Data from the
NATIONAL HEALTH SURVEY

Series 11
Number 208

Weight by Height and Age for Adults 18-74 Years:

United States, 1971-74

Age and sex distributions of weight by single inches of height for adults 18-74 years of age in the civilian noninstitutionalized population of the United States.

DHEW Publication No. (PHS) 79-1656

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Office of Health Research, Statistics, and Technology
National Center for Health Statistics
Hyattsville, Md. September 1979

NATIONAL CENTER FOR HEALTH STATISTICS

DIVISION OF HEALTH RESOURCES UTILIZATION STATISTICS

DIVISION OF OPERATIONS

COOPERATION OF THE U.S. BUREAU OF THE CENSUS

In accordance with specifications established by the National Center for Health Statistics, 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.

Vital and Health Statistics-Series 11-No. 208

DHEW Publication No. (PHS) 79-1656
Library of Congress Catalog Card Number 78-606159

Library of Congress Cataloging in Publication Data

Abraham, Sidney.
Weight by height and age for adults 18-74 years, United States, 1971-74.

(Vital and health statistics: Series 11, Data from the National Health Survey; no. 208) (DHEW publication; no. (PHS) 79-1656)
Includes bibliographical references.
1. Anthropometry—United States. 2. Body weight—United States. 3. Health surveys United States. I. Johnson, Clifford L., joint author. II. Najjar, Matthew F., joint author. III. Title. IV. Series: United States. National Center for Health Statistics. Vital and health statistics: Series 11, Data from the National Health Survey, Data from the health examination survey; no. 208. V. Series: United States. Dept. of Health, Education, and Welfare. DHEW publication; no. (PHS) 79-1656. [DNLM: 1. Biometry. 2. Body weight—In adulthood United States Statistics. 3. Age factors. 4. Sex factors. W2 AN148vk no. 208]
RA407.3.A347 no. 208 [GN58.U5] 312'.0973s
ISBN 0-8406-0141-7 [573'.6] 78-606159

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SYMBOLS

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WEIGHT BY HEIGHT AND AGE FOR ADULTS 18-74 YEARS

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INTRODUCTION

The height and weight measurements obtained from the Health and Nutrition Examination Survey (HANES), conducted by the National Center for Health Statistics from April 1971 through June 1974, are used to present weight findings by height among men and women aged 18-74 years in the United States.

In this report, weight by height data are analyzed and discussed by age and sex. The techniques of measurement are also discussed. The present findings are compared with the Health Examination Survey (HES), 1960-62.[1] The analysis of weight by height studies with variables other than age and sex will be presented in future reports. Consideration of body composition and configuration of obesity and of nutritional status will also be subjects of future reports.

HANES was designed to measure the nutritional status of a scientifically designed sample representative of the civilian noninstitutionalized population in the United States of ages 1 through 74 years. This survey was also designed to obtain some limited information on the general health status of the entire age group as well as specific information on the health status and medical care needs of those aged 25-74 years in the civilian noninstitutionalized population. A detailed description of the specific content and plan of operation, including sample design, has been published.[2]

As in previous Health Examination Survey programs, the U.S. Bureau of the Census cooperated in the sample design and in the initial visits 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 of the examination portion of the program were performed by the mobile examination center's field teams. 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 of the primary sampling units. The teams, which traveled to the various survey locations throughout the country, included professional and paraprofessional medical and dental examiners and technicians, interviewers, and other staff.

The probability sample design used in the survey provided a higher sampling ratio of the poor, preschool children, women of childbearing ages, and the elderly than of others in the civilian, noninstitutionalized population.

Field data collection operations for the first HANES survey were started in April 1971 and completed in June 1974. Of the 28,043 persons aged 1-74 years who were selected in the national probability sample to represent the 194 million persons in that age group in the civilian noninstitutionalized population, 20,749, or 74 percent, were examined. When adjustments are made for the differential sampling ratios used for the effect of oversampling among the poor, preschool children, women of childbearing age, and the elderly, this corresponds to an effective response rate of 75 percent.

Among those 18-74 years of age at the time of interview for whom height and weight

measurements were made, there were 13,645 persons examined out of the probability sample of 19,572 selected to represent the 128.0 million of that age in the population.

This is an unadjusted response rate of 70 percent and an effective adjusted response rate of 70 percent. National 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.

METHODS

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 of the day at each examination center and in different seasons of the year. Thus body measurements were not standardized by diurnal and seasonal variations. Weights vary between winter and summer and may differ depending upon recency of food and water intake.

Height

For persons aged 18-74 years, height was measured with the examinee wearing disposable foam rubber slippers, 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 to purposefully "stretch everyone in a standard manner," as is recommended by some.[3]

The height-measuring equipment consisted of a vertical bar with a steel tape attached to a level platform. Attached perpendicularly to the vertical bar 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, thereby giving a precise reading. The camera not only gave a permanent record that minimized observer and recording errors but, by sliding up and down with a horizontal bar and always being in the same plane, also 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.

Weight

A Toledo self-balancing scale that mechanically prints the weight to one-quarter of a pound directly onto the permanent record was used. This direct printing minimized observer and recording errors. The scale was calibrated with a set of known weights; 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 examination clothing used was the same throughout the year so there is no seasonal variation in the weight of clothing.

FINDINGS

Among men the average weights range from 140 pounds for those 62 inches in height to 197 pounds for those 74 inches tall (table 1 and figure 1).

Among women the average weights range from 123 pounds for those 57 inches tall to 161 pounds for those 68 inches in height. Weights at the extremes of the height range in some age groups did not show this constant increase in weight with advancing height. For example, in the age group 55-64 years, those measuring 57 inches weighed 10 pounds more, on the average, than those 1 inch taller. In the age group 65-74 years, the tallest group at 68 inches averaged 5 pounds less than those 1 inch shorter. This reflects, in part, the greater sampling variability at the extremes of the height range.

Tables 2 and 3 present descriptions of the distributions of weight by height for each sex-age group. The 5th, 10th, 25th, 50th, 90th,

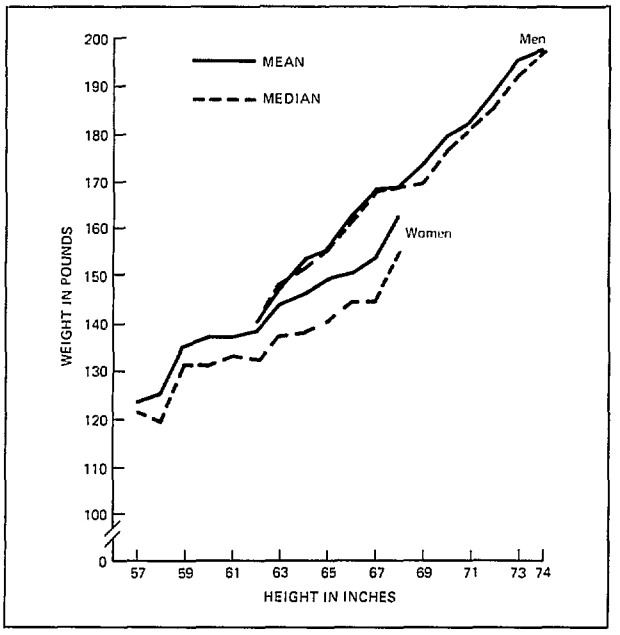


Figure 1. Unadjusted mean and median weight of men and women aged 18-74 years, by height: United States, 1971-74

and 95th percentiles are given. At times, the 5th and the 95th percentiles are unstable. This instability is caused by the small sample size of groups subclassified by sex, age, and height.

Percentile distributions were derived from sample sizes as small as 15 for some of the above subclassifications. Whenever less than 15 were available for a sex-age-height group, the percentile is not given since these sample sizes made the distributions at the extreme lower and upper tail less meaningful. This cutoff of 15 is arbitrary and relative—less value should be attached to the percentiles obtained from sample sizes of 15-30 than to those derived from much larger samples.

At each selected percentile point in the distributions of weight by height among men and women, there tends to be an increase in weight with height for all age groups. This pattern was also described previously for the mean weight by height. Some indication of the variation in weight among individuals of the same height and age is shown by the percentiles in tables 2 and 3.

Within each age group, the average weight tends to increase with height. Deviations from this tendency probably reflect sampling errors rather than any real weight differences in the population groups from one height interval to the next.

For persons taller or shorter than the extremes of the height range shown, the sample was too small to provide reliable estimates of the population's weight distribution. More complete weight and height distributions containing further information on these extremes are shown in tables 2 and 3.

The distribution of weight for any given height tends to be positively skewed, with greater deviations above than below the average weight. This is reflected by the fairly consistent excess of mean over median weights shown in figure 1.

For the purposes of smoothing the findings from HANES linear regression of weight on height was used (see appendix). Mean weights for given heights were obtained from a linear regression equation for men and women for the six age groups 18-24, 25-34, 35-44, 45-54, 55-64, and 65-74 years. The equations of weight by height were fitted by the least-squares method, which holds that the line of "best fit" is the one for which the sum of the squares of the residual errors is a minimum. The linear regression of weight by height describes the average change in weight accompanying a unit of change in height. The estimates of the constants—regression coefficient (b) and Y-intercept (a)—in the regression equation $Y = a + bx$ and the standard error of estimate around these regression lines for 12 age-sex groups are shown in table XV (see appendix).

Height-weight tables are presented for men and women in the age range 18-74 years, with mean weight values for each inch of height for the height range of 62-74 inches for men and 57-68 inches for women (tables 4 and 5). Three additional values below and above the mean weight are also given in these tables. They represent estimates of the range of 60, 80, and 90 percent, respectively, of the population around the mean weight.

$$Y \pm 0.8416\, S_{y \cdot x}$$

$$Y \pm 1.2816\, S_{y \cdot x}$$

$$Y \pm 1.6449\, S_{y \cdot x}$$

For example, assuming normality the predicted mean plus or minus 0.8416 times standard error of the estimate indicates the range of weights that is expected to include 60 percent of the examined persons of a specific height for a given age and sex group.

In this instance one would expect 30 percent of the individuals to be within this weight range below and above the mean weight, with 20 percent falling outside either of these ranges, values roughly equivalent to the lower and upper 20th percentiles of the distribution of weight by height for age and sex groups. The other two estimates around the mean ($Y \pm 1.2816\ S_{y \cdot x}$ and $Y \pm 1.6449\ S_{y \cdot x}$ represent 80 and 90 percent of the particular height group. This is roughly equivalent to the lower and upper 10th and 5th percentile, respectively, of the distribution of weight by height for age and sex groups.

The smoothed averages shown in table 6 were obtained from the linear regression equations of weight on height for each of the 12 age-sex groups (see appendix). There are small differences between the smoothed averages and the averages obtained directly from the data, averaging less than a pound over the indicated height range (figures 2 and 3).

Among men the differences range from 0.08 pound at ages 25-34 to 1.38 pounds at ages 55-64 years. The corresponding values among women are 0.33 pound at ages 65-74 years and 2.3 pounds at ages 55-64 years. The differences are attributed to the less stable values at the extremes of the height distribution.

The height-weight tables (tables 4 and 5) summarized in table 6 show that the average weights by height for men and women increase with age but in different patterns. Average weights of men increase rapidly until the age group 25-34 years. The rate of increase then flattens out, with the average weights peaking in the age group 45-54 years for men of heights less than 68 inches and declining thereafter. The average weights of men of heights 68 inches and more peak at ages 35-44 years and then tend to decline.

The average weights of women generally advance rapidly to the age group 35-44 years. They increase less rapidly in the age groups

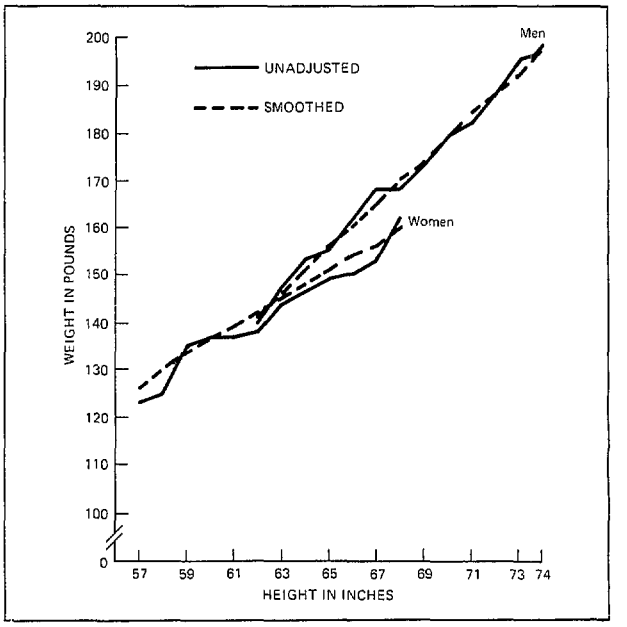


Figure 2. Unadjusted mean weights and smoothed mean weights (estimated from the regression equations) of men and women aged 18-74 years, by height: United States, 1971-74

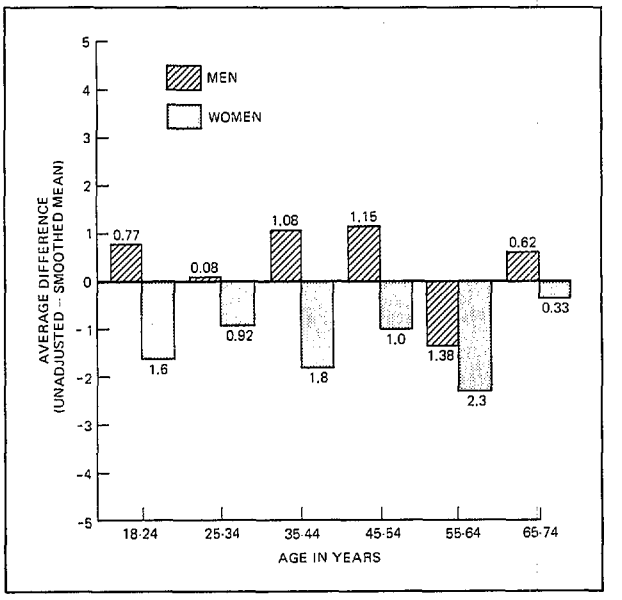


Figure 3. Average difference over height range between unadjusted mean weights and mean weights from regression equations for men and women, by age: United States, 1971-74

45-54 and 55-64 years, peak at the latter age group, and then decline.

The estimated number of adults, by age and sex in the general population by weight groups for height, is shown in tables 7-20. The number of adults in the HANES sample, by weight group for height, is presented in tables III-XIV.

COMPARISON WITH PREVIOUS HES SURVEY

The average weights of men and women by height as measured in the Health and Nutrition Examination Survey of 1971-74 were generally greater than those from the Health Examination Survey (HES) of 1960-62 (table 21, figures 4 and 5). Among persons in age group 18-24 years, the differences between averages during this period increased with height. This direction was less evident for men than for women, particularly in the shorter heights. However, at ages 25-34 years the pattern was reversed for women. The difference between the average weights of women in HANES and in HES decreased as height increased.

The differences in average weights for men and women 35-44 years showed the same pattern. HANES data showed the average weights of shorter people to be less than those in HES data and those of taller and medium weight people to be more. Differences in average weights for taller persons and those of medium height ranged from 1 to 13 pounds.

Average weights of women 45-54 years in HES were, with one exception, 2 pounds less than those of women in HANES. Average weights for men shorter than 69 inches in this same age group were also 2 pounds less for HES and were 2 to 5 pounds less for men taller than 69 inches.

At ages 55 years and over the average weight for women in HANES differed little from that of women in HES. On the other hand, differences between the average weight of men in HANES and that of men in HES increased with an increase in height. Men in HANES with above average height (69 inches and more) weighed more on the average—7 to 14 pounds at ages 55-64 and 7 to 11 pounds at ages 65-74 years—than men in HES did.

Women examined in HES, 1960-62, tend to attain their maximum average weight two decades later than men of heights 67 inches and less. The corresponding figure is one decade later for men 68 inches and more. Women in HANES show the same picture with the exception that their maximum average weight is attained two decades later than the taller men and one decade later than the shorter men (table 22). This delay may reflect the weight and calorie consciousness of women.

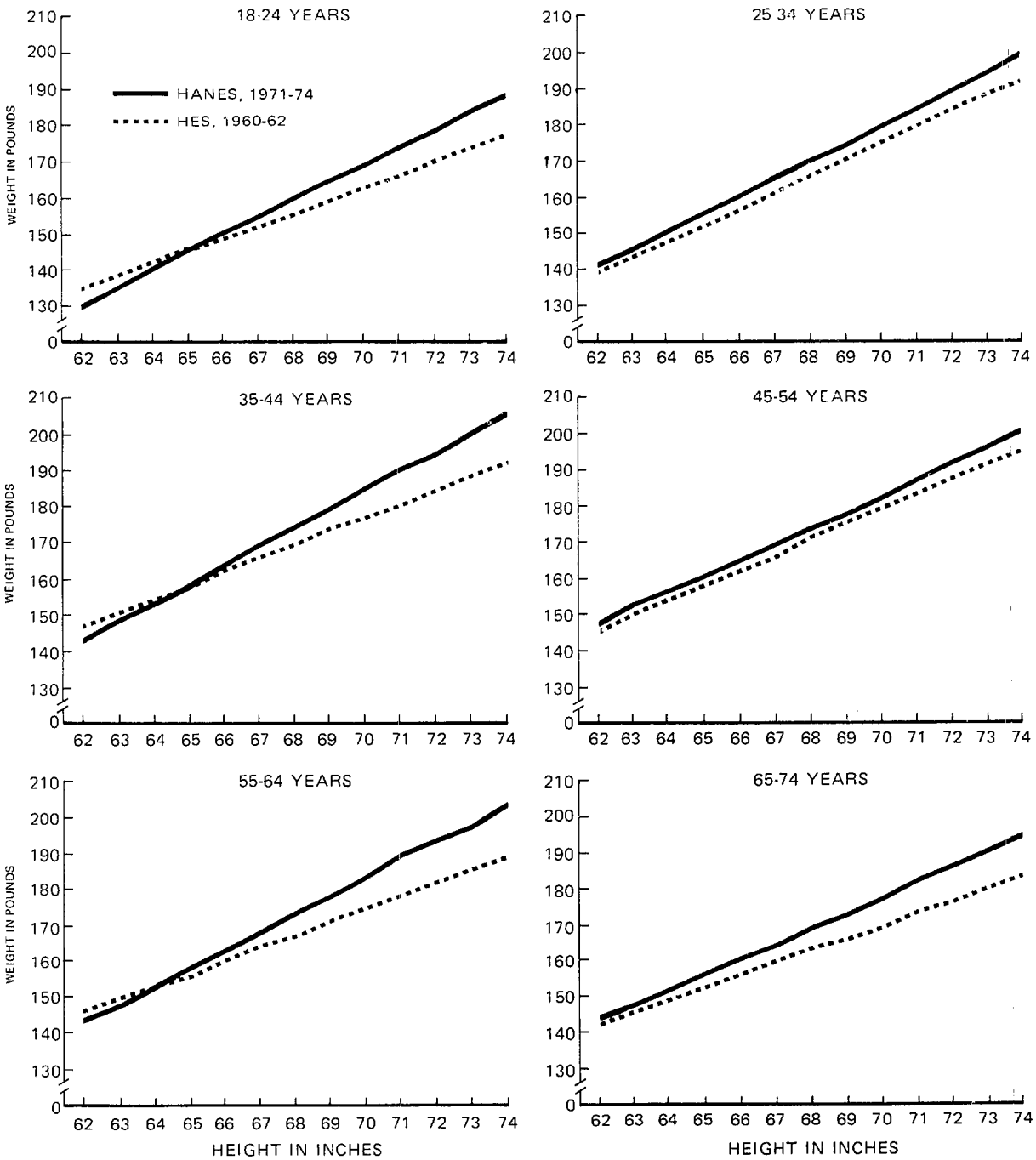
In both HES and HANES women show a greater relative gain in average weight with age as compared to men. It should be noted that these findings may be influenced by changes in body size for the successive generations in these cross-sectional data.

Selected percentiles of weights for each inch of height are shown for HES, 1960-62, and HANES, 1971-74, by age and sex in tables 23-28 and figures 6-11. The differences in weight between HANES and HES, discussed previously for the mean of the distribution, were also observed for the upper end of the distribution (80th, 90th, and 95th percentiles) but at a larger order of magnitude.

The greatest difference in weights of men was at the 95th percentile. HANES, greater at each inch of height for each age group than the corresponding percentiles for HES, averaged 9 pounds overall. It ranged from a high of 10 pounds at ages 18-24 to a low of 6 pounds at ages 65-74. At the 90th and 80th percentiles, the corresponding weights averaged 7 and 6 pounds more, respectively, over all age groups than those for HES.

Similar patterns appear when the differences between HANES and HES in the weight of women in the upper distribution were analyzed (tables 23-28 and figures 6-11). At the 95th, 90th, and 80th percentiles, weights of persons examined for HANES were higher, on the average, than those for HES by 9, 8, and 6 pounds, respectively, for all age groups. The differences in weights increased consistently with increased height except for the age group 25-34 years, when the weights of shorter women were greater than those of the medium and taller heights.

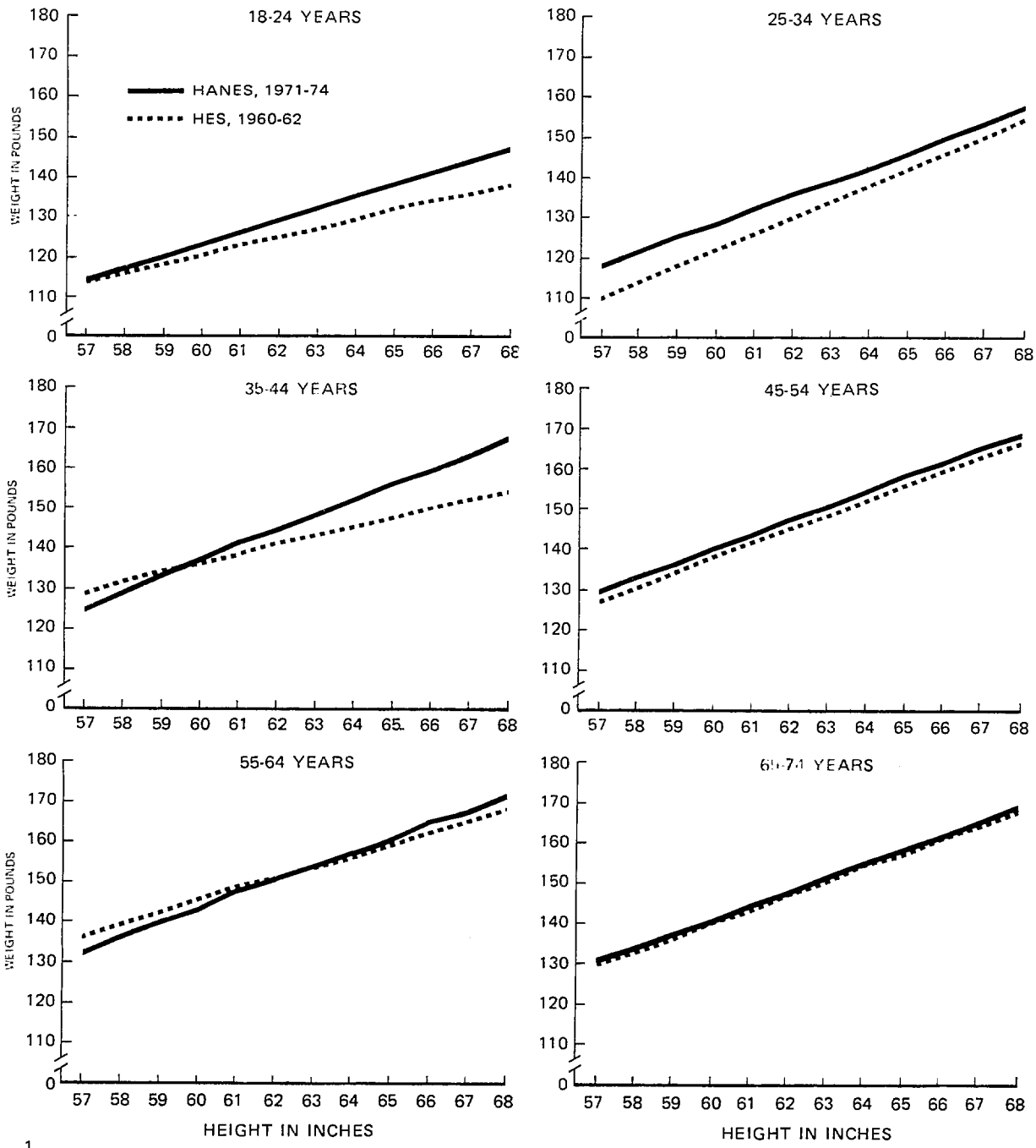
In contrast, for the lower end of the distribution (20th, 10th, and 5th percentiles)



[1] Estimated values from regression equations of weights for specified age groups.

NOTE: For 1960-62 and 1971-74, height was measured without shoes. For 1960-62 clothing weight was estimated as averaging 2 pounds, which were deducted from weights shown; for 1971-74 clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Figure 4. Average weights[1] of men by age group and height: United States, 1960-62 and 1971-74



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NOTE: For 1960-62 and 1971-74, height was measured without shoes. For 1960-62 clothing weight was estimated as averaging 2 pounds, which were deducted from weights shown; for 1971-74 clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Figure 5. Average weights[1] of women by age group and height: United States, 1960-62 and 1971-74

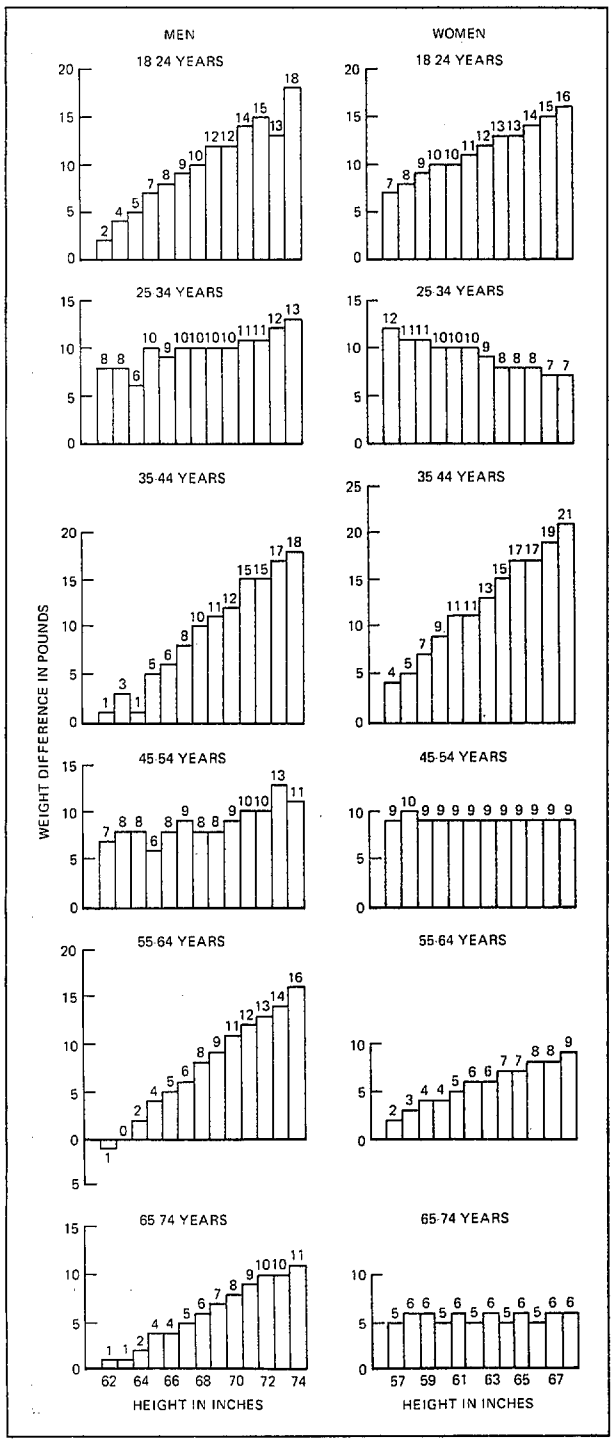

Figure 6. Differences at the 95th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

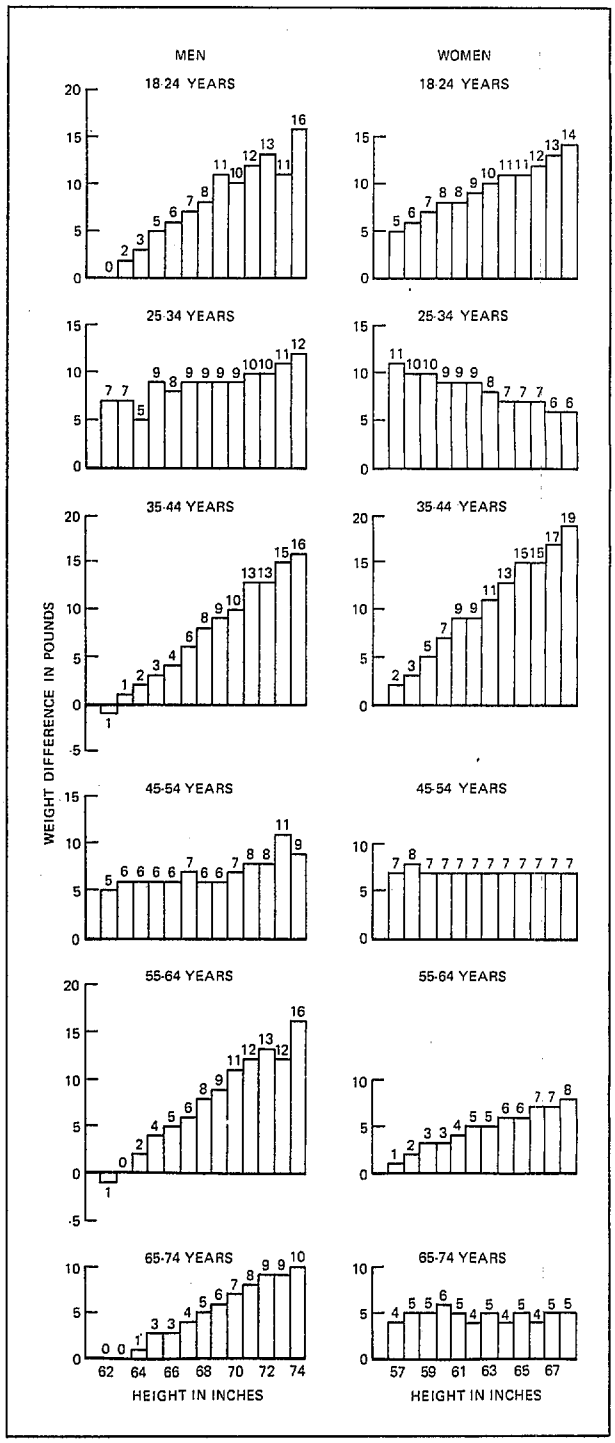

Figure 7. Differences at the 90th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

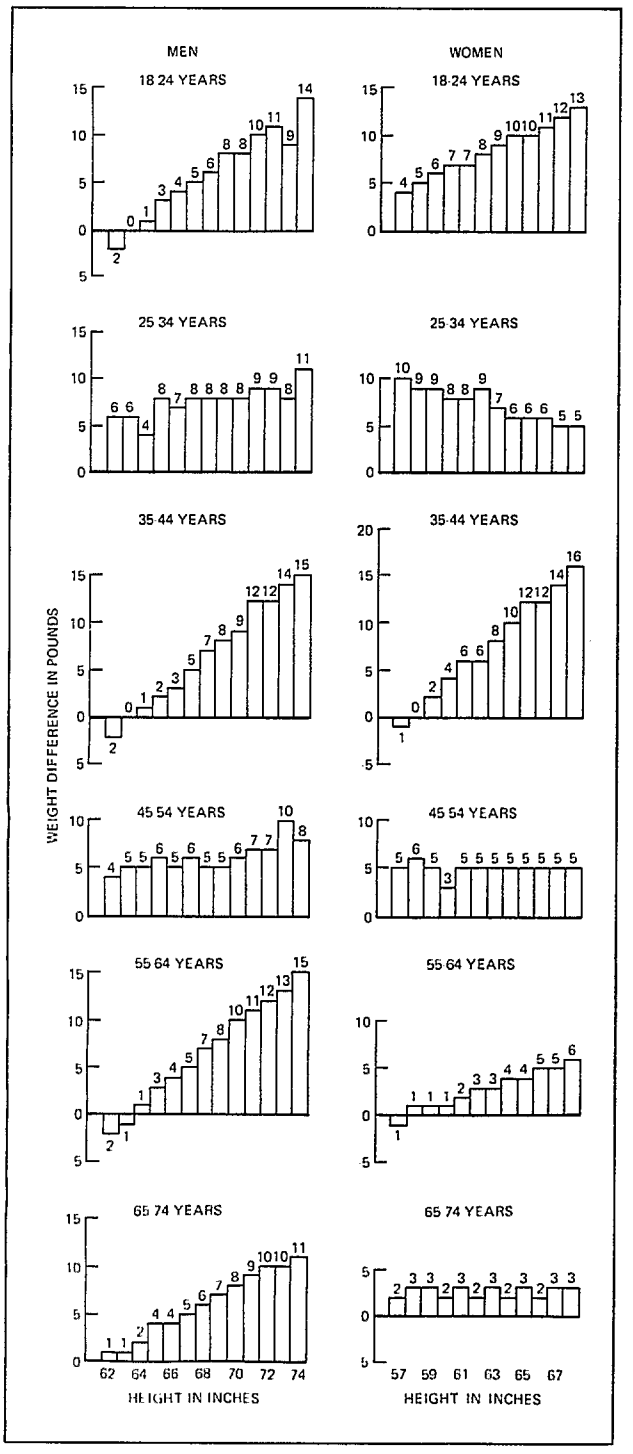

Figure 8. Differences at the 80th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

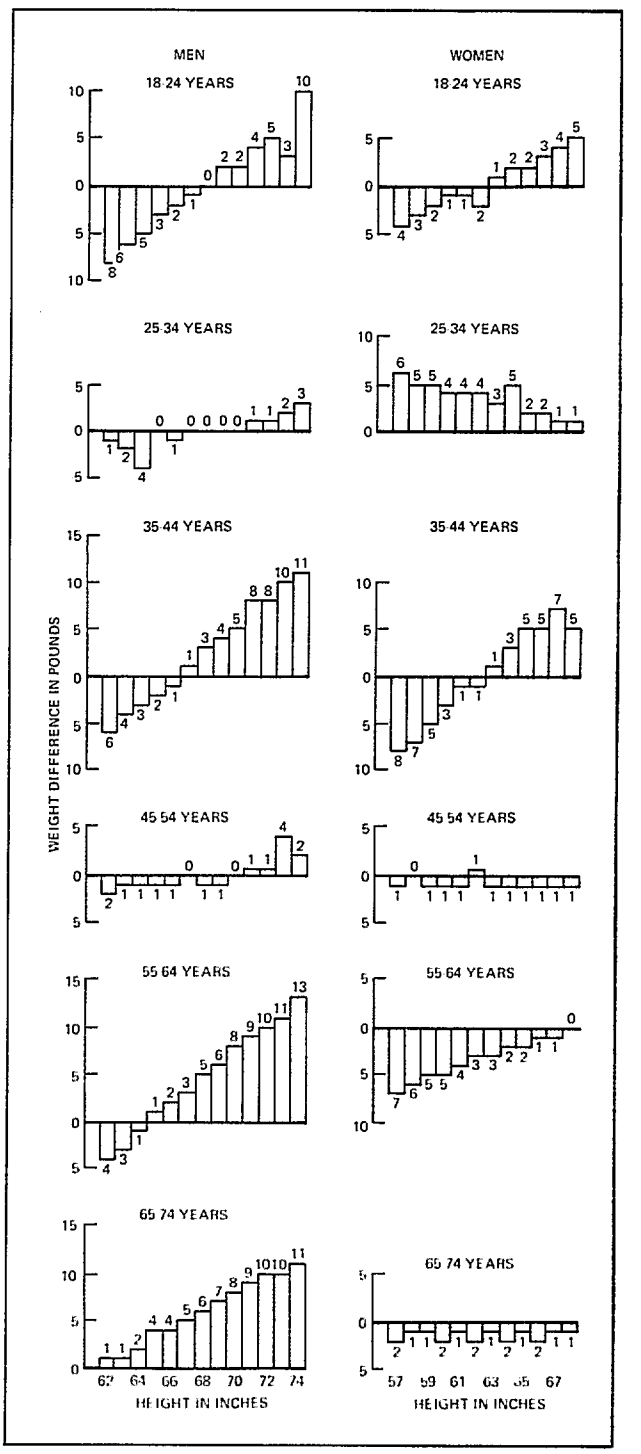

Figure 9. Differences at the 20th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

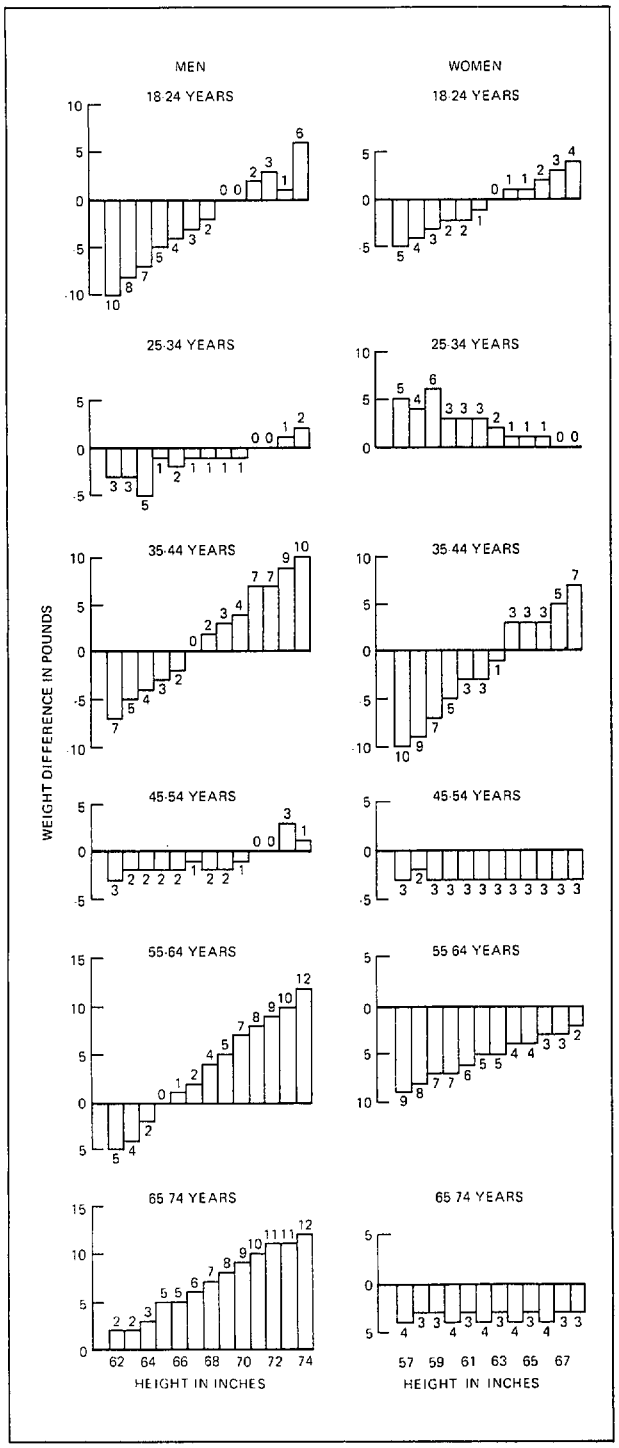

Figure 10. Differences at the 10th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

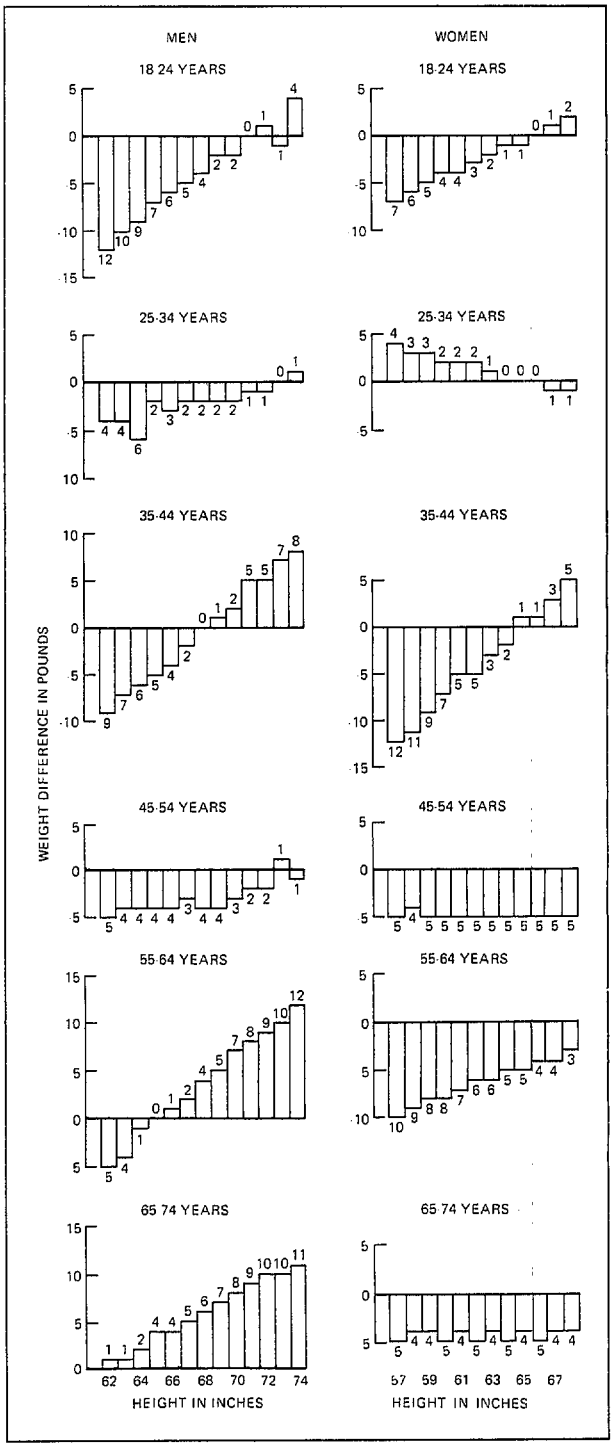

Figure 11. Differences at the 5th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

this direction was less evident for men, particularly in the shorter heights. The weights of men between the two surveys in these percentiles were consistently greater only in ages 65-74 years. The weights of women ages 45 years and over were consistently less in HANES than in HES.

DISCUSSION

Data on weight in relation to height by sex and age are a useful criterion of one aspect of nutritional status. There are no current estimates of weight by height that are representative of the general population. Data on such estimates, published by the National Center for Health Statistics, Health Examination Survey, 1960-62,[1] described a representative sample of the population. Other available data are taken from selected segments of the population[4-5] and special study groups[6] but cannot be generalized for the population. The largest collection of data is from life insurance studies of insured persons. However, because of the composition of such populations, the data do not represent a true cross section of the country.

These cross-sectional data on weight and height measurements of adults were obtained on different age cohorts. The age trends show the mean and percentile body measurements for successive cohorts of persons and reflect the effect of different environmental and hereditary influences. The limitations of cross-sectional data are recognized in considering group age changes. Patterns of weight gain and of gradual decline may be influenced by a secular trend in body size for successive generations in a cross-sectional survey. A more accurate assessment of these changes can be done from longitudinal data, where the same persons are followed for many years.

The tables in this report are not presumed to indicate desirable or standard weight but only to present a reference base for the person's observed weight. They show estimates over and under excess body weight of men and women by height and age. There are no estimates of body fat other than what can be inferred from the deviation of actual weight from the mean weight; such estimates will not yield information on how much of the weight difference is accounted for by excess fat.

This approach of predicting weight by height showed a correlation which ranged from the order of + 0.460 at ages 35-44 years to 0.390 at ages 45-54 years for men of ages 18-74 years. Corresponding correlation values for women ranged from + 0.285 at ages 65-74 years to + 0.246 at ages 45-54 years. The maximum coefficient of determination for men ages 25-44 years showed that about 20 percent of the variance can be explained by regression of weight by height. For women this value was about 8 percent.

Comparison of an individual's actual weight with a standard weight is the most widely used criterion of leanness or fatness. Interest in this measurement stems from the findings of life insurance and epidemiological studies that relate excess body weight status to unfavorable morbidity and mortality experiences. Using this method, the life insurance studies determined excess body weight status, which is defined as the deviation of actual weight for a given sex, age, and height from the average weight tables times 100.

These tables were obtained initially from the Medico-Actuarial Investigations (1912)[4] and later from the Build and Blood Pressure Study (1959).[5] Other studies, such as the Framingham Heart Study,[6] defined excess body weight due to obesity as a relative weight of 20 percent or more above the median weight for a given height and sex.

Since it is recognized that height and weight alone are incomplete indications of obesity, "desirable" weight tables that take into consideration measurements of body build have been developed by the Metropolitan Life Insurance Company. These tables for adults 25 years and over, showing ranges of weights for given heights, answer the criticism that height-weight tables 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 but the determination of frame size has not been specified or defined in terms of body measurements.

The user must exercise clinical judgment about type of body frame.

Such data are not satisfactory for studying the influence of obesity on mortality. Obesity, an excess accumulation of fat, is used interchangeably with overweight or excess body weight above standard weight. Total body weight is a measure of bone, muscle, and fat. Departure from average weight may be due to one or a combination of these body components. Overweight prevention and control is directed against overweight due to fat, which is primarily attributed to excess food intake over the energy demands of the individual. This is the major form of overweight in the United States.

Comparison With Previous Survey

Three factors were considered in comparing the height-weight data from the Health Examination Survey (1960-62)[2] with the current HANES findings. The first factor, which involved methods used in obtaining smoothed average weights, was not a problem for the HANES, 1971-74, data since a similar linear regression estimation was used.

The second factor, differences in clothing weights, will substantially affect the comparability between the studies. Clothing weights for HES were nearly like those for HANES, averaging about 2 pounds more. Adjustments were made for this difference. In both surveys, subjects were measured without shoes.

The third factor was measurement techniques in HES and HANES. HES, done by the Division of Health Examination Statistics of the National Center for Health Statistics using the same standardization of height and weight techniques, provided the baseline against which the values from HANES were measured.

Comparable response rates of examined persons on whom measurements were taken are also necessary in order to compare the weight measures by height from the two surveys. The HES sample had a response rate of 95 percent interviewed and 86 percent examined, a highly representative sample of the civilian noninstitutionalized population of the United States. The corresponding rates for HANES were over 95 percent interviewed and 70 percent examined. The lower examination rate in the HANES sample could have biased the mean weight downward if heavier persons might be less likely to come for an examination. This is, however, unlikely because an analysis of medical histories comparing the nonexaminees with the examinees indicated no large differences between the nonexamined group and the examined group for the medical statistics compared.

Findings from the present study show that adults in HANES, 1971-74, generally weighed more than their counterparts in HES, 1960-62. Among women the differences in average weights generally were largest at the ages under 45 years. Of women 64 inches tall, those in the age groups 18-44 years were 4 to 7 pounds heavier, on the average, than women of the same height and age in 1960-62. In the age groups 45 years and over, the differences in average weights of women this height in the 1971-74 period over those in 1960-62 do not exceed 2 pounds.

The increase in heights cannot explain the greater weights of men and women in HANES, 1971-74, compared with HES, 1960-62. Although adults measured in HANES were taller than those in HES, differences are numerically small. HANES data showed men's heights ranging from less than one-half inch to an inch taller than the heights from HES data. Corresponding values for women are from less than one-half inch to slightly more than three-quarters of an inch taller. Excess caloric intake and sedentary habits are probably responsible for this greater weight.

The differences in average weights per inch of height by age for men and women were not identical for the selected percentiles. In particular, the lowest percentiles, 20th, 10th, and 5th, were changed much less than the upper percentiles, which showed substantial gains in weight between surveys.

SUMMARY

This report contains weight by height findings by age among adult men and women aged 18-74 years in the civilian noninstitutionalized

population of the United States based on data from HANES in 1971-74. Tables of average weights and selected percentiles for adult Americans are estimated from linear regression equations. Linear regression equations gave a better than expected fit when used to smooth the data for comparative purposes and to extend them at the extremes where the sample was too small to produce reliable estimates.

A comparison of the findings from the HANES study with those from the Health Examination Survey study shows that American men range in average weight from 140 pounds at 62 inches to 197 pounds at 74 inches tall; among American women this average progresses from 123 pounds at 57 inches to 161 pounds at 68 inches.

- Adults in the HANES study generally weighed more than those in the Health Examination Survey. Men 18-74 years of age in HES averaged 3 pounds lighter than those in HANES. Women of this same age were about 1 pound less than women in HANES.
- The pattern of difference in average weights between the HANES study and HES study varied with height and age. Comparisons are made with adjustments for clothing.
- Mean weight increased consistently with age and height according to both studies. However, adults in HANES were generally heavier than those in HES.
- At age groups 18-24, 35-44, and 55-64 years, the differences in weight are more for men less than 65 inches in height in HES than in HANES. For women in HANES at age groups 25-34 years, the differences were larger at the shorter height than at the taller height, ranging from 3-8 pounds over HES.

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LIST OF DETAILED TABLES

Table 1. Average weight of men and women aged 18-74 years, by age and height: United States, 1971-74

Sex and height	18-74	Age group in years					
		18-24	25-34	35-44	45-54	55-64	65 and over
	Weight in pounds						
Men							
62 inches	140	[1]130	[1]141	[1]143	[1]147	[1]143	148
63 inches	147	140	151	[1]148	151	[1]147	146
64 inches	153	146	151	158	165	154	147
65 inches	155	138	155	156	161	163	155
66 inches	162	154	160	165	166	163	160
67 inches	168	157	168	173	172	168	167
68 inches	168	155	166	177	170	170	169
69 inches	173	166	176	172	178	175	172
70 inches	179	165	185	184	183	184	181
71 inches	182	176	178	188	187	187	188
72 inches	188	175	190	195	193	184	183
73 inches	195	186	195	210	196	189	[1]190
74 inches	197	191	191	[1]205	[1]200	[1]203	[1]194
Women							
57 inches	123	[1]114	[1]118	[1]125	[1]129	[1]132	130
58 inches	125	118	119	128	[1]133	122	133
59 inches	135	118	126	136	136	143	137
60 inches	137	123	125	135	146	142	138
61 inches	137	124	130	134	141	148	144
62 inches	138	124	135	142	140	146	146
63 inches	144	132	138	146	149	154	149
64 inches	145	133	141	148	153	151	152
65 inches	149	136	143	155	156	162	153
66 inches	150	140	146	157	155	155	162
67 inches	153	143	153	155	161	[1]167	173
68 inches	161	142	162	171	173	[1]171	168

[1]Estimated values obtained from linear regression equations.

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 2. Weight of men aged 18-74 years by age and height: sample size, estimated population in thousands, mean, standard deviation, standard error of the mean, and selected percentiles, United States, 1971-74

Age and height	Sample size	Estimated population in thousands	Mean	Standard deviation	Standard error of the mean	Percentile						
						5th	10th	25th	50th	75th	90th	95th
						Weight in pounds						
18-74 years												
62 inches	70	647	140	18.44	3.20	108	123	126	140	150	163	169
63 inches	139	1,217	147	24.93	3.37	109	116	126	148	159	177	182
64 inches	272	2,167	153	25.33	2.19	112	124	135	151	166	184	199
65 inches	453	3,867	155	25.87	1.60	116	122	137	155	172	189	198
66 inches	555	6,005	162	23.33	1.49	124	133	148	161	176	191	196
67 inches	699	7,556	168	27.38	1.40	130	135	151	167	183	201	213
68 inches	756	8,352	168	25.05	1.33	129	138	151	168	182	199	212
69 inches	686	8,642	173	27.96	1.46	137	143	153	169	188	210	225
70 inches	584	7,554	179	33.38	1.97	138	144	159	176	195	212	232
71 inches	385	5,495	182	29.50	1.58	141	150	163	181	197	215	230
72 inches	287	4,269	188	31.68	2.19	139	151	166	185	211	225	241
73 inches	176	2,806	195	30.90	3.07	154	159	173	192	214	230	253
74 inches	73	1,155	197	32.99	4.53	148	158	173	196	218	233	264
75 inches	30	417	208	42.29	9.18	169	173	179	192	216	274	288
76 inches	19	552	198	31.83	8.80	144	164	169	197	213	231	232
18-24 years												
62 inches	7	147	*	*	*	*	*	*	*	*	*	*
63 inches	10	119	*	*	*	*	*	*	*	*	*	*
64 inches	17	213	146	19.81	7.64	118	120	133	145	151	186	187
65 inches	41	550	138	22.24	4.74	111	112	121	134	145	164	193
66 inches	59	888	154	22.35	3.03	116	125	146	155	165	172	179
67 inches	81	1,140	157	23.94	3.99	121	131	140	153	173	187	203
68 inches	116	1,500	155	20.78	2.65	124	132	142	153	168	180	195
69 inches	108	1,667	166	26.18	3.48	133	139	147	161	182	208	224
70 inches	115	1,809	165	25.10	2.61	129	137	146	162	179	195	213
71 inches	76	1,342	176	25.52	3.46	141	146	157	170	187	202	228
72 inches	58	870	175	30.19	5.36	140	147	155	168	185	214	228
73 inches	43	764	186	34.99	6.99	132	157	164	180	201	229	247
74 inches	22	329	191	35.53	9.57	134	148	159	197	218	228	234
75 inches	6	112	*	*	*	*	*	*	*	*	*	*
76 inches	7	260	*	*	*	*	*	*	*	*	*	*
25-34 years												
62 inches	3	13	*	*	*	*	*	*	*	*	*	*
63 inches	17	273	151	29.37	10.0	109	110	130	155	159	196	197
64 inches	23	383	151	25.35	6.85	111	126	133	148	161	195	206
65 inches	41	547	155	25.24	5.53	123	128	136	150	162	194	201
66 inches	70	1,217	160	21.46	3.37	129	134	145	157	176	191	194
67 inches	86	1,305	168	24.16	3.55	134	136	152	167	182	199	207
68 inches	92	1,404	166	25.36	2.44	129	140	149	164	181	196	201
69 inches	120	2,044	176	32.99	4.02	140	148	154	167	194	225	233
70 inches	112	1,763	185	44.16	6.02	141	148	159	180	197	215	253
71 inches	73	1,193	178	37.47	4.17	128	142	154	175	193	212	224
72 inches	69	1,142	190	29.62	4.50	154	157	168	185	210	224	244
73 inches	52	931	195	24.60	4.04	156	165	176	192	211	224	241
74 inches	21	366	191	30.61	8.21	157	158	167	182	217	226	244
75 inches	11	177	*	*	*	*	*	*	*	*	*	*
76 inches	8	216	*	*	*	*	*	*	*	*	*	*

Table 2. Weight of men aged 18-74 years by age and height: sample size, estimated population in thousands, mean, standard deviation, standard error of the mean, and selected percentiles, United States, 1971-74—Con.

Age and height	Sample size	Estimated population in thousands	Mean	Standard deviation	Standard error of the mean	Percentile						
						5th	10th	25th	50th	75th	90th	95th
35-44 years						Weight in pounds						
62 inches	3	88	*	*	*	*	*	*	*	*	*	*
63 inches	12	200	*	*	*	*	*	*	*	*	*	*
64 inches	23	298	158	18.03	6.02	125	139	151	160	173	183	184
65 inches	40	524	156	25.59	4.46	121	125	137	159	169	190	192
66 inches	63	987	165	24.76	3.86	124	132	144	164	181	192	203
67 inches	75	1,241	173	24.10	3.09	134	147	159	172	185	206	211
68 inches	98	1,603	177	20.79	2.47	140	150	162	177	194	204	209
69 inches	97	1,536	172	23.74	2.35	140	147	153	169	189	199	208
70 inches	88	1,343	184	30.72	4.02	143	147	166	185	198	207	218
71 inches	69	1,128	188	23.46	2.99	155	159	169	186	199	223	232
72 inches	44	882	195	36.68	6.21	138	140	169	197	222	237	243
73 inches	29	465	210	31.76	5.27	159	172	186	204	225	258	277
74 inches	11	198	*	*	*	*	*	*	*	*	*	*
75 inches	5	72	*	*	*	*	*	*	*	*	*	*
76 inches	2	30	*	*	*	*	*	*	*	*	*	*
45-54 years												
62 inches	9	141	*	*	*	*	*	*	*	*	*	*
63 inches	16	211	151	14.91	4.70	107	136	143	154	161	168	169
64 inches	23	290	165	35.96	10.33	101	126	140	159	193	224	236
65 inches	59	765	161	26.01	3.20	116	131	143	161	177	189	211
66 inches	76	1,076	166	24.19	3.60	136	137	151	165	179	194	200
67 inches	112	1,605	172	29.19	2.96	129	143	158	168	185	202	215
68 inches	121	1,720	170	27.48	3.53	126	130	154	173	185	210	223
69 inches	110	1,594	178	27.30	2.92	136	142	162	176	190	215	220
70 inches	84	1,341	183	25.08	2.87	143	147	164	184	199	211	234
71 inches	54	818	187	28.61	4.67	134	153	169	190	199	220	236
72 inches	49	870	193	24.84	4.27	156	164	176	193	213	225	240
73 inches	27	425	196	31.36	8.08	144	156	173	192	217	222	234
74 inches	10	173	*	*	*	*	*	*	*	*	*	*
75 inches	6	50	*	*	*	*	*	*	*	*	*	*
76 inches	1	22	*	*	*	*	*	*	*	*	*	*
55-64 years												
62 inches	10	133	*	*	*	*	*	*	*	*	*	*
63 inches	12	192	*	*	*	*	*	*	*	*	*	*
64 inches	33	485	154	23.85	3.82	104	124	140	154	165	182	201
65 inches	59	757	163	26.82	3.40	112	128	146	162	177	196	209
66 inches	69	1,089	163	21.21	3.76	123	131	152	165	176	186	193
67 inches	96	1,439	168	31.72	3.26	128	135	145	167	182	204	229
68 inches	90	1,313	170	24.57	3.94	130	146	154	171	182	201	214
69 inches	75	1,241	175	26.47	4.32	139	146	154	172	188	209	238
70 inches	56	841	184	32.05	5.60	139	149	165	177	198	224	236
71 inches	48	833	187	28.38	6.02	153	154	167	187	203	214	232
72 inches	22	325	184	35.01	9.20	131	132	157	182	213	215	239
73 inches	15	195	189	22.52	6.65	158	160	171	194	202	212	233
74 inches	4	70	*	*	*	*	*	*	*	*	*	*
75 inches	1	5	*	*	*	*	*	*	*	*	*	*
76 inches	1	24	*	*	*	*	*	*	*	*	*	*

Table 2. Weight of men aged 18-74 years by age and height: sample size, estimated population in thousands, mean, standard deviation, standard error of the mean, and selected percentiles, United States, 1971-74—Con.

Age and height	Sample size	Estimated population in thousands	Mean	Standard deviation	Standard error of the mean	Percentile						
						5th	10th	25th	50th	75th	90th	95th
65-74 years						Weight in pounds						
62 inches	38	124	148	18.17	3.26	120	124	138	148	155	172	179
63 inches	72	224	146	19.94	2.43	112	121	132	144	156	177	182
64 inches	153	497	147	21.61	2.12	110	121	132	148	161	175	182
65 inches	213	725	155	21.34	1.58	118	124	141	156	170	181	188
66 inches	218	745	160	24.53	2.04	117	129	147	159	175	189	199
67 inches	249	827	167	24.48	1.67	127	135	153	167	180	197	212
68 inches	239	812	169	25.20	1.87	126	137	152	167	182	204	214
69 inches	176	558	172	24.65	3.02	139	143	152	168	187	209	214
70 inches	129	458	181	29.36	3.00	139	149	161	177	193	214	236
71 inches	65	181	188	23.47	4.32	146	153	178	190	204	218	230
72 inches	45	179	183	28.19	5.32	143	149	161	185	202	211	233
73 inches	10	26	*	*	*	*	*	*	*	*	*	*
74 inches	5	18	*	*	*	*	*	*	*	*	*	*
75 inches	1	1	*	*	*	*	*	*	*	*	*	*
76 inches	-	-	*	*	*	*	*	*	*	*	*	*

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 3. Weight of women aged 18-74 years by age and height: sample size, estimated population in thousands, mean, standard deviation, standard error of the mean, and selected percentiles, United States, 1971-74

Age and height	Sample size	Estimated population in thousands	Mean	Standard deviation	Standard error of the mean	Percentile						
						5th	10th	25th	50th	75th	90th	95th
18-74 years						Weight in pounds						
57 inches	99	536	123	28.35	4.09	85	88	105	121	146	165	171
58 inches	165	1,105	125	29.67	3.78	87	92	106	119	139	177	188
59 inches	338	2,503	135	28.77	1.92	95	103	112	131	153	169	185
60 inches	619	4,583	137	30.34	2.55	98	105	115	131	152	180	194
61 inches	970	7,493	137	29.31	1.01	100	104	116	133	154	176	191
62 inches	1,242	10,163	138	30.43	1.19	103	109	119	132	151	176	194
63 inches	1,297	10,316	144	31.59	1.03	106	110	122	137	159	187	206
64 inches	1,200	10,148	145	30.80	1.25	109	114	125	138	161	187	202
65 inches	1,061	9,079	149	33.82	1.43	110	115	127	140	162	193	212
66 inches	623	5,328	150	32.81	1.68	114	119	128	144	163	192	214
67 inches	375	3,134	153	32.65	1.91	117	122	132	144	164	194	216
68 inches	217	1,818	161	36.18	2.78	122	127	137	154	173	209	238
69 inches	87	744	158	43.24	4.44	120	126	133	144	166	216	254
70 inches	40	347	162	30.56	6.18	128	130	142	159	172	206	220
18-24 years												
57 inches	11	70	*	*	*	*	*	*	*	*	*	*
58 inches	20	162	118	19.50	4.38	87	90	106	112	131	155	157
59 inches	38	248	118	20.10	4.02	95	98	107	112	132	145	162
60 inches	81	560	123	24.26	4.28	93	96	107	115	132	154	179
61 inches	125	1,037	124	25.24	2.41	97	101	109	118	132	150	182
62 inches	197	1,691	124	25.00	2.31	97	99	109	119	133	150	166
63 inches	248	1,964	132	24.93	1.72	101	106	114	129	142	162	188
64 inches	245	1,982	133	24.00	1.74	104	108	116	130	142	165	179
65 inches	224	2,151	135	30.15	2.67	104	110	119	130	143	162	190
66 inches	142	1,257	140	28.78	3.02	112	114	121	131	154	174	190
67 inches	93	886	143	30.16	3.55	112	115	129	138	151	164	187
68 inches	48	431	142	23.50	3.46	117	119	127	140	150	161	168
69 inches	25	244	136	17.25	4.87	104	119	130	134	142	152	170
70 inches	12	113	*	*	*	*	*	*	*	*	*	*
25-34 years												
57 inches	13	80	*	*	*	*	*	*	*	*	*	*
58 inches	26	158	119	20.47	4.95	95	97	102	115	141	147	157
59 inches	43	296	126	25.82	3.30	91	97	115	126	131	151	186
60 inches	74	528	125	25.75	4.76	95	97	106	120	134	171	185
61 inches	205	1,444	130	28.51	2.12	100	103	110	121	138	172	187
62 inches	279	2,081	135	28.10	1.64	103	107	116	127	146	172	190
63 inches	308	2,256	138	30.47	2.33	104	109	118	131	147	178	201
64 inches	272	1,943	141	33.81	2.83	107	110	120	131	150	188	207
65 inches	269	2,047	143	32.07	2.44	109	115	122	134	153	187	210
66 inches	180	1,381	146	31.92	2.05	109	118	124	137	160	190	217
67 inches	114	843	153	31.33	3.14	120	123	131	144	173	191	221
68 inches	71	539	162	36.28	3.84	125	129	137	152	172	217	237
69 inches	23	161	153	40.26	8.65	120	124	136	143	155	177	292
70 inches	12	113	*	*	*	*	*	*	*	*	*	*

Table 3. Weight of women aged 18-74 years by age and height: sample size, estimated population in thousands, mean, standard deviation, standard error of the mean, and selected percentiles, United States, 1971-74—Con.

Age and height	Sample size	Estimated population in thousands	Mean	Standard deviation	Standard error of the mean	Percentile						
						5th	10th	25th	50th	75th	90th	95th
35-44 years						Weight in pounds						
57 inches	10	31	*	*	*	*	*	*	*	*	*	*
58 inches	21	105	128	35.70	10.88	94	95	107	118	141	182	216
59 inches	65	428	136	31.51	5.59	97	102	117	132	147	171	209
60 inches	100	690	135	30.15	3.27	104	109	116	124	149	173	193
61 inches	147	964	134	30.59	3.60	101	106	113	128	147	164	180
62 inches	208	1,555	142	33.89	3.21	108	111	121	134	150	181	199
63 inches	245	1,655	146	31.37	1.81	109	114	124	136	164	195	205
64 inches	264	1,889	148	30.86	2.42	111	114	125	138	166	195	210
65 inches	255	1,830	155	32.46	2.39	118	123	131	147	174	201	219
66 inches	147	977	157	40.72	5.77	118	121	130	145	167	214	239
67 inches	94	637	155	36.13	4.88	123	124	130	146	162	205	235
68 inches	58	458	171	44.70	6.82	123	125	145	160	179	240	268
69 inches	24	197	180	42.76	9.84	139	143	152	167	184	230	300
70 inches	13	73	*	*	*	*	*	*	*	*	*	*
45-54 years												
57 inches	5	27	*	*	*	*	*	*	*	*	*	*
58 inches	7	59	*	*	*	*	*	*	*	*	*	*
59 inches	34	493	136	29.72	5.96	94	100	105	148	165	169	174
60 inches	59	1,004	146	35.27	7.60	110	112	118	135	170	214	216
61 inches	94	1,257	141	29.05	3.60	100	108	120	140	154	181	196
62 inches	138	1,969	140	31.31	3.55	108	111	120	134	153	172	195
63 inches	126	1,842	149	34.35	2.45	110	112	125	143	163	187	215
64 inches	135	2,118	153	29.13	3.09	119	123	130	147	167	191	209
65 inches	104	1,449	156	29.79	3.57	116	126	134	150	166	194	217
66 inches	71	1,031	155	23.33	3.05	127	129	139	151	165	186	201
67 inches	32	489	161	31.89	5.87	123	124	141	152	183	194	217
68 inches	15	228	173	28.64	8.75	132	138	146	186	191	197	212
69 inches	9	90	*	*	*	*	*	*	*	*	*	*
70 inches	2	31	*	*	*	*	*	*	*	*	*	*
55-64 years												
57 inches	9	124	*	*	*	*	*	*	*	*	*	*
58 inches	18	323	122	32.69	9.04	70	86	101	119	126	181	200
59 inches	43	558	143	24.42	5.24	110	112	127	141	161	167	179
60 inches	63	896	142	25.82	3.68	103	105	122	145	161	177	188
61 inches	99	1,611	148	27.26	2.56	100	110	128	148	166	183	190
62 inches	104	1,565	146	29.28	3.30	106	116	128	139	164	187	199
63 inches	96	1,570	154	34.09	4.74	109	118	132	147	176	203	223
64 inches	102	1,439	151	32.39	2.96	109	117	129	147	169	191	208
65 inches	71	1,031	162	42.87	6.74	110	119	141	151	171	200	225
66 inches	29	428	155	38.77	9.43	90	100	127	151	175	209	223
67 inches	13	189	*	*	*	*	*	*	*	*	*	*
68 inches	8	85	*	*	*	*	*	*	*	*	*	*
69 inches	3	37	*	*	*	*	*	*	*	*	*	*
70 inches	1	17	*	*	*	*	*	*	*	*	*	*

Table 3. Weight of women aged 18-74 years by age and height: sample size, estimated population in thousands, mean, standard deviation, standard error of the mean, and selected percentiles, United States, 1971-74—Con.

Age and height	Sample size	Estimated population in thousands	Mean	Standard deviation	Standard error of the mean	Percentile						
						5th	10th	25th	50th	75th	90th	95th
65-74 years						Weight in pounds						
57 inches	51	204	130	26.44	4.87	87	105	113	133	147	167	171
58 inches	73	297	133	26.29	4.75	94	105	111	130	150	180	188
59 inches	115	482	137	30.45	3.58	94	104	115	131	153	179	190
60 inches	242	917	138	29.15	2.59	99	107	116	136	158	178	191
61 inches	300	1,173	144	28.12	2.51	100	112	126	140	160	177	195
62 inches	316	1,305	146	28.80	1.83	106	115	126	142	165	183	200
63 inches	274	1,030	149	26.32	2.06	113	120	131	144	160	183	192
64 inches	182	768	152	27.64	2.55	111	121	135	150	167	183	195
65 inches	138	572	153	27.77	3.37	119	122	132	150	169	189	199
66 inches	54	251	162	26.20	5.00	135	140	146	147	175	208	215
67 inches	29	91	173	31.50	9.21	127	145	149	168	190	220	251
68 inches	17	78	168	23.58	6.25	132	138	155	171	184	190	223
69 inches	3	15	*	*	*	*	*	*	*	*	*	*
70 inches	-	-	*	*	*	*	*	*	*	*	*	*

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 4. Average weights and selected percentiles for each inch of height for men by age: United States, 1971-74

Height	Age group in years					
	18-24	25-34	35-44	45-54	55-64	65-74
	Weight in pounds					
62 inches	175	191	188	194	190	186
	165	180	178	183	180	176
	153	167	166	171	167	165
	[130]	[141]	[143]	[147]	[143]	[143]
	107	115	120	123	119	121
	95	102	108	111	106	110
	85	91	98	100	96	100
63 inches	180	195	193	199	194	190
	170	184	183	188	184	180
	158	171	171	176	171	169
	[135]	[145]	[148]	[152]	[147]	[147]
	112	119	125	128	123	125
	100	106	113	116	110	114
	90	95	103	105	100	104
64 inches	185	200	198	203	200	194
	175	189	188	192	190	184
	163	176	176	180	177	173
	[140]	[150]	[153]	[156]	[153]	[151]
	117	124	130	132	129	129
	105	111	118	120	116	118
	95	100	108	109	106	108
65 inches	190	206	203	207	205	199
	180	195	193	196	195	189
	168	182	181	184	182	178
	[145]	[156]	[158]	[160]	[158]	[156]
	122	130	135	136	134	134
	110	117	123	124	121	123
	100	106	113	113	111	113
66 inches	195	210	208	211	210	203
	185	199	198	200	200	193
	173	186	186	188	187	182
	[150]	[160]	[163]	[164]	[163]	[160]
	127	134	140	140	139	138
	115	121	128	128	126	127
	105	110	118	117	116	117
67 inches	199	215	214	216	215	207
	189	204	204	205	205	197
	177	191	192	193	192	186
	[154]	[165]	[169]	[169]	[168]	[164]
	131	139	146	145	144	142
	119	126	134	133	131	131
	109	115	124	122	121	121
68 inches	204	220	219	220	220	212
	194	209	209	209	210	202
	182	196	197	197	197	191
	[159]	[170]	[174]	[173]	[173]	[169]
	136	144	151	149	149	147
	124	131	139	137	136	136
	114	120	129	126	126	126
69 inches	209	224	224	224	225	216
	199	213	214	213	215	206
	187	200	202	201	202	195
	[164]	[174]	[179]	[177]	[178]	[173]
	141	148	156	153	154	151
	129	135	144	141	141	140
	119	124	134	130	131	130
70 inches	213	229	229	229	230	220
	203	218	212	218	220	210
	191	205	207	206	207	199
	[168]	[179]	[184]	[182]	[183]	[177]
	145	153	161	158	159	155
	133	140	149	146	146	144
	123	129	139	135	136	134
71 inches	218	234	235	234	236	225
	208	223	225	223	226	215
	196	210	213	211	213	204
	[173]	[184]	[190]	[187]	[189]	[182]
	150	158	167	163	165	160
	138	145	155	151	152	149
	128	134	145	140	142	139
72 inches	223	239	239	238	240	229
	213	228	229	227	230	219
	201	215	217	215	217	208
	[178]	[189]	[194]	[191]	[193]	[186]
	155	163	171	167	169	164
	143	150	159	155	156	153
	133	139	149	144	146	143
73 inches	228	244	245	243	244	233
	218	233	235	232	234	223
	206	220	223	220	221	212
	[183]	[194]	[200]	[196]	[197]	[190]
	160	168	177	172	173	168
	148	155	165	160	160	157
	138	144	155	149	150	147
74 inches	233	249	250	247	250	237
	223	238	240	236	240	227
	211	225	228	224	227	216
	[188]	[199]	[205]	[200]	[203]	[194]
	165	173	182	176	179	172
	153	160	170	164	166	161
	143	149	160	153	156	151

NOTES: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

The weight values were computed from the regression equation of weight on height by age. The values above and below the expected mean value represent the ±.8416, ±1.2816, and ±1.6449 standard error of the estimate covering within this range 60, 80, and 90 percent of the population around the mean, respectively. The first range is expected thus to identify 20, 10, and 5 percent of the population of the specific height on either side of the range.

Figures in [ ] are the expected means.

Table 5. Average weights and selected percentiles for each inch of height for women, by age: United States, 1971-74

Height	Age group in years						Height	Age group in years					
	18-24	25-34	35-44	45-54	55-64	65-74		18-24	25-34	35-44	45-54	55-64	65-74
	Weight in pounds							Weight in pounds					
57 inches	160	171	183	185	187	178	63 inches	178	192	206	206	208	199
	150	159	170	172	175	167		168	180	193	193	196	188
	138	145	154	157	160	154		156	166	177	178	181	175
	[114]	[118]	[125]	[129]	[132]	[130]		[132]	[139]	[148]	[150]	[153]	[151]
	90	91	96	101	104	106		108	112	119	122	125	127
	78	77	80	86	89	93		96	98	103	107	110	114
	68	65	67	73	77	82		86	86	90	94	98	103
58 inches	163	174	187	189	191	182	64 inches	181	195	210	210	212	202
	153	162	174	176	179	171		171	183	197	197	200	191
	141	148	158	161	164	158		159	169	181	182	185	178
	[117]	[121]	[129]	[133]	[136]	[134]		[135]	[142]	[152]	[154]	[157]	[154]
	93	94	100	105	108	110		111	115	123	126	129	130
	81	80	84	90	93	97		90	101	107	110	114	117
	71	68	71	77	81	86		89	89	94	98	102	106
59 inches	166	178	191	192	195	185	65 inches	184	199	214	214	215	206
	156	166	178	179	183	174		174	187	201	201	203	195
	144	152	162	164	168	161		162	173	185	186	188	182
	[120]	[125]	[133]	[136]	[140]	[137]		[138]	[146]	[156]	[158]	[160]	[158]
	96	98	104	108	112	113		114	119	127	130	132	134
	84	84	88	93	97	100		102	105	111	115	117	121
	74	72	75	80	85	89		92	93	98	102	105	110
60 inches	169	181	195	196	198	188	66 inches	187	203	217	217	219	209
	159	169	182	183	186	177		177	191	204	204	207	198
	147	155	166	168	171	164		165	177	188	189	192	185
	[123]	[128]	[137]	[140]	[143]	[140]		[141]	[150]	[159]	[161]	[164]	[161]
	99	101	108	112	115	116		117	123	130	133	136	137
	87	87	92	97	100	103		106	109	114	118	121	124
	77	75	79	84	88	92		95	97	101	105	109	113
61 inches	172	185	199	199	202	192	67 inches	190	206	221	221	222	213
	162	173	186	186	190	181		180	194	208	208	210	202
	150	159	170	171	175	168		168	180	192	193	195	189
	[126]	[132]	[141]	[143]	[147]	[144]		[144]	[153]	[163]	[165]	[167]	[165]
	102	105	112	115	119	120		120	126	134	137	139	141
	90	91	96	100	104	107		108	112	158	122	124	128
	80	79	83	87	92	96		98	100	105	109	112	117
62 inches	175	189	202	203	205	195	68 inches	193	210	225	224	226	217
	165	177	189	190	193	184		183	198	212	211	214	206
	153	163	173	175	178	171		171	184	196	196	199	193
	[129]	[136]	[144]	[147]	[150]	[147]		[147]	[157]	[167]	[168]	[171]	[169]
	105	109	115	119	122	123		123	130	138	140	143	145
	93	95	99	104	107	110		111	116	122	125	128	132
	83	83	86	91	95	99		101	104	109	112	116	121

NOTES: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from body weight.

The weight values were computed from the regression equation of weight on height by age. The values above and below the expected mean value represent the ±.8416, ±1.2816, and ±1.6449 standard error of the estimate covering within this range 60, 80, and 90 percent of the population around the mean, respectively. The first range is expected thus to identify 20, 10, and 5 percent of the population of the specific height on either side of the range.

Figures in [ ] are the expected means.

Table 6. Average weights[1] for men and women aged 18-74 years, by age and height: United States, 1971-74

Sex and height	Age group in years					
	18-24	25-34	35-44	45-54	55-64	65-74
	Weight in pounds					
Men						
62 inches	130	141	143	147	143	143
63 inches	135	145	148	152	147	147
64 inches	140	150	153	156	153	151
65 inches	145	156	158	160	158	156
66 inches	150	160	163	164	163	160
67 inches	154	165	169	169	168	164
68 inches	159	170	174	173	173	169
69 inches	164	174	179	177	178	173
70 inches	168	179	184	182	183	177
71 inches	173	184	190	187	189	182
72 inches	178	189	194	191	193	186
73 inches	183	194	200	196	197	190
74 inches	188	199	205	200	203	194
Women						
57 inches	114	118	125	129	132	130
58 inches	117	121	129	133	136	134
59 inches	120	125	133	136	140	137
60 inches	123	128	137	140	143	140
61 inches	126	132	141	143	147	144
62 inches	129	136	144	147	150	147
63 inches	132	139	148	150	153	151
64 inches	135	142	152	154	157	154
65 inches	138	146	156	158	160	158
66 inches	141	150	159	161	164	161
67 inches	144	153	163	165	167	165
68 inches	147	157	167	168	171	169

[1] Estimated values from regression equations of weight on height for specified age groups.

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 7. Estimated number of men aged 18-74 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds													
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210-219	220-229	230 or more
	Estimated population in thousands														
Total	61,095	488	821	2,359	3,888	6,204	8,493	8,762	8,347	6,904	5,140	3,339	2,330	1,635	2,385
Less than 62 inches	394	36	33	108	122	24	19	8	19	2	4	5	-	-	14
62 inches	647	51	11	170	95	184	71	40	15	7	1	2	-	-	-
63 inches	1,217	93	86	160	149	161	286	93	124	12	33	2	-	14	4
64 inches	2,167	92	82	161	342	348	374	284	159	155	63	67	-	19	21
65 inches	3,867	102	201	346	453	561	526	617	402	300	178	76	25	65	15
66 inches	6,005	47	129	303	501	847	992	1,226	828	493	381	102	22	84	50
67 inches	7,556	26	103	259	668	783	1,252	1,116	1,263	827	457	369	176	57	200
68 inches	8,352	23	129	347	530	915	1,310	1,109	1,674	898	610	322	256	127	102
69 inches	8,642	5	36	184	363	996	1,414	1,467	1,297	886	676	456	348	207	307
70 inches	7,554	13	8	167	262	788	849	1,035	903	1,211	900	619	222	196	381
71 inches	5,495	-	3	110	118	311	647	788	671	847	892	376	273	181	278
72 inches	4,269	-	-	35	204	154	443	483	490	670	328	354	480	290	338
73 inches	2,806	-	-	-	49	65	213	299	361	362	311	364	266	243	273
74 inches	1,155	-	-	10	32	43	94	73	52	175	136	121	170	111	138
75 inches or more	969	-	-	-	-	24	3	24	88	59	170	103	92	41	264

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 8. Estimated number of men aged 18-24 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds								
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Estimated population in thousands										
Total	11,754	956	1,116	1,795	1,959	1,818	1,198	883	706	357	966
Less than 63 inches	191	113	73	-	-	-	-	-	-	5	-
63 inches	119	82	10	-	-	-	23	-	-	-	4
64 inches	213	33	72	39	27	-	11	31	-	-	-
65 inches	550	213	121	85	16	78	3	6	11	17	-
66 inches	888	117	65	159	240	168	97	3	-	5	34
67 inches	1,140	83	200	203	252	100	103	82	45	40	32
68 inches	1,500	123	191	350	350	143	184	58	43	47	11
69 inches	1,667	60	118	310	320	302	139	107	113	63	135
70 inches	1,809	107	125	357	261	303	216	130	170	14	126
71 inches	1,342	6	36	149	150	341	218	144	112	68	118
72 inches	870	19	23	75	233	97	84	186	20	-	133
73 inches or more	1,464	-	80	68	110	287	119	136	191	99	374

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 9. Estimated number of men aged 25-34 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Estimated population in thousands										
Total	13,003	521	740	1,328	2,102	1,518	1,676	1,448	1,218	740	1,712
Less than 63 inches	42	19	13	3	-	-	7	-	-	-	-
63 inches	273	64	37	36	90	-	-	-	32	-	14
64 inches	383	55	100	82	24	37	24	21	12	28	-
65 inches	547	78	84	106	133	14	29	28	44	12	19
66 inches	1,217	72	114	276	195	148	179	73	112	40	8
67 inches	1,305	21	169	88	234	228	192	174	79	71	49
68 inches	1,404	82	63	237	222	212	209	193	99	31	56
69 inches	2,044	30	84	174	516	260	317	124	158	62	319
70 inches	1,763	16	41	154	305	189	161	300	191	181	225
71 inches	1,193	84	12	134	163	139	169	139	187	4	162
72 inches	1,142	-	23	19	111	169	171	144	100	115	290
73 inches or more	1,689	-	-	21	108	122	218	252	202	196	570

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 10. Estimated number of men aged 35-44 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Estimated population in thousands										
Total	10,691	469	493	694	1,082	1,648	1,473	1,507	1,224	962	1,139
Less than 63 inches	183	85	57	27	-	-	-	-	-	-	14
63 inches	200	48	11	29	34	23	55	-	-	-	-
64 inches	298	25	8	32	91	64	44	34	-	-	-
65 inches	524	111	42	62	47	139	23	43	42	-	15
66 inches	987	65	111	152	93	130	145	118	121	22	30
67 inches	1,241	39	47	81	175	193	321	177	31	97	80
68 inches	1,603	-	88	73	137	233	398	223	225	164	62
69 inches	1,536	56	18	127	262	349	183	174	235	89	43
70 inches	1,343	32	18	95	51	244	126	248	270	163	96
71 inches	1,128	-	2	3	126	158	75	276	235	101	152
72 inches	882	9	90	12	31	116	39	133	23	145	284
73 inches or more	765	-	-	-	34	-	64	81	42	181	363

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 11. Estimated number of men aged 45-54 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Estimated population in thousands										
Total	11,151	569	575	893	1,292	1,662	1,564	1,491	1,140	564	1,401
Less than 63 inches	193	77	23	68	5	13	4	-	3	-	-
63 inches	211	14	16	41	76	64	-	-	-	-	-
64 inches	290	35	39	32	56	25	27	-	36	-	40
65 inches	765	71	103	74	120	150	76	110	6	5	50
66 inches	1,076	27	117	105	156	306	135	93	87	7	43
67 inches	1,605	91	58	120	265	321	211	207	113	107	112
68 inches	1,720	171	79	139	236	180	412	143	158	24	178
69 inches	1,594	58	64	124	125	258	303	270	91	94	207
70 inches	1,341	-	25	133	105	151	143	319	150	174	141
71 inches	818	22	34	10	83	77	57	117	238	30	150
72 inches	870	5	16	10	34	75	145	106	138	70	271
73 inches or more	670	-	-	38	32	41	51	126	119	54	209

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 12. Estimated number of men aged 55-64 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Population in thousands										
Total	8,999	594	543	877	1,125	1,297	1,662	1,044	513	515	829
Less than 63 inches	188	38	23	64	33	23	-	7	-	-	-
63 inches	192	82	44	13	23	-	30	-	-	-	-
64 inches	485	80	37	92	72	103	10	51	3	37	-
65 inches	757	87	18	130	79	97	174	68	49	34	21
66 inches	1,089	107	50	77	136	359	164	132	31	14	19
67 inches	1,439	102	144	207	187	143	271	99	130	37	119
68 inches	1,313	64	52	68	252	185	330	198	32	14	118
69 inches	1,241	7	61	172	129	186	285	134	44	121	102
70 inches	841	24	36	25	67	95	177	141	70	56	150
71 inches	833	-	31	0	116	62	145	127	82	145	125
72 inches	325	-	47	26	14	3	31	87	14	-	103
73 inches or more	294	-	-	5	17	40	47	-	58	56	71

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 13. Estimated number of men aged 65-74 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds								
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Population in thousands									
Total	5,497	559	423	616	933	819	775	529	340	503
Less than 63 inches	242	76	28	47	51	11	23	2	2	2
63 inches	224	49	31	43	63	6	17	12	1	2
64 inches	497	107	85	72	104	55	43	17	12	2
65 inches	725	88	85	104	131	139	97	46	26	9
66 inches	745	91	43	78	171	115	108	73	30	36
67 inches	827	53	50	84	138	131	165	87	60	59
68 inches	812	60	58	49	113	156	141	82	52	101
69 inches	558	13	18	89	62	112	71	77	34	82
70 inches	458	9	16	25	61	52	80	74	49	92
71 inches	181	1	2	15	9	10	9	44	37	54
72 inches or more	225	12	5	12	29	30	21	14	37	65

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 14. Estimated number of women aged 18-74 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds														
		Less than 90	90-99	100-109	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210-219	220 or more
	Population in thousands															
Total	67,927	554	1,586	4,516	8,721	10,733	11,364	8,083	6,022	4,994	3,404	2,301	1,856	1,021	929	1,843
Less than 57 inches	403	44	60	24	78	21	155	16	5	-	-	1	-	-	-	-
57 inches	536	70	54	65	69	69	52	61	22	39	18	16	1	-	-	-
58 inches	1,105	100	75	224	188	155	100	66	63	11	19	65	9	18	9	3
59 inches	2,503	57	132	340	316	367	311	275	180	324	69	37	30	13	18	34
60 inches	4,583	38	269	380	927	579	613	450	371	262	223	156	148	31	114	22
61 inches	7,493	101	300	882	1,092	1,123	1,029	802	666	493	344	279	182	72	21	107
62 inches	10,163	45	301	890	1,634	2,058	1,493	1,148	622	627	460	272	230	75	86	222
63 inches	10,316	36	160	743	1,427	1,451	1,861	1,259	915	689	563	283	259	170	191	309
64 inches	10,148	41	103	485	1,219	1,712	1,903	1,174	830	779	571	462	325	167	110	267
65 inches	9,079	-	99	348	966	1,452	1,796	1,072	955	663	407	306	323	202	163	327
66 inches	5,328	22	31	95	518	963	823	678	658	544	256	163	126	171	89	191
67 inches	3,134	-	-	19	192	464	647	600	289	235	209	115	122	44	61	137
68 inches	1,818	-	-	-	74	180	290	277	265	222	152	79	71	32	43	133
69 inches or more	1,315	-	4	18	22	141	291	206	182	107	112	65	29	26	22	90

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 15. Estimated number of women aged 18-24 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Population in thousands											
Total	12,925	1,991	2,560	2,392	2,428	1,282	672	589	348	177	186	300
Less than 59 inches	265	128	47	35	34	2	13	-	6	-	-	-
59 inches	248	100	69	16	29	14	-	20	-	-	-	-
60 inches	560	178	143	81	47	44	15	10	21	-	21	-
61 inches	1,037	275	292	166	147	62	9	22	3	17	32	12
62 inches	1,691	466	416	349	159	127	61	39	19	18	-	37
63 inches	1,964	324	347	336	394	245	82	75	26	56	41	38
64 inches	1,982	266	383	375	432	147	115	101	79	18	25	41
65 inches	2,151	204	399	477	492	195	145	42	75	17	25	80
66 inches	1,257	11	263	340	196	112	78	95	68	32	29	33
67 inches	886	19	129	95	249	170	57	100	19	12	4	32
68 inches or more	883	18	72	121	249	163	98	85	33	8	8	28

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 16. Estimated number of women aged 25-34 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Population in thousands											
Total	13,934	1,649	2,147	2,669	2,298	1,450	970	634	657	439	238	783
Less than 58 inches	105	47	35	11	5	2	-	5	-	-	-	-
58 inches	158	71	30	11	6	25	11	4	-	-	-	-
59 inches	296	71	45	103	30	15	6	-	4	12	4	6
60 inches	528	144	125	79	79	12	25	1	31	22	-	10
61 inches	1,444	368	285	263	190	50	79	44	38	69	12	46
62 inches	2,081	285	422	451	287	178	115	89	107	37	56	54
63 inches	2,256	295	405	386	380	274	114	90	112	49	21	130
64 inches	1,943	183	309	422	301	244	114	53	58	83	71	105
65 inches	2,047	109	291	416	472	172	175	90	56	76	26	164
66 inches	1,381	78	145	296	213	159	139	146	44	23	23	115
67 inches	843	-	40	137	168	149	73	40	100	40	25	71
68 inches or more	852	-	14	95	168	168	118	71	106	30	-	82

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 17. Estimated number of women aged 35-44 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Population in thousands											
Total	11,577	714	1,314	1,966	2,011	1,390	1,109	750	576	428	349	970
Less than 58 inches	70	12	29	2	6	4	-	11	4	2	-	-
58 inches	105	34	25	6	13	6	5	3	-	4	-	9
59 inches	428	86	40	71	88	46	50	2	4	9	2	30
60 inches	690	78	162	161	57	76	59	15	21	10	36	15
61 inches	964	179	186	145	132	121	96	33	24	7	6	35
62 inches	1,555	107	230	342	249	245	67	70	80	49	40	76
63 inches	1,655	107	142	334	345	155	103	141	69	64	87	108
64 inches	1,889	60	273	259	452	146	174	111	105	94	65	150
65 inches	1,830	38	115	287	333	203	232	124	144	109	51	194
66 inches	977	13	81	158	167	152	90	89	55	20	23	129
67 inches	637	-	22	144	97	112	90	29	27	10	33	73
68 inches or more	776	-	10	57	71	124	142	122	44	50	4	152

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 18. Estimated number of women aged 45-54 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Population in thousands											
Total	12,161	724	1,239	1,707	1,816	1,601	1,349	1,285	653	488	490	809
Less than 58 inches	67	13	3	13	28	3	-	7	-	-	-	-
58 inches	59	30	3	5	-	-	-	-	-	18	-	3
59 inches	493	156	40	25	-	36	86	119	27	-	-	4
60 inches	1,004	36	265	104	183	51	73	32	62	54	31	113
61 inches	1,257	201	111	135	176	244	135	62	66	50	41	36
62 inches	1,969	166	319	444	283	242	146	149	66	34	45	75
63 inches	1,842	91	276	214	247	221	214	242	125	28	21	163
64 inches	2,118	9	110	402	352	379	105	242	177	127	93	122
65 inches	1,449	18	93	156	315	157	173	238	26	28	116	129
66 inches	1,031	4	19	108	146	127	295	137	35	65	39	56
67 inches	489	-	-	75	32	119	60	41	40	42	44	36
68 inches or more	383	-	-	27	54	21	63	16	29	41	61	71

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 19. Estimated number of women aged 55-64 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Population in thousands											
Total	10,054	958	770	1,086	1,720	1,221	1,137	1,045	643	462	372	640
Less than 58 inches	300	111	15	27	105	21	10	-	-	11	-	-
58 inches	323	141	52	67	11	4	-	-	8	22	-	18
59 inches	558	24	61	79	109	87	21	148	5	-	14	10
60 inches	896	123	70	51	129	160	131	112	42	52	26	-
61 inches	1,611	167	111	186	220	156	219	242	122	117	40	31
62 inches	1,565	116	117	300	307	184	106	129	88	74	70	74
63 inches	1,570	96	181	49	291	197	237	76	151	42	58	192
64 inches	1,439	76	107	211	242	108	212	141	101	86	50	105
65 inches	1,031	59	52	34	105	261	143	100	55	41	83	98
66 inches	428	41	5	58	83	15	43	60	23	15	-	85
67 inches	189	-	-	6	101	28	-	10	18	-	6	20
68 inches or more	142	4	-	18	18	-	15	25	30	-	25	7

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 20. Estimated number of women aged 65-74 years in the population, by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Population in thousands											
Total	7,276	618	691	913	1,092	1,140	785	691	527	307	222	290
Less than 58 inches	292	59	51	33	56	43	17	16	12	4	1	-
58 inches	297	71	44	35	43	30	34	4	6	21	9	-
59 inches	482	92	62	74	56	77	17	34	29	16	11	14
60 inches	917	128	162	102	118	108	69	92	46	18	34	30
61 inches	1,173	92	107	227	164	168	127	90	90	19	50	39
62 inches	1,305	96	130	172	208	172	129	151	101	60	18	68
63 inches	1,030	27	76	133	204	166	165	64	81	45	30	39
64 inches	768	25	37	42	124	150	110	130	52	55	21	22
65 inches	572	19	17	82	79	84	87	68	51	35	23	27
66 inches or more	440	-	5	12	39	145	29	43	58	35	24	50

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 21. Comparison of average weights for men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

Sex and height	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES
	18-24 years			25-34 years			35-44 years		
Men									
62 inches	135	130	-5	139	141	+2	147	143	-4
63 inches	138	135	-3	143	145	+2	150	148	-2
64 inches	142	140	-2	148	150	+2	154	153	-1
65 inches	145	145	-	152	156	+4	158	158	-
66 inches	149	150	+1	157	160	+3	162	163	+1
67 inches	152	154	+2	161	165	+4	166	169	+3
68 inches	156	159	+3	166	170	+4	169	174	+5
69 inches	159	164	+5	170	174	+4	173	179	+6
70 inches	163	168	+5	175	179	+4	177	184	+7
71 inches	166	173	+7	179	184	+5	180	190	+10
72 inches	170	178	+8	184	189	+5	184	194	+10
73 inches	173	183	+10	188	194	+6	188	200	+12
74 inches	177	188	+11	192	199	+7	192	205	+13
Women									
57 inches	114	114	-	110	118	+8	129	125	-4
58 inches	116	117	+1	114	121	+7	132	129	-3
59 inches	118	120	+2	118	125	+7	134	133	-1
60 inches	120	123	+3	122	128	+6	136	137	+1
61 inches	123	126	+3	126	132	+6	138	141	+3
62 inches	125	129	+4	130	136	+6	141	144	+3
63 inches	127	132	+5	134	139	+5	143	148	+5
64 inches	129	135	+6	138	142	+4	145	152	+7
65 inches	132	138	+6	142	146	+4	147	156	+9
66 inches	134	141	+7	146	150	+4	150	159	+9
67 inches	136	144	+8	150	153	+3	152	163	+11
68 inches	138	147	+9	154	157	+3	154	167	+13
	45-54 years			55-64 years			65-74 years		
Men									
62 inches	146	147	+1	146	143	-3	142	143	+1
63 inches	150	152	+2	149	147	-2	146	147	+1
64 inches	154	156	+2	153	153	-	149	151	+2
65 inches	158	160	+2	156	158	+2	152	156	+4
66 inches	162	164	+2	160	163	+3	156	160	+4
67 inches	166	169	+3	164	168	+4	159	164	+5
68 inches	171	173	+2	167	173	+6	163	169	+6
69 inches	175	177	+2	171	178	+7	166	173	+7
70 inches	179	182	+3	174	183	+9	169	177	+8
71 inches	183	187	+4	178	189	+11	173	182	+9
72 inches	187	191	+4	182	193	+11	176	186	+10
73 inches	191	196	+5	185	197	+12	180	190	+10
74 inches	195	200	+5	189	203	+14	183	194	+11
Women									
57 inches	127	129	+2	136	132	-4	130	130	-
58 inches	130	133	+3	139	136	-3	133	134	+1
59 inches	134	136	+2	142	140	-2	136	137	+1
60 inches	138	140	+2	145	143	-2	140	140	-
61 inches	141	143	+2	148	147	-1	143	144	+1
62 inches	145	147	+2	150	150	-	147	147	-
63 inches	148	150	+2	153	153	-	150	151	+1
64 inches	152	154	+2	156	157	+1	154	154	-
65 inches	156	158	+2	159	160	+1	157	158	+1
66 inches	159	161	+2	162	164	+2	161	161	-
67 inches	163	165	+2	165	167	+2	164	165	+1
68 inches	166	168	+2	168	171	+3	168	169	+1

NOTE: Height was measured without shoes. Two pounds were deducted from HES data to allow for weight of clothing; total weights of all clothing for HANES ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 22. Comparison of relative change in weight by height with age over the mean for men and women 18-24 years in HES (1960-62) and HANES (1971-74): United States

Sex and height	Health Examination Survey					Health and Nutrition Examination Survey				
	Age in years					Age in years				
	25-34	35-44	45-54	55-64	65-74	25-34	35-44	45-54	55-64	65-74
Men										
62 inches	3.0	8.9	8.2	8.2	5.2	8.5	10.0	13.1	10.0	10.0
63 inches	3.6	8.7	8.7	8.0	5.8	7.4	9.6	12.6	8.9	8.9
64 inches	4.2	8.5	8.5	7.8	4.9	7.1	9.3	11.4	9.3	7.9
65 inches	4.8	9.0	9.0	7.6	4.8	7.6	9.0	10.3	9.0	7.6
66 inches	5.4	8.7	8.7	7.4	4.7	6.7	8.7	9.3	8.7	6.7
67 inches	5.9	9.2	9.2	7.9	4.6	7.1	9.7	9.7	9.1	6.5
68 inches	6.4	8.3	9.6	7.1	4.5	6.9	9.4	8.8	8.8	6.3
69 inches	6.9	8.8	10.1	7.6	4.4	6.1	9.2	7.9	8.5	5.5
70 inches	7.4	8.6	9.8	6.8	3.7	6.6	9.5	8.3	8.9	5.4
71 inches	7.8	8.4	10.2	7.2	4.2	6.4	9.8	8.1	9.3	5.2
72 inches	8.2	8.2	10.0	7.1	3.5	6.2	9.0	7.3	8.4	4.5
73 inches	8.7	8.7	10.4	6.9	4.1	6.0	9.3	7.1	7.7	3.8
74 inches	8.5	8.5	10.2	6.8	3.4	5.9	9.0	6.4	8.0	3.2
Women										
57 inches	-3.5	13.2	11.4	19.3	14.0	3.5	9.7	13.2	15.8	14.0
58 inches	-1.7	13.8	12.1	19.8	14.7	3.4	10.3	13.7	16.2	14.5
59 inches	-	13.6	13.6	20.3	15.3	4.2	10.8	13.3	16.7	14.2
60 inches	1.7	13.3	15.0	20.8	16.7	4.1	11.4	13.8	16.3	13.8
61 inches	2.4	12.2	14.6	20.3	16.3	4.8	11.9	13.5	16.7	14.3
62 inches	4.0	12.8	16.0	20.0	17.6	5.4	11.6	14.0	16.3	14.0
63 inches	5.5	12.6	16.5	20.5	18.1	5.3	12.1	13.6	15.9	14.4
64 inches	7.0	12.4	17.8	20.9	19.4	5.2	12.6	14.1	16.3	14.1
65 inches	7.6	11.4	18.2	20.5	18.9	5.8	13.0	14.5	15.9	14.5
66 inches	9.0	11.9	18.7	20.9	20.2	6.4	12.8	14.2	16.3	14.2
67 inches	10.3	11.8	19.9	21.3	20.6	6.3	13.2	14.6	16.0	14.6
68 inches	11.6	11.6	20.3	21.7	21.7	6.8	13.6	14.3	16.3	15.0

Table 23. Differences at the 95th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

Sex and height	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES
Men	18-24 years			25-34 years			35-44 years		
62 inches	173	175	+2	183	191	+8	187	188	+1
63 inches	176	180	+4	187	195	+8	190	193	+3
64 inches	180	185	+5	194	200	+6	197	198	+1
65 inches	183	190	+7	196	206	+10	198	203	+5
66 inches	187	195	+8	201	210	+9	202	208	+6
67 inches	190	199	+9	205	215	+10	206	214	+8
68 inches	194	204	+10	210	220	+10	209	219	+10
69 inches	197	209	+12	214	224	+10	213	224	+11
70 inches	201	213	+12	219	229	+10	217	229	+12
71 inches	204	218	+14	223	234	+11	220	235	+15
72 inches	208	223	+15	228	239	+11	224	239	+15
73 inches	215	228	+13	232	244	+12	228	245	+17
74 inches	215	233	+18	236	249	+13	232	250	+18
Women									
57 inches	153	160	+7	159	171	+12	179	183	+4
58 inches	155	163	+8	163	174	+11	182	187	+5
59 inches	157	166	+9	167	178	+11	184	191	+7
60 inches	159	169	+10	171	181	+10	186	195	+9
61 inches	162	172	+10	175	185	+10	188	199	+11
62 inches	164	175	+11	179	189	+10	191	202	+11
63 inches	166	178	+12	183	192	+9	193	206	+13
64 inches	168	181	+13	187	195	+8	195	210	+15
65 inches	171	184	+13	191	198	+8	197	214	+17
66 inches	173	187	+14	195	203	+8	200	217	+17
67 inches	175	190	+15	199	206	+7	202	221	+19
68 inches	177	193	+16	203	210	+7	204	225	+21
Men	45-54 years			55-64 years			65-74 years		
62 inches	187	194	+7	191	190	-1	185	186	+1
63 inches	191	199	+8	194	194	-	189	190	+1
64 inches	195	203	+8	198	200	+2	192	194	+2
65 inches	201	207	+6	201	205	+4	195	199	+4
66 inches	203	211	+8	205	210	+5	199	203	+4
67 inches	207	216	+9	209	215	+6	202	207	+5
68 inches	212	220	+8	212	220	+8	206	212	+6
69 inches	216	224	+8	216	224	+9	209	216	+7
70 inches	220	229	+9	219	230	+11	212	220	+8
71 inches	224	234	+10	224	236	+12	216	225	+9
72 inches	228	238	+10	227	240	+13	219	229	+10
73 inches	230	243	+13	230	244	+14	223	233	+10
74 inches	236	247	+11	234	250	+16	226	237	+11
Women									
57 inches	176	185	+9	185	187	+2	173	178	+5
58 inches	179	189	+10	188	191	+3	176	182	+6
59 inches	183	192	+9	191	195	+4	179	185	+6
60 inches	187	196	+9	194	198	+4	183	188	+5
61 inches	190	199	+9	197	202	+5	186	192	+6
62 inches	194	203	+9	199	205	+6	190	195	+5
63 inches	197	206	+9	202	208	+6	193	199	+6
64 inches	201	210	+9	205	212	+7	197	202	+5
65 inches	205	214	+9	208	215	+7	200	206	+6
66 inches	209	217	+9	211	219	+8	204	209	+5
67 inches	212	221	+9	214	222	+8	207	213	+6
68 inches	215	224	+9	217	226	+9	211	217	+6

NOTE: Height was measured without shoes. Two pounds were deducted from HES data to allow for weight of clothing; total weights of all clothing for HANES ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 24. Differences at the 90th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

Sex and height	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES
Men	18-24 years			25-34 years			35-44 years		
62 inches	165	165	-	173	180	+7	179	178	-1
63 inches	168	170	+2	177	184	+7	182	183	+1
64 inches	172	175	+3	184	189	+5	186	188	+2
65 inches	175	180	+5	186	195	+9	190	193	+3
66 inches	179	185	+6	191	199	+8	194	198	+4
67 inches	182	189	+7	195	204	+9	198	204	+6
68 inches	186	194	+8	200	209	+9	201	209	+8
69 inches	188	199	+11	204	213	+9	205	214	+9
70 inches	193	203	+10	209	218	+9	209	219	+10
71 inches	196	208	+12	213	223	+10	212	225	+13
72 inches	200	213	+13	218	228	+10	216	229	+13
73 inches	207	218	+11	222	233	+11	220	235	+15
74 inches	207	223	+16	226	238	+12	224	240	+16
Women									
57 inches	145	150	+5	148	159	+11	168	170	+2
58 inches	147	153	+6	152	162	+10	171	174	+3
59 inches	149	156	+7	156	166	+10	173	178	+5
60 inches	151	159	+8	160	169	+9	175	182	+7
61 inches	154	162	+8	164	173	+9	177	186	+9
62 inches	156	165	+9	168	177	+9	180	189	+9
63 inches	158	168	+10	172	180	+8	182	193	+11
64 inches	160	171	+11	176	183	+7	184	197	+13
65 inches	163	174	+11	180	187	+7	186	201	+15
66 inches	165	177	+12	184	191	+7	189	204	+15
67 inches	167	180	+13	188	194	+6	191	208	+17
68 inches	169	183	+14	192	198	+6	193	212	+19
Men	45-54 years			55-64 years			65-74 years		
62 inches	178	183	+5	181	180	-1	176	176	-
63 inches	182	188	+6	184	184	-	180	180	-
64 inches	186	192	+6	188	190	+2	183	184	+1
65 inches	190	196	+6	191	195	+4	186	189	+3
66 inches	194	200	+6	195	200	+5	190	193	+3
67 inches	198	205	+7	199	205	+6	193	197	+4
68 inches	203	209	+6	202	210	+8	197	202	+5
69 inches	207	213	+6	206	215	+9	200	206	+6
70 inches	211	218	+7	209	220	+11	203	210	+7
71 inches	215	223	+8	214	226	+12	207	215	+8
72 inches	219	227	+8	217	230	+13	210	219	+9
73 inches	221	232	+11	221	234	+12	214	223	+9
74 inches	227	236	+9	224	240	+16	217	227	+10
Women									
57 inches	165	172	+7	174	175	+1	163	167	+4
58 inches	168	176	+8	177	179	+2	166	171	+5
59 inches	172	179	+7	180	183	+3	169	174	+5
60 inches	176	183	+7	183	186	+3	173	179	+6
61 inches	179	186	+7	186	190	+4	176	181	+5
62 inches	183	190	+7	188	193	+5	180	184	+4
63 inches	186	193	+7	191	196	+5	183	188	+5
64 inches	190	197	+7	194	200	+6	187	199	+4
65 inches	194	201	+7	197	203	+6	190	195	+5
66 inches	197	204	+7	200	207	+7	194	198	+4
67 inches	201	208	+7	203	210	+7	197	202	+5
68 inches	204	211	+7	206	214	+8	201	206	+5

NOTE: Height was measured without shoes. Two pounds were deducted from HES data to allow for weight of clothing; total weights of all clothing for HANES ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 25. Differences at the 80th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

Sex and height	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES
Men	18-24 years			25-34 years			35-44 years		
62 inches	155	153	-2	161	167	+6	168	166	-2
63 inches	158	158	-	165	171	+6	171	171	-
64 inches	162	163	+1	172	176	+4	175	176	+1
65 inches	165	168	+3	174	182	+8	179	181	+2
66 inches	169	173	+4	179	186	+7	183	186	+3
67 inches	172	177	+5	183	191	+8	187	192	+5
68 inches	176	182	+6	188	196	+8	190	197	+7
69 inches	179	187	+8	192	200	+8	194	202	+8
70 inches	183	191	+8	197	205	+8	198	207	+9
71 inches	186	196	+10	201	210	+9	201	213	+12
72 inches	190	201	+11	206	215	+9	205	217	+12
73 inches	197	206	+9	210	218	+8	209	223	+14
74 inches	197	211	+14	214	225	+11	213	228	+15
Women									
57 inches	134	138	+4	135	145	+10	155	154	-1
58 inches	136	141	+5	139	148	+9	158	158	-
59 inches	138	144	+6	143	152	+9	160	162	+2
60 inches	140	147	+7	147	155	+8	162	166	+4
61 inches	143	150	+7	151	159	+8	164	170	+6
62 inches	145	153	+8	155	163	+9	167	173	+6
63 inches	147	156	+9	159	166	+7	169	177	+8
64 inches	149	159	+10	163	169	+6	171	181	+10
65 inches	152	162	+10	167	173	+6	173	185	+12
66 inches	154	165	+11	171	177	+6	176	188	+12
67 inches	156	168	+12	175	180	+5	178	192	+14
68 inches	158	171	+13	179	184	+5	180	196	+16
Men	45-54 years			55-64 years			65-74 years		
62 inches	167	171	+4	169	167	-2	164	165	+1
63 inches	171	176	+5	172	171	-1	168	169	+1
64 inches	175	180	+5	176	177	+1	171	173	+2
65 inches	178	184	+6	179	182	+3	174	178	+4
66 inches	183	188	+5	183	187	+4	178	182	+4
67 inches	187	193	+6	187	192	+5	181	186	+5
68 inches	192	197	+5	190	197	+7	185	191	+6
69 inches	196	201	+5	194	202	+8	188	195	+7
70 inches	200	206	+6	197	207	+10	191	199	+8
71 inches	204	211	+7	202	213	+11	195	204	+9
72 inches	208	215	+7	205	217	+12	198	208	+10
73 inches	210	220	+10	208	221	+13	202	212	+10
74 inches	216	224	+8	212	227	+15	205	216	+11
Women									
57 inches	152	157	+5	161	160	-1	152	154	+2
58 inches	155	161	+6	163	164	+1	155	158	+3
59 inches	159	164	+5	167	168	+1	158	161	+3
60 inches	165	168	+3	170	171	+1	162	164	+2
61 inches	166	171	+5	173	175	+2	165	168	+3
62 inches	170	175	+5	175	178	+3	169	171	+2
63 inches	173	178	+5	178	181	+3	172	175	+3
64 inches	177	182	+5	181	185	+4	176	178	+2
65 inches	181	186	+5	184	188	+4	179	182	+3
66 inches	184	189	+5	187	192	+5	183	185	+2
67 inches	188	193	+5	190	195	+5	186	189	+3
68 inches	191	196	+5	193	199	+6	190	193	+3

NOTE: Height was measured without shoes. Two pounds were deducted from HES data to allow for weight of clothing; total weights of all clothing for HANES ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 26. Differences at the 20th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

Sex and height	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES
	18-24 years			25-34 years			35-44 years		
Men									
62 inches	115	107	-8	116	115	-1	126	120	-6
63 inches	118	112	-6	121	119	-2	129	125	-4
64 inches	122	117	-5	128	124	-4	133	130	-3
65 inches	125	122	-3	130	130	-	137	135	-2
66 inches	129	127	-2	135	134	-1	141	140	-1
67 inches	132	131	-1	139	139	-	145	146	+1
68 inches	136	136	-	144	144	-	148	151	+3
69 inches	139	141	+2	148	148	-	152	156	+4
70 inches	143	145	+2	153	153	-	156	161	+5
71 inches	146	150	+4	157	158	+1	159	167	+8
72 inches	150	155	+5	162	163	+1	163	171	+8
73 inches	157	160	+3	166	168	+2	167	177	+10
74 inches	157	167	+10	170	173	+3	171	182	+11
Women									
57 inches	94	90	-4	85	91	+6	104	96	-8
58 inches	96	93	-3	89	94	+5	107	100	-7
59 inches	98	96	-2	93	98	+5	109	104	-5
60 inches	100	99	-1	97	101	+4	111	108	-3
61 inches	103	102	-1	101	105	+4	113	112	-1
62 inches	105	103	-2	105	109	+4	116	115	-1
63 inches	107	108	+1	109	112	+3	118	119	+1
64 inches	109	111	+2	113	115	+5	120	123	+3
65 inches	112	114	+2	117	119	+2	122	127	+5
66 inches	114	117	+3	121	123	+2	125	130	+5
67 inches	116	120	+4	125	126	+1	127	134	+7
68 inches	118	123	+5	129	130	+1	129	134	+5
	45-54 years			55-64 years			65-74 years		
Men									
62 inches	125	123	-2	123	119	-4	120	121	+1
63 inches	129	128	-1	126	123	-3	124	125	+1
64 inches	133	132	-1	130	129	-1	127	129	+2
65 inches	137	136	-1	133	134	+1	130	134	+4
66 inches	141	140	-1	137	139	+2	134	138	+4
67 inches	145	145	-	141	144	+3	137	142	+5
68 inches	150	149	-1	144	149	+5	141	147	+6
69 inches	154	153	-1	148	154	+6	144	151	+7
70 inches	158	158	-	151	159	+8	147	155	+8
71 inches	162	163	+1	156	165	+9	151	160	+9
72 inches	166	167	+1	159	169	+10	154	164	+10
73 inches	168	172	+4	162	173	+11	158	168	+10
74 inches	174	176	+2	166	179	+13	161	172	+11
Women									
57 inches	102	101	-1	111	104	-7	108	106	-2
58 inches	105	105	-	114	108	-6	111	110	-1
59 inches	109	108	-1	117	112	-5	114	113	-1
60 inches	113	112	-1	120	115	-5	118	116	-2
61 inches	116	115	-1	123	119	-4	121	120	-1
62 inches	118	119	+1	125	122	-3	125	123	-2
63 inches	123	122	-1	128	125	-3	128	127	-1
64 inches	127	126	-1	131	129	-2	132	130	-2
65 inches	131	130	-1	134	132	-2	135	134	-1
66 inches	134	133	-1	137	136	-1	139	137	-2
67 inches	138	137	-1	140	139	-1	142	141	-1
68 inches	141	140	-1	143	143	-	146	145	-1

NOTE: Height was measured without shoes. Two pounds were deducted from HES data to allow for weight of clothing; total weights of all clothing for HANES ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 27. Differences at the 10th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

Sex and height	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES
	18-24 years			25-34 years			35-44 years		
Men									
62 inches	105	95	-10	105	102	-3	115	108	-7
63 inches	108	100	-8	109	106	-3	118	113	-5
64 inches	112	105	-7	116	111	-5	122	118	-4
65 inches	115	110	-5	118	117	-1	126	123	-3
66 inches	119	115	-4	123	121	-2	130	128	-2
67 inches	122	119	-3	127	126	-1	134	134	-
68 inches	126	124	-2	132	131	-1	137	139	+2
69 inches	129	129	-	136	135	-1	141	144	+3
70 inches	133	133	-	141	140	-1	145	149	+4
71 inches	136	138	+2	145	145	-	148	155	+7
72 inches	140	143	+3	150	150	-	152	159	+7
73 inches	147	148	+1	154	155	+1	156	165	+9
74 inches	147	153	+6	158	160	+2	160	170	+10
Women									
57 inches	83	78	-5	72	77	+5	90	80	-10
58 inches	85	81	-4	76	80	+4	93	84	-9
59 inches	87	84	-3	80	84	+6	95	88	-7
60 inches	89	87	-2	84	87	+3	97	92	-5
61 inches	92	90	-2	88	91	+3	99	96	-3
62 inches	94	93	-1	92	95	+3	102	99	-3
63 inches	96	96	-	96	98	+2	104	103	-1
64 inches	98	99	+1	100	101	+1	106	109	+3
65 inches	101	102	+1	104	105	+1	108	111	+3
66 inches	103	105	+2	108	109	+1	111	114	+3
67 inches	105	108	+3	112	112	-	113	118	+5
68 inches	107	111	+4	116	116	-	115	122	+7
	45-54 years			55-64 years			65-74 years		
Men									
62 inches	114	111	-3	111	106	-5	108	110	+2
63 inches	118	116	-2	114	110	-4	112	114	+2
64 inches	122	120	-2	118	116	-2	115	118	+3
65 inches	126	124	-2	121	121	-	118	123	+5
66 inches	130	128	-2	125	126	+1	122	127	+5
67 inches	134	133	-1	129	131	+2	125	131	+6
68 inches	139	137	-2	132	136	+4	129	136	+7
69 inches	143	141	-2	136	141	+5	132	140	+8
70 inches	147	146	-1	139	146	+7	135	144	+9
71 inches	151	151	-	144	152	+8	139	149	+10
72 inches	155	155	-	147	156	+9	142	153	+11
73 inches	157	160	+3	150	160	+10	146	157	+11
74 inches	163	164	+1	154	166	+12	149	161	+12
Women									
57 inches	89	86	-3	98	89	-9	97	93	-4
58 inches	92	90	-2	101	93	-8	100	97	-3
59 inches	96	93	-3	104	97	-7	103	100	-3
60 inches	100	97	-3	107	100	-7	107	103	-4
61 inches	103	100	-3	110	104	-6	110	107	-3
62 inches	107	104	-3	112	107	-5	114	110	-4
63 inches	110	107	-3	115	110	-5	117	114	-3
64 inches	114	111	-3	118	114	-4	121	117	-4
65 inches	118	115	-3	121	117	-4	124	121	-3
66 inches	121	118	-3	124	121	-3	128	124	-4
67 inches	125	122	-3	127	124	-3	131	128	-3
68 inches	128	125	-3	130	128	-2	135	132	-3

NOTE: Height was measured without shoes. Two pounds were deducted from HES data to allow for weight of clothing; total weights of all clothing for HANES ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table 28. Differences at the 5th percentile of the weight distribution of men and women in HES (1960-62) and HANES (1971-74), by age and height: United States

Sex and height	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES	HES, 1960-62	HANES, 1971-74	Excess of HANES over HES
	18-24 years			25-34 years			35-44 years		
Men									
62 inches	97	85	-12	95	91	-4	107	98	-9
63 inches	100	90	-10	99	95	-4	110	103	-7
64 inches	104	95	-9	106	100	-6	114	108	-6
65 inches	107	100	-7	108	106	-2	118	113	-5
66 inches	111	105	-6	113	110	-3	122	118	-4
67 inches	114	109	-5	117	115	-2	126	124	-2
68 inches	118	114	-4	122	120	-2	129	129	-
69 inches	121	119	-2	126	124	-2	133	134	+1
70 inches	125	123	-2	131	129	-2	137	139	+2
71 inches	128	128	-	135	134	-1	140	145	+5
72 inches	132	133	+1	140	139	-1	144	149	+5
73 inches	139	138	-1	144	144	-	148	155	+7
74 inches	139	143	+4	148	149	+1	152	160	+8
Women									
57 inches	75	68	-7	61	65	+4	79	67	-12
58 inches	77	71	-6	65	68	+3	82	71	-11
59 inches	79	74	-5	69	72	+3	84	75	-9
60 inches	81	77	-4	73	75	+2	86	79	-7
61 inches	84	80	-4	77	79	+2	88	83	-5
62 inches	86	83	-3	81	83	+2	91	86	-5
63 inches	88	86	-2	85	86	+1	93	90	-3
64 inches	90	89	-1	89	89	-	95	94	-2
65 inches	93	92	-1	93	93	-	97	98	+1
66 inches	95	95	-	97	97	-	100	101	+1
67 inches	97	98	+1	101	100	-1	102	105	+3
68 inches	99	101	+2	105	104	-1	104	109	+5
	45-54 years			55-64 years			65-74 years		
Men									
62 inches	105	100	-5	101	96	-5	99	100	+1
63 inches	109	105	-4	104	100	-4	103	104	+1
64 inches	113	109	-4	107	106	-1	106	108	+2
65 inches	117	113	-4	111	111	-	109	113	+4
66 inches	121	117	-4	115	116	+1	113	117	+4
67 inches	125	122	-3	119	121	+2	116	121	+5
68 inches	130	126	-4	122	126	+4	120	126	+6
69 inches	134	130	-4	126	131	+5	123	130	+7
70 inches	138	135	-3	129	136	+7	126	134	+8
71 inches	142	140	-2	134	142	+8	130	139	+9
72 inches	146	144	-2	137	146	+9	133	143	+10
73 inches	148	149	+1	140	150	+10	137	147	+10
74 inches	154	153	-1	144	156	+12	140	151	+11
Women									
57 inches	78	73	-5	87	77	-10	87	82	-5
58 inches	81	77	-4	90	81	-9	90	86	-4
59 inches	85	80	-5	93	85	-8	93	89	-4
60 inches	89	84	-5	96	88	-8	97	92	-5
61 inches	92	87	-5	99	92	-7	100	96	-4
62 inches	96	91	-5	101	95	-6	104	99	-5
63 inches	99	94	-5	104	98	-6	107	103	-4
64 inches	103	98	-5	107	102	-5	111	106	-5
65 inches	107	102	-5	110	105	-5	114	110	-4
66 inches	110	105	-5	113	109	-4	118	113	-5
67 inches	114	109	-5	116	112	-4	121	117	-4
68 inches	117	112	-5	119	116	-3	125	121	-4

NOTE: Height was measured without shoes. Two pounds were deducted from HES data to allow for weight of clothing; total weights of all clothing for HANES ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

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STATISTICAL NOTES

The sampling plan of the Health and Nutrition Examination Survey 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. Persons confined to institutions or residing upon any of the reservation lands set aside for American Indians were excluded from the selection process. Successive elements dealt with in the sampling process were the primary sampling unit (PSU), census enumeration district (ED), segment (a cluster of households), household, eligible person, and 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 PSU's into which the conterminous United States was divided. Each PSU is either a standard metropolitan statistical area, a single county, or two or three contiguous counties. The primary sampling units were grouped into 357 strata for use in the Health Interview Survey and subsequently collapsed into 40 superstrata for HANES.

Fifteen of the 40 superstrata contained a single large metropolitan area of more than 2,000,000 population. These 15 areas were chosen for the sample with certainty. The remaining 25 superstrata were formed by classifying the noncertainty strata into four population density groups within each of four geographic regions. Then, a modified Goodman-Kish controlled selection technique was used to assure proportionate representation of specified State groups and rate of population change classes, the probability of selecting a PSU being proportionate to its 1960 population. In this manner a total first-stage sample of 65 PSU's, or "stands," are the areas within which a sample of persons would be selected for examination. The PSU's are scheduled for sampling over a 3-year period, with 300-600 persons examined per stand.

The 1970 census data, when they became available, were used as the frame for selecting the sample within PSU's. However, the calendar of operations required that the 1960 census data be used for the first 44 locations in the HANES sample. The 1970 census data were used for the last 21 stands of the sample.

Beginning with the 1970 census data, the segment size was changed from an expected 6 households selected from compact clusters of 18 households to an expected compact cluster of 8 households. The change was made because of operational advantages. In addition, research by the U.S. Bureau of the Census indicated that precision of estimates would not be appreciably affected by the change from noncompact clusters to compact clusters.

For ED's not having usable addresses, generally located in rural areas, area sampling was employed. Consequently some variation in the segment size occurred. To make the sample representative of the current population of the United States, the addresses or ED segments were supplemented by a sample of housing units that had been constructed since the 1960 and 1970 decennial censuses.

Within each PSU, a systematic sample of segments was selected. The ED's that 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 were identified by the U.S. Bureau of the Census in 1970 (pre-1970 census).

In addition, other ED's in the PSU with a mean family income of less than $3,000 in 1959 (based on 1960 census) were included. The second economic class, the "nonpoverty 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 the first 42 stands sample segments in nonpoverty stratum ED's were divided into eight random subgroups. One of these subgroups was chosen to remain in the HANES sample. Research indicated that efficiency of estimates could be increased by changing the ratio of poverty to nonpoverty segments in the nonpoverty stratum. ED's were divided into two random subgroups; one of the subgroups was chosen to remain in the HANES sample. The differential sampling 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 identifying the sample segments, a list of all current addresses within the segment boundaries was made, and a member of each household was interviewed to determine the age and sex of each household member as well as other demographic and socioeconomic information required for the survey. If no one was at home after repeated calls or if the household members refused to be interviewed, the interviewer tried to determine the household composition from neighbors.

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 group. The sample selection worksheets were then put in segment number order, and a systematic random sample of persons in each age-sex group was selected to be examined using the following sampling rates.

Age	*Rate*
1-5 years	1/2
6-19 years	1/4
20-44 years (male)	1/4
20-44 years (female)	1/2
45-64 years	1/4
65-74 years	1

The persons selected in the 65-stand sample of HANES comprise a representative sample of the target population and included 28,043 sample persons 1-74 years of age of whom 20,749, or 74 percent, were examined. When adjustments are made for differential sampling for high-risk groups, the response rate becomes 75 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. The third factor increases precision by bringing survey results into closer alignment with known U.S. population figures for 60 age, race, and sex groups as of November 1, 1972, the approximate midpoint of HANES.

A detailed description of the survey design and selection technique is described in a previous *Vital and Health Statistics* report.[2]

Nonresponse

In any health examination survey, one of the severe problems is nonresponse. Usually a sizable number of sample persons will not participate in the examination. Another potential for bias occurs if the characteristics being examined are not similar for nonparticipating and participating sample persons. Intensive efforts were made in HANES to develop and implement procedures and inducements to reduce the number of nonrespondents, thereby diminishing this potential for bias.

NOTE: A list of references follows the text.

Despite these intensive efforts, 25 percent of the sample persons from 65 stands were not examined. Consequently, the potential for a sizable bias does exist in the estimates in this publication. However, from what is known about the nonrespondents and the nature of nonresponse, it is believed that the likelihood of sizable bias is small. For instance, only a small proportion of persons in the first 65 stands gave reasons for nonparticipation. Therefore, they differ from the examined persons on the characteristics being examined.

An analysis of medical history data obtained for nonexaminees as well as examinees indicates there is no sizable bias due to nonresponse. No large differences were found between the examined group and nonexamined group for the statistics compared. For example, 12 percent of persons examined reported having an illness or condition that interferes with their eating, as compared with 10 percent of persons who were not examined but had completed a medical history. The percent of examined persons reporting ever being told by a doctor that they had arthritis was 20 percent; for high blood pressure it was 16 percent; and for diabetes it was 4 percent. The corresponding percentages for nonexamined persons were arthritis, 18 percent; high blood pressure, 22 percent; and diabetes, 4 percent.

As 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. A procedure was adopted that multiplies the reciprocal of the probability of selection of examined persons by a factor. This factor brings estimates based on examined persons up to a level which would have been achieved if all sample persons had been examined. The nonresponse adjustment factor is calculated by dividing the sum of the reciprocals of the probability of selection for all sample persons in each of five income groups within each stand by the sum of the reciprocals of the probability of selection for examined sample persons in the same stand and income group. The five income groups are under $3,000, $3,000-6,999, $7,000-9,999, $10,000-14,999, and $15,000 or more. For sample weighting purposes, the income group for 5.6 percent of the sample persons was imputed using the educational level of the head of the household. To the extent that the income-within-stand classes are homogeneous for the health characteristics under study, the adjustment procedure is effective in reducing the potential of bias due to nonresponse. The percent distribution of the nonresponse adjustment factors computed for the 65-stand sample of HANES is shown in table I.

Table I. Percent distribution of nonresponse adjustment factors in stands 1-65: United States, 1971-74

Size of factor	Percent distribution
Total	100.0
1.00-1.24	32.6
1.25-1.49	38.5
1.50-1.74	18.2
1.75-1.99	7.4
2.00-2.49	2.8
2.50-2.99	0.3
3.00[1]	0.3

[1]A size of 3.00 was assigned for all factors greater than 3.00. The final poststratified ratio adjustment corrects for this truncation.

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. However, 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 II.

Estimates for missing anthropometric data were generally made subjectively on the basis of a multiple-regression type decision, substituting for the missing measurements those of 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 examined persons with no

Table II. Number of examinees with one or more missing anthropometric measurements: United States, 1971-74

Measurement missing	Number of examinees
All measurements	23
Height only	15
Weight only	45
Height and weight	4

anthropometric measurements, a respondent of the same age-sex-race group was selected at random and his measurements were assigned to the nonexamined person.

Height by weight distributions by age for men and women measured in the 1971-74 HANES are shown in tables III-XIV.

Table III. Number of men aged 18-24 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Number of examinees										
Total	772	65	90	124	129	101	75	56	45	25	62
Less than 63 inches	9	4	4	-	-	-	-	-	-	1	-
63 inches	10	5	2	-	-	-	2	-	-	-	1
64 inches	17	5	6	2	2	-	1	1	-	-	-
65 inches	41	13	11	6	4	3	1	1	1	1	-
66 inches	59	12	6	9	14	10	4	1	-	1	2
67 inches	81	5	16	17	21	7	5	3	2	3	2
68 inches	116	8	17	27	25	12	14	5	4	2	2
69 inches	108	4	9	21	19	16	8	7	8	5	11
70 inches	115	6	12	22	16	16	13	12	9	2	7
71 inches	76	1	2	8	8	17	12	7	9	5	7
72 inches	58	2	2	9	12	6	6	11	2	-	8
73 inches or more	82	-	3	3	8	14	9	8	10	5	22

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table IV. Number of men aged 25-34 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Number of examinees										
Total	804	33	54	86	129	102	103	84	72	42	99
Less than 63 inches	6	1	3	1	-	-	1	-	-	-	-
63 inches	17	4	3	5	3	-	-	-	1	-	1
64 inches	23	3	5	8	2	1	1	1	1	1	-
65 inches	41	5	6	7	11	3	3	1	2	2	1
66 inches	70	5	10	11	11	10	9	5	6	2	1
67 inches	86	3	10	6	19	15	11	9	5	4	4
68 inches	92	5	4	15	12	15	14	13	7	2	5
69 inches	120	3	5	10	26	17	22	8	10	4	15
70 inches	112	2	5	12	15	14	11	18	13	10	12
71 inches	73	2	1	8	14	10	8	7	13	1	9
72 inches	69	-	2	1	10	9	8	9	5	6	19
73 inches or more	95	-	-	2	6	8	15	13	9	10	32

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table V. Number of men aged 35-44 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Number of examinees										
Total	665	33	38	46	65	107	88	86	82	49	71
Less than 63 inches	9	5	2	1	-	-	-	-	-	-	1
63 inches	12	3	2	1	3	1	2	-	-	-	-
64 inches	23	5	1	3	6	4	2	2	-	-	-
65 inches	40	9	4	4	3	10	2	4	3	-	1
66 inches	63	4	8	11	6	9	8	6	7	2	2
67 inches	75	2	6	6	9	12	15	11	4	3	7
68 inches	98	-	4	5	9	19	21	13	13	7	7
69 inches	97	3	3	7	14	21	12	11	15	9	2
70 inches	88	1	3	5	5	17	12	12	19	7	7
71 inches	69	-	1	1	7	10	6	15	16	4	9
72 inches	44	1	4	2	1	4	3	6	2	7	14
73 inches or more	47	-	-	-	2	-	5	6	3	10	21

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table VI. Number of men aged 45-54 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Number of examinees										
Total	765	45	47	77	89	110	99	92	69	40	97
Less than 63 inches	16	7	2	3	1	1	1	-	1	-	-
63 inches	16	1	2	5	4	4	-	-	-	-	-
64 inches	23	3	3	4	4	2	2	-	3	-	2
65 inches	59	6	6	10	10	10	6	5	2	1	3
66 inches	76	5	9	9	10	20	7	7	5	2	2
67 inches	112	11	6	12	16	21	14	11	6	6	9
68 inches	121	6	9	10	17	15	24	10	12	4	14
69 inches	110	3	6	8	9	16	18	20	8	5	17
70 inches	84	-	1	11	6	9	11	17	9	10	10
71 inches	54	2	2	1	6	5	4	7	10	4	13
72 inches	49	1	1	1	2	5	9	5	7	4	14
73 inches or more	45	-	-	3	4	2	3	10	6	4	13

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table VII. Number of men aged 55-64 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds									
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200-209	210 or more
	Number of examinees										
Total	597	44	36	54	75	87	96	73	41	35	56
Less than 63 inches	15	4	1	4	2	3	-	1	-	-	-
63 inches	12	4	3	2	2	-	1	-	-	-	-
64 inches	33	4	3	6	6	7	1	3	1	2	-
65 inches	59	10	2	9	5	9	10	6	4	2	2
66 inches	69	6	3	4	11	20	9	9	3	2	2
67 inches	96	8	8	13	14	11	17	6	9	3	7
68 inches	90	5	6	6	14	14	19	13	3	3	7
69 inches	75	2	5	6	10	11	15	11	3	6	6
70 inches	56	1	2	2	4	4	10	13	4	6	10
71 inches	48	-	2	-	5	4	9	6	7	7	8
72 inches	22	-	1	1	1	1	3	5	3	-	7
73 inches or more	22	-	-	1	1	3	2	-	4	4	7

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table VIII. Number of men aged 65-74 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds								
		Less than 130	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Number of examinees									
Total	1,657	196	144	191	261	231	207	160	103	164
Less than 63 inches	82	27	10	16	14	4	7	1	2	1
63 inches	72	16	13	12	18	5	3	3	1	1
64 inches	153	37	24	24	25	15	14	8	3	3
65 inches	213	35	23	28	35	40	26	15	8	3
66 inches	218	26	18	27	42	31	28	20	11	15
67 inches	249	22	21	23	41	37	38	26	18	23
68 inches	239	19	18	18	34	40	39	22	19	30
69 inches	176	7	9	27	25	25	24	25	9	25
70 inches	129	4	5	7	16	19	18	23	11	26
71 inches	65	1	1	7	4	6	4	13	10	19
72 inches or more	61	2	2	2	7	9	6	4	11	18

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table IX. Number of women aged 18-24 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Number of examinees											
Total	1,524	236	290	272	261	156	93	71	45	27	24	49
Less than 59 inches	36	18	6	4	4	1	1	-	2	-	-	-
59 inches	38	15	9	3	6	2	-	3	-	-	-	-
60 inches	81	22	19	14	7	7	2	2	6	-	2	-
61 inches	125	39	29	17	15	7	2	4	1	3	5	3
62 inches	197	50	49	36	19	16	8	5	3	4	-	7
63 inches	248	45	46	43	44	26	12	9	5	4	4	10
64 inches	245	25	50	48	47	24	14	11	12	3	4	7
65 inches	224	17	43	42	49	22	22	8	4	3	3	11
66 inches	142	2	22	37	26	17	11	8	7	3	4	5
67 inches	93	2	11	12	23	14	10	10	3	4	1	3
68 inches or more	95	1	6	16	21	20	11	11	2	3	1	3

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table X. Number of women aged 25-34 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Number of examinees											
Total	1,896	229	274	343	304	190	143	99	99	63	35	117
Less than 58 inches	17	6	5	2	1	1	-	2	-	-	-	-
58 inches	26	12	3	3	2	3	2	1	-	-	-	-
59 inches	43	15	8	8	4	1	2	-	1	1	2	1
60 inches	74	18	16	12	11	4	6	1	3	2	-	1
61 inches	205	48	36	38	26	10	14	10	6	6	3	8
62 inches	279	37	54	56	39	24	15	15	14	7	6	12
63 inches	308	42	53	54	48	36	18	15	15	5	4	18
64 inches	272	27	42	52	39	32	17	10	12	13	12	16
65 inches	269	16	31	52	60	23	25	13	11	12	3	23
66 inches	180	8	19	34	30	20	19	17	12	5	1	15
67 inches	114	-	4	18	24	16	9	8	11	8	4	12
68 inches or more	109	-	3	14	20	20	16	7	14	4	-	11

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table XI. Number of women aged 35-44 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Number of examinees											
Total	1,663	101	177	256	277	199	164	111	89	76	46	167
Less than 58 inches	16	3	4	1	3	1	-	1	2	1	-	-
58 inches	21	4	4	2	3	3	2	1	-	1	-	1
59 inches	65	15	6	12	11	5	7	1	2	1	1	4
60 inches	100	11	23	20	10	13	8	3	3	2	3	4
61 inches	147	26	26	22	24	17	11	6	6	2	2	5
62 inches	208	15	27	45	34	27	13	9	12	6	6	14
63 inches	245	13	22	44	44	28	19	20	11	12	12	20
64 inches	264	7	35	31	59	23	28	21	10	16	8	26
65 inches	255	5	17	34	43	30	30	18	20	18	6	34
66 inches	147	2	9	21	24	21	15	12	10	7	4	22
67 inches	94	-	3	17	13	15	15	5	5	3	3	15
68 inches or more	101	-	1	7	9	16	16	14	8	7	1	22

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table XII. Number of women aged 45-54 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Number of examinees											
Total	836	52	73	114	130	112	90	76	48	43	34	64
Less than 58 inches	8	2	1	2	1	1	-	1	-	-	-	-
58 inches	7	3	1	1	-	-	-	-	-	1	-	1
59 inches	34	11	2	4	-	3	6	5	2	-	-	1
60 inches	59	4	12	5	10	8	3	2	4	6	1	4
61 inches	94	9	8	12	15	16	12	6	5	4	3	4
62 inches	138	11	18	26	19	20	11	11	6	4	7	5
63 inches	126	6	16	16	19	17	15	14	9	2	2	10
64 inches	135	2	7	22	24	21	7	14	10	11	8	9
65 inches	104	3	6	14	21	9	15	12	4	4	5	11
66 inches	71	1	2	7	14	10	13	6	4	4	3	7
67 inches	32	-	-	3	2	5	5	3	3	4	3	4
68 inches or more	28	-	-	2	5	2	3	2	1	3	2	8

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table XIII. Number of women aged 55-64 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150 159	160-169	170-179	180-189	190-199	200 or more
	Number of examinees											
Total	670	52	51	72	103	92	74	62	54	33	29	48
Less than 58 inches	19	6	1	2	6	1	2	-	-	1	-	-
58 inches	18	5	3	4	1	1	-	-	2	1	-	1
59 inches	43	2	5	5	9	10	2	7	1	-	1	1
60 inches	63	8	6	6	11	9	6	6	4	3	4	-
61 inches	99	8	8	11	13	12	14	12	9	7	2	3
62 inches	104	6	10	20	18	14	9	8	6	4	4	5
63 inches	96	5	5	3	14	13	16	6	11	6	6	11
64 inches	102	5	7	11	14	12	12	8	10	6	5	12
65 inches	71	4	5	3	7	17	9	8	5	3	3	7
66 inches	29	2	1	4	5	2	3	4	2	2	-	4
67 inches	13	-	-	2	4	1	-	1	2	-	1	2
68 inches or more	13	1	-	1	1	-	1	2	2	-	3	2

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Table XIV. Number of women aged 65-74 years by weight for height: United States, 1971-74

Height	Total	Weight in pounds										
		Less than 110	110-119	120-129	130-139	140-149	150-159	160-169	170-179	180-189	190-199	200 or more
	Number of examinees											
Total	1,822	160	170	222	268	257	192	179	139	83	62	90
Less than 58 inches	78	17	17	11	12	6	6	4	2	2	1	-
58 inches	73	16	11	9	11	7	10	2	3	2	2	-
59 inches	115	21	12	21	15	14	5	9	8	3	3	4
60 inches	242	31	33	31	33	33	19	24	15	7	6	10
61 inches	300	28	34	45	39	45	30	22	22	8	12	15
62 inches	316	22	30	46	54	42	35	30	20	13	7	17
63 inches	274	10	22	31	48	38	35	24	28	14	11	13
64 inches	182	12	6	12	28	29	22	32	13	14	6	8
65 inches	138	3	4	12	18	20	19	20	15	12	6	9
66 inches or more	104	-	1	4	10	23	11	12	13	8	8	14

NOTE: Examined persons were measured without shoes; clothing weight ranged from 0.20 to 0.62 pound, which was not deducted from weights shown.

Standard Errors

The probability design of the survey enables the estimation of standard errors to correspond to the weighted estimates presented. The standard error is primarily a measure of sampling variability, i.e., 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 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 selected statistics used in this report are presented in tables 2 and 3. These estimates have been prepared by a replication technique that 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.

Small Categories

In some tables, magnitudes are shown for cells when the sample size is so small that the sampling error may be several times as great as the statistic itself. In such instances the statistic has no meaning except to indicate that the true quantity is small. Such numbers, if shown, have been included to explain the overall story of the table.

Regression Estimates

For the purpose of smoothing the sample findings in the present study to make estimates within certain cells where the number of examinees of a given age and height was too small to produce sufficiently reliable data, linear

regression equations of the form

$$\widehat{Y}_i = a + bX_i$$

for predicting weight (y) in pounds from height (x) in inches were fitted by the method of least squares to each of the 12 age-sex groups in the sample of examinees. The constants—regression coefficient (b) and Y-intercept (a)—in the regression equations are then of the form

$$b = \frac{\Sigma X_i Y_i - n\bar{X}\bar{Y}}{\Sigma(X_i^2) - n(\bar{X})^2}$$

$$a = \bar{Y} - b\bar{X}$$

where $\bar{x}$ and $\bar{y}$ are the mean values of x and y, respectively.

The regression coefficient, estimating the slope of the regression line, here measures the average number of pounds increase in weight which occurs with each inch of increase in height.

The goodness of fit of these regression lines to the observed data is determined by the usual standard error of estimate formula

$$S_{y \cdot x} = \left[\frac{\Sigma(Y_i - \widehat{Y}_i)^2}{n-2}\right]^{1/2}$$

which indicates how well the estimated weight values from the regression equations, Y, agree with the actual observed weight values, y. The resultant estimates of the constants determined for the regression equations for the 12 age-sex groups and the standard error are shown in table XV. To measure the precision of the regression equation the sum of squares of the observed values of weight Y_i about the mean $\bar{Y}$, $\Sigma(Y_i - \bar{Y})^2$ is considered. It can be shown that $\Sigma(Y_i - \bar{Y})^2 = \Sigma(Y_i - \widehat{Y}_i)^2 + \Sigma(\widehat{Y}_i - \bar{Y})^2$ ($\widehat{Y}_i$ = value of weight predicted by the regression equation) or where $\Sigma(Y_i - \widehat{Y}_i)^2$ = sum of squares about regression and represents the variation unexplained by the regression line and

$\Sigma(\widehat{Y}_i - \bar{Y})^2$ = sum of squares due to regression

represents the variation explained by the regression line. Clearly it is desirable to have $\Sigma(\widehat{Y}_i - \bar{Y})^2$ large and $\Sigma(Y_i - \widehat{Y}_i)^2$ small or equivalently to have $R^2 = \dfrac{\Sigma(\widehat{Y}_i - \bar{Y})^2}{\Sigma(Y_i - \bar{Y})^2}$ close to unity. R^2 defined above is called the coefficient of determination. The closer R^2 is to unity, the more precise the regression equation.

Although linear regression equations were used to estimate the basic weight-height relationship in a previous NCHS report,[2] the distribution of weight by height might be fitted by a logarithm of weight. In their series of weight-height data on Army personnel, Karpinos[7] and Rosenbaum[8] found that the test for linearity of regression of weight by height showed a significant departure of the array means from linearity.

In this report, linear regression equations were calculated to estimate weight from height. Similar calculations were made using logarithms of weight rather than the arithmetic weight measurements in relation to arithmetic height measurements. For each age and sex group, the line representing the equation of arithmetic weight by height nearly coincides with that representing the equation of $\log_{10}$ weight by height (figures I and II).

The coefficients of correlation obtained from the regression equations derived by correlating the logarithms of weight ($\log_{10} y$) in pounds with actual height (x, in inches) were slightly different from those obtained from the linear relationship of weight to height (table XV). Where differences in these estimates exist, they are small and could be attributed to sampling error.

The weight by height relationship of data from HANES appears to be a good linear fit within the limits of 62-74 inches for men and 57-68 inches for women. These limits may account for the close fit between the two equations. Weight data from Karpinos[7] were for men ages 18-37 years with heights of 59 to 78 inches. Corresponding data from Rosenbaum[8]

NOTE: A list of references follows the text.

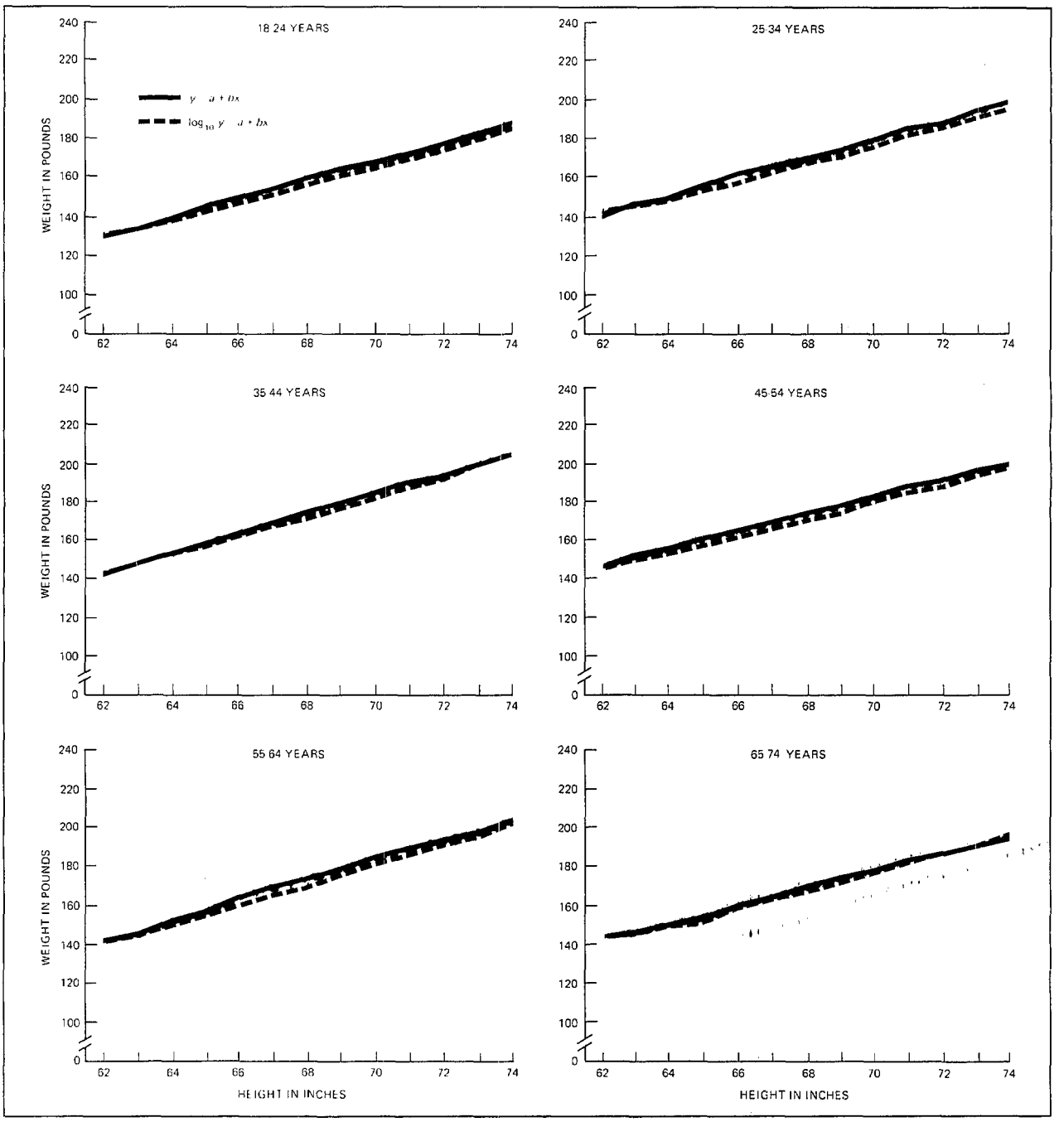

Figure 1. Average weights of men by age and height estimated from regression equations for weight (y) and height (x): $y = a + bx$ and $\log_{10} y = a + bx$: United States, 1971-74

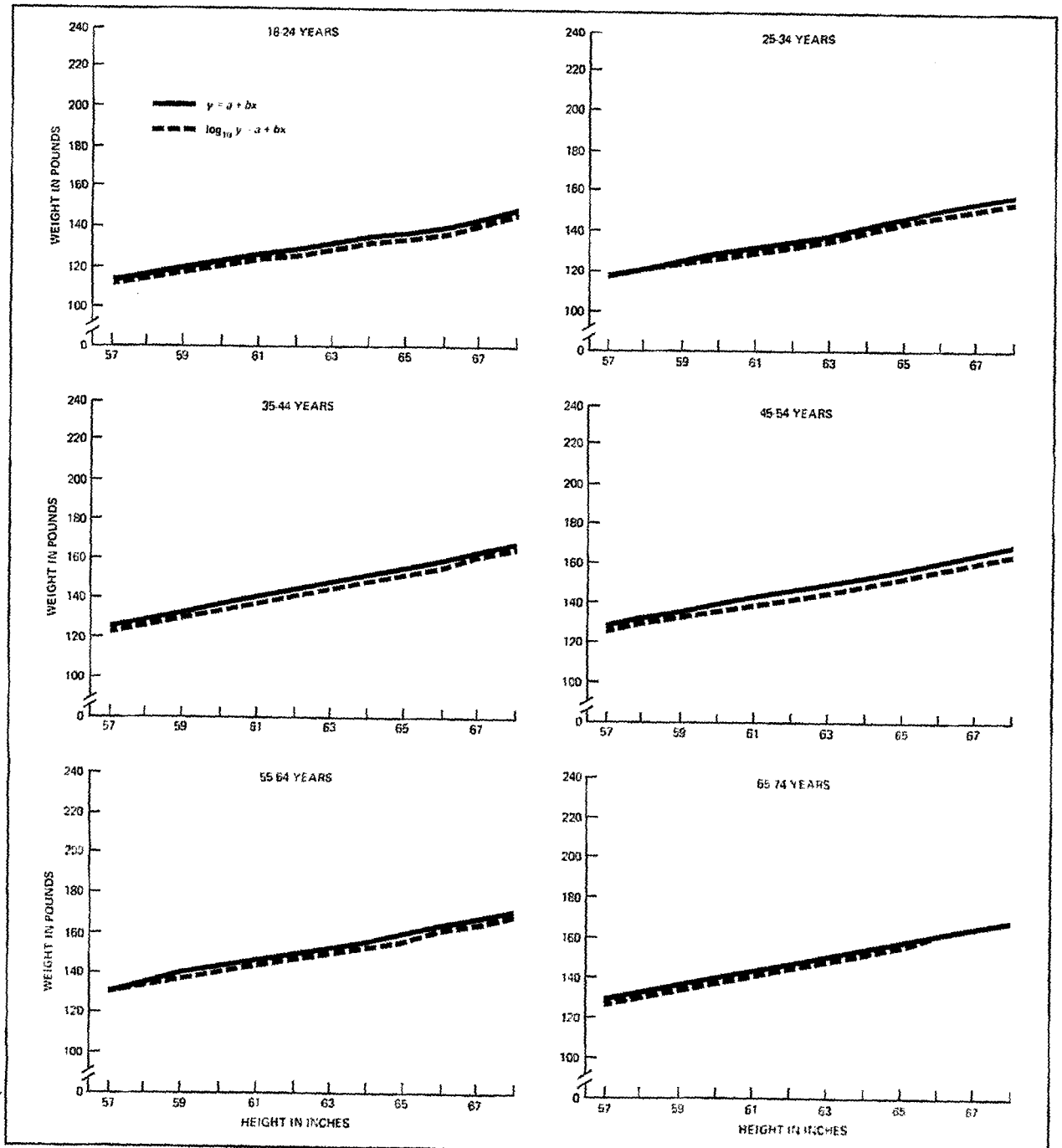

Figure II. Average weights of women by age and height estimated from regression equations for weight (y) and height (x): $y = a + bx$ and $\log_{10} y = a + bx$: United States, 1971-74

Table XV. Coefficient of correlation, constants for regression equations, and standard error of estimate of weight (y) on height (x) of adults aged 18-74 years: United States, 1971-74

Sex and age	Linear			Semilogarithmic		
	Regression equation		Coefficient of correlation	Regression equation		Coefficient of correlation
	$Y = a + bx$	$S_{y \cdot x}$	r	$\log_{10} Y = a + bx$	$(S_{y \cdot x})$ (log)[1]	r
Men						
18-24	-172.63 + 4.842x	27.3	.438	1.32 + .0127x	.0303	.459
25-34	-168.67 + 4.941x	30.5	.420	1.39 + .0121x	.0268	.445
35-44	-187.49 + 5.277x	27.4	.460	1.34 + .0131x	.0264	.474
45-54	-131.83 + 4.454x	28.4	.390	1.46 + .0113x	.0272	.401
55-64	-173.99 + 5.069x	28.5	.426	1.35 + .0128x	.0289	.435
65-74	-131.64 + 4.385x	26.0	.404	1.42 + .0117x	.0249	.404
Women						
18-24	-56.28 + 2.965x	28.0	.259	1.48 + .0099x	.0255	.297
25-34	-88.62 + 3.587x	32.1	.263	1.43 + .0111x	.0253	.292
35-44	-94.02 + 3.815x	35.0	.270	1.46 + .0110x	.0257	.295
45-54	-77.17 + 3.587x	33.8	.246	1.51 + .0104x	.0259	.270
55-64	-68.24 + 3.492x	33.4	.249	1.56 + .0097x	.0259	.254
65-74	-76.38 + 3.583x	29.0	.285	1.47 + .0111x	.0251	.301

[1]Woodriff, R. S.: A simple method for approximating the variance of a complicated variance. *J. Am. Stat. Assoc.* 411-414, 1971.
NOTE: a = intercept in regression equation.
b = regression coefficient.
r = coefficient of correlation.
$S_{y \cdot x}$ = standard error of estimate.

were available for men ages 18-40 years with heights ranging from 59 inches and under to 77 inches and over.

Since there is little change when using the semilogarithmic equation, this report treated the regression of weight by height as linear. This method smooths the findings from HANES and simplifies the job of comparing this report with other data series reports that are based on height-weight relationships.

*U.S. GOVERNMENT PRINTING OFFICE : 1979 O-281-259/33

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