive Chvostek's sign in both race and income groups of the same age; bleeding and swollen gums (vitamin C) in Negroes aged 45-59 years of both incomes and bowed legs (vitamin D) in the same racial group above poverty level; absent ankle jerks (thiamine) in Negroes aged 60 years and over of both income levels and fissures of the tongue (niacin) in both racial and income groups of the same age. Older people show generally a higher prevalence of more signs than the young do.

Some of these findings are summarized below, first for growth of children and youth

and for adult obesity, and then for clinical findings.

Anthropometric Measurements

1. Children in the income group above poverty level show a significant statistical difference in mean heights; however, the differences in heights between the two income groups are found to be less than 2.5 cm. (1 in.) in 10 of the 17 age comparisons for both boys and girls.

2. Significant statistical differences in mean weights and median triceps skinfolds were also observed for children in the income group above poverty level, but the differences are of a larger magnitude than those for heights. For boys of ages 9 through 16, differences in mean weights between the two income groups except for age 11, range from 1.4 kg. (3.1 lb.) to 8.3 kg. (18.3 lb.). For girls of ages 8 through 17, except for ages 11 and 14, the range is from 1.7 kg. (3.7 lb.) to 4.8 kg. (10.6 lb.).

3. Boys in the income group above poverty level show differences in median triceps skinfolds as high as 3.2 mm. with only two age groups having values less than 1.0 mm. For girls there were only three ages with values less than 1.0 mm.

Adult Obesity

1. Obesity as measured by triceps skinfold thickness was found to be most prevalent in women, particularly Negro women in the older age group (45-74) who had a prevalence of 32.4 percent.

2. White men had a higher prevalence of obesity than Negro men did. The lowest prevalence of obesity, 7.7 percent, was found in Negro men 45-74 years.

3. Men had lower percentages of obesity than women did. The percentages for men ranged from 7.7 percent for Negro men 45-74 years to 16.0 percent for white men 20-44 years; for women the ranges were from 18.9 percent for white women 20-44 years to 32.4 percent for Negro women 45-74 years.

4. Lower income levels were associated with a higher prevalence of obesity for both white and Negro women.

5. Negro women regardless of income had a higher prevalence of obesity than white women did.

6. In the younger age group (20-44) higher income level was associated with a higher prevalence for white men. This was also true for Negro men, though the magnitude of the difference of percentage of obesity was small. In the older age group, income level was less consistently associated with prevalence of obesity.

7. In the older age group, white men regardless of income level had a higher prevalence of obesity than Negro men did. This association was not evident in the younger age group.

Clinical Signs

1. Negroes showed generally higher prevalence rates than whites did for clinical signs indicating possible nutrient deficiencies disregarding age and income level. These nutrients include vitamins A, C, and D, thiamine, calcium-phosphorus, and iodine (thyroid enlargement, group II).

2. Persons with incomes below the poverty level had generally higher prevalences for clinical signs when compared to persons above the poverty level over the different age groups for vitamins A and C and for the calcium-phosphorus imbalance.

3. Males had generally higher prevalence rates than did females for clinical signs indicating possible nutrient deficiencies that include hepatomegaly (protein), bleeding and swollen gums (vitamin C) (principally Negroes), and bowed legs (vitamin D).

4. Females had higher rates than males for follicular hyperkeratosis (vitamin A) of the arms, fungiform papillary hypertrophy of the tongue (niacin), calcium-phosphorus imbalance, and thyroid (enlargement groups I and II).

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LIST OF DETAILED TABLES

Table 1. Height of children aged 1-17 years by race and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)

	Sex and age	Total[2]						White					
		Mean age[1]	*n*	*N*	Mean	Median	Standard error of mean	Mean age[1]	*n*	*N*	Mean	Median	Standard error of mean
	Boys				In centimeters						In centimeters		
1	1 year	1.55	140	1,772	83.6	83.2	0.66	1.55	93	1,467	83.9	83.2	0.77
2	2 years	2.45	146	1,530	90.7	89.9	0.64	2.46	90	1,213	90.3	89.8	0.76
3	3 years	3.46	144	1,573	98.6	97.8	0.60	3.45	87	1,265	98.7	97.8	0.62
4	4 years	4.49	165	2,046	106.2	106.5	0.42	4.48	112	1,815	106.2	106.5	0.37
5	5 years	5.53	140	1,681	112.8	112.9	0.69	5.53	101	1,490	112.8	113.1	0.81
6	6 years	6.46	82	1,796	117.9	117.8	0.83	6.43	51	1,403	117.6	117.5	1.02
7	7 years	7.47	96	2,754	124.8	124.6	0.71	7.47	71	2,451	124.5	124.5	0.58
8	8 years	8.46	79	1,745	129.0	128.9	0.77	8.47	61	1,542	129.0	129.1	0.96
9	9 years	9.46	100	2,235	134.6	135.2	1.02	9.45	66	1,825	134.3	134.8	1.20
10	10 years	10.52	87	2,154	140.3	139.6	0.75	10.49	68	1,908	139.9	139.4	0.83
11	11 years	11.48	89	1,908	146.1	144.6	0.86	11.49	59	1,577	145.4	144.1	1.04
12	12 years	12.56	101	2,251	154.1	153.2	1.04	12.55	74	1,965	154.4	153.2	1.15
13	13 years	13.48	88	1,894	160.4	159.0	1.19	13.50	57	1,575	161.4	160.4	1.18
14	14 years	14.46	77	2,015	166.3	166.5	0.88	14.47	52	1,651	166.4	165.9	0.89
15	15 years	15.50	90	2,294	170.2	171.0	0.90	15.47	57	1,869	169.9	171.0	1.15
16	16 years	16.52	75	1,795	176.4	176.6	1.29	16.49	51	1,558	176.5	176.6	1.43
17	17 years	17.51	86	2,259	177.8	177.6	0.63	17.49	64	2,033	178.0	177.6	0.68
	Girls												
18	1 year	1.49	142	1,509	80.9	81.0	0.87	1.55	88	1,267	80.7	80.7	1.01
19	2 years	2.45	142	1,647	90.1	89.7	0.51	2.45	99	1,358	90.2	90.0	0.58
20	3 years	3.50	149	1,534	98.3	97.9	0.50	3.52	98	1,324	98.0	97.7	0.60
21	4 years	4.54	151	1,785	105.9	104.5	1.62	4.53	106	1,487	106.0	104.4	1.91
22	5 years	5.55	170	1,801	112.6	111.9	0.41	5.54	112	1,506	112.1	111.6	0.53
23	6 years	6.47	87	1,885	118.4	117.8	0.76	6.50	58	1,478	118.0	118.2	0.96
24	7 years	7.51	93	2,135	125.3	125.1	0.74	7.55	56	1,736	125.1	124.6	0.86
25	8 years	8.47	71	1,716	129.3	128.8	0.83	8.45	53	1,471	129.1	128.5	0.94
26	9 years	9.52	93	2,070	136.0	135.2	0.76	9.51	66	1,851	136.1	135.4	0.86
27	10 years	10.47	103	2,403	140.0	140.1	1.30	10.43	69	2,085	139.6	138.6	1.35
28	11 years	11.55	87	2,033	148.4	148.2	1.18	11.54	60	1,728	148.3	148.1	1.48
29	12 years	12.49	85	1,742	153.7	152.6	0.83	12.46	50	1,390	154.0	152.7	1.02
30	13 years	13.52	99	2,389	160.0	160.7	0.70	13.53	71	2,093	160.3	161.2	0.73
31	14 years	14.50	95	2,189	162.0	162.4	0.87	14.47	62	1,790	161.9	162.2	1.02
32	15 years	15.48	83	1,997	164.5	164.7	1.36	15.50	52	1,593	164.3	164.3	1.54
33	16 years	16.55	83	2,062	161.3	159.6	1.23	16.56	63	1,919	161.1	159.4	1.31
34	17 years	17.46	83	1,860	160.8	161.4	1.41	17.45	55	1,595	160.7	161.4	1.61

Table 1. Height of children aged 1-17 years by race and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)—Con.

Negro						Total[2]		White		Negro		
Mean age[1]	*n*	*N*	Mean	Median	Standard error of mean	Mean	Median	Mean	Median	Mean	Median	
			In centimeters			In inches						
1.54	46	304	82.3	82.8	0.68	32.9	32.8	33.0	32.8	32.4	32.6	1
2.45	56	317	92.3	90.9	0.70	35.7	35.4	35.6	35.4	36.3	35.8	2
3.46	50	233	98.4	97.6	1.10	38.8	38.5	38.8	38.5	38.7	38.4	3
4.50	53	230	106.6	107.2	1.13	41.8	41.9	41.8	41.9	41.9	42.2	4
5.53	38	174	112.9	112.6	0.86	44.4	44.4	44.4	44.5	44.4	44.3	5
6.52	30	371	119.0	118.3	2.35	46.4	46.4	46.3	46.3	46.9	46.6	6
7.46	25	303	126.9	125.9	3.71	49.1	49.1	49.1	49.1	50.0	49.6	7
8.44	17	200	129.1	128.3	2.25	50.8	50.7	50.8	50.8	50.8	50.5	8
9.50	34	409	135.9	135.9	0.68	53.0	53.2	52.9	53.1	53.5	53.5	9
10.63	17	196	142.8	142.1	2.91	55.2	55.0	55.1	55.0	56.2	55.9	10
11.55	30	331	149.1	149.2	0.78	57.5	56.9	57.2	56.7	58.7	58.7	11
12.60	27	266	151.3	153.1	1.41	60.7	60.3	60.8	60.3	59.6	60.3	12
13.44	31	320	155.4	153.5	1.75	63.1	62.6	63.5	63.1	61.2	60.4	13
14.43	24	324	169.6	171.1	2.05	65.5	65.6	65.5	65.3	66.8	67.4	14
15.55	29	325	172.3	175.1	2.15	67.0	67.3	66.9	67.3	67.8	68.9	15
16.58	24	237	175.8	176.5	3.07	69.4	69.5	69.4	69.5	69.2	69.4	16
17.57	21	200	176.8	178.3	1.43	70.0	69.9	70.1	69.9	69.6	70.2	17
1.52	53	237	81.7	84.1	1.39	31.9	31.9	31.8	31.8	32.2	33.1	18
2.44	42	287	89.7	89.3	0.79	35.5	35.3	35.5	35.4	35.3	35.2	19
3.47	49	197	100.2	99.8	1.08	38.7	38.5	38.6	38.5	39.4	39.3	20
4.58	44	296	105.8	105.4	1.48	41.7	41.1	41.7	41.1	41.7	41.5	21
5.56	58	295	115.3	116.0	1.28	44.3	44.1	44.1	43.9	45.4	45.7	22
6.42	29	406	119.6	117.7	1.03	46.6	46.4	46.5	46.5	47.1	46.3	23
7.47	37	400	126.5	125.8	1.05	49.3	49.3	49.3	49.1	49.8	49.5	24
8.51	18	245	130.6	129.7	1.60	50.9	50.7	50.8	50.6	51.4	51.1	25
9.55	26	205	135.1	133.5	1.23	53.5	53.2	53.5	53.3	53.2	52.6	26
10.57	34	318	142.3	142.1	4.05	55.1	55.2	55.0	53.8	56.0	55.9	27
11.59	27	304	148.5	148.6	1.54	58.4	58.3	58.4	58.3	58.5	58.5	28
12.53	33	308	153.2	152.8	1.80	60.5	60.1	60.6	60.1	60.3	60.2	29
13.46	27	294	157.9	158.1	1.14	63.0	63.3	63.1	63.5	62.2	62.2	30
14.52	32	359	163.1	163.6	1.34	63.8	63.9	63.8	63.9	64.2	64.4	31
15.46	31	404	165.3	167.1	1.91	64.8	64.8	64.7	64.7	65.1	65.8	32
16.49	20	142	163.3	163.1	1.94	63.5	62.8	63.4	62.8	64.3	64.2	33
17.47	27	251	160.9	160.4	2.66	63.3	63.5	63.3	63.5	63.3	63.2	34

[1]Mean age at time of examination (in years).
[2]Total includes all races.

NOTE: *n* = examined children; *N* = estimated population in thousands.

Table 2. Weight of children aged 1-17 years by race and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)

	Sex and age	Total[2]						White					
		Mean age[1]	*n*	*N*	Mean	Median	Standard error of mean	Mean age[1]	*n*	*N*	Mean	Median	Standard error of mean
					In kilograms						In kilograms		
	Boys												
1	1 year	1.55	140	1,772	11.9	11.7	0.23	1.55	93	1,467	12.0	11.9	0.27
2	2 years	2.45	146	1,530	13.4	13.3	0.30	2.46	90	1,213	13.2	13.2	0.29
3	3 years	3.46	144	1,573	15.6	15.6	0.24	3.45	87	1,265	15.6	15.6	0.25
4	4 years	4.49	165	2,046	17.7	17.8	0.23	4.48	112	1,815	17.7	17.7	0.20
5	5 years	5.53	140	1,681	20.0	19.8	0.35	5.53	101	1,490	20.0	19.8	0.40
6	6 years	6.46	82	1,796	22.0	21.9	0.40	6.43	51	1,403	21.9	21.7	0.43
7	7 years	7.47	96	2,754	24.6	24.4	0.31	7.47	71	2,451	24.7	24.5	0.33
8	8 years	8.46	79	1,745	26.2	25.5	0.52	8.47	61	1,542	26.0	25.3	0.57
9	9 years	9.46	100	2,234	32.0	30.7	1.11	9.45	66	1,825	32.2	31.2	1.29
10	10 years	10.52	87	2,154	34.4	33.6	0.87	10.49	68	1,908	34.1	33.6	1.04
11	11 years	11.48	89	1,908	37.6	37.1	0.74	11.44	59	1,577	37.5	37.1	0.86
12	12 years	12.56	101	2,251	44.8	43.3	1.29	12.55	74	1,985	45.2	43.9	1.43
13	13 years	13.48	88	1,894	50.6	49.2	1.22	13.50	57	1,574	51.8	49.8	1.60
14	14 years	14.46	77	2,015	56.2	53.0	2.19	14.47	52	1,651	57.2	52.9	2.52
15	15 years	15.50	90	2,294	60.5	57.6	1.78	15.47	57	1,869	59.4	57.0	2.08
16	16 years	16.52	75	1,795	68.9	67.5	2.13	16.49	51	1,558	69.4	67.9	2.53
17	17 years	17.51	86	2,259	69.7	67.6	0.85	17.49	64	2,033	69.7	67.7	1.01
	Girls												
18	1 year	1.49	142	1,509	10.9	10.9	0.22	1.55	88	1,267	11.8	10.8	0.20
19	2 years	2.45	142	1,647	12.8	12.7	0.16	2.45	99	1,358	13.0	12.8	0.15
20	3 years	3.50	149	1,534	15.4	15.3	0.25	3.52	98	1,324	15.4	15.4	0.27
21	4 years	4.54	151	1,785	16.9	16.8	0.26	4.53	106	1,487	16.8	16.8	0.30
22	5 years	5.55	170	1,801	20.0	18.9	0.28	5.54	112	1,506	19.8	18.8	0.31
23	6 years	6.47	87	1,885	21.6	21.3	0.45	6.50	58	1,478	21.6	21.5	0.60
24	7 years	7.51	93	2,135	24.4	24.0	0.36	7.55	56	1,736	24.2	23.8	0.43
25	8 years	8.47	71	1,716	27.7	25.6	0.78	8.45	53	1,471	27.5	25.3	0.83
26	9 years	9.52	93	2,070	32.0	31.7	0.88	9.51	66	1,851	32.4	31.9	0.98
27	10 years	10.47	103	2,403	34.1	32.3	0.84	10.43	69	2,085	33.9	32.4	0.83
28	11 years	11.55	87	2,033	40.6	39.8	1.16	11.54	60	1,728	40.3	39.5	1.28
29	12 years	12.49	85	1,742	45.5	44.5	1.12	12.46	50	1,390	46.2	44.9	1.15
30	13 years	13.52	99	2,389	53.3	50.6	1.38	13.53	71	2,093	53.4	50.6	1.43
31	14 years	14.50	95	2,189	56.1	52.8	1.64	14.49	62	1,790	56.4	53.2	2.01
32	15 years	15.48	83	1,997	58.4	57.3	1.93	15.50	52	1,593	59.7	59.4	1.95
33	16 years	16.55	83	2,062	55.2	52.7	1.59	16.56	63	1,919	54.9	51.9	1.72
34	17 years	17.46	83	1,860	58.8	55.9	2.50	17.45	55	1,595	58.7	56.1	2.87

Table 2. Weight of children aged 1-17 years by race and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)—Con.

Negro						Total[2]		White		Negro		
Mean age[1]	n	N	Mean	Median	Standard error of mean	Mean	Median	Mean	Median	Mean	Median	
			In kilograms			In pounds						
1.54	46	304	11.3	11.1	0.22	26.3	25.6	26.6	25.9	24.8	24.5	1
2.45	56	317	14.4	13.8	0.68	29.6	29.4	29.1	29.1	31.8	30.6	2
3.46	50	233	15.5	15.7	0.39	34.4	34.6	34.5	34.5	34.1	34.9	3
4.50	53	230	18.2	18.0	0.63	39.1	39.1	39.0	38.9	40.0	39.9	4
5.53	38	174	20.6	20.0	0.77	44.2	43.7	44.1	43.7	45.4	44.4	5
6.52	30	371	22.8	22.6	1.18	48.6	47.0	48.2	46.7	50.2	49.6	6
7.46	25	303	24.1	24.4	1.35	54.2	53.0	54.4	52.9	53.2	53.2	7
8.44	17	200	27.6	26.8	0.78	57.7	56.5	57.3	56.2	60.9	58.9	8
9.50	34	409	31.2	30.3	1.67	70.6	68.2	71.0	68.9	68.8	67.6	9
10.63	17	196	34.6	32.5	2.24	75.8	73.7	75.3	73.8	76.2	72.5	10
11.53	30	331	38.1	37.2	0.91	83.0	81.5	82.8	82.0	84.0	80.5	11
12.60	27	266	41.9	41.3	1.79	98.7	94.6	99.6	95.7	92.4	89.7	12
13.44	31	320	44.7	42.3	3.57	111.5	108.9	114.1	109.7	98.5	96.0	13
14.43	24	324	54.7	54.5	1.90	124.0	116.9	126.2	116.6	120.6	120.0	14
15.55	29	325	65.8	62.1	6.16	133.5	127.1	131.0	126.0	145.0	138.1	15
16.58	24	237	65.8	62.5	2.89	151.9	150.0	153.0	150.8	145.2	138.5	16
17.57	21	200	70.4	67.2	3.12	153.7	149.1	153.7	149.5	155.3	147.4	17
1.52	53	237	11.3	11.1	0.63	23.9	24.0	23.7	23.9	25.0	25.0	18
2.44	42	287	12.2	12.2	0.38	28.3	28.3	28.6	28.5	27.0	26.5	19
3.47	49	197	15.2	14.8	0.39	33.9	33.6	33.9	33.7	33.6	32.6	20
4.58	44	296	17.3	17.1	0.54	37.2	37.3	37.0	37.3	38.2	37.3	21
5.56	58	295	20.8	20.1	0.60	44.0	41.7	43.7	41.6	45.8	45.1	22
6.42	29	406	21.8	20.1	0.79	47.7	46.8	47.6	46.5	48.0	45.0	23
7.47	37	400	24.8	24.8	0.68	53.7	51.6	53.4	51.8	54.8	51.0	24
8.51	18	245	29.4	33.1	2.01	61.2	56.2	60.6	55.5	64.7	73.1	25
9.55	26	205	28.4	27.6	1.08	70.5	70.0	71.4	70.5	62.7	60.6	26
10.57	34	318	35.5	32.2	2.96	75.2	72.2	74.7	72.2	78.3	70.9	27
11.59	27	304	41.9	46.2	2.08	89.4	87.8	88.9	87.5	92.4	98.2	28
12.53	33	308	43.3	41.5	2.16	100.4	98.2	101.9	98.8	95.6	91.7	29
13.46	27	294	52.3	50.6	5.04	117.4	111.5	117.7	111.6	115.3	110.8	30
14.52	32	359	56.5	52.4	1.28	123.7	115.8	124.3	117.5	124.6	115.4	31
15.46	31	404	52.9	50.2	2.41	128.7	126.4	131.7	131.5	116.7	110.3	32
16.49	20	142	59.7	56.5	3.36	121.7	116.4	121.0	114.0	131.6	124.5	33
17.47	27	251	56.6	53.9	3.04	129.6	123.0	129.5	123.2	124.8	119.8	34

[1]Mean age at time of examination (in years).
[2]Total includes all races.

NOTE: n = examined children; N= estimated population in thousands.

Table 3. Triceps skinfold of children aged 1-17 years by race and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)

	Sex and age	Total[2]						White		
		Mean[1] age	*n*	*N*	Mean	Median	Standard error of mean	Mean[1] age	*n*	*N*
					In millimeters					
	Boys									
1	1 year----------------------	1.55	140	1,772	10.7	10.7	0.43	1.55	93	1,467
2	2 years---------------------	2.45	146	1,530	10.1	10.2	0.32	2.46	90	1,213
3	3 years---------------------	3.46	144	1,573	9.9	10.4	0.33	3.45	87	1,265
4	4 years---------------------	4.49	165	2,046	9.5	9.8	0.33	4.48	112	1,815
5	5 years---------------------	5.53	140	1,681	9.3	9.2	0.36	5.53	101	1,490
6	6 years---------------------	6.46	82	1,796	8.8	8.6	0.49	6.43	51	1,403
7	7 years---------------------	7.47	96	2,754	8.7	8.3	0.34	7.47	71	2,451
8	8 years---------------------	8.46	79	1,745	8.9	8.6	0.45	8.47	61	1,542
9	9 years---------------------	9.47	100	2,234	11.0	10.2	0.55	9.45	66	1,825
10	10 years--------------------	10.52	87	2,154	10.4	10.0	0.49	10.49	68	1,908
11	11 years--------------------	11.48	89	1,908	10.8	9.6	0.61	11.44	59	1,577
12	12 years--------------------	12.56	101	2,251	11.2	10.5	0.51	12.55	74	1,985
13	13 years--------------------	13.48	88	1,894	11.3	10.2	0.96	13.50	57	1,574
14	14 years--------------------	14.46	77	2,015	10.2	8.9	0.92	14.47	52	1,651
15	15 years--------------------	15.50	90	2,294	10.9	9.3	0.89	15.47	57	1,869
16	16 years--------------------	16.52	75	1,795	9.8	8.4	0.83	16.49	51	1,558
17	17 years--------------------	17.51	86	2,259	9.0	7.6	0.75	17.49	64	2,033
	Girls									
18	1 year----------------------	1.49	142	1,509	10.3	10.6	0.42	1.55	88	1,267
19	2 years---------------------	2.45	142	1,647	10.4	10.5	0.28	2.45	99	1,358
20	3 years---------------------	3.50	149	1,534	11.3	11.8	0.36	3.52	98	1,324
21	4 years---------------------	4.54	151	1,785	10.5	10.7	0.29	4.53	106	1,487
22	5 years---------------------	5.55	170	1,801	10.7	10.3	0.29	5.54	112	1,506
23	6 years---------------------	6.47	87	1,885	10.2	10.7	0.42	6.50	58	1,478
24	7 years---------------------	7.51	93	2,135	10.7	10.9	0.59	7.55	56	1,736
25	8 years---------------------	8.47	71	1,716	12.8	11.6	0.70	8.45	53	1,471
26	9 years---------------------	9.52	93	2,070	13.5	13.4	0.61	9.51	66	1,851
27	10 years--------------------	10.47	103	2,403	13.4	12.6	0.52	10.43	69	2,085
28	11 years--------------------	11.55	87	2,033	13.9	13.1	0.83	11.54	60	1,728
29	12 years--------------------	12.49	85	1,742	14.8	15.1	0.56	12.46	50	1,390
30	13 years--------------------	13.52	99	2,389	16.6	15.7	0.87	13.53	71	2,093
31	14 years--------------------	14.50	95	2,189	17.6	17.1	0.83	14.49	62	1,790
32	15 years--------------------	15.48	83	1,997	17.6	17.2	1.05	15.50	52	1,593
33	16 years--------------------	16.55	83	2,062	17.8	17.1	1.25	16.56	63	1,919
34	17 years--------------------	17.46	83	1,860	19.7	18.9	1.42	17.45	55	1,595

Table 3. Triceps skinfold of children aged 1-17 years by race and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)—Con.

White			Negro						
Mean	Median	Standard error of mean	Mean[1] age	n	N	Mean	Median	Standard error of mean	
In millimeters						In millimeters			
11.0	11.1	0.44	1.54	46	304	9.5	9.0	0.57	1
9.7	9.9	0.39	2.45	56	317	11.8	10.5	1.57	2
10.1	10.5	0.40	3.46	50	233	9.1	10.0	0.65	3
9.7	10.1	0.36	4.50	53	230	8.4	8.1	0.57	4
9.4	9.4	0.39	5.53	38	174	8.7	7.7	0.87	5
9.2	9.1	0.57	6.52	30	371	7.1	7.5	0.64	6
9.0	8.6	0.37	7.46	25	303	6.2	6.3	0.38	7
9.1	8.8	0.52	8.44	17	200	7.3	6.6	0.76	8
11.6	10.6	0.75	9.50	34	409	8.5	8.0	0.83	9
10.5	10.3	0.56	10.63	17	196	8.7	8.3	0.74	10
11.5	10.2	0.66	11.55	30	331	7.4	6.6	0.60	11
11.6	10.8	0.60	12.60	27	266	8.7	7.6	0.72	12
11.9	10.4	1.33	13.44	31	320	8.4	7.6	1.53	13
11.0	9.6	1.06	[3]14.99	[3]53	[3]649	[3]8.7	[3]8.2	[3]1.56	14
10.9	9.2	0.87							15
10.2	8.8	0.98	16.58	24	237	7.3	6.8	0.66	16
8.9	7.7	0.84	17.57	21	200	9.6	6.4	2.29	17
10.2	10.6	0.42	1.52	53	237	10.7	10.7	0.73	18
10.6	10.7	0.31	2.44	42	287	9.5	9.9	0.41	19
11.5	12.0	0.37	3.47	49	197	10.1	10.4	0.65	20
10.8	10.9	0.30	4.58	44	296	8.9	8.5	0.60	21
10.7	10.3	0.31	5.56	58	295	10.2	10.0	0.96	22
10.6	11.3	0.51	6.42	29	406	8.9	8.6	0.44	23
10.8	11.3	0.71	7.47	37	400	10.4	9.7	0.90	24
12.7	11.5	0.76	8.51	18	245	13.5	13.1	2.24	25
14.1	14.4	0.70	9.55	26	205	8.7	7.6	0.81	26
13.6	13.1	0.54	10.57	34	318	11.8	10.8	1.13	27
13.8	13.1	0.84	11.57	27	304	14.2	13.1	2.07	28
14.9	15.1	0.61	12.53	33	308	14.5	14.8	1.72	29
16.7	15.7	0.97	13.46	27	294	16.0	15.7	1.04	30
17.9	17.3	0.99	14.52	32	359	16.7	15.8	1.44	31
18.8	18.0	1.16	15.46	31	404	12.8	12.3	1.18	32
18.0	17.1	1.37	16.47	20	142	15.9	13.9	2.26	33
20.2	19.0	1.76	17.47	27	251	16.0	14.6	2.03	34

[1]Mean age at time of examination (in years).
[2]Total includes all races.
[3]A pooled value necessitated by unreliable estimates computed from smaller groupings (see "Standard of Reliability and Precision" in appendix I).

NOTE: n = examined children;
N = estimated population in thousands.

Table 4. Subscapular skinfold of children aged 1-17 years by race and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)

	Sex and age	Total[2]						White		
		Mean[1] age	n	N	Mean	Median	Standard error of mean	Mean[1] age	n	N
	Boys				In millimeters					
1	1 year	1.55	140	1,772	6.4	6.4	0.25	1.55	93	1,467
2	2 years	2.45	146	1,530	5.5	5.5	0.28	2.46	90	1,213
3	3 years	3.46	144	1,573	5.5	5.5	0.29	3.45	87	1,265
4	4 years	4.49	165	2,046	5.2	5.3	0.22	4.48	112	1,815
5	5 years	5.53	140	1,681	5.0	5.0	0.18	5.53	101	1,490
6	6 years	6.46	82	1,796	5.1	4.8	0.27	6.43	51	1,403
7	7 years	7.47	96	2,754	5.4	4.8	0.38	7.47	71	2,451
8	8 years	8.46	79	1,745	5.0	4.9	0.26	8.47	61	1,542
9	9 years	9.47	100	2,234	7.7	5.8	0.72	9.45	66	1,825
10	10 years	10.52	87	2,154	7.2	5.9	0.62	10.49	68	1,908
11	11 years	11.48	89	1,908	7.1	6.1	0.51	11.44	59	1,577
12	12 years	12.56	101	2,251	7.7	6.0	0.53	12.55	74	1,985
13	13 years	13.48	88	1,894	8.9	6.8	1.05	13.50	57	1,574
14	14 years	14.46	77	2,015	8.8	7.0	1.16	14.47	52	1,651
15	15 years	15.50	90	2,294	10.4	7.7	0.79	15.47	57	1,869
16	16 years	16.52	75	1,795	10.4	8.4	0.94	16.49	51	1,558
17	17 years	17.51	86	2,259	10.0	8.3	0.66	17.49	64	2,033
	Girls									
18	1 year	1.49	142	1,509	6.2	6.3	0.35	1.55	88	1,267
19	2 years	2.45	142	1,647	6.1	6.1	0.21	2.45	99	1,358
20	3 years	3.50	149	1,534	5.9	5.9	0.25	3.52	98	1,324
21	4 years	4.54	151	1,785	5.6	5.6	0.16	4.53	106	1,487
22	5 years	5.55	170	1,801	6.3	5.5	0.31	5.54	112	1,506
23	6 years	6.47	87	1,885	6.2	6.2	0.53	6.50	58	1,478
24	7 years	7.51	93	2,135	6.0	5.5	0.45	7.55	56	1,736
25	8 years	8.47	71	1,716	8.2	5.9	0.63	8.45	53	1,471
26	9 years	9.52	93	2,070	8.3	7.4	0.66	9.51	66	1,851
27	10 years	10.47	103	2,403	9.2	6.8	0.68	10.43	69	2,085
28	11 years	11.55	87	2,033	10.0	8.1	0.94	11.54	60	1,728
29	12 years	12.49	85	1,742	11.0	8.9	0.98	12.46	50	1,390
30	13 years	13.52	99	2,389	12.7	10.5	0.91	13.53	71	2,093
31	14 years	14.50	95	2,189	13.8	10.8	0.98	14.49	62	1,790
32	15 years	15.48	83	1,997	12.6	10.5	1.12	15.50	52	1,593
33	16 years	16.55	83	2,062	13.4	10.6	1.46	16.56	63	1,919
34	17 years	17.46	83	1,860	15.9	12.7	1.48	17.45	55	1,595

Table 4. Subscapular skinfold of children aged 1-17 years by race and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)—Con.

White			Negro						
Mean	Median	Standard error of mean	Mean[1] age	n	N	Mean	Median	Standard error of mean	
In millimeters						In millimeters			
6.5	6.5	0.31	1.54	46	304	5.6	5.8	0.28	1
5.3	5.4	0.27	2.45	56	317	6.6	5.8	0.96	2
5.6	5.5	0.32	3.46	50	233	5.2	5.4	0.30	3
5.2	5.3	0.25	4.50	53	230	5.0	5.3	0.23	4
5.0	5.0	0.20	5.53	38	174	5.3	4.8	0.53	5
5.2	4.8	0.32	6.52	30	371	4.8	4.8	0.47	6
5.5	5.0	0.43	7.46	25	303	4.1	4.2	0.36	7
5.0	4.8	0.26	8.44	17	200	5.5	5.3	0.75	8
7.7	6.0	0.71	[3]10.07	[3]51	[3]605	[3]7.1	[3]5.5	[3]1.27	9
7.2	6.0	0.70							10
7.3	6.2	0.62	11.55	30	331	6.1	5.7	0.55	11
7.8	6.1	0.63	[3]13.02	[3]58	[3]586	[3]7.5	[3]5.6	[3]1.33	12
9.1	7.2	1.30							13
9.4	7.3	1.39	[3]14.99	[3]53	[3]649	[3]9.2	[3]8.2	[3]1.53	14
10.1	7.5	0.78							15
10.7	8.4	1.10	16.58	24	237	8.4	8.2	0.68	16
10.0	8.3	0.72	17.57	21	200	10.1	8.7	1.00	17
6.2	6.2	0.37	1.52	53	237	6.6	6.6	0.60	18
6.0	6.1	0.25	2.44	42	287	6.3	5.9	0.66	19
5.9	6.0	0.29	3.47	49	197	5.6	5.5	0.27	20
5.7	5.7	0.17	4.58	44	296	5.1	5.2	0.17	21
6.3	5.5	0.34	5.56	58	295	6.2	5.5	0.78	22
6.3	6.2	0.66	6.42	29	406	5.8	5.7	0.49	23
5.9	5.4	0.54	[3]7.99	[3]55	[3]645	[3]8.5	[3]10.1	[3]1.05	24
7.9	5.9	0.71							25
8.6	7.6	0.76	9.55	26	205	5.7	5.2	0.62	26
9.3	6.9	0.74	10.57	34	318	8.2	6.5	1.31	27
9.9	7.8	1.06	11.59	27	304	10.3	10.4	1.24	28
11.1	8.9	1.24	12.53	33	308	10.5	7.3	1.60	29
12.5	10.2	1.02	13.46	27	294	13.5	12.0	1.79	30
14.1	11.3	1.19	14.52	32	359	13.2	10.1	1.31	31
13.4	10.8	1.42	15.46	31	404	9.3	7.6	1.08	32
13.4	10.4	1.59	16.49	20	142	14.2	11.8	2.48	33
15.7	12.7	1.67	17.47	27	251	15.9	12.0	3.17	34

[1]Mean age at time of examination (in years).
[2]Total includes all races.
[3]A pooled value necessitated by unreliable estimates computed from smaller groupings (see "Standards of Reliability and Precision" in appendix I).

NOTE: n= estimated children; N= estimated population in thousands.

Table 5. Mean height and differences in mean height of children aged 1-17 years by sex and race: United States, 1971-72 (HANES Preliminary)

Age	Boys					Girls				
	White		Negro		Difference in mean height (cm.)[1]	White		Negro		Difference in mean height (cm.)[1]
	n	Mean height (cm.)	*n*	Mean height (cm.)		*n*	Mean height (cm.)	*n*	Mean height (cm.)	
1 year	93	83.9	46	82.3	1.6	88	80.7	53	81.7	-1.0
2 years	90	90.3	56	92.3	-2.0	99	90.2	42	89.7	0.5
3 years	87	98.7	50	98.4	0.3	98	98.0	49	100.2	-2.2
4 years	112	106.2	53	106.6	-0.4	106	106.0	44	105.8	0.2
5 years	101	112.8	38	112.9	-0.1	112	112.1	58	115.3	-3.2
6 years	51	117.6	30	119.0	-1.4	58	118.0	29	119.6	-1.6
7 years	71	124.5	25	126.9	-2.4	56	125.1	37	126.5	-1.4
8 years	61	129.0	17	129.1	-0.1	53	129.1	18	130.6	-1.5
9 years	66	134.3	34	135.9	-1.6	66	136.1	26	135.1	1.0
10 years	68	139.9	17	142.8	-2.9	69	139.6	34	142.3	-2.7
11 years	59	145.4	30	149.1	-3.7	60	148.3	27	148.5	-0.2
12 years	74	154.4	27	151.3	3.1	50	154.0	33	153.2	0.8
13 years	57	161.4	31	155.4	6.0	71	160.3	27	157.9	2.4
14 years	52	166.4	24	169.6	-3.2	62	161.9	32	163.1	-1.2
15 years	57	169.9	29	172.3	-2.4	52	164.3	31	165.3	-1.0
16 years	51	176.5	24	175.8	0.7	63	161.1	20	163.3	-2.2
17 years	64	178.0	21	176.8	1.2	55	160.7	27	160.9	-0.2

[1]Negative numbers indicate that mean height for Negro children is greater than that for white children.

NOTE: *n* = examined children.

Table 6. Mean height and differences in mean height of children aged 1-17 years by sex and income level: United States, 1971-72 (HANES Preliminary)

Age	Boys					Girls				
	Income below poverty level		Income above poverty level		Difference in mean height (cm.)[1]	Income below poverty level		Income above poverty level		Difference in mean height (cm.)[1]
	n	Mean height (cm.)	*n*	Mean height (cm.)		*n*	Mean height (cm.)	*n*	Mean height (cm.)	
1 year----------	34	82.7	101	83.7	-1.0	43	82.5	98	80.6	1.9
2 years---------	56	91.0	89	90.6	0.4	42	89.0	97	90.4	-1.4
3 years---------	38	98.1	95	98.8	-0.7	54	98.0	88	98.4	-0.4
4 years---------	50	104.0	113	106.8	-2.8	39	103.2	107	106.4	-3.2
5 years---------	43	113.2	94	112.7	0.5	46	110.9	117	113.1	-2.2
6 years---------	28	115.1	51	119.0	-3.9	29	117.8	58	118.5	-0.7
7 years---------	28	124.0	65	124.8	-0.8	34	125.1	56	125.4	-0.3
8 years---------	21	127.4	57	129.3	-1.9	22	126.8	45	129.6	-2.8
9 years---------	34	130.5	62	136.5	-6.0	24	135.1	65	136.3	-1.2
10 years--------	23	136.7	59	140.8	-4.1	24	136.8	77	140.6	-3.8
11 years--------	24	145.4	61	146.0	-0.6	19	145.5	62	148.8	-3.3
12 years--------	20	148.6	76	154.9	-6.3	26	151.2	52	154.7	-3.5
13 years--------	26	156.2	58	161.7	-5.5	24	157.5	73	160.5	-3.0
14 years--------	13	166.2	57	167.1	-0.9	27	163.4	64	162.2	1.2
15 years--------	22	170.6	61	170.2	0.4	25	164.4	53	165.7	-1.3
16 years--------	22	174.0	49	176.3	-2.3	18	157.2	60	162.0	-4.8
17 years--------	17	173.9	63	178.8	-4.9	21	161.3	59	161.2	0.1

[1]Negative numbers indicate that mean height for the income group above poverty level is greater than that for the income group below poverty level.

NOTE: *n* = examined children.

Table 7. Mean weight and differences in mean weight of children aged 1-17 years by sex and race: United States, 1971-72 (HANES Preliminary)

Age	Boys					Girls				
	White		Negro		Difference in mean weight (kg.)[1]	White		Negro		Difference in mean weight (kg.)[1]
	n	Mean weight (kg.)	*n*	Mean weight (kg.)		*n*	Mean weight (kg.)	*n*	Mean weight (kg.)	
1 year	93	12.0	46	11.3	0.7	88	11.8	53	11.3	0.5
2 years	90	13.2	56	14.4	-1.2	99	13.0	42	12.2	0.8
3 years	87	15.6	50	15.5	0.1	98	15.4	49	15.2	0.2
4 years	112	17.7	53	18.2	-0.5	106	16.8	44	17.3	-0.5
5 years	101	20.0	38	20.6	-0.6	112	19.8	58	20.8	-1.0
6 years	51	21.9	30	22.8	-0.9	58	21.6	29	21.8	-0.2
7 years	71	24.7	25	24.1	0.6	56	24.2	37	24.8	-0.6
8 years	61	26.0	17	27.6	-1.6	53	27.5	18	29.4	-1.9
9 years	66	32.2	34	31.2	1.0	66	32.4	26	28.4	4.0
10 years	68	34.1	17	34.6	-0.5	69	33.9	34	35.5	-1.6
11 years	59	37.5	30	38.1	-0.6	60	40.3	27	41.9	-1.6
12 years	74	45.2	27	41.9	3.3	50	46.2	33	43.3	2.9
13 years	57	51.8	31	44.7	7.1	71	53.4	27	52.3	1.1
14 years	52	57.2	24	54.7	2.5	62	56.4	32	56.5	-0.1
15 years	57	59.4	29	65.8	-6.4	52	59.7	31	52.9	6.8
16 years	51	69.4	24	65.8	3.6	63	54.9	20	59.7	-4.8
17 years	64	69.7	21	70.4	-0.7	55	58.7	27	56.6	2.1

[1]Negative numbers indicate that mean weight for Negro children is greater than that for white children.

NOTE: *n*=examined children.

Table 8. Mean weight and differences in mean weight of children aged 1-17 years by sex and income level: United States, 1971-72 (HANES Preliminary)

Age	Boys					Girls				
	Income below poverty level		Income above poverty level		Difference in mean weight (kg.)[1]	Income below poverty level		Income above poverty level		Difference in mean weight (kg.)[1]
	n	Mean weight (kg.)	*n*	Mean weight (kg.)		*n*	Mean weight (kg.)	*n*	Mean weight (kg.)	
1 year----------	34	11.6	101	11.9	-0.3	43	11.5	98	10.7	0.8
2 years---------	56	13.7	89	13.3	0.4	42	12.5	97	12.9	-0.4
3 years---------	38	15.7	95	15.7	0.0	54	15.0	88	15.5	-0.5
4 years---------	50	17.4	113	17.8	-0.4	39	16.2	107	16.9	-0.7
5 years---------	43	20.6	94	20.0	0.6	46	19.3	117	20.1	-0.8
6 years---------	28	21.2	51	22.3	-1.1	29	21.1	58	21.8	-0.7
7 years---------	28	24.3	65	24.4	-0.1	34	23.9	56	24.5	-0.6
8 years---------	21	26.3	57	26.1	0.2	22	26.0	45	28.1	-2.1
9 years---------	34	29.8	62	33.4	-3.6	24	30.7	65	32.4	-1.7
10 years--------	23	30.9	59	34.8	-3.9	24	30.6	77	34.8	-4.2
11 years--------	24	37.5	61	37.7	-0.2	19	40.4	62	40.5	-0.1
12 years--------	20	39.2	76	45.7	-6.5	26	47.4	52	45.4	2.0
13 years--------	26	45.5	58	51.6	-6.1	24	50.4	73	53.8	-3.4
14 years--------	13	55.4	57	57.0	-1.6	27	56.1	64	56.8	-0.7
15 years--------	22	59.2	61	60.6	-1.4	25	55.5	53	58.5	-3.0
16 years--------	22	61.7	49	70.0	-8.3	18	51.8	60	56.6	-4.8
17 years--------	17	69.8	63	70.0	-0.2	21	61.5	59	58.3	3.2

[1] Negative numbers indicate that mean weight for the income group above poverty level is greater than that for the income group below poverty level.

NOTE: *n*=examined children.

Table 9. Median triceps skinfold and differences in median triceps skinfold of children aged 1-17 years by sex and race: United States, 1971-72 (HANES Preliminary)

Age	Boys					Girls				
	White		Negro		Difference in median triceps (mm.)[1]	White		Negro		Difference in median triceps (mm.)[1]
	n	Median triceps (mm.)	*n*	Median triceps (mm.)		*n*	Median triceps (mm.)	*n*	Median triceps (mm.)	
1 year----------	93	11.1	46	9.0	2.1	88	10.6	53	10.7	-0.1
2 years---------	90	9.9	56	10.5	-0.6	99	10.7	42	9.9	0.8
3 years---------	87	10.5	50	10.0	0.5	98	12.0	49	10.4	1.6
4 years---------	112	10.1	53	8.1	2.0	106	10.9	44	8.5	2.4
5 years---------	101	9.4	38	7.7	1.7	112	10.3	58	10.0	0.3
6 years---------	51	9.1	30	7.5	1.6	58	11.3	29	8.6	2.7
7 years---------	71	8.6	25	6.3	2.3	56	11.3	37	9.7	1.6
8 years---------	61	8.8	17	6.6	2.2	53	11.5	18	13.1	-1.6
9 years---------	66	10.6	34	8.0	2.6	66	14.4	26	7.6	6.8
10 years--------	68	10.3	17	8.3	2.0	69	13.1	34	10.8	2.3
11 years--------	59	10.2	30	6.6	3.6	60	13.1	27	13.1	0.0
12 years--------	74	10.8	27	7.6	3.2	50	15.1	33	14.8	0.3
13 years--------	57	10.4	31	7.6	2.8	71	15.7	27	15.7	0.0
14 years--------	[2]109	[2]9.4	[2]53	[2]8.2	[2]1.2	62	17.3	32	15.8	1.5
15 years--------						52	18.0	31	12.3	5.7
16 years--------	51	8.8	24	6.8	2.0	63	17.1	20	13.9	3.2
17 years--------	64	7.7	21	6.4	1.3	55	19.0	27	14.6	4.4

[1]Negative numbers indicate that the median triceps skinfold for Negro children is greater than that for white children.

[2]A pooled value necessitated by unreliable estimates computed from smaller groupings (see Standard of Reliability and Precision in appendix I).

NOTE: *n* =examined children.

Table 10. Median subscapular skinfold and differences in median subscapular skinfold of children aged 1-17 years by sex and race: United States, 1971-72 (HANES Preliminary)

Age	Boys					Girls				
	White		Negro		Difference in median subscapular (mm.)[1]	White		Negro		Difference in median subscapular (mm.)[1]
	n	Median sub-scap-ular (mm.)	*n*	Median sub-scap-ular (mm.)		*n*	Median sub-scap-ular (mm.)	*n*	Median sub-scap-ular (mm.)	
1 year----------	93	6.5	46	5.8	0.7	88	6.2	53	6.6	-0.4
2 years---------	90	5.4	56	5.8	-0.4	99	6.1	42	5.9	0.2
3 years---------	87	5.5	50	5.4	0.1	98	6.0	49	5.5	0.5
4 years---------	112	5.3	53	5.3	0.0	106	5.7	44	5.2	0.5
5 years---------	101	5.0	38	4.8	0.2	112	5.5	58	5.5	0.0
6 years---------	51	4.8	30	4.8	0.0	58	6.2	29	5.7	0.5
7 years---------	71	5.0	25	4.2	0.8	[2]109	[2]5.6	[2]55	[2]10.1	[2]-4.5
8 years---------	61	4.8	17	5.3	-0.5					
9 years---------	[2]134	[2]6.0	[2]51	[2]5.5	[2]0.5	66	7.6	26	5.2	2.4
10 years--------						69	6.9	34	6.5	0.4
11 years--------	59	6.2	30	5.7	0.5	60	7.8	27	10.4	-2.6
12 years--------	[2]131	[2]6.6	[2]58	[2]5.6	[2]1.0	50	8.9	33	7.3	1.6
13 years--------						71	10.2	27	12.0	-1.8
14 years--------	[2]109	[2]7.4	[2]53	[2]8.2	[2]-0.8	62	11.3	32	10.1	1.2
15 years--------						52	10.8	31	7.6	3.2
16 years--------	51	8.4	24	8.2	0.2	63	10.4	20	11.8	-1.4
17 years--------	64	8.3	21	8.7	-0.4	55	12.7	27	12.0	0.7

[1]Negative numbers indicate that the median subscapular skinfold for Negro children is greater than that for white children.

[2]A pooled value necessitated by unreliable estimates computed from smaller groupings (see Standard of Reliability and Precision in appendix I).

NOTE: *n* = examined children.

Table 11. Median triceps skinfold and differences in median triceps skinfold of children aged 1-17 years by sex and income level: United States, 1971-72 (HANES Preliminary)

Age	Boys					Girls				
	Income below poverty level		Income above poverty level		Difference in median triceps (mm.)[1]	Income below poverty level		Income above poverty level		Difference in median triceps (mm.)[1]
	n	Median triceps (mm.)	*n*	Median triceps (mm.)		*n*	Median triceps (mm.)	*n*	Median triceps (mm.)	
1 year----------	34	8.5	101	11.0	-2.5	43	10.6	98	10.6	0.0
2 years---------	56	9.0	89	10.3	-1.3	42	10.0	97	10.7	-0.7
3 years---------	38	10.2	95	10.5	-0.3	54	10.4	88	12.0	-1.6
4 years---------	50	10.2	113	9.6	0.6	39	10.7	107	10.7	0.0
5 years---------	43	9.8	94	9.2	0.6	46	10.0	117	10.3	-0.3
6 years---------	28	7.8	51	9.2	-1.4	29	10.2	58	10.7	-0.5
7 years---------	28	7.4	65	8.4	-1.0	34	9.5	56	11.2	-1.7
8 years---------	21	8.2	57	8.7	-0.5	22	8.7	45	13.2	-4.5
9 years---------	34	8.6	62	10.9	-2.3	24	10.4	65	14.4	-4.0
10 years--------	23	8.6	59	10.3	-1.7	24	10.8	77	13.1	-2.3
11 years--------	24	9.2	61	10.7	-1.5	19	10.8	62	13.4	-2.6
12 years--------	20	7.6	76	10.8	-3.2	26	20.2	52	14.2	6.0
13 years--------	26	8.8	58	10.3	-1.5	24	14.4	73	16.1	-1.7
14 years--------	13	8.2	57	9.3	-1.1	27	18.1	64	16.7	1.4
15 years--------	22	9.2	61	9.1	0.1	25	15.3	53	17.1	-1.8
16 years--------	22	6.8	49	9.0	-2.2	18	12.0	60	17.7	-5.7
17 years--------	17	11.2	63	7.6	3.6	21	17.7	59	18.8	-1.1

[1]Negative numbers indicate that median triceps skinfolds for the income group above poverty level are greater than that for the income group below poverty level.

NOTE: *n* = examined children.

Table 12. Median subscapular skinfold and differences in median subscapular skinfold of children aged 1-17 years by sex and income level: United States, 1971-72 (HANES Preliminary)

Age	Boys					Girls				
	Income below poverty level		Income above poverty level		Difference in median subscapular (mm.)[1]	Income below poverty level		Income above poverty level		Difference in median subscapular (mm.)[1]
	n	Median sub-scap-ular (mm.)	*n*	Median sub-scap-ular (mm.)		*n*	Median sub-scap-ular (mm.)	*n*	Median sub-scap-ular (mm.)	
1 year----------	34	6.3	101	6.4	-0.1	43	6.7	98	6.2	0.5
2 years---------	56	5.4	89	5.5	-0.1	42	5.6	97	6.2	-0.6
3 years---------	38	5.6	95	5.5	0.1	54	5.6	88	6.1	-0.5
4 years---------	50	5.6	113	5.2	0.4	39	5.2	107	5.6	-0.4
5 years---------	43	5.5	94	5.0	0.5	46	5.3	117	5.5	-0.2
6 years---------	28	4.8	51	4.8	0.0	29	6.3	58	6.1	0.2
7 years---------	28	4.6	65	5.0	-0.4	34	5.8	56	5.4	0.4
8 years---------	21	5.4	57	4.8	0.6	22	5.5	45	6.6	-1.1
9 years---------	34	4.7	62	6.6	-1.9	24	7.2	65	7.6	-0.4
10 years--------	23	5.5	59	6.1	-0.6	24	6.4	77	7.5	-1.1
11 years--------	24	5.7	61	6.3	-0.6	19	7.5	62	8.1	-0.6
12 years--------	20	5.7	76	6.1	-0.4	26	19.0	52	8.5	10.5
13 years--------	26	6.2	58	7.0	-0.8	24	10.8	73	10.5	0.3
14 years--------	13	6.7	57	7.2	-0.5	27	10.5	64	11.4	-0.9
15 years--------	22	8.3	61	7.6	0.7	25	9.5	53	10.6	-1.1
16 years--------	[2]39	[2]7.9	[2]112	[2]8.6	[2]-0.7	18	9.5	60	11.3	-1.8
17 years--------						21	17.2	59	12.4	4.8

[1]Negative numbers indicate that the median subscapular skinfolds for the income group above poverty level is greater than that for the income group below poverty level.

[2]A pooled value necessitated by unreliable estimates computed from smaller groupings (see Standard of Reliability and Precision in appendix I).

NOTE: *n* =examined children.

Table 13. Height of children aged 1-17 years by income level and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)

	Sex and age	All income						Income below poverty level[2]					
		Mean age[1]	*n*	*N*	Mean	Median	Standard error of mean	Mean age[1]	*n*	*N*	Mean	Median	Standard error of mean
					In centimeters						In centimeters		
	Boys												
1	1 year	1.55	140	1,772	83.6	83.2	0.66	1.55	34	308	82.7	82.8	1.07
2	2 years	2.45	146	1,530	90.7	89.9	0.64	2.47	56	438	91.0	90.6	0.92
3	3 years	3.46	144	1,573	98.6	97.8	0.60	3.44	38	220	98.1	97.6	1.03
4	4 years	4.49	165	2,046	106.2	106.5	0.42	4.50	50	373	104.0	104.6	1.94
5	5 years	5.53	140	1,681	112.8	112.9	0.69	5.57	43	322	113.2	112.8	1.38
6	6 years	6.46	82	1,796	117.9	117.8	0.83	6.59	28	616	115.1	116.4	1.83
7	7 years	7.47	96	2,754	124.8	124.6	0.71	7.43	28	690	124.0	124.2	1.20
8	8 years	8.46	79	1,745	129.0	128.9	0.77	8.46	21	313	127.4	126.5	1.59
9	9 years	9.46	100	2,234	134.6	135.2	1.02	9.40	34	616	130.5	131.2	1.75
10	10 years	10.52	87	2,154	140.3	139.6	0.75	10.60	23	267	136.7	136.1	0.97
11	11 years	11.48	89	1,908	146.1	144.6	0.86	11.50	24	458	145.4	144.1	1.85
12	12 years	12.56	101	2,251	154.1	153.2	1.04	12.49	20	238	148.6	147.6	1.58
13	13 years	13.48	88	1,894	160.4	159.0	1.19	13.47	26	390	156.2	153.9	2.70
14	14 years	14.46	77	2,015	166.3	166.5	0.88	14.46	13	190	166.2	165.5	2.72
15	15 years	15.50	90	2,294	170.2	171.0	0.90	15.56	22	286	170.6	169.7	0.97
16	16 years	16.52	75	1,795	176.4	176.6	1.29	16.54	22	260	174.0	174.7	2.14
17	17 years	17.51	86	2,259	177.8	177.6	0.63	17.46	17	220	173.9	174.7	0.77
	Girls												
18	1 year	1.49	142	1,509	80.9	81.0	0.87	1.54	43	253	82.5	83.6	1.22
19	2 years	2.45	142	1,647	90.1	89.7	0.51	2.50	42	269	89.0	88.6	0.80
20	3 years	3.50	149	1,534	98.3	97.9	0.50	3.52	54	369	98.0	98.4	0.57
21	4 years	4.54	151	1,785	105.9	104.5	1.62	4.58	39	325	103.2	104.1	1.28
22	5 years	5.55	170	1,801	112.6	111.9	0.41	5.56	46	290	110.9	112.6	1.32
23	6 years	6.47	87	1,885	118.4	117.8	0.76	6.50	29	461	117.8	117.6	1.45
24	7 years	7.51	93	2,135	125.3	125.1	0.74	7.49	34	501	125.1	125.1	0.68
25	8 years	8.47	71	1,716	129.3	128.8	0.83	8.44	22	376	126.8	124.7	1.54
26	9 years	9.52	93	2,070	136.0	135.2	0.76	9.59	24	195	135.1	135.1	1.32
27	10 years	10.47	103	2,403	140.0	140.1	1.30	10.44	24	421	136.8	138.4	4.73
28	11 years	11.55	87	2,033	148.4	148.2	1.18	11.57	19	332	145.5	143.9	2.26
29	12 years	12.49	85	1,742	153.7	152.6	0.83	12.48	26	355	151.2	148.7	1.48
30	13 years	13.52	99	2,389	160.0	160.7	0.70	13.52	24	320	157.5	158.2	1.48
31	14 years	14.50	95	2,189	162.0	162.4	0.87	14.53	27	407	163.4	163.6	1.06
32	15 years	15.48	83	1,997	164.5	164.7	1.36	15.49	25	303	164.4	164.5	2.45
33	16 years	16.55	83	2,062	161.3	159.6	1.23	16.60	18	380	157.2	157.3	1.91
34	17 years	17.46	83	1,860	160.8	161.4	1.41	17.49	21	245	161.3	163.0	2.48

Table 13. Height of children aged 1-17 years by income level and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)—Con.

Income above poverty level[2]						All incomes		Income below poverty level		Income above poverty level[2]		
Mean age[1]	n	N	Mean	Median	Standard error of mean	Mean	Median	Mean	Median	Mean	Median	
			In centimeters			In inches						
1.55	101	1,415	83.7	83.2	0.79	32.9	32.8	32.3	32.3	32.7	32.3	1
2.44	89	1,087	90.6	89.6	0.83	35.7	35.4	35.5	35.6	35.3	35.0	2
3.47	95	1,189	98.8	98.0	0.69	38.8	38.5	38.2	38.2	38.5	38.3	3
4.49	113	1,656	106.8	106.8	0.51	41.8	41.9	40.6	40.8	41.6	41.7	4
5.51	94	1,298	112.7	113.2	0.85	44.4	44.4	44.2	43.9	43.8	44.0	5
6.40	51	1,115	119.0	118.5	0.57	46.4	46.4	44.9	45.2	46.4	45.9	6
7.47	65	1,983	124.8	124.5	1.08	49.1	49.1	48.3	48.3	48.7	48.6	7
8.47	57	1,429	129.3	129.3	0.95	50.8	50.7	49.7	49.2	50.4	50.2	8
9.50	62	1,464	136.5	135.7	1.20	53.0	53.2	51.5	51.3	53.2	53.1	9
10.49	59	1,753	140.8	140.3	0.86	55.2	55.0	53.3	53.1	54.9	54.7	10
11.48	61	1,363	146.0	144.6	1.02	57.5	56.9	56.7	56.1	56.9	56.5	11
12.59	76	1,923	154.9	153.7	1.18	60.7	60.3	58.0	57.3	60.4	59.8	12
13.48	58	1,345	161.7	160.2	1.51	63.1	62.6	60.9	60.7	63.1	62.5	13
14.46	57	1,621	167.1	167.8	1.03	65.5	65.6	64.8	64.5	65.2	65.3	14
15.47	61	1,855	170.2	171.5	1.08	67.0	67.3	66.5	66.5	66.4	66.8	15
16.52	49	1,439	176.3	176.5	1.51	69.4	69.5	67.9	67.7	68.8	68.8	16
17.54	63	1,870	178.8	178.5	0.67	70.0	69.9	67.8	67.9	69.7	69.6	17
1.54	98	1,251	80.6	80.6	0.97	31.9	31.9	32.2	32.8	31.4	31.3	18
2.43	97	1,358	90.4	89.8	0.60	35.5	35.3	34.7	34.6	35.4	35.1	19
3.49	88	1,121	98.4	97.8	0.71	38.7	38.5	38.2	38.3	38.4	38.1	20
4.53	107	1,425	106.4	104.5	1.92	41.7	41.1	40.2	40.6	41.5	40.8	21
5.55	117	1,447	113.1	112.0	0.53	44.3	44.1	43.2	43.8	43.8	43.6	22
6.46	58	1,423	118.5	118.4	0.88	46.6	46.4	45.9	45.7	56.2	45.8	23
7.54	56	1,599	125.4	125.1	0.99	49.3	49.3	48.8	48.3	59.2	48.8	24
8.46	45	1,217	129.6	129.6	1.05	50.9	50.7	49.5	48.7	50.6	50.3	25
9.51	65	1,792	136.3	135.4	0.85	53.5	53.2	52.7	52.6	53.1	52.8	26
10.48	77	1,961	140.6	140.7	1.04	55.1	55.2	53.4	54.2	54.9	54.8	27
11.54	62	1,554	148.8	148.3	1.42	58.4	58.3	56.7	56.3	58.0	57.6	28
12.50	52	1,277	154.7	154.2	1.03	60.5	60.1	59.0	58.7	60.3	60.1	29
13.51	73	2,025	160.5	161.6	0.72	63.0	63.3	61.4	61.4	62.6	63.0	30
14.48	64	1,659	162.2	162.4	1.03	63.8	63.9	63.7	63.8	63.3	63.5	31
15.49	53	1,444	165.7	167.2	1.21	64.8	64.8	64.1	64.4	64.6	65.1	32
16.55	60	1,525	162.0	160.5	1.03	63.5	62.8	61.3	61.4	63.2	62.6	33
17.43	59	1,522	161.2	161.4	1.12	63.5	63.5	62.9	63.1	62.9	62.9	34

[1] Mean age at time of examination (in years).
[2] Excludes persons with unknown income.

NOTE: n=examined children; N=estimated population in thousands.

Table 14. Weight of children aged 1-17 years by income level and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)

	Sex and age	All income						Income below poverty level[2]					
		Mean age[1]	n	N	Mean	Median	Standard error of mean	Mean age[1]	n	N	Mean	Median	Standard error of mean
	Boys				In kilograms						In kilograms		
1	1 year	1.55	140	1,772	11.9	11.7	0.23	1.55	34	308	11.6	11.2	0.73
2	2 years	2.45	146	1,530	13.4	13.3	0.30	2.47	56	438	13.7	13.7	0.30
3	3 years	3.46	144	1,573	15.6	15.6	0.24	3.44	38	220	15.7	16.0	0.38
4	4 years	4.49	165	2,046	17.7	17.8	0.23	4.50	50	373	17.4	17.5	0.51
5	5 years	5.53	140	1,681	20.0	19.8	0.35	5.57	43	322	20.6	20.3	0.74
6	6 years	6.46	82	1,796	22.0	21.9	0.40	6.59	28	616	21.2	22.0	0.78
7	7 years	7.47	96	2,754	24.6	24.4	0.31	7.43	28	690	24.3	23.2	0.89
8	8 years	8.46	79	1,745	26.2	25.5	0.52	8.46	21	313	26.3	25.7	0.82
9	9 years	9.46	100	2,234	32.0	30.7	1.11	9.40	34	616	29.8	27.3	2.24
10	10 years	10.52	87	2,154	34.4	33.6	0.87	10.60	23	267	30.9	29.8	1.13
11	11 years	11.48	89	1,908	37.6	37.1	0.74	11.50	24	458	37.5	36.2	1.94
12	12 years	12.56	101	2,251	44.8	43.3	1.29	12.49	20	238	39.2	38.3	1.66
13	13 years	13.48	88	1,894	50.6	49.2	1.22	13.47	26	390	45.5	42.7	3.36
14	14 years	14.46	77	2,015	56.2	53.0	2.19	14.46	13	190	55.4	52.4	3.97
15	15 years	15.50	90	2,294	60.5	57.6	1.78	15.56	22	286	59.2	57.5	1.18
16	16 years	16.52	75	1,795	68.9	67.5	2.13	16.54	22	260	61.7	62.1	3.26
17	17 years	17.51	86	2,259	69.7	67.6	0.85	17.46	17	220	69.8	65.4	4.70
	Girls												
18	1 years	1.49	142	1,509	10.9	10.9	0.22	1.54	43	253	11.5	11.4	0.59
19	2 years	2.45	142	1,647	12.8	12.7	0.16	2.50	42	269	12.5	12.5	0.34
20	3 years	3.50	149	1,534	15.4	15.3	0.25	3.52	54	369	15.0	14.5	0.41
21	4 years	4.54	151	1,785	16.9	16.8	0.26	4.58	39	325	16.2	16.5	0.49
22	5 years	5.55	170	1,801	20.0	18.9	0.28	5.56	46	290	19.3	19.2	0.49
23	6 years	6.47	87	1,885	21.6	21.3	0.45	6.50	29	461	21.1	19.9	1.14
24	7 years	7.51	93	2,135	24.4	24.0	0.36	7.49	34	501	23.9	23.2	0.65
25	8 years	8.47	71	1,716	27.7	25.6	0.78	8.44	22	376	26.0	24.5	1.56
26	9 years	9.52	93	2,070	32.0	31.7	0.88	9.59	24	195	30.7	27.0	1.99
27	10 years	10.47	103	2,403	34.1	32.3	0.84	10.44	24	421	30.6	30.4	3.19
28	11 years	11.55	87	2,033	40.6	39.8	1.16	11.57	19	332	40.4	42.7	3.59
29	12 years	12.49	85	1,742	45.5	44.5	1.12	12.48	26	355	47.4	48.3	0.77
30	13 years	13.52	99	2,389	53.3	50.6	1.39	13.52	24	320	50.4	49.8	4.50
31	14 years	14.50	95	2,189	56.1	52.8	1.64	14.53	27	407	56.1	55.4	2.76
32	15 years	15.48	83	1,997	58.4	57.3	1.93	15.49	25	303	55.5	54.3	2.06
33	16 years	16.55	83	2,062	55.2	52.7	1.59	16.60	18	380	51.8	47.1	4.85
34	17 years	17.46	83	1,860	58.8	55.9	2.50	17.49	21	245	61.5	57.9	4.70

Table 14. Weight of children aged 1-17 years by income level and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)—Con.

Income above poverty level[2]						All incomes		Income below poverty level[2]		Income above poverty level[2]		
Mean age[1]	n	N	Mean	Median	Standard error of mean	Mean	Median	Mean	Median	Mean	Median	
			In kilograms			In pounds						
1.55	101	1,415	11.9	11.9	0.26	26.2	25.6	25.6	24.7	26.2	26.2	1
2.44	89	1,087	13.3	13.3	0.43	29.6	29.3	30.2	30.0	29.3	29.3	2
3.47	95	1,189	15.7	15.7	0.28	34.4	34.6	34.6	35.3	34.6	34.6	3
4.49	113	1,656	17.8	17.9	0.27	39.1	39.1	38.4	38.6	39.2	39.5	4
5.51	94	1,298	20.0	19.7	0.35	44.2	43.7	45.4	44.8	44.1	43.4	5
6.40	51	1,115	22.3	21.8	0.48	48.6	47.0	46.7	48.5	49.2	48.1	6
7.47	65	1,983	24.4	24.6	0.58	54.2	53.0	53.6	51.1	53.8	54.2	7
8.47	57	1,429	26.1	25.3	0.63	57.7	56.5	58.0	56.7	57.5	55.8	8
9.50	62	1,464	33.4	33.0	1.17	70.6	68.2	65.7	60.2	73.6	72.8	9
10.49	59	1,753	34.8	34.0	1.07	75.8	73.7	68.1	65.7	76.7	75.0	10
11.48	61	1,363	37.7	37.4	0.84	83.0	81.5	82.7	79.8	83.1	82.5	11
12.59	76	1,923	45.7	45.1	1.45	98.7	94.6	86.4	84.4	100.8	99.4	12
13.48	58	1,345	51.6	50.3	1.46	111.5	108.9	100.3	94.1	113.8	110.9	13
14.46	57	1,621	57.0	54.3	2.23	124.0	116.9	122.1	115.5	125.7	119.7	14
15.47	61	1,855	60.6	57.5	2.05	133.5	127.1	130.5	126.8	133.6	126.8	15
16.52	49	1,439	70.0	69.3	2.57	151.9	150.0	136.0	136.9	154.3	152.8	16
17.54	63	1,870	70.0	68.0	1.11	153.7	149.1	153.9	144.2	154.3	149.9	17
1.54	98	1,251	10.7	10.8	0.21	23.9	24.0	25.4	25.1	23.6	23.6	18
2.43	97	1,358	12.9	12.8	0.19	28.3	28.3	27.6	27.6	28.4	28.2	19
3.49	88	1,121	15.5	15.6	0.32	33.9	33.6	33.1	32.0	34.2	34.4	20
4.53	107	1,425	16.9	16.9	0.23	37.2	37.3	35.7	36.4	37.3	37.3	21
5.55	117	1,447	20.1	18.8	0.31	44.0	41.7	42.5	42.3	44.3	41.4	22
6.46	58	1,423	21.8	21.4	0.37	47.7	46.8	46.5	43.9	48.1	47.2	23
7.54	56	1,599	24.5	24.4	0.53	53.7	51.6	52.7	51.1	54.0	53.8	24
8.46	45	1,217	28.1	26.3	0.82	61.2	56.2	57.3	54.0	61.9	58.0	25
9.51	65	1,792	32.4	32.1	1.02	70.5	70.0	67.7	59.5	71.4	70.8	26
10.48	77	1,961	34.8	33.4	0.68	75.2	72.2	67.5	67.0	76.7	73.6	27
11.54	62	1,554	40.5	39.2	1.39	89.4	87.8	89.1	94.1	89.3	86.4	28
12.50	52	1,277	45.4	44.2	1.40	100.4	98.2	104.5	106.5	100.1	97.4	29
13.51	73	2,025	53.8	52.1	1.49	117.4	111.5	111.1	109.8	118.6	114.9	30
14.48	64	1,659	56.8	53.3	2.15	123.7	115.8	123.7	122.1	125.2	117.5	31
15.49	53	1,444	58.5	57.0	2.95	128.7	126.4	122.4	119.7	129.0	125.7	32
16.55	60	1,525	56.6	55.2	1.52	121.7	116.4	114.2	103.8	124.9	121.7	33
17.43	59	1,522	58.3	54.8	2.52	129.6	123.0	135.6	127.6	128.5	120.8	34

[1]Mean age at time of examination (in years).
[2]Excludes persons with unknown income.

NOTE: n = examined children; N= estimated population in thousands.

Table 15. Triceps skinfold of children aged 1-17 years by income level and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)

	Sex and age	All income						Income below poverty level[2]		
		Mean age[1]	n	N	Mean	Median	Standard error of mean	Mean age[1]	n	N
	Boys				In millimeters					
1	1 year	1.55	140	1,772	10.7	10.7	0.43	1.55	34	308
2	2 years	2.45	146	1,530	10.1	10.2	0.32	2.47	56	438
3	3 years	3.46	144	1,573	9.9	10.4	0.33	3.44	38	220
4	4 years	4.49	165	2,046	9.5	9.8	0.33	4.50	50	373
5	5 years	5.53	140	1,681	9.3	9.2	0.36	5.57	43	322
6	6 years	6.46	82	1,796	8.8	8.6	0.49	6.59	28	616
7	7 years	7.47	96	2,754	8.7	8.3	0.34	7.43	28	690
8	8 years	8.46	79	1,745	8.9	8.6	0.45	8.46	21	313
9	9 years	9.46	100	2,234	11.0	10.2	0.55	9.40	34	616
10	10 years	10.52	87	2,154	10.4	10.0	0.49	10.60	23	267
11	11 years	11.48	89	1,908	10.8	9.6	0.61	11.50	24	458
12	12 years	12.56	101	2,251	11.2	10.5	0.51	12.49	20	238
13	13 years	13.48	88	1,894	11.3	10.2	0.96	13.47	26	390
14	14 years	14.46	77	2,015	10.2	8.9	0.92	14.46	13	190
15	15 years	15.50	90	2,294	10.9	9.3	0.89	15.56	22	286
16	16 years	16.52	75	1,795	9.8	8.4	0.83	16.54	22	260
17	17 years	17.51	86	2,259	9.0	7.6	0.75	17.46	17	220
	Girls									
18	1 years	1.49	142	1,509	10.3	10.6	0.43	1.54	43	253
19	2 years	2.45	142	1,647	10.4	10.5	0.28	2.50	42	269
20	3 years	3.50	149	1,534	11.3	11.8	0.36	3.52	54	369
21	4 years	4.54	151	1,785	10.5	10.7	0.29	4.58	39	325
22	5 years	5.55	170	1,801	10.7	10.3	0.29	5.56	46	290
23	6 years	6.47	87	1,885	10.2	10.7	0.42	6.50	29	461
24	7 years	7.51	93	2,135	10.7	10.9	0.59	7.49	34	501
25	8 years	8.47	71	1,716	12.8	11.6	0.70	8.44	22	376
26	9 years	9.52	93	2,070	13.5	13.4	0.61	9.59	24	195
27	10 years	10.47	103	2,403	13.4	12.6	0.52	10.44	24	421
28	11 years	11.55	87	2,033	13.9	13.1	0.83	11.57	19	332
29	12 years	12.49	85	1,742	14.8	15.1	0.56	12.48	26	355
30	13 years	13.52	99	2,389	16.6	15.7	0.87	13.52	24	320
31	14 years	14.50	95	2,189	17.6	17.1	0.83	14.53	27	407
32	15 years	15.48	83	1,997	17.6	17.2	1.05	15.49	25	303
33	16 years	16.55	83	2,062	17.8	17.1	1.25	16.60	18	380
34	17 years	17.46	83	1,860	19.7	18.9	1.42	17.49	21	245

Table 15. Triceps skinfold of children aged 1-17 years by income level and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)—Con.

Income below poverty level—Con.[2]			Income above poverty level[2]						
Mean	Median	Standard error of mean	Mean age[1]	n	N	Mean	Median	Standard error of mean	
In millimeters						In millimeters			
9.8	8.5	1.36	1.55	101	1,415	10.9	11.0	0.46	1
10.6	9.0	1.25	2.44	89	1,087	9.9	10.3	0.42	2
9.2	10.2	0.54	3.47	95	1,189	10.2	10.5	0.38	3
9.6	10.2	0.29	4.49	113	1,656	9.5	9.6	0.43	4
9.1	9.8	1.09	5.51	94	1,298	9.4	9.2	0.38	5
7.8	7.8	0.55	6.40	51	1,115	9.4	9.2	0.66	6
7.8	7.4	0.61	7.47	65	1,983	8.8	8.4	0.44	7
8.1	8.2	0.70	8.47	57	1,429	9.1	8.7	0.61	8
9.9	8.6	1.28	9.50	62	1,464	11.9	10.9	0.75	9
9.4	8.6	0.85	10.49	59	1,753	10.7	10.3	0.51	10
8.8	9.2	0.41	11.48	61	1,363	11.5	10.7	0.87	11
9.4	7.6	1.61	12.59	76	1,923	11.6	10.8	0.49	12
9.8	8.8	1.19	13.48	58	1,345	11.5	10.3	1.42	13
9.3	8.2	1.98	14.46	57	1,621	10.5	9.3	1.02	14
10.5	9.2	1.72	15.47	61	1,855	10.8	9.1	0.96	15
6.9	6.8	0.81	16.52	49	1,439	10.4	9.0	1.05	16
11.0	11.2	2.29	17.54	63	1,870	8.9	7.6	0.61	17
10.2	10.6	0.67	1.54	98	1,251	10.3	10.6	0.46	18
9.9	10.0	0.62	2.43	97	1,358	10.6	10.7	0.27	19
10.0	10.4	0.85	3.49	88	1,121	11.8	12.0	0.44	20
10.0	10.7	0.58	4.53	107	1,425	10.6	10.7	0.33	21
10.4	10.0	0.93	5.55	117	1,447	10.7	10.3	0.32	22
9.9	10.2	0.98	6.46	58	1,423	10.3	10.7	0.39	23
9.6	9.5	0.82	7.54	56	1,599	11.1	11.2	1.02	24
10.3	8.7	1.13	8.46	45	1,217	13.5	13.2	0.81	25
11.2	10.4	1.35	9.51	65	1,792	13.9	14.4	0.72	26
10.9	10.8	1.28	10.48	77	1,961	13.9	13.1	0.60	27
14.2	10.8	2.56	11.54	62	1,554	13.8	13.4	0.84	28
18.4	20.2	1.19	12.50	52	1,277	13.8	14.2	0.56	29
15.2	14.4	1.06	13.51	73	2,025	16.8	16.1	1.03	30
17.9	18.1	2.73	14.48	64	1,659	17.6	16.7	0.99	31
15.9	15.3	0.95	15.49	53	1,444	16.8	17.1	1.44	32
14.9	12.0	2.14	16.55	60	1,525	18.9	17.7	1.57	33
20.4	17.7	3.12	17.43	59	1,522	19.6	18.8	1.47	34

[1] Mean age at time of examination (in years).
[2] Excludes persons with unknown incomes.

NOTE: n = examined children; N = estimated population in thousands.

Table 16. Subscapular skinfold of children aged 1-17 years by income level and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)

	Sex and age	All income						Income below poverty level[2]		
		Mean age[1]	*n*	*N*	Mean	Median	Standard error of mean	Mean age[1]	*n*	*N*
					In millimeters					
	Boys									
1	1 year	1.55	140	1,772	6.4	6.4	0.25	1.55	34	308
2	2 years	2.45	146	1,530	5.5	5.5	0.28	2.47	56	438
3	3 years	3.46	144	1,573	5.5	5.5	0.29	3.44	38	220
4	4 years	4.49	165	2,046	5.2	5.3	0.22	4.50	50	373
5	5 years	5.53	140	1,681	5.0	5.0	0.18	5.57	43	322
6	6 years	6.46	82	1,796	5.1	4.8	0.27	6.59	28	616
7	7 years	7.47	96	2,754	5.4	4.8	0.38	7.43	28	690
8	8 years	8.46	79	1,745	5.0	4.9	0.26	8.46	21	313
9	9 years	9.46	100	2,234	7.7	5.8	0.72	9.40	34	616
10	10 years	10.52	87	2,154	7.2	5.9	0.62	10.60	23	267
11	11 years	11.48	89	1,908	7.1	6.1	0.51	11.50	24	458
12	12 years	12.56	101	2,251	7.7	6.0	0.53	12.49	20	238
13	13 years	13.48	88	1,894	8.9	6.8	1.05	13.47	26	390
14	14 years	14.46	77	2,015	8.8	7.0	1.16	14.46	13	190
15	15 years	15.50	90	2,294	10.4	7.7	0.79	15.56	22	286
16	16 years	16.52	75	1,795	10.4	8.4	0.94	[3]17.0	[3]39	[3]480
17	17 years	17.51	86	2,259	10.0	8.3	0.66			
	Girls									
18	1 year	1.49	142	1,509	6.2	6.3	0.35	1.54	43	253
19	2 years	2.45	142	1,647	6.1	6.1	0.21	2.50	42	269
20	3 years	3.50	149	1,534	5.9	5.9	0.25	3.52	54	369
21	4 years	4.54	151	1,785	5.6	5.6	0.16	4.58	39	325
22	5 years	5.55	170	1,801	6.3	5.5	0.31	5.56	46	290
23	6 years	6.47	87	1,885	6.2	6.2	0.53	6.50	29	461
24	7 years	7.51	93	2,135	6.0	5.5	0.45	7.49	34	501
25	8 years	8.47	71	1,716	8.2	5.9	0.63	8.44	22	376
26	9 years	9.52	93	2,070	8.3	7.4	0.66	9.59	24	195
27	10 years	10.47	103	2,403	9.2	6.8	0.68	10.44	24	421
28	11 years	11.55	87	2,033	10.0	8.1	0.94	11.57	19	332
29	12 years	12.49	85	1,742	11.0	8.9	0.98	12.48	26	355
30	13 years	13.52	99	2,389	12.7	10.5	0.91	13.52	24	320
31	14 years	14.50	95	2,189	13.8	10.8	0.98	14.53	27	407
32	15 years	15.48	83	1,997	12.6	10.5	1.12	15.49	25	303
33	16 years	16.55	83	2,062	13.4	10.6	1.46	16.60	18	380
34	17 years	17.46	83	1,860	15.9	12.7	1.48	17.49	21	245

Table 16. Subscapular skinfold of children aged 1-17 years by income level and sex: number of children, mean age, mean, median, and standard error of the mean, United States, 1971-72 (HANES Preliminary)—Con.

Income below poverty level[2]—Con.			Income above poverty level[2]						
Mean[1]	Median	Standard error of mean	Mean age	n	N	Mean[1]	Median	Standard error of mean	
In millimeters						In millimeters			
6.5	6.3	0.77	1.55	101	1,415	6.4	6.4	0.24	1
5.5	5.4	0.62	2.44	89	1,087	5.5	5.5	0.31	2
5.6	5.6	0.33	3.47	95	1,189	5.6	5.5	0.33	3
5.2	5.6	0.24	4.49	113	1,656	5.2	5.2	0.26	4
5.4	5.5	0.61	5.51	94	1,298	4.9	5.0	0.16	5
4.7	4.8	0.28	6.40	51	1,115	5.4	4.8	0.36	6
5.3	4.6	0.63	7.47	65	1,983	5.2	5.0	0.47	7
5.0	5.4	0.44	8.47	57	1,429	5.0	4.8	0.31	8
7.6	4.7	1.53	9.50	62	1,464	8.0	6.6	0.78	9
5.7	5.5	0.61	10.49	59	1,753	7.5	6.1	0.75	10
6.7	5.7	1.43	11.48	61	1,363	7.3	6.3	0.60	11
7.4	5.7	1.23	12.59	76	1,923	7.9	6.1	0.59	12
7.9	6.2	1.93	13.48	58	1,345	9.0	7.0	1.21	13
8.5	6.7	1.98	14.46	57	1,621	9.0	7.2	1.28	14
8.6	8.3	0.80	15.47	61	1,855	10.5	7.6	0.79	15
[3]9.8	[3]7.9	[3]1.86	16.52	49	1,439	11.1	8.7	1.14	16
			17.54	63	1,870	10.0	8.4	0.63	17
6.6	6.7	0.56	1.54	98	1,251	6.2	6.2	0.38	18
5.9	5.6	0.44	2.43	97	1,358	6.2	6.2	0.23	19
5.8	5.6	0.83	3.49	88	1,121	5.9	6.1	0.27	20
5.3	5.2	0.33	4.53	107	1,425	5.7	5.6	0.18	21
5.8	5.3	0.86	5.55	117	1,447	6.3	5.5	0.35	22
5.7	6.3	0.76	6.46	58	1,423	6.4	6.1	0.65	23
6.2	5.8	0.44	7.54	56	1,599	6.0	5.4	0.63	24
7.3	5.5	1.49	8.46	45	1,217	8.5	6.6	0.86	25
8.1	7.2	1.44	9.51	65	1,792	8.4	7.6	0.75	26
6.4	6.4	0.81	10.48	77	1,961	9.6	7.5	0.74	27
9.4	7.5	1.91	11.54	62	1,554	10.1	8.1	1.26	28
16.7	19.0	2.72	12.50	52	1,277	9.5	8.5	0.67	29
12.0	10.8	1.90	13.51	73	2,025	12.9	10.5	1.04	30
13.0	10.5	2.13	14.48	64	1,659	14.2	11.4	1.27	31
10.9	9.5	0.92	15.49	53	1,444	12.9	10.6	1.57	32
13.7	9.5	2.38	16.55	60	1,525	13.9	11.3	1.68	33
17.4	17.2	3.26	17.43	59	1,522	15.4	12.4	1.60	34

[1]Mean age at time of examination (in years).
[2]Excludes persons with unknown incomes.
[3]A pooled value necessitated by unreliable estimates computed from smaller groupings (see "Standards of Reliability and Precision" in appendix I).

NOTE: n =examined children; N=estimated population in thousands.

Table 17. Number and percent of obese adults aged 20-74 years by race, sex, and income level: United States, 1971-72 (HANES Preliminary)

Age and race	Male					
	All incomes		Income below poverty level[1]		Income above poverty level[1]	
	Number	Percent	Number	Percent	Number	Percent
20-44 years						
White	712	16.0	54	9.3	629	17.0
Negro	180	10.6	46	10.9	124	11.3
45-74 years						
White	1,141	13.4	162	15.4	916	13.3
Negro	349	7.7	136	5.1	186	9.7

Age and race	Female					
	All incomes		Income below poverty level[1]		Income above poverty level[1]	
	Number	Percent	Number	Percent	Number	Percent
20-44 years						
White	1,602	18.9	171	25.1	1,363	18.6
Negro	554	29.2	226	35.0	300	25.0
45-74 years						
White	1,216	24.7	206	29.6	937	24.7
Negro	349	32.4	143	32.9	185	32.4

[1]Excludes persons with unknown income.

Table 18. Clinical findings for persons aged 1-74 years by race, sex, and income level: number of persons and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
Both sexes									
n	10,126	7,355	2,666	2,264	1,041	1,203	7,410	6,005	1,326
N	192,726	168,615	22,691	24,748	15,556	8,914	158,982	145,295	12,620
Protein									
Hepatomegaly (M)	1.4	1.5	1.2	1.0	1.0	1.6	1.4	1.5	1.0
Potbelly (M)	-	-	-	-	-	-	-	-	-
Riboflavin									
Magenta tongue (H)	-	-	-	-	-	-	-	-	-
Angular lesions of lips (H)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Angular scars of lips (H)	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0
Cheilosis (M)	1.0	1.0	1.1	1.0	1.0	1.0	1.0	0.0	1.2
Nasolabial seborrhea (M)	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0
Conjunctival injection (L)	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0
Niacin									
Filiform papillary atrophy of tongue (H)	1.8	1.9	1.6	1.3	1.3	1.3	1.9	1.9	1.9
Scarlet beefy tongue (H)	0.0	0.0	0.0	0.0	1.0	-	0.0	0.0	-
Fungiform papillary hypertrophy of tongue (M)	4.2	3.6	8.1	4.7	3.0	7.6	4.0	3.6	9.0
Fissures of tongue (M)	4.5	4.6	3.9	3.8	4.2	3.2	4.6	4.6	4.3
Serrations or swelling of tongue (L)	5.6	5.8	4.1	3.3	3.1	3.2	6.0	6.1	4.8
Thiamine									
Absent knee jerks (M)	1.0	1.0	2.1	1.3	1.0	2.1	1.0	1.0	2.1
Absent ankle jerks (M)	1.7	1.5	3.1	1.8	1.1	3.2	1.5	1.4	3.0
Vitamin D									
Bowed legs (M)	3.3	3.1	5.4	3.7	2.4	6.0	3.3	3.1	5.4
Knock knees (M)	1.3	1.1	3.1	2.2	1.7	3.0	1.2	1.0	3.3
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)	4.0	3.9	4.9	6.0	5.9	6.2	3.8	3.8	3.9
Follicular hyperkeratosis of upper back (L)	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0
Dry or scaling skin (L)	2.5	2.3	3.8	3.0	2.0	4.7	2.2	2.1	3.2
Vitamin C									
Bleeding and swollen gums (M)	2.5	2.2	4.7	3.3	2.8	4.2	2.5	2.2	5.3
Swollen red papillae (L)	6.5	5.6	12.3	9.6	8.6	11.0	6.1	5.4	13.9
Diffuse marginal inflammation (L)	17.6	15.6	30.4	26.1	20.5	35.3	16.3	15.2	28.1
Iodine									
Thyroid enlargement, Group I (M)	3.7	3.7	3.9	2.7	2.3	3.4	4.0	4.0	4.5
Thyroid enlargement, Group II (H)	1.0	1.0	2.1	1.0	1.0	1.3	1.0	1.0	2.9
Calcium									
Positive Chvostek's sign (M)	6.8	6.5	9.3	8.0	7.0	10.1	6.6	6.4	9.3
Male									
n	4,329	3,163	1,112	932	431	489	3,206	2,602	565
N	93,512	82,144	10,504	11,297	7,052	4,055	78,055	71,578	5,816
Protein									
Hepatomegaly (M)	2.2	2.3	2.2	1.4	1.0	3.0	2.2	2.3	1.5
Potbelly	-	-	-	-	-	-	-	-	-
Riboflavin									
Magenta tongue (H)	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0
Angular lesions of lips (H)	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0
Angular scars of lips (H)	0.0	0.0	0.0	1.0	1.1	0.0	0.0	0.0	1.0
Cheilosis (M)	0.0	0.0	1.1	1.0	1.0	1.7	0.0	0.0	1.0
Nasolabial seborrhea (M)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Conjunctival injection (L)	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	-
Niacin									
Filiform papillary atrophy of tongue (H)	1.7	1.8	1.7	1.8	1.6	2.2	1.6	1.7	1.3
Scarlet beefy tongue (H)	0.0	0.0	-	1.0	1.0	-	0.0	0.0	-
Fungiform papillary hypertrophy of tongue (M)	3.3	3.0	5.4	2.6	2.3	3.0	3.4	3.0	7.4
Fissures of tongue (M)	4.1	4.2	3.7	3.8	4.2	3.1	4.1	4.1	4.1
Serrations or swelling of tongue (L)	5.2	5.1	5.7	3.1	2.6	4.0	5.5	5.3	6.8
Thiamine									
Absent knee jerks (M)	1.0	1.0	2.6	1.2	0.0	3.1	1.0	1.0	2.4
Absent ankle jerks (M)	1.4	1.2	3.2	1.6	1.0	3.6	1.3	1.1	3.0

See footnotes at end of table.

Table 18. Clinical findings for persons aged 1-74 years by race, sex, and income level: number of persons and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)—Con.

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
Male—Con.									
Vitamin D									
Bowed legs (M)	5.1	5.0	6.8	6.3	4.1	10.3	5.0	5.0	4.9
Knock knees (M)	1.1	1.0	2.5	2.6	2.2	3.4	1.0	1.0	2.2
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)	3.0	2.9	4.2	4.9	4.5	5.3	2.9	2.8	3.5
Follicular hyperkeratosis of upper back (L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dry or scaling skin (L)	1.3	1.0	4.6	3.3	1.9	6.0	1.0	1.0	3.9
Vitamin C									
Bleeding and swollen gums (M)	2.7	2.3	6.2	4.2	3.2	6.1	2.5	2.2	6.6
Swollen red papillae (L)	7.6	6.6	15.5	10.2	9.1	12.6	7.3	6.4	18.5
Diffuse marginal inflammation (L)	18.8	16.4	35.0	26.4	20.1	37.7	17.8	16.1	35.0
Iodine									
Thyroid enlargement, Group I (M)	2.1	2.2	2.0	2.1	2.1	2.2	2.2	2.2	1.9
Thyroid enlargement, Group II (H)	0.0	0.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0
Calcium									
Positive Chvostek's sign (M)	4.8	4.6	6.9	6.0	4.1	9.6	4.6	4.6	5.3
Female									
n	5,797	4,192	1,554	1,332	610	714	4,204	3,403	761
N	99,214	86,470	12,188	13,451	8,504	4,858	80,927	73,718	6,804
Protein									
Hepatomegaly (M)	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Potbelly (M)	-	-	-	-	-	-	-	-	-
Riboflavin									
Magenta tongue (H)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Angular lesions of lips (H)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Angular scars of lips (H)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cheilosis (M)	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.5
Nasolabial seborrhea (M)	1.2	1.1	1.0	1.0	1.1	0.0	1.3	1.2	0.0
Conjunctival injection (L)	0.0	0.0	-	-	-	-	0.0	0.0	-
Niacin									
Filiform papillary atrophy of tongue (H)	2.0	2.0	1.5	1.0	1.1	0.0	2.1	2.1	2.3
Scarlet beefy tongue (H)	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-
Fungiform papillary hypertrophy of tongue (M)	5.0	4.2	10.5	6.4	3.6	11.5	4.7	4.1	10.4
Fissures of tongue (M)	4.9	5.0	4.0	3.8	4.1	3.4	5.0	5.1	4.5
Serrations or swelling of tongue (L)	6.1	6.5	2.7	3.6	3.5	2.6	6.5	6.9	3.0
Thiamine									
Absent knee jerks (M)	1.0	1.0	1.7	1.3	1.3	1.3	1.0	1.0	1.9
Absent ankle jerks (M)	2.0	1.8	3.0	2.0	1.5	2.9	1.7	1.6	3.0
Vitamin D									
Bowed legs (M)	1.6	1.3	4.2	1.5	1.0	2.3	1.7	1.3	5.7
Knock knees (M)	1.5	1.2	3.7	1.8	1.4	2.7	1.5	1.2	4.3
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)	5.0	4.9	5.5	7.0	7.0	6.9	4.6	4.7	4.3
Follicular hyperkeratosis of upper back (L)	0.0	0.0	1.1	0.0	-	1.1	1.0	0.0	1.1
Dry or scaling skin (L)	3.6	3.7	3.0	2.7	2.2	3.6	3.5	3.6	2.5
Vitamin C									
Bleeding and swollen gums (H)	2.4	2.2	3.3	2.4	2.4	2.5	2.4	2.2	4.1
Swollen red papillae (H)	5.4	4.7	9.5	9.0	8.1	9.6	4.9	4.4	9.8
Diffuse marginal inflammation (M)	16.4	14.9	26.2	25.7	20.9	33.1	14.9	14.2	21.9
Iodine									
Thyroid enlargement, Group I (M)	5.2	5.2	5.6	3.1	2.4	4.4	5.8	5.7	6.7
Thyroid enlargement, Group II (H)	1.4	1.1	3.4	1.2	1.0	1.8	1.5	1.2	4.8
Calcium									
Positive Chvostek's sign (M)	8.6	8.2	11.5	9.7	9.3	10.5	8.6	8.2	12.7

[1] Total includes all races.
[2] Excludes persons with unknown income.

NOTES: n = examined persons; N = estimated population in thousands.

(H) = high risk indicator of possible deficiency; (M) = moderate risk indicator of possible deficiency; (L) = low risk indicator of possible deficiency.

Table 19. Clinical findings for children aged 1-5 years by race and income level: number of children and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
n	1,489	986	489	448	180	265	1,010	791	208
N	16,877	14,193	2,570	3,183	1,915	1,252	13,344	12,019	1,229
Protein									
Hepatomegaly (M)	0.0	0.0	0.0	0.0	-	0.0	1.0	1.0	0.0
Potbelly (M)	0.0	0.0	1.2	1.0	0.0	1.6	0.0	0.0	1.0
Riboflavin									
Magenta tongue (H)	-	-	-	-	-	-	-	-	-
Angular lesions of lips (H)	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-
Angular scars of lips (H)	-	-	-	-	-	-	-	-	-
Cheilosis (M)	0.0	0.0	-	-	-	-	0.0	0.0	-
Nasolabial seborrhea (M)	0.0	0.0	-	-	-	-	0.0	0.0	-
Conjunctival injection (L)	0.0	0.0	-	-	-	-	0.0	0.0	-
Niacin									
Filiform papillary atrophy of tongue (H)	1.0	1.0	0.0	1.0	1.1	1.0	1.0	1.0	-
Scarlet beefy tongue (H)	-	-	-	-	-	-	-	-	-
Fungiform papillary hypertrophy of tongue (M)	1.9	1.5	4.2	3.4	1.1	6.1	1.6	1.6	2.3
Fissures of tongue (M)	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Serrations or swelling of tongue (L)	0.0	-	0.0	0.0	-	0.0	-	-	-
Thiamine									
Absent knee jerks (M)	1.0	0.0	1.0	1.0	1.0	0.0	1.0	0.0	1.4
Absent ankle jerks (M)	1.0	0.0	1.0	1.0	1.0	0.0	1.0	0.0	1.4
Vitamin D									
Bowed legs (M)	1.0	0.0	2.9	1.8	0.0	4.4	0.0	0.0	1.5
Knock knees (M)	4.6	4.5	5.4	5.8	5.7	6.0	4.4	4.4	4.7
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)	2.3	2.2	3.2	5.2	5.2	5.2	1.7	1.7	1.5
Follicular hyperkeratosis of upper back (L)	0.0	-	0.0	0.0	-	0.0	-	-	-
Dry or scaling skin (L)	0.0	0.0	1.9	1.0	-	1.3	0.0	0.0	2.6
Vitamin C									
Bleeding and swollen gums (M)	-	-	-	-	-	-	-	-	-
Swollen red papillae (L)	0.0	-	0.0	-	-	-	0.0	-	0.0
Diffuse marginal inflammation (L)	0.0	0.0	0.0	-	-	-	1.0	1.0	0.0
Iodine									
Thyroid enlargement, Group I (M)	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	-
Group II (H)	0.0	-	1.0	1.0	-	1.4	-	-	-
Calcium									
Positive Chvostek's sign (M)	2.4	2.5	1.7	1.0	0.0	1.1	2.7	2.7	2.4

[1] Total includes all races.
[2] Excludes persons with unknown income.

NOTES: *n* = examined children; *N* = estimated population in thousands.

(H) = high risk indicator of possible deficiency; (M) = moderate risk indicator of possible deficiency; (L) = low risk indicator of possible deficiency.

Table 20. Clinical findings for children aged 6-11 years by race and income level: number of children and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
n	1,067	738	324	312	133	177	721	587	131
N	24,835	21,056	3,690	5,294	3,415	1,831	18,695	17,050	1,602
Protein									
Hepatomegaly (M)	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-
Potbelly (M)	-	-	-	-	-	-	-	-	-
Riboflavin									
Magenta tongue (H)	-	-	-	-	-	-	-	-	-
Angular lesions of lips (H)	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0
Angular scars of lips (H)	0.0	0.0	0.0	-	-	-	0.0	0.0	2.7
Cheilosis (M)	1.3	1.2	1.7	1.6	2.5	-	1.3	1.0	4.0
Nasolabial seborrhea (M)	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-
Conjunctival injection (L)	0.0	0.0	-	-	-	-	0.0	0.0	-
Niacin									
Filiform papillary atrophy of tongue (H)	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
Scarlet beefy tongue (H)	-	-	-	-	-	-	-	-	-
Fungiform papillary hypertrophy of tongue (M)	4.2	3.9	6.4	3.7	4.2	2.8	4.5	3.9	11.0
Fissures of tongue (M)	0.0	0.0	1.0	1.0	1.0	1.2	0.0	0.0	1.0
Serrations or swelling of tongue (L)	0.0	-	0.0	0.0	-	0.0	-	-	-
Thiamine									
Absent knee jerks (M)	0.0	0.0	1.0	0.0	0.0	0.0	1.0	1.0	1.0
Absent ankle jerks (M)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vitamin D									
Bowed legs (M)	1.4	1.5	1.0	0.0	-	1.0	1.5	1.6	1.0
Knock knees (M)	3.0	2.8	4.0	2.9	2.6	3.6	3.2	3.0	5.2
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)	6.7	6.0	9.8	10.6	7.9	14.6	5.6	5.9	2.6
Follicular hyperkeratosis of upper back (L)	0.0	0.0	1.1	-	-	-	1.0	0.0	2.2
Dry or scaling skin(L)	2.1	1.0	8.5	4.3	3.1	6.8	1.4	0.0	11.6
Vitamin C									
Bleeding and swollen gums (M)	1.0	1.0	-	0.0	0.0	-	1.0	1.0	-
Swollen red papillae((L)	1.1	1.0	2.5	1.5	1.0	2.4	1.1	1.0	3.0
Diffuse marginal inflammation (L)	4.3	4.2	4.6	5.0	3.6	7.8	4.3	4.5	1.0
Iodine									
Thyroid enlargement Group									
Group I (M)	4.4	4.3	5.0	2.6	1.0	6.3	5.1	5.1	4.4
Group II (H)	0.0	0.0	0.0	0.0	-	0.0	1.0	1.0	1.0
Calcium									
Positive Chvostek's sign (M)	4.8	4.6	6.6	6.2	5.6	7.6	4.7	4.5	6.4

[1]Total includes all races.
[2]Excludes persons with unknown income.

NOTES: *n* = examined persons; *N* = estimated population in thousands.

(H) = high risk indicator of possible deficiency; (M) = moderate risk indicator of possible deficiency; (L) = low risk indicator of possible deficiency.

Table 21. Clinical findings for children aged 12-17 years by race and income level: number of children and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
n	1,045	708	326	264	93	168	732	582	143
N	24,747	21,051	3,432	3,626	2,023	1,571	19,694	17,820	1,684
Protein									
Hepatomegaly (M)	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-
Potbelly (M)	-	-	-	-	-	-	-	-	-
Riboflavin									
Magenta tongue (H)	-	-	-	-	-	-	-	-	-
Angular lesions of lips (H)	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0
Angular scars of lips (H)	1.0	1.0	0.0	0.0	-	0.0	1.0	1.0	-
Cheilosis (M)	1.0	1.0	1.0	0.0	-	1.1	1.0	1.0	0.0
Nasolabial seborrhea (M)	2.8	3.0	1.0	3.8	6.8	-	2.4	2.4	1.0
Conjunctival injection (L)	0.0	0.0	-	1.1	1.9	-	0.0	0.0	-
Niacin									
Filiform papillary atrophy of tongue (H)	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0
Scarlet beefy tongue (H)	-	-	-	-	-	-	-	-	-
Fungiform papillary hypertrophy of tongue (M)	8.3	7.1	13.8	11.5	6.1	18.6	7.8	7.2	10.4
Fissures of tongue (M)	1.5	1.3	2.1	3.0	2.8	3.2	1.3	1.2	1.0
Serrations or swelling of tongue (L)	1.6	1.6	1.4	1.0	0.0	1.1	1.9	1.9	1.9
Thiamine									
Absent knee jerks (M)	0.0	0.0	1.0	0.0	-	1.0	1.0	0.0	1.0
Absent ankle jerks (M)	0.0	-	0.0	-	-	-	0.0	-	0.0
Vitamin D									
Bowed legs (M)	2.8	2.4	5.8	1.9	0.0	4.3	2.9	2.5	7.8
Knock knees (M)	1.1	1.0	3.3	0.0	0.0	1.0	1.1	1.0	5.8
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)	7.9	8.3	5.6	8.8	10.6	6.5	7.3	7.6	5.1
Follicular hyperkeratosis of upper back (L)	1.1	1.0	1.7	1.4	0.0	2.7	1.1	1.1	1.0
Dry or scaling skin (L)	1.1	1.0	3.7	2.9	0.0	6.6	1.0	1.0	1.3
Vitamin C									
Bleeding and swollen gums (M)	1.6	1.1	4.6	3.9	3.0	5.1	1.3	1.0	4.5
Swollen red papillae (L)	5.9	5.2	10.6	14.2	18.7	8.7	4.8	4.0	13.3
Diffuse marginal inflammation (L)	12.3	10.4	22.5	28.4	29.1	27.8	10.0	9.0	19.2
Iodine									
Thyroid enlargement									
Group I (M)	5.0	4.8	6.3	1.6	1.4	1.9	5.7	5.3	11.0
Group II (H)	1.0	1.0	1.0	1.6	1.9	1.1	1.0	1.0	1.0
Calcium									
Positive Chvostek's sign (M)	12.7	12.3	15.7	16.4	14.8	18.9	12.4	12.5	12.4

[1] Total includes all races.
[2] Excludes persons with unknown income.

NOTES: *n* = examined children; *N* = estimated population in thousands.

(H) = high risk indicator of possible deficiency; (M) = moderate risk indicator of possible deficiency; (L) = low risk indicator of possible deficiency.

Table 22. Clinical findings for persons aged 18-44 years by race, sex, and income level: number of persons and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
Male									
n	1,038	808	211	128	62	61	866	714	140
N	34,341	30,458	3,440	2,538	1,504	936	30,482	27,756	2,393
Protein									
Hepatomegaly (M)	1.5	1.4	1.8	1.0	-	2.6	1.4	1.4	1.1
Potbelly (M)	-	-	-	-	-	-	-	-	-
Riboflavin									
Magenta tongue (H)	-	-	-	-	-	-	-	-	-
Angular lesions of lips (H)	0.0	0.0	-	-	-	-	0.0	0.0	-
Angular scars of lips (H)	0.0	0.0	0.0	1.0	1.1	1.0	0.0	0.0	-
Cheilosis (M)	1.0	0.0	2.8	2.1	0.0	5.3	0.0	0.0	1.9
Nasolabial seborrhea (M)	1.0	0.0	1.1	0.0	-	1.0	1.0	1.0	1.4
Conjunctival injection (L)	1.0	1.0	-	-	-	-	1.2	1.1	-
Niacin									
Filiform papillary atrophy of tongue (H)	1.9	2.0	1.9	2.7	1.3	5.1	1.5	1.7	0.0
Scarlet beefy tongue (H)	0.0	0.0	-	-	-	-	0.0	0.0	-
Fungiform papillary hypertrophy of tongue (M)	3.4	2.9	8.7	2.4	2.7	2.3	3.3	2.7	11.7
Fissures of tongue (M)	3.4	3.2	5.5	4.0	2.2	7.3	3.3	3.2	4.9
Serrations or swelling of tongue (L)	8.5	8.2	9.6	6.2	4.1	10.2	8.6	8.4	8.4
Thiamine									
Absent knee jerks (M)	1.0	1.0	4.1	2.4	0.0	6.1	1.0	1.0	3.0
Absent ankle jerks (M)	1.0	1.0	3.0	1.0	0.0	1.4	1.0	1.0	3.2
Vitamin D									
Bowed legs (M)	5.2	4.6	10.7	11.3	1.4	28.6	4.6	4.8	3.7
Knock knees (M)	-	-	-	-	-	-	-	-	-
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)	2.5	2.5	2.5	-	-	-	2.8	2.8	3.6
Follicular hyperkeratosis of upper back (L)	0.0	1.0	0.0	0.0	-	0.0	1.0	1.0	0.0
Dry or scaling skin (L)	1.0	0.0	1.0	0.0	-	1.3	1.0	0.0	0.0
Vitamin C									
Bleeding and swollen gums (M)	3.7	3.4	6.2	4.5	3.2	7.0	3.6	3.4	6.2
Swollen red papillae (L)	11.0	9.9	21.7	14.3	14.4	15.8	10.6	9.4	25.0
Diffuse marginal inflammation (L)	25.9	22.5	54.9	42.9	31.5	65.9	24.4	21.9	51.1
Iodine									
Thyroid enlargement									
Group I (M)	2.1	2.4	-	4.4	7.4	-	2.0	2.2	-
Group II (H)	0.0	0.0	1.2	-	-	-	0.0	0.0	1.8
Calcium									
Positive Chvostek's sign (M)	6.2	6.0	8.4	11.3	10.9	13.0	5.7	5.6	7.0

See footnotes at end of table.

Table 22. Clinical findings for persons aged 18-44 years by race, sex, and income level: number of persons and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)—Con.

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
Female									
n --------------------------	2,406	1,758	618	463	205	253	1,834	1,478	333
N --------------------------	37,134	32,342	4,541	4,252	2,679	1,536	31,365	28,331	2,840
Protein									
Hepatomegaly (M)-----------	0.0	0.0	0.0	1.2	1.6	1.0	0.0	0.0	0.0
Potbelly (M)---------------	-	-	-	-	-	-	-	-	-
Riboflavin-----------									
Magenta tongue-------------	-	-	-	-	-	-	-	-	-
Angular lesions of lips (H)------------------	0.0	0.0	-	0.0	0.0	-	0.0	0.0	-
Angular scars of lips (H))-----------------	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	1.0
Cheilosis (M)--------------	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.4
Nasolabial seborrhea (M)---	1.0	1.0	1.3	0.0	0.0	1.0	1.0	1.0	1.5
Conjunctival injection (L)---------------	0.0	-	-	-	-	-	0.0	0.0	-
Niacin									
Filiform papillary atrophy of tongue (H)-------------	1.3	1.3	1.4	0.0	1.0	0.0	1.4	1.4	2.1
Scarlet beefy tongue (H)---	0.0	0.0	-	-	-	-	0.0	0.0	-
Fungiform papillary hypertrophy of tongue (M)------	6.4	5.6	12.0	5.7	2.9	10.8	6.2	5.5	13.2
Fissures of tongue (M)-----	4.0	4.0	3.4	4.0	5.8	1.0	4.1	4.0	4.6
Serrations or swelling of tongue (L)-------------	8.8	9.4	4.4	6.8	7.6	4.5	9.2	9.6	4.6
Thiamine									
Absent knee jerks (M)------	1.0	1.0	1.8	1.0	-	2.6	1.0	1.0	1.4
Absent ankle jerks (M)-----	1.0	1.0	2.1	1.4	0.0	3.6	1.0	1.0	1.4
Vitamin D									
Bowed legs (M)-------------	2.3	1.8	5.6	2.5	1.2	4.7	2.3	2.0	6.3
Knock knees (M)------------	1.0	0.0	3.4	1.3	1.0	2.1	1.0	0.0	4.1
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)------------------	5.7	5.8	5.1	8.3	10.1	5.4	5.3	5.4	5.1
Follicular hyperkeratosis of upper back (L)---------	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0
Dry or scaling skin (L)----	1.6	1.8	1.9	1.8	1.0	3.1	1.6	1.7	1.2
Vitamin C									
Bleeding and swollen gums (M)-------------------	3.1	3.1	3.0	4.2	4.7	3.3	3.1	3.1	3.0
Swollen red papillae (L)---	7.1	6.7	9.9	11.9	11.8	12.3	6.7	6.4	8.7
Difuse marginal Inflammation (L)------------	20.4	18.2	35.5	35.4	28.1	48.6	18.4	17.4	27.8
Iodine									
Thyroid enlargement									
Group I (M)--------------	7.0	6.8	8.8	5.3	4.2	7.3	7.4	7.1	10.1
Group II (H)-------------	1.5	1.3	3.6	2.7	2.3	3.5	1.4	1.1	3.8
Calcium									
Positive Chvostek's sign (M)	13.2	13.0	15.1	13.9	13.7	14.7	13.4	13.2	15.5

[1] Total includes all races.
[2] Excludes persons with unknown income.

NOTES: *n* = examined persons; *N* = estimated population in thousands.

(H) = high risk indicator of possible deficiency; (M) = moderate risk indicator of possible deficiency; (L) = low risk indicator of possible deficiency.

Table 23. Clinical findings for persons aged 45-59 years by race and income level: number of persons and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
n	1,143	871	263	165	76	88	916	749	159
N	34,232	30,796	3,228	2,743	1,623	1,074	29,452	27,323	1,966
Protein									
Hepatomegaly (M)	3.3	3.3	4.4	3.7	1.0	8.0	3.4	3.5	2.5
Potbelly (M)	-	-	-	-	-	-	-	-	-
Riboflavin									
Magenta tongue (H)	1.0	0.0	1.6	1.9	2.9	1.0	0.0	0.0	2.3
Angular lesions of lips (H)	1.0	1.0	-	0.0	1.0	-	1.0	1.0	-
Angular scars of lips (H)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Cheilosis (M)	0.0	0.0	0.0	0.0	-	1.1	0.0	0.0	-
Nasolabial seborrhea (M)	1.6	1.4	1.0	1.3	1.0	2.2	1.7	1.5	0.0
Conjunctival injection (L)	1.0	1.0	0.0	0.0	-	1.0	1.0	1.0	-
Niacin									
Filiform papillary atrophy of tongue (H)	3.2	3.2	3.1	2.0	2.9	1.0	3.4	3.3	4.7
Scarlet beefy tongue (H)	0.0	0.0	-	-	-	-	0.0	0.0	-
Fungiform papillary hypertrophy of tongue (M)	2.1	1.9	4.0	1.9	1.0	3.5	2.1	1.9	4.7
Fissures of tongue (M)	8.6	9.0	5.0	5.1	6.2	3.6	8.8	9.1	5.6
Serrations or swelling of tongue (L)	8.9	8.8	8.9	4.4	1.0	6.0	9.6	9.5	11.2
Thiamine									
Absent knee jerks (M)	1.3	1.1	2.8	2.3	1.0	4.6	1.1	1.0	2.1
Absent ankle jerks (M)	3.0	2.6	6.5	4.0	1.5	7.9	2.2	1.9	6.2
Vitamin D									
Bowed legs (M)	4.6	4.3	7.2	4.4	6.9	1.0	4.7	4.3	11.4
Knock knees (M)	1.0	1.0	3.5	3.0	1.0	6.7	1.0	1.0	2.2
Vitamin A and/or essential fatty acids									
Follicular hyperkeratosis, arms (M)	1.1	1.1	2.0	1.0	-	1.4	1.2	1.2	2.1
Follicular hyperkeratosis of upper back (L)	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0
Dry or scaling skin (L)	3.5	3.4	3.9	2.6	0.0	6.2	3.0	3.1	2.9
Vitamin C									
Bleeding and swollen gums (M)	3.8	2.6	14.7	7.2	3.0	13.1	3.6	2.6	16.7
Swollen red papillae (L)	9.2	7.2	25.9	21.4	12.8	28.8	8.3	6.9	26.5
Diffuse marginal inflammation (L)	27.0	23.6	53.9	53.9	34.9	76.5	25.0	23.1	46.6
Iodine									
Thyroid enlargement									
Group I (M)	2.6	2.7	1.1	1.0	1.0	1.0	2.9	3.0	1.0
Group II (H)	1.4	1.0	5.0	0.0	-	1.0	1.6	1.1	7.9
Calcium									
Positive Chvostek's sign (M)	2.9	2.3	8.4	4.0	1.4	8.0	2.5	2.0	9.4

[1] Total includes all races.
[2] Excludes persons with unknown income.

NOTES: *n* = examined persons; *N* = estimated population in thousands.

(H) = high risk indicator of possible deficiency; (M) = moderate risk indicator of possible deficiency; (L) = low risk indicator of possible deficiency.

Table 24. Clinical findings for persons aged 60 years and over by race and income level: number of persons and percent with positive clinical signs suggestive of specific nutrient deficiency by risk category, United States, 1971-72 (HANES Preliminary)

Nutrient deficiency and clinical signs by risk category	All income			Income below poverty level[2]			Income above poverty level[2]		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
n ------------------------------	1,938	1,486	435	484	292	191	1,331	1,104	212
N ------------------------------	20,560	18,719	1,791	3,113	2,397	714	15,949	14,996	906
Protein									
Hepatomegaly (M)--------------	4.0	4.2	2.3	2.5	2.5	2.8	4.2	4.4	1.8
Potbelly (M)------------------	-	-	-	-	-	-	-	-	-
Riboflavin									
Magenta tongue (H)------------	-	-	-	-	-	-	-	-	-
Angular lesions of lips (H)---	0.0	0.0	-	0.0	1.0	-	0.0	0.0	-
Angular scars of lips (H)-----	1.2	1.3	0.0	1.8	2.4	-	1.1	1.1	0.0
Cheilosis (M)-----------------	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0
Nasolabial seborrhea (M)------	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0
Conjunctival injection (L)----	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	-
Niacin									
Filiform papillary atrophy of tongue (H)-------------------	4.9	4.8	6.1	3.4	3.0	4.6	5.4	5.3	8.4
Scarlet beefy tongue (H)------	1.0	1.0	0.0	3.2	4.2	-	1.0	1.0	-
Fungiform papillary hypertrophy of tongue (M)---------	1.7	1.6	2.8	2.6	2.0	4.7	1.6	1.6	1.4
Fissures of tongue (M)--------	13.2	13.1	14.6	11.9	11.8	12.2	13.3	13.0	18.2
Serrations or swelling of tongue (L)-------------------	6.1	6.4	3.3	7.7	8.4	5.3	5.4	5.7	2.3
Thiamine									
Absent knee jerks (M)---------	2.3	1.9	5.8	3.6	3.7	3.4	2.1	1.8	7.7
Absent ankle jerks (M)--------	7.1	6.5	13.6	7.7	4.9	17.3	6.7	6.4	12.2
Vitamin D									
Bowed legs (M)----------------	5.4	5.5	4.3	8.2	8.8	6.4	5.0	5.1	2.8
Knock knees (M)---------------	1.0	1.0	2.5	1.7	1.5	2.4	1.0	1.0	2.7
Vitamin A and/or essential fatty acid									
Follicular hyperkeratosis, arms (M)---------------------	2.2	1.9	5.6	2.4	2.3	2.7	2.4	2.0	8.9
Follicular hyperkeratosis of upper back (L)------------	0.0	0.0	0.0	-	-	-	0.0	0.0	-
Dry or scaling skin (L)-------	9.2	9.4	7.4	7.2	7.4	6.7	9.6	9.8	6.9
Vitamin C									
Bleeding and swollen gums (M)-	4.0	3.7	6.7	9.2	9.5	8.5	3.2	3.0	5.4
Swollen red papillae (L)------	7.3	5.6	23.6	15.6	8.5	31.9	6.1	5.6	15.4
Diffuse Marginal inflammation (L)-------------------	26.6	23.7	52.7	53.8	44.5	75.1	22.2	21.2	37.4
Iodine									
Thyroid enlargement									
Group I (M)------------------	2.6	2.6	2.6	3.1	2.7	4.4	2.8	2.8	1.4
Group II (H)-----------------	1.1	1.0	3.2	1.2	1.1	1.6	1.1	1.0	5.0
Calcium									
Positive Chvostek's sign (M)--	1.3	1.2	2.8	1.8	1.7	2.1	1.3	1.2	3.9

Total includes all races.
Excludes persons with unknown income.

NOTES: *n* = examined persons; *N* = estimated population in thousands.

(H) = high risk indicator of possible deficiency; (M) = moderate risk indicator of possible deficiency; (L) = low risk indicator of possible deficiency.

APPENDIX I
STATISTICAL NOTES

The Survey Design

The sampling plan of the Health and Nutrition Examination Survey (HANES) followed a highly stratified multistage probability design in which a sample of the civilian noninstitutionalized population of the conterminous United States, 1-74 years of age, was selected. Excluded from the selection process were those persons confined to institutions or residing upon any of the reservation lands set aside for use of American Indians. Successive elements dealt with in the process of sampling were the primary unit (PSU), census enumeration district (ED), segment (a cluster of households), household, eligible person, and finally sample person.

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 single county or two or three contiguous counties. The PSU's were grouped into 357 strata for use in the Health Interview Survey and subsequently collapsed into 40 superstrata for use in Cycles II and III of the Health Examination Survey and HANES.

Fifteen of the 40 superstrata contained a single large metropolitan area of more than 2,000,000 population. These 15 large metropolitan areas were chosen into the sample with certainty. The 25 noncertainty strata were classified into four broad geographic regions of approximately equal population and cross-classified into four broad population density groups in each region. Then a modified Goodman-Kish controlled selection technique was used to select two PSU's from each of the 25 noncertainty superstrata with the probability of selection of a PSU proportionate to its 1960 population so that proportionate representation of specified State groups and rate of population change classes was maintained in the sample. In this manner a total first-stage sample of 65 PSU's was selected. These 65 sample PSU's or stands are the areas within which a sample of persons would be selected for examination over a 3-year survey period.

In order to produce national estimates of the nutritional status of the U.S. population at an earlier date, a probability subsample of 35 of the 65 stands was selected. Included among the 35 stands are 10 of the 15 large certainty metropolitan areas and one stand from each of the 25 noncertainty superstrata. The reduction from 15 to 10 large metropolitan areas was accomplished by randomly selecting one stand from multiple-stand Standard Metropolitan Statistical Areas, e.g., selecting the southern half of the Chicago SMSA to represent the entire SMSA. (This selection procedure was based on operational considerations and, although unbiased, is recognized as not being statistically optimal.) It is this subsample of 35 stands upon which the findings contained in this report are based.

Stand number	Location[1]	Persons examined
	All locations	10,126
1	Philadelphia, Pa.	272
2	Pittsburgh, Pa.	188
3	Albany, N.Y.	165
4	Mercer, Pa.	220
5	Boston, Mass.	304
6	Detroit, Mich.	395
7	Newark, N.J.	250
8	Springfield, Mass.	175
9	Cleveland, Ohio	329
10	Bay City, Mich.	241
11	New York, N.Y.	196
12	La Porte, Ind.	221
13	Angola, Ind.	188
14	Cabarrus, N.C.	216
15	Los Angeles, Calif.	375
16	Savannah, Ga.	216
17	West Palm Beach, Fla.	352
18	Tucson, Ariz.	264
19	San Antonio, Tex.	453
20	Barbour, Ala.	478
21	Fresno, Calif.	278
22	Avoyelles, La.	539
23	Columbia, S.C.	254
24	San Francisco, Calif.	429
25	Lamar, Miss.	363
26	New York, N.Y.	326
27	Clallum, Wash.	259
28	St. Joseph, Mo.	221
29	Hartford, Conn.	246
30	Grant, Wash.	247
31	Chicago, Ill.	406
32	Sussex, Del.	272
33	Boone, Iowa	275
34	Washington, D.C.	279
35	Milwaukee, Wis.	234

[1]Stand locations are counties, cities, or towns in which the examination center is located. Sample areas from which examinees are drawn for the stand consist of the PSU's which may include several counties.

Although the 1970 census data were used as the frame for selecting the sample within PSU's, when they became available the calendar of operations required that 1960 census data be used for the 35-stand sample of HANES. Census enumeration districts (ED's) in each PSU were divided into segments of an expected six housing units each. In urban ED's the segments were clusters of six addresses from the 1960 Census Listing Books. For ED's not having usable addresses, area sampling was employed and consequently some variation in the segment size occurred. To make the sample representative of the 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 which fell into 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 "non-poverty stratum," includes 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 HANES sample. This procedure permits a separate analysis with adequate reliability of those classified as being below the poverty level and those classified as being above the poverty level.

After identification of 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.

To select the persons in sample segments to be examined in HANES and at the same time to oversample certain groups at high risk of malnutrition, all household members aged 1-74 years in each segment were first 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 below were then listed on the worksheet under the appropriate age-sex group column. The sample selection worksheets were next put in segment number order and a systematic random sample of persons in each age-sex group was selected to be examined using the following sampling rates.

Ages	*Rate*	*Ages*	*Rate*
1-5 years	½	20-44 years (female)	½
6-19 years	¼	45-64 years	¼
20-44 years (male)	¼	65-74 years	1

The persons selected in the 35-stand sample of HANES comprise a representative sample of the target population and included 14,147 sample persons 1-74 years of age of whom 10,126 or 71.6 percent were examined. When adjustments are made for differential sampling for high risk groups, the response rate becomes 72.8 percent.

All data presented in this report are based on "weighted" observations. That is, data recorded for each sample person are inflated to characterize the subuniverse from which that sample person was drawn. The weight for each examined person is a product of the reciprocal of the probability of selecting the person, an adjustment for nonresponse cases (i.e., persons not examined), and a poststratified ratio adjustment which increases precision by bringing survey results into closer alignment with known U.S. population figures.

A more detailed description of the survey design and selection technique can be found in the Plan and Operation of a Health and Nutrition Examination Survey, United States, 1971-1973, *Vital and Health Statistics*, Series 1, No. 10a.[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 will not participate in the examination. Whether or not an individual participates is determined by many factors, some of them uncontrollable, and therefore, may be reasonably treated as an outcome of a random event with a particular probability of occurrence. If these probabilities of participation were known and greater than zero for all persons, then the examined persons would constitute a probability sample from which unbiased estimates of the target population could be derived. In this situation, the effect of nonparticipation would only be to reduce the sample size, thereby increasing the sampling errors of examination findings. However, in practice a potential for bias due to nonresponse exists since the exact probabilities are never known. A further potential for bias exists if: (1) a sizable proportion of sample persons have a zero probability of participation, that is, they would never agree to participate in an examination survey of the same procedures and inducements, and (2) these persons differ from other sample persons with respect to characteristics under examination. It is for these reasons that intensive efforts are made in HANES to develop and implement procedures and inducements that would reduce the number of nonrespondents and thereby reduce the potential of bias due to nonresponse.

NOTE: The list of references follows the text.

These procedures and inducements are discussed in the Plan and Operation of the Health and Nutrition Examination Survey, United States, 1971-1973, Series 1, No. 10a.[4]

Despite these intensive efforts 27.2 percent of the sample persons from the first 35 stands were not examined. Consequently, the potential for a sizable bias does exist in the estimates in this publication. From what we know about the nonrespondents and the nature of nonresponse we believe that the likelihood of sizable bias is small. For instance, only a small proportion of persons gave reasons for nonparticipation which 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 characteristic under examination. Only 15 percent of the nonrespondents gave as their reasons for nonparticipation personal illness, physically unable, pregnant, anti-doctor, or fear of finding something wrong. Typical among the reasons given by the other nonrespondents were: unable because of work, school, or household duties; suspicious or skeptical of the program; just not interested in participating; and private medical care sufficient or just visited doctor.

An analysis of 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 nonexamined group for the statistics compared. For example, 11 percent of persons examined reported having an illness or condition which interferes with their eating as compared to 9 percent of persons not examined but who had completed a medical history. The percent of persons examined reporting 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 was 4 percent. The corresponding percents for nonexamined persons were: arthritis, 17 percent; high blood pressure, 21 percent; and diabetes, 4 percent.

As was mentioned earlier, the data in this report are based on weighted observations, and one of the components of the weight assigned to an examined person was an adjustment for nonresponse. Since the probabilities of participation are not known for sample persons in HANES, a procedure was adopted which multiplies the reciprocal of the probability of selection of sample persons by a factor which brings estimates based on examined persons only up to a level which would have been achieved if all sample persons had been examined. This nonresponse adjustment factor is calculated in two stages. In the first stage a ratio is computed which is the sum of sampling weights for all sample persons within a relatively homogeneous class defined by age, sex, poverty status, and stand, divided by the sum of sampling weights for examined sample persons within the same homogeneous class. Within each class this ratio, which is limited to three, is assigned to all examined responding sample persons. In the second stage the part of all first-stage ratios in excess of three is distributed to responding sample persons within classes defined by region and whether or not the sample person resided in a Standard Metropolitan Statistical Area. To the degree that these classes are homogeneous with respect to the characteristics under study, the procedure is effective in reducing the potential of bias from nonresponse. The distribution of nonresponse adjustment factors for the 35-stand sample of HANES is shown in table I.

NOTE: The list of references follows the text.

Table I. Percent distribution of nonresponse adjustment factors, Stands 1-35, 1971-72 (HANES Preliminary)

Size of factor	Percent distribution
Total	100.0
1.00-1.24	38.4
1.25-1.49	31.6
1.50-1.74	12.9
1.75-1.99	8.4
2.00-2.49	6.1
2.50-2.99	1.2
3.00-3.03	1.4

Small Numbers

In some tables magnitudes are shown for cells for which the sample size is so small that the standard error may be several times as great as the statistic itself. Obviously in such instances the numbers, if shown, have been included to convey an impression of the overall story of the table.

Standard Errors

The probability design of the survey makes possible the estimation of standard errors corresponding to the weighted estimates presented. The standard error is primarily a measure of sampling variability, that is, the variations that might occur by chance because only a sample of the population is surveyed. As calculated for this report, the standard error also reflects part of the variation which arises in the measurement process. It does not include estimates of any biases which might lie in the data. The chances are about 68 out of 100 that an estimate from the sample would differ from a complete census by less than the standard error. The chances are about 95 out of 100 that the difference would be less than twice the standard error and about 99 out of 100 that it would be less than 2½ times as large.

Estimates of standard errors are obtained from the sample data and are themselves subject to sampling error when the number of cases in a cell is small or, even occasionally, when the number of cases is substantial.

Estimates of the standard errors for prevalence of clinical findings are presented in tables II and III.

Table II. Standard errors of prevalence of clinical signs of nutrient deficiency by age, sex, race, and income level: United States, 1971-72 (HANES Preliminary)

	Age and sex	Protein						Riboflavin		
		Hepatomegaly			Potbelly			Magenta tongue		
		Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
		All income								
1	All ages, both sexes	0.16	0.17	0.30	0.42	0.37	0.88	0.08	0.06	0.26
2	Male	0.34	0.35	0.67	0.47	0.41	1.17	0.07	0.04	0.51
3	Female	0.13	0.15	0.13	0.44	0.43	0.74	0.11	0.12	0.05
4	1-5 years, both sexes	0.28	0.34	0.05	0.20	0.04	1.12	0.00	0.00	0.00
5	6-11 years, both sexes	0.18	0.21	0.13	0.00	0.00	0.00	0.00	0.00	0.00
6	12-17 years, both sexes	0.04	0.04	0.13	0.03	0.04	0.00	0.00	0.00	0.00
7	18-44 years, male	0.63	0.67	0.97	0.67	0.55	2.19	0.00	0.00	0.00
8	18-44 years, female	0.11	0.13	0.32	0.58	0.47	1.58	0.16	0.17	0.09
9	45-59 years, both sexes	0.48	0.47	2.02	0.40	0.37	0.88	0.32	0.24	1.69
10	60 years and over, both sexes	0.55	0.59	0.69	1.73	1.65	3.00	0.06	0.06	0.12
		Income below poverty level[2]								
11	All ages, both sexes	0.17	0.26	0.75	0.38	0.39	0.46	0.22	0.26	0.15
12	Male	0.65	0.16	1.79	0.38	0.43	0.66	0.15	0.23	0.16
13	Female	0.33	0.48	0.22	0.45	0.54	0.44	0.35	0.47	0.14
14	1-5 years, both sexes	0.03	0.00	0.09	0.77	0.31	1.57	0.00	0.00	0.00
15	6-11 years, both sexes	0.09	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
16	12-17 years, both sexes	0.13	0.00	0.31	0.25	0.48	0.00	0.00	0.00	0.00
17	18-44 years, male	0.59	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00
18	18-44 years, female	0.89	1.22	0.41	0.00	0.12	0.00	0.10	0.00	0.29
19	45-59 years, both sexes	2.63	0.55	7.18	1.22	1.48	1.96	1.77	2.47	0.72
20	60 years and over, both sexes	0.78	0.83	1.84	1.49	1.73	1.69	0.28	0.37	0.39
		Income above poverty level[2]								
21	All ages, both sexes	0.18	0.19	0.44	0.45	0.40	1.28	0.07	0.05	0.38
22	Male	0.36	0.36	0.88	0.52	0.46	1.72	0.06	0.02	0.83
23	Female	0.17	0.19	0.20	0.47	0.46	1.08	0.09	0.10	0.00
24	1-5 years, both sexes	0.37	0.41	0.08	0.07	0.00	0.79	0.00	0.00	0.00
25	6-11 years, both sexes	0.24	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	12-17 years, both sexes	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	18-44 years, male	0.64	0.70	0.85	0.76	0.61	3.09	0.00	0.00	0.00
28	18-44 years, female	0.11	0.14	0.46	0.68	0.53	2.43	0.17	0.19	0.00
29	45-59 years, both sexes	0.59	0.52	2.01	0.41	0.40	0.87	0.24	0.20	2.43
30	60 years and over, both sexes	0.59	0.61	0.75	1.99	1.84	5.64	0.03	0.03	0.00

Table II. Standard errors of prevalence of clinical signs of nutrient deficiency by age, sex, race, and income level: United States, 1971-72 (HANES Preliminary)—Con.

Riboflavin—Con.												
Angular lesions of the lips			Angular scars of the lips			Cheilosis			Nasolabial seborrhea			
Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro	
All income												
0.06	0.07	0.03	0.10	0.11	0.23	0.27	0.23	0.72	0.36	0.35	0.31	1
0.06	0.07	0.05	0.10	0.11	0.43	0.22	0.18	0.71	0.35	0.37	0.42	2
0.09	0.11	0.03	0.15	0.17	0.21	0.33	0.29	0.79	0.46	0.35	0.34	3
0.07	0.08	0.15	0.00	0.00	0.00	0.15	0.18	0.00	0.08	0.46	0.00	4
0.17	0.20	0.08	0.24	0.20	1.22	0.93	0.86	1.83	0.11	10.13	0.05	5
0.14	0.17	0.08	0.27	0.32	0.15	0.36	0.39	0.38	1.27	1.42	0.57	6
0.11	0.12	0.00	0.10	0.11	0.24	0.25	0.16	1.83	0.45	0.50	1.01	7
0.06	0.07	0.00	0.12	0.12	0.46	0.37	0.34	0.68	0.44	0.50	0.67	8
0.24	0.27	0.00	0.15	0.17	0.09	0.08	0.08	0.29	0.64	0.65	0.84	9
0.14	0.15	0.00	0.33	0.37	0.12	0.10	0.11	0.18	0.13	0.14	0.17	10
Income below poverty level[2]												
0.06	0.10	0.04	0.10	0.12	0.14	0.45	0.60	0.66	0.34	0.47	0.34	11
0.07	0.11	0.00	0.26	0.35	0.24	0.58	0.62	1.17	0.47	0.69	0.69	12
0.10	0.15	0.07	0.06	0.08	0.12	0.40	0.62	0.25	0.39	0.66	0.27	13
0.13	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14
0.00	0.00	0.00	0.00	0.00	0.00	1.72	2.77	0.00	0.04	0.00	0.11	15
0.00	0.00	0.00	0.15	0.00	0.39	0.28	0.00	0.63	1.93	3.40	0.00	16
0.00	0.00	0.00	0.78	1.16	0.89	1.69	0.39	4.53	0.20	0.00	0.62	17
0.03	0.05	0.00	0.10	0.17	0.00	0.46	0.71	0.36	0.28	0.05	0.87	18
0.32	0.52	0.00	0.20	0.52	0.31	0.36	0.00	1.14	1.14	0.75	2.56	19
0.44	0.56	0.00	1.51	1.90	0.00	0.04	0.00	0.20	0.53	0.68	0.14	20
Income above poverty level[2]												
0.08	0.09	0.04	0.11	0.12	0.38	0.28	0.22	1.02	0.39	0.36	0.41	21
0.07	0.08	0.10	0.14	0.14	0.75	0.22	0.18	0.74	0.34	0.36	0.62	22
0.11	0.13	0.00	0.15	0.16	0.29	0.36	0.29	1.27	0.54	0.53	0.48	23
0.09	0.10	0.00	0.00	0.00	0.00	0.19	0.21	0.00	0.10	0.12	0.00	24
0.23	0.25	0.18	0.24	0.08	2.76	1.04	0.78	3.98	0.15	0.16	0.00	25
0.18	0.20	0.18	0.35	0.38	0.00	0.38	0.40	0.30	1.07	1.05	0.89	26
0.12	0.13	0.00	0.05	0.06	0.00	0.22	0.17	1.60	0.51	0.55	1.48	27
0.07	0.08	0.00	0.14	0.13	0.70	0.42	0.38	0.88	0.52	0.57	0.86	28
0.28	0.30	0.00	0.17	0.18	0.00	0.09	0.10	0.00	0.72	0.73	0.22	29
0.07	0.08	0.00	0.40	0.42	0.27	0.08	0.08	0.35	0.13	0.14	0.36	30

[1]Total includes other races.
[2]Excludes persons with unknown income.

These estimates have been prepared by a replication technique which yields overall variability through observation of variability among random subsamples of the total sample. Again, readers are reminded that these estimated standard errors do not reflect any residual bias which might still be present after the attempted correction for nonresponse.

Missing Data

Examination surveys are subject to the loss of information not only through the failure to examine all sample persons but also from the failure to obtain and record all items of information for examined persons. Age, sex, and race were known for every examined person, but for a number of examinees, one or more of the anthropometric measurements were not available. The extent of these missing measurements is indicated in table III.

Estimates for missing anthropometric data were generally made subjectively on the basis of a multiple regression type decision, substituting for the missing measurements, therefore, an individual who was of the same age, sex, and race and who had other dimensions similar to those available for the examinee with incomplete data.

For those with no anthropometric measurements available, a respondent of the same age-sex-race group was selected at random and his measurements were assigned to the nonexamined person.

Of the 10,126 subjects examined for vitamin C deficiency, data were excluded for 1,245 persons who were fully edentulous, and data for 7 of these people were imputed. Data for 8,881 persons were used in the analysis, of which 58 were imputed.

Imputations were done by the same method as previously described for those persons with no anthropometric measurements available. This process preserves both the expected values and the distribution of values of the recorded information.

Number of examinees with one or more missing anthropometric measurements: Health and Nutrition Examination Survey, United States, 1971-1972 (HANES Preliminary)

Measurements Missing	*Number of Examinees*
All measurements	10
Height only	13
Weight only	7
Triceps skinfold only	3
Subscapular skinfold only	18
Height and weight	2
Triceps and subscapular skinfold	137
Height and subscapular skinfold	3
Subscapular skinfold, weight, and height	1
Triceps and subscapular skinfold and height	1

Standards of Reliability and Precision

All means, variances, and percentages appearing in this report had to meet certain standards before they could be considered sufficiently precise and reliable to be suitable for publication.

For reporting means, two basic criteria were used. The first criterion was that a sample size of at least five was required. If, on the other hand, the first criterion of sample size five was satisfied, then the second criterion must have been demonstrated as well. If the coefficient of variation, that is, the standard error of the mean divided by the mean $s_{\bar{x}}/\bar{X}$ was greater than 25 percent, the variation with respect to the mean was considered too large and the estimate was neither precise nor reliable enough to meet the standards.

When percentages are reported, there is only one criterion used and that is that the number of people from which the percentage is calculated was at least 10. All statistics met the standards. The mean in six instances did not meet the requirements of the second criterion. The cell, therefore, containing the unreliable mean was pooled with the adjacent cell. The means reported met the specified criterion for inclusion after pooling.

Hypothesis Testing

In the analysis of HANES data, a large number of comparisons were made of the differences between averages of anthropometric measurements. The usual approach of testing the significance of the difference between two means or whether the two samples could have been drawn from the same population is to use the statistic

$$z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{s_{\bar{x}_1}^2 + s_{\bar{x}_2}^2}}$$

where $\bar{X}_1$ is the mean of the first sample and $\bar{X}_2$ is the mean of the second sample; $s_{\bar{x}_1}$ is a measure for the standard error, using the replicate half sample method obtained from the first sample and $s_{\bar{x}_2}$ from the second sample. The statistic is then compared to a table of normal deviates to determine the probability of obtaining values of the test statistic as extreme or more extreme than that computed, if in fact the population means were equal.

However, when one is performing a large number of such tests simultaneously, the usual levels of significance do not apply. With a known level of significance, as the number of possible comparisons is increased, the critical values needed for a significant result also increase. Thus if one uses the conventional critical value of 0.05 to decide the significance of five means simultaneously, the probability level will increase to 0.25, for 10 means to 0.50 at the 0.05 level. This last "overall error rate" will get increasingly large as the number of tests increases.

Table III. Standard errors of the prevalence of clinical signs of nutritional deficienciea by age, aex, race, and income level: United States, 1971-72 (HANES Preliminary)

Age and sex	Riboflavin			Niacin								
	Conjunctival injection			Filiform papillary atrophy of tongue			Scarlet beefy tongue			Fungiform papillary hypertrophy of tongue		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
	All income											
All ages, both sexes------	0.18	0.19	0.03	0.33	0.33	0.58	0.11	0.12	0.03	0.54	0.54	0.98
Male------------------------	0.30	0.32	0.08	0.37	0.38	0.76	0.20	0.22	0.00	0.53	0.53	1.34
Female----------------------	0.12	0.13	0.00	0.38	0.38	0.80	0.04	0.05	0.06	0.71	0.75	1.29
1-5 years, both sexes-----------	0.08	0.10	0.00	0.31	0.38	0.21	0.00	0.00	0.00	0.78	0.63	2.02
6-11 years, both sexes----------	0.24	0.28	0.00	0.27	0.32	0.29	0.00	0.00	0.00	0.89	0.99	1.82
12-17 years, both sexes---------	0.16	0.19	0.00	0.03	0.03	0.12	0.00	0.00	0.00	1.70	1.87	2.17
18-44 years, male---------------	0.45	0.44	0.00	0.75	0.75	1.54	0.16	0.18	0.00	0.77	0.68	3.60
18-44 years, female-------------	0.17	0.20	0.00	0.30	0.38	1.17	0.07	0.08	0.00	0.79	0.78	2.00
45-59 years, both sexes---------	0.33	0.36	0.21	0.79	0.74	2.52	0.22	0.24	0.00	0.64	0.69	1.43
60 years and over, both sexes---	0.33	0.36	0.24	0.92	0.95	2.36	0.46	0.49	0.43	0.55	0.56	1.06
	Income below poverty level[2]											
All ages, both sexes------	0.17	0.27	0.09	0.54	0.56	0.83	0.33	0.53	0.00	1.16	1.35	1.34
Male------------------------	0.39	0.61	0.19	0.85	0.82	1.82	0.69	1.12	0.00	0.87	1.28	0.64
Female----------------------	0.00	0.00	0.00	0.40	0.57	0.21	0.15	0.23	0.00	1.66	1.76	2.36
1-5 years, both sexes-----------	0.00	0.00	0.00	0.53	0.88	0.47	0.00	0.00	0.00	1.83	0.91	3.20
6-11 years, both sexes----------	0.00	0.00	0.00	0.60	0.95	0.49	0.00	0.00	0.00	2.42	3.77	0.93
12-17 years, both sexes---------	1.06	1.81	0.00	0.10	0.00	0.24	0.00	0.00	0.00	2.82	3.90	4.04
18-44 years, male---------------	0.00	0.00	0.00	2.26	1.37	5.80	0.00	0.00	0.00	1.36	2.42	0.99
18-44 years, female-------------	0.00	0.00	0.00	0.26	0.39	0.20	0.00	0.00	0.00	2.00	1.76	3.04
45-59 years, both sexes---------	0.25	0.00	0.72	1.39	2.33	0.67	0.00	0.00	0.00	1.07	0.76	2.23
60 years and over, both sexes---	0.57	0.72	0.20	1.74	1.71	3.08	2.57	3.24	0.00	0.99	1.15	2.08
	Income above poverty level[2]											
All ages, both sexes------	0.19	0.20	0.00	0.35	0.35	0.81	0.09	0.10	0.00	0.56	0.54	1.92
Male------------------------	0.31	0.32	0.00	0.38	0.41	0.73	0.16	0.18	0.00	0.57	0.55	2.46
Female----------------------	0.14	0.16	0.00	0.41	0.40	1.33	0.05	0.05	0.00	0.75	0.76	2.03
1-5 years, both sexes-----------	0.10	0.12	0.00	0.29	0.33	0.00	0.00	0.00	0.00	0.77	0.72	1.70
6-11 years, both sexes----------	0.32	0.35	0.00	0.30	0.33	0.31	0.00	0.00	0.00	0.76	0.82	4.74
12-17 years, both sexes---------	0.02	0.03	0.00	0.04	0.04	0.12	0.00	0.00	0.00	1.87	1.97	3.56
18-44 years, male---------------	0.51	0.48	0.00	0.64	0.70	0.26	0.18	0.20	0.00	0.82	0.68	4.92
18-44 years, female-------------	0.21	0.23	0.00	0.34	0.41	1.85	0.08	0.09	0.00	0.85	0.79	3.81
45-59 years, both sexes---------	0.37	0.40	0.00	0.87	0.78	3.85	0.26	0.28	0.00	0.72	0.74	2.50
60 years and over, both sexes---	0.36	0.39	0.00	1.00	1.02	3.90	0.29	0.31	0.00	0.63	0.64	0.84

Age and sex	Niacin—Con.						Thiamine					
	Fissures of tongue			Serrations or swelling of tongue			Absent knee jerks			Absent ankle jerks		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
	All income											
All ages, both sexes------	0.76	0.76	1.09	0.94	0.91	1.30	0.15	0.14	0.42	0.33	0.34	0.46
Male------------------------	0.86	0.91	1.07	1.07	0.96	2.08	0.21	0.20	0.82	0.29	0.28	0.75
Female----------------------	0.76	0.71	1.57	0.94	0.98	0.75	0.11	0.13	0.46	0.45	0.50	0.60
1-5 years, both sexes-----------	0.04	0.02	0.15	0.01	0.00	0.09	0.31	0.34	0.76	0.30	0.34	0.67
6-11 years, both sexes----------	0.16	0.13	0.46	0.01	0.00	0.08	0.26	0.31	0.16	0.19	0.22	0.18
12-17 years, both sexes---------	0.57	0.55	1.28	0.62	0.67	0.63	0.27	0.30	0.56	0.03	0.00	0.22
18-44 years, male---------------	0.96	1.01	2.66	2.21	1.96	4.46	0.44	0.32	2.19	0.48	0.39	1.87
18-44 years, female-------------	1.02	1.02	1.56	1.48	1.63	0.84	0.20	0.18	0.74	0.20	0.19	0.57
45-59 years, both sexes---------	1.84	1.92	3.11	1.56	1.49	3.62	0.33	0.31	1.90	0.80	0.79	2.89
60 years and over, both sexes---	2.11	2.15	4.73	1.42	1.46	1.49	0.52	0.56	2.67	1.86	1.98	2.29
	Income below poverty level[2]											
All ages, both sexes------	0.80	0.89	1.34	0.87	0.95	1.10	0.32	0.22	0.92	0.30	0.37	0.51
Male------------------------	1.03	1.21	1.83	0.89	1.08	2.21	0.63	0.15	1.73	0.44	0.30	1.08
Female----------------------	0.90	0.93	1.75	1.03	1.01	1.30	0.36	0.43	0.63	0.45	0.54	0.78
1-5 years, both sexes-----------	0.21	0.18	0.32	0.07	0.00	0.18	0.46	0.69	0.19	0.52	0.93	0.25
6-11 years, both sexes----------	0.38	0.55	0.72	0.05	0.00	0.17	0.18	0.15	0.46	0.18	0.15	0.46
12-17 years, both sexes---------	1.51	1.93	2.64	0.27	0.11	0.63	0.23	0.00	0.53	0.00	0.00	0.00
18-44 years, male---------------	2.83	2.21	7.07	3.04	1.05	8.26	1.62	0.31	4.20	0.41	0.31	0.93
18-44 years, female-------------	1.63	2.37	0.45	2.00	2.64	1.71	0.53	0.00	1.46	0.26	0.20	0.81
45-59 years, both sexes---------	2.29	3.52	2.52	2.40	0.61	4.13	1.81	0.72	5.00	1.19	0.82	3.36
60 years and over, both sexes---	3.04	2.61	7.47	2.75	3.04	2.95	0.95	1.22	2.49	1.53	1.57	3.07
	Income above poverty level[2]											
All ages, both sexes------	0.72	0.74	1.18	1.00	0.97	1.73	0.17	0.17	0.29	0.31	0.31	0.76
Male------------------------	0.82	0.92	1.20	1.17	1.04	3.28	0.23	0.22	0.96	0.29	0.27	1.09
Female----------------------	0.78	0.72	1.80	0.98	1.03	0.56	0.16	0.17	0.68	0.41	0.43	1.06
1-5 years, both sexes-----------	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.37	1.58	0.36	0.37	1.58
6-11 years, both sexes----------	0.10	0.05	0.64	0.00	0.00	0.00	0.35	0.38	0.50	0.25	0.28	0.22
12-17 years, both sexes---------	0.48	0.52	0.57	0.75	0.80	1.19	0.32	0.35	0.75	0.03	0.00	0.44
18-44 years, male---------------	0.89	1.03	2.40	2.32	2.09	5.05	0.49	0.35	2.59	0.54	0.43	2.63
18-44 years, female-------------	1.06	1.06	2.28	1.48	1.60	0.59	0.23	0.21	1.09	0.25	0.22	0.98
45-59 years, both sexes---------	1.79	1.80	4.25	1.64	1.61	5.79	0.30	0.34	1.38	0.45	0.42	3.96
60 years and over, both sexes---	2.13	2.23	5.81	1.23	1.25	1.29	0.64	0.63	4.23	2.08	2.13	4.11

See footnotes at end of table.

Table III. Standard errors of the prevalence of clinical signs of nutritional deficiencies by age, sex, race, and income level: United States, 1971-72 (HANES Preliminary)—Con.

Age and sex	Vitamin D						Vitamin A					
	Knock knees			Bowed legs			Follicular hyperkeratosis, arms			Follicular hyperkeratosis of upper back		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
	All income											
All ages, both sexes------	0.34	0.25	1.31	0.75	0.75	1.33	0.82	0.89	1.14	0.12	0.12	0.23
Male------------------------	0.33	0.24	1.30	1.15	1.24	1.83	0.57	0.64	1.10	0.14	0.16	0.09
Female----------------------	0.40	0.33	1.42	0.41	0.33	1.68	1.08	1.17	1.54	0.15	0.14	0.41
1-5 years, both sexes-----------	1.43	1.36	2.36	0.24	0.14	1.34	0.66	0.75	1.32	0.01	0.00	0.07
6-11 years, both sexes----------	0.84	0.85	2.45	0.63	0.73	0.35	1.84	1.91	3.95	0.33	0.26	0.91
12-17 years, both sexes---------	0.49	0.40	2.19	0.88	0.75	2.73	1.98	2.19	1.89	0.35	0.38	0.89
18-44 years, male---------------	0.00	0.00	0.00	1.42	1.53	4.59	0.66	0.76	0.93	0.27	0.31	0.22
18-44 years, female-------------	0.27	0.20	1.64	0.69	0.60	1.86	1.47	1.62	1.73	0.21	0.20	0.37
45-59 years, both sexes---------	0.34	0.26	2.49	1.24	1.34	2.06	0.55	0.60	0.65	0.18	0.20	0.17
60 years and over, both sexes---	0.27	0.24	1.31	1.38	1.44	1.40	0.66	0.69	3.12	0.08	0.09	0.02
	Income below poverty level[2]											
All ages, both sexes------	0.79	0.70	1.85	1.09	0.78	1.98	1.31	1.44	2.06	0.13	0.06	0.35
Male------------------------	1.13	1.23	2.36	2.19	1.53	4.14	1.35	1.51	2.25	0.09	0.14	0.12
Female----------------------	0.64	0.52	1.46	0.34	0.48	0.44	1.82	2.35	2.70	0.23	0.00	0.60
1-5 years, both sexes-----------	2.41	3.56	2.95	1.02	0.16	2.90	2.52	3.92	2.38	0.06	0.00	0.15
6-11 years, both sexes----------	1.60	2.24	2.72	0.18	0.00	0.51	3.51	3.91	6.57	0.00	0.00	0.00
12-17 years, both sexes---------	0.19	0.22	0.37	1.56	0.11	3.70	2.65	3.33	3.47	0.84	0.49	1.88
18-44 years, male---------------	0.00	0.00	0.00	5.10	1.22	12.22	0.00	0.00	0.00	0.14	0.00	0.45
18-44 years, female-------------	0.82	0.87	1.62	0.68	0.99	1.25	3.29	5.10	1.69	0.14	0.00	0.48
45-59 years, both sexes---------	2.09	0.68	5.82	2.07	3.28	0.73	0.57	0.00	1.53	0.00	0.00	0.00
60 years and over, both sexes---	0.84	0.82	1.82	3.48	3.95	4.01	1.01	1.28	1.87	0.00	0.00	0.00
	Income above poverty level[2]											
All ages, both sexes------	0.32	0.27	1.38	0.79	0.78	1.67	0.86	0.92	1.03	0.14	0.14	0.33
Male------------------------	0.29	0.23	1.35	1.22	1.31	1.48	0.65	0.70	1.09	0.17	0.19	0.11
Female----------------------	0.40	0.36	1.71	0.45	0.32	2.80	1.09	1.17	1.42	0.18	0.16	0.61
1-5 years, both sexes-----------	1.38	1.35	2.52	0.19	0.17	1.15	0.44	0.49	1.02	0.00	0.00	0.00
6-11 years, both sexes----------	0.93	0.96	3.20	0.66	0.71	0.38	1.89	2.05	1.35	0.43	0.32	2.14
12-17 years, both sexes---------	0.55	0.42	4.03	0.95	0.80	4.39	1.96	2.14	2.66	0.41	0.44	0.52
18-44 years, male---------------	0.00	0.00	0.00	1.41	1.51	2.23	0.74	0.83	1.37	0.31	0.34	0.29
18-44 years, female-------------	0.27	0.18	2.22	0.79	0.66	2.84	1.54	1.66	2.41	0.25	0.23	0.58
45-59 years, both sexes---------	0.32	0.32	1.96	1.36	1.40	3.43	0.64	0.68	0.66	0.21	0.23	0.27
60 years and over, both sexes---	0.29	0.29	2.34	1.47	1.54	1.39	0.80	0.78	5.82	0.11	0.12	0.00

Age and sex	Vitamin A—Con.			Vitamin C								
	Dry or scaling skin			Bleeding and swollen gums			Swollen red papillae			Diffuse marginal inflammation		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
	All income											
All ages, both sexes------	0.40	0.41	1.03	0.90	0.83	1.94	1.79	1.66	3.37	0.88	0.83	2.12
Male------------------------	0.26	0.24	1.14	0.97	0.87	2.44	1.89	1.86	2.97	1.14	1.00	3.24
Female----------------------	0.66	0.71	1.15	0.90	0.90	1.72	1.85	1.64	4.03	0.80	0.83	1.55
1-5 years, both sexes-----------	0.22	0.17	1.13	0.00	0.00	0.00	0.39	0.48	0.07	0.01	0.00	0.07
6-11 years, both sexes----------	0.88	0.68	3.12	0.69	0.81	0.00	1.03	1.16	2.04	0.37	0.36	1.43
12-17 years, both sexes---------	0.31	0.37	1.70	0.69	0.62	1.91	1.88	1.78	4.63	1.30	1.19	3.31
18-44 years, male---------------	0.20	0.27	0.12	1.80	1.72	3.40	2.39	2.38	6.47	1.70	1.63	4.56
18-44 years, female-------------	0.27	0.32	0.93	1.17	1.19	2.17	2.24	1.92	7.04	0.96	1.01	1.98
45-59 years, both sexes---------	1.04	1.13	1.92	1.45	1.09	6.83	3.57	3.72	5.44	1.84	1.78	4.70
60 years and over, both sexes---	1.53	1.63	1.98	1.65	1.61	4.03	3.99	3.54	9.66	1.56	1.45	5.07
	Income below poverty level[2]											
All ages, both sexes------	0.99	0.84	1.81	1.34	1.61	2.04	2.78	3.34	3.64	1.91	2.73	2.02
Male------------------------	1.30	1.52	2.25	1.65	1.79	3.15	3.39	3.75	3.80	2.21	2.60	3.81
Female----------------------	0.84	0.62	2.18	1.38	2.09	1.19	3.40	4.49	4.06	2.55	3.72	1.46
1-5 years, both sexes-----------	0.25	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-11 years, both sexes----------	3.19	3.30	3.97	0.18	0.29	0.00	1.52	1.32	3.70	0.83	0.76	2.11
12-17 years, both sexes---------	1.44	0.11	3.58	1.83	2.66	1.94	6.53	10.21	7.54	5.79	9.53	2.79
18-44 years, male---------------	0.09	0.00	0.38	2.80	2.66	5.52	6.51	9.00	5.43	3.58	4.61	7.80
18-44 years, female-------------	0.96	0.79	2.39	2.56	3.85	2.15	5.15	5.54	7.97	2.46	3.34	3.33
45-59 years, both sexes---------	2.04	0.44	5.99	3.92	2.70	10.03	4.84	8.91	8.08	7.18	8.58	10.18
60 years and over, both sexes---	1.76	2.30	2.42	5.80	6.96	9.37	9.49	9.98	9.73	3.27	4.57	9.05
	Income above poverty level[2]											
All ages, both sexes------	0.37	0.39	0.86	0.85	0.79	2.27	1.78	1.72	3.68	0.80	0.72	2.62
Male------------------------	0.20	0.15	1.39	0.93	0.88	2.77	1.97	1.99	3.21	1.11	0.96	3.92
Female----------------------	0.69	0.74	1.18	0.85	0.79	2.34	1.78	1.64	4.49	0.68	0.65	2.15
1-5 years, both sexes-----------	0.25	0.20	2.01	0.00	0.00	0.00	0.50	0.57	0.16	0.01	0.00	0.16
6-11 years, both sexes----------	0.60	0.46	3.82	0.87	0.95	0.00	1.35	1.42	0.79	0.48	0.43	2.39
12-17 years, both sexes---------	0.33	0.36	0.71	0.70	0.65	3.21	1.69	1.63	6.45	1.17	0.91	5.91
18-44 years, male---------------	0.23	0.30	0.17	1.69	1.67	3.75	2.49	2.56	7.64	1.62	1.56	4.97
18-44 years, female-------------	0.33	0.36	0.64	1.07	1.05	2.42	1.94	1.76	6.77	0.93	0.95	2.57
45-59 years, both sexes---------	0.98	1.04	1.19	1.27	1.03	6.71	4.05	4.10	6.04	1.79	1.87	4.35
60 years and over, both sexes---	1.65	1.75	2.54	1.47	1.45	5.02	3.45	3.30	8.76	1.44	1.39	5.48

See footnotes at end of table.

Table 111. Standard errors of the prevalence of clinical signs of nutritional deficiencies by age, sex, race, and income level: United States, 1971-72 (HANES Preliminary)—Con.

Age and sex	Iodine						Calcium		
	Thyroid enlargement, group I			Thyroid enlargement, group II			Positive Chvostek's sign		
	Total[1]	White	Negro	Total[1]	White	Negro	Total[1]	White	Negro
	All income								
All ages, both sexes	0.61	0.62	1.06	0.23	0.25	0.61	0.94	0.89	2.05
Male	0.42	0.45	0.81	0.12	0.12	0.48	0.85	0.84	1.98
Female	0.94	0.96	1.66	0.37	0.39	1.15	1.11	1.10	2.42
1-5 years, both sexes	0.27	0.32	0.08	0.11	0.00	0.74	0.88	0.95	0.89
6-11 years, both sexes	1.15	1.37	1.68	0.29	0.34	0.34	1.02	1.00	2.57
12-17 years, both sexes	1.21	1.02	3.09	0.39	0.45	0.62	1.78	1.92	4.07
18-44 years, male	0.72	0.81	0.00	0.20	0.17	1.31	1.39	1.36	2.72
18-44 years, female	1.25	1.30	2.30	0.37	0.38	1.94	1.45	1.49	3.10
45-59 years, both sexes	0.64	0.70	0.44	0.61	0.63	3.25	1.08	0.99	3.00
60 years and over, both sexes	0.92	1.02	0.84	0.42	0.42	1.68	0.59	0.55	1.52
	Income below poverty level[2]								
All ages, both sexes	0.51	0.48	0.97	0.32	0.45	0.44	1.44	1.88	2.22
Male	0.84	1.05	1.53	0.43	0.59	0.52	1.53	1.49	2.80
Female	0.42	0.62	1.16	0.41	0.51	0.80	1.86	2.98	2.60
1-5 years, both sexes	0.13	0.17	0.18	0.59	0.00	1.57	0.20	0.15	0.41
6-11 years, both sexes	1.57	0.73	3.90	0.17	0.00	0.47	2.72	3.90	2.77
12-17 years, both sexes	0.87	1.56	0.94	1.13	1.81	1.18	3.66	4.80	6.61
18-44 years, male	2.65	4.19	0.00	0.00	0.00	0.00	4.84	5.88	5.63
18-44 years, female	0.60	1.84	2.76	1.27	1.58	2.29	3.25	5.66	3.70
45-59 years, both sexes	0.58	0.94	0.97	0.21	0.00	0.61	1.79	0.52	3.94
60 years and over, both sexes	1.36	1.54	2.48	0.67	0.85	1.22	0.78	1.02	1.42
	Income above poverty level[2]								
All ages, both sexes	0.74	0.72	1.75	0.26	0.27	0.98	0.89	0.83	2.50
Male	0.47	0.47	1.14	0.10	0.09	0.78	0.82	0.83	2.01
Female	1.15	1.13	2.58	0.45	0.46	1.68	1.13	1.08	3.26
1-5 years, both sexes	0.33	0.37	0.00	0.00	0.00	0.00	1.15	1.14	1.99
6-11 years, both sexes	1.60	1.72	2.26	0.39	0.42	0.64	1.11	1.12	3.80
12-17 years, both sexes	1.50	1.18	6.13	0.44	0.48	0.57	1.88	2.02	4.00
18-44 years, male	0.69	0.75	0.00	0.23	0.19	1.90	1.26	1.23	3.39
18-44 years, female	1.46	1.43	3.07	0.38	0.41	2.48	1.59	1.59	4.07
45-59 years, both sexes	0.77	0.82	0.39	0.71	0.71	5.49	0.80	0.74	3.94
60 years and over, both sexes	1.06	1.13	0.57	0.43	0.38	4.07	0.74	0.67	2.33

[1]Total includes other races.
[2]Excludes persons with unknown income.

It was decided, therefore, to place the greatest emphasis on a relationship remaining constant over both sex, race, and all ages under consideration. In other words to say that "white boys of all age groups have greater statures than Negro boys of corresponding income and age group," has far greater meaning and interpretability than to say "the mean stature for white males age 1 year in the income group below poverty level is significantly greater (at the 0.05 level) than the mean stature for Negro boys of similar age and the mean stature for white boys of age 3 years is...etc., as determined by a normal deviate." In these analyses, consistency rather than statements about successions of individual probability levels is the factor considered most important in demonstrating a relationship.

One method of hypothesis testing was used in this report—test for consistency of a relationship. The nonparametric procedure known as the "sign test," as its name implies, is concerned with the directions of differences rather than the magnitude of these differences. Consistency of direction of change is the important factor to be tested. Although it is not an extremely powerful procedure, use in the analysis of these data merely as a quick indicator of consistency of a particular relationship makes it quite useful. In application to HANES data, independence of each of the 17 age comparisons by sex and race is assumed. For each of these 17 groups two statistics are selected (e.g., for each age, race, and sex the analysis may compare the mean height of white boys age 1 year with that of Negro boys of similar age. In all cases, within each age, the direction of the difference is recorded (e.g., the height of white boys of age 1 year may exceed the height of Negro boys of a similar age but of age 3 years the opposite may be the case). The number of positive or negative differences is recorded, and this is compared with a critical value determined by the binomial distribution.

The null hypothesis tested by the sign test is that $P(X_A > X_B) = P(X_B > X_A) = ½$ where X_A is the parameter under the first condition and X_B is the parameter under the second condition. Thus, $\hat{X}_A$ and $\hat{X}_B$ are means under various conditions for a particular age-sex category, where $\hat{X}_A$ and $\hat{X}_B$ are statistics estimating the parameters.

Obviously 8 pluses and 9 minuses of the 17 age groups would dictate that the null hypothesis cannot be rejected, and this lack of consistency indicates that there is no difference in the two conditions. On the other hand, if it is found that of the 17 groups the statistic of one of the two conditions is greater than that from the other 16 times, the binomial distribution indicates that this could happen less than 1 percent of the time if the null hypothesis were true, and thus the null hypothesis is rejected which indicates that one of the body measurements yields higher means than does the other.

APPENDIX II

DEMOGRAPHIC AND SOCIOECONOMIC TERMS

The demographic and socioeconomic characteristics of the population sampled are defined as follows:

Age.—The age recorded for each examinee was the age at his last birthday on the date of examination. The age criterion for inclusion in the sample used in this survey was defined in terms of his age at time of census interview. Some of those who were 74 years old at the time of interview became 75 years old by the time of the examination. There were eight such cases. In the adjustment and weighting procedures used to produce national estimates, these persons were included in the 74-year-old group.

Race.—For each individual, race was recorded as "white," "Negro," or "other races." The last category included American Indians, Chinese, Japanese, and all races other than white or Negro. Mexican persons were included with "white" unless definitely known to be American Indian or of another race other than white. Negroes and persons of mixed Negro and other parentage were recorded as "Negro."

Family income.—The income recorded was the total income reported during the past 12 months by the head of the household and all other household members related to the head by blood, marriage, or adoption. This income was the total cash income (excluding pay in kind, e.g., meals, living quarters, or supplies provided in place of cash wages) except in the case of a family with its own farm or business, in which case net income was recorded. Also included in the family income figure were allotments and other money received by the family from a member of the Armed Forces whether he was living at home or not.

Poverty index.—Income status was determined by the Poverty Income Ratio (PIR). Poverty statistics published in the Census Bureau reports [29] were based on the poverty index developed by the Social Security Administration in 1964. (For a detailed discussion of the SSA poverty standards, see reference [30].) Modifications in the definition of poverty were adopted in 1969.[30] The standard data series in poverty for statistical use by all executive departments and establishments has been established.[31]

NOTE: The list of references follows the text.

The two components of the PIR are the total income of the household (numerator) and a multiple of the total income necessary to maintain a family with given characteristics on a nutritionally adequate food plan[30] (denominator). The dollar value of the denominator of the PIR is constructed from a food plan (economy plan) necessary to maintain minimum recommended daily nutritional requirements. The economy plan is designated by the Department of Agriculture for "emergency or temporary use when funds are low."

For families of three or more persons, the poverty level was set at three times the cost of the economy food plan. For smaller families and persons living alone, the cost of the economy food plan was adjusted by the relatively higher fixed expenses of these smaller households.

The denominator or poverty income cutoff adjusts the family poverty income maintenance requirements by the family size, the sex of the family head, the age of the family head in families with one or two members, and the place of residence (farm, nonfarm). Annual revisions of the poverty income cutoffs are based on the changes in the average cost of living as reflected in the Consumer Price Index.

As shown in table IV the annual income considered to be the poverty level increases as the family size increases. A family with any combination of characteristics and with the same income as shown in the table has been designated as having a PIR or poverty level of 1.0. The same family with twice the income found in the table would have a PIR of 2.0. Ratios of less than 1.0 can be described as "below poverty," ratios greater than 1.0, as "above poverty."

Poverty thresholds are computed on a national basis only. No attempt has been made to adjust these thresholds for regional, State, or other local variation in the cost of living (except for the farm, nonfarm difference). None of the noncash public welfare benefits such as food stamp bonuses or free food commodities are included in the income of the low income families receiving these benefits.

The table of threshold income values for the combinations listed above is as follows:

Table IV. Weighted average thresholds at the low income level in 1971 by size of family and sex of head, by farm-nonfarm residence

Size of family	Total	Nonfarm			Farm		
		Total	Male head[1]	Female head[1]	Total	Male head[1]	Female head[1]
All unrelated individuals	$2,033	$2,040	$2,136	$1,978	$1,727	$1,783	$1,669
Under 65 years	2,093	2,098	2,181	2,017	1,805	1,853	1,715
65 years and over	1,931	1,940	1,959	1,934	1,652	1,666	1,643
All families	3,700	3,724	3,764	3,428	3,235	3,242	3,079
2 persons	2,612	2,633	2,641	2,581	2,219	2,224	2,130
Head under 65 years	2,699	2,716	2,731	2,635	2,317	2,322	2,195
Head 65 years and over	2,424	2,448	2,450	2,437	2,082	2,081	2,089
3 persons	3,207	3,229	3,246	3,127	2,745	2,749	2,627
4 persons	4,113	4,137	4,139	4,116	3,527	3,528	3,513
5 persons	4,845	4,880	4,884	4,837	4,159	4,159	4,148
6 persons	5,441	5,489	5,492	5,460	4,688	4,689	4,656
7 persons or more	6,678	6,751	6,771	6,583	5,736	5,749	5,516

[1]For unrelated individuals, sex of the individual.

SOURCE: U.S. Department of Commerce, Social and Economic Statistics Administration, U.S. Bureau of the Census "Characteristics of the Low Income Population: 1971," Current Population Reports, Series P-60, No. 86, p. 28.

APPENDIX III

Table V. Classification of clinical signs of nutrient deficiency by severity of deficiency: United States, 1971-72 (HANES Preliminary)

Nutrient	Clinical Sign	Severity of Deficiency[1]
Protein	Dry, staring hair	L - if single
	Dyspigmented hair	M - if 2 or more signs present
	Easily pluckable hair	L; M - if 2 or more signs present
	Abnormal texture or loss of curl of hair	M
	Visible or enlarged parotids	M
	Hepatomegaly	M
	Potbelly	M
	Apathy	M
	Marked hyperirritability	M
Vitamin B Complex: Riboflavin	Circumcorneal injection	L
	Conjunctival injection	L
	Angular blepharitis	M
	Angular lesions of lips } bilateral	H
	Angular scars of lips } bilateral	H
	Cheilosis	M
	Magenta tongue	H
	Nasolabial seborrhea	M
Vitamin B complex other than Riboflavin: Niacin	Filiform papillary atrophy of tongue	H
	Fungiform papillary hypertrophy of tongue	M
	Fissures of tongue	M
	Serrations or swelling of tongue	L
	Hyperpigmentation, hands and face	M
	Pellagrous dermatitis	H
	Scarlet beefy tongue	H
Thiamine	Absent knee jerks	M
	Absent ankle jerks	M
Vitamin D	Bossing of skull	M
	Beading of ribs	H
	Bowed legs	M
	Knock knees	M
	Epiphyseal enlargement, wrists	H
Vitamin A	Bitot's spots	H
	Keratomalacia	H
	Xerophthalmia	H
	Xerosis of the conjunctiva	H
Vitamin A and/or essential fatty acids	Follicular hyperkeratosis of upper back	L
	Follicular hyperkeratosis, arms	M } if both occur = M
	Dry or scaling skin (xerosis)	L } if both occur = M
	Mosaic skin	L
Vitamin C	Perifolliculosis	M } if two or more occur = H
	Petechiae	M } if two or more occur = H
	Ecchymosis	M } if two or more occur = H
	Bleeding and swollen gums	M
	Swollen red papillae of gingivae	L
	Diffuse marginal inflammation	L
Iodine	Enlarged thyroid gland, Group I	M
	Enlarged thyroid gland, Group II	H
Calcium	Positive Chvostek's sign	M

[1]L = low, M = moderate, H = high-risk indicator of possible deficiency.

Table VI. Clinical signs which failed to show a prevalence of at least 0.1 percent for the persons classified by age-sex-race and income level

Nutrient	Clinical sign	Severity of Deficiency
Protein	Dry, staring hair Dyspigmented hair	L - if single M - if 2 or more signs present
	Abnormal texture or loss of curl of hair	M
	Visible or enlarged parotids	M
	Apathy	M
	Marked hyperirritability	M
Riboflavin	Circumcorneal injection	L
Niacin	Hyperpigmentation of face and hands	M
	Pellagrous dermatitis	H
Vitamin D	Bossing of skull	M
	Beading of ribs	H
	Epiphyseal enlargement, wrists	H
Vitamin A	Mosaic skin	L
	Xerosis of the conjunctiva	H
Vitamin C	Perifolliculosis	M
	Petechial	M
	Ecchymosis	M

From the 10,126 persons sampled, the number of persons distributed in the subgroups with each of the above signs varied between 2 (loss of curl), and 11 (Ecchymosis).

Important clinical signs surveyed but not found include:

Nutrient	Clinical sign	Severity of Deficiency
Protein	Easily pluckable hair	L - if single M - if 2 or more signs present
Riboflavin	Angular blepharitis	M
Vitamin A	Bitot's spots	H
	Keratomalacia	H
	Xerophthalmia	H

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