HEIGHTS AND WEIGHTS OF ADULTS IN RURAL AND URBAN AREAS OF JAMAICA

BY

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Very few studies have been made on the stature of adult Negroes in the Western hemisphere. The data reported in this paper were obtained during a survey of blood pressures of adult Jamaicans living in rural and urban areas (Miall, Kass, Ling, and Stuart, 1962).

METHODS

Two populations, one rural and one urban, were defined geographically and numerically by a private census.

The rural population lived about 16 miles north-west of the capital city, Kingston, in an area surrounding the village of Lawrence Tavern. The terrain is a complex of steep hills intersected by valleys lying between 750 and 2,000 ft above sea level. Agriculture is the main occupation and most of the land is under cultivation, a variety of fruits and vegetables being grown for home consumption or for sale in local markets. The houses are scattered, some of them being situated several miles from the nearest road. The people must in general lead energetic lives, not only when they are working but when they move about the hilly countryside. The diet is low in calories, proteins, and fats compared with that in North America or Britain (Cruickshank and Fox, 1961).

The urban population lived in Greenwich Town, a section of Kingston, which is on level ground near the sea. Kingston is the only city of any size, the population of the metropolitan area being 380,000 out of a total Jamaican population of 1,610,000 according to the 1960 census. Employment was varied as is usual in a city. The diet was not investigated.

Almost all inhabitants of both areas were of predominantly African origin with a small varying mixture of European stock; most of their ancestors had come from the western coast of Africa in the

17th and 18th centuries. The populations in both areas were mostly poor.

The surveys were carried out by two of us (WEM and JL) from March to July, 1959, in Lawrence Tavern and from August to December, 1959, in Kingston. A portable bathroom scale was used for weighing. Heights were measured by a horizontal bar sliding on a vertical rod which was fixed to a small wooden platform on which the subject stood upright. Shoes were removed but other clothes were worn.

In the rural area 90 per cent. of the women and 95 per cent. of the men on the census were investigated; in the urban area the corresponding figures were 98 and 87 per cent. respectively. Measurements of those whose stated ages had been verified by inspection of birth certificates were analysed—76 per cent. of women and 79 per cent. of men in the rural area, 64 per cent. of women and 66 per cent. of men in the urban area; measurements of persons of unverified age were discarded. We believe that errors introduced into the height and weight data by using inaccurate ages would be greater than those introduced by omitting persons with unverified ages. The measurements of all women known to be pregnant, 112 in the rural and 68 in the urban area, were also omitted.

The data were grouped in yearly age intervals from 15 to 19 years, in 5-yearly intervals up to 54 years, and in 10-yearly intervals up to 74 years. Means and standard deviations were calculated on a computer. Samples of clothing were weighed; 2½ pounds were subtracted from the mean weight of men and 1½ pounds from that of the women in order to obtain estimated nude weights.

RESULTS

Mean estimated nude weights (lb.) and mean heights (in.) of men and women from the rural and

urban areas at various age intervals are given in Tables I and II

These are also shown for ages above 20 years in Figs 1 and 2.

TABLE I
MEAN HEIGHTS (in.) OF ADULT JAMAICANS IN RURAL AND URBAN AREAS, BY AGE AND SEX

Sex	Age (yrs)	Rural			Urban		
		No.	Mean	S.D.	No.	Mean	S.D.
Male	15-	22	61.1	3.2	8	65.4	2.7
	16-	27	63.3	3.5	7	65.3	3.1
	17-	44	64.7	3.5	7	66.6	2.4
	18-	13	65.6	3.4	15	67.2	2.8
	19-	11	68.7	1.6	18	66.6	2.8
	20-	94	66.8	2.4	61	67.3	2.7
	25-	65	66.3	2.6	43	66.2	2.6
	30-	87	66.1	2.3	52	66.8	2.5
	35-	66	66.0	2.6	34	66.9	2.2
	40-	73	65.6	2.3	32	67.1	2.3
	45-	80	65.7	2.6	34	67.0	2.2
	50-	69	65.8	2.5	29	67.0	2.3
	55-65-74	68	64.9	3.3	16	65.6	4.1
		47	64.7	2.6	6	64.7	1.8
	15-	25	62.6	2.8	18	62.5	2.0
	16-	24	63.1	2.7	18	63.6	2.8
	17-	24	62.5	2.6	19	62.7	2.1
	18-	25	62.9	1.8	21	62.9	2.2
	19-	31	62.5	2.0	25	62.3	2.5
Female	20-	79	62.1	2.2	98	62.9	2.4
	25-	92	62.4	2.5	88	62.5	2.2
	30-	75	62.4	2.4	86	63.2	2.5
	35-	79	62.3	2.2	48	62.2	2.3
	40-	75	62.7	2.6	61	62.7	2.5
	45-	77	62.3	2.6	43	63.1	2.2
	50-	64	62.4	2.4	27	61.7	4.1
	55-65-74	81	61.7	2.6	36	61.6	2.1
		53	61.2	2.4	15	62.2	2.5

FIG. 1.—Mean heights of Jamaican adults in rural and urban areas.

Table III (overleaf) shows the distributions of weights for urban and rural men and women aged 35 to 54.

TABLE II
MEAN ESTIMATED NUDE WEIGHTS (lb.) OF ADULT JAMAICANS IN RURAL AND URBAN AREAS, BY AGE AND SEX

Sex	Age (yrs)	Rural			Urban		
		No.	Mean	S.D.	No.	Mean	S.D.
Male	15-	22	96.4	14.3	8	116.8	16.2
	16-	27	108.5	17.8	8	119.9	17.5
	17-	44	115.4	17.6	7	116.7	19.8
	18-	13	127.5	19.6	15	124.6	15.1
	19-	11	141.0	10.1	18	128.9	13.4
	20-	94	136.0	13.8	61	134.5	15.8
	25-	65	139.4	15.4	43	138.0	17.6
	30-	87	135.6	14.6	52	141.8	23.8
	35-	66	135.8	13.2	34	147.0	24.8
	40-	73	136.9	16.4	32	148.4	20.8
	45-	80	134.7	17.9	34	149.3	27.5
	50-	69	133.3	14.9	29	147.6	24.7
	55-65-74	68	129.4	15.4	16	144.0	20.9
		47	123.2	16.4	6	121.4	9.9
	15-	25	106.8	16.4	18	109.8	17.1
	16-	24	114.1	17.1	18	111.6	16.2
	17-	24	116.0	13.5	19	117.3	15.2
	18-	25	120.3	11.4	21	115.9	14.1
	19-	31	118.6	12.7	25	115.5	20.4
Female	20-	79	117.3	15.6	98	117.5	18.5
	25-	92	121.5	19.2	88	121.8	22.7
	30-	75	132.2	25.3	86	128.8	26.7
	35-	79	127.9	22.4	48	130.6	25.3
	40-	75	131.1	27.9	61	135.9	29.2
	45-	77	125.6	22.0	43	145.5	28.9
	50-	64	129.6	22.3	27	133.4	31.9
	55-65-74	81	122.5	22.0	36	139.4	31.6
		53	117.3	21.6	15	125.2	19.1

FIG. 2.—Mean estimated nude weights of Jamaican adults in rural and urban areas.

DISCUSSION

Although the persons measured were of the same social class and of the same ethnic group as the majority of Jamaicans (see Roberts, 1957), they were not strictly representative because they came from two selected areas. However, these areas were chosen as being typical of rural and urban Jamaica.

TABLE III

DISTRIBUTIONS OF WEIGHTS OF RURAL AND URBAN MALE AND FEMALE JAMAICANS AGED 35 TO 54 YEARS

Sex	Male		Female	
	Rural	Urban	Rural	Urban
Weight (lb.)				
80-	—	—	2	4
90-	2	1	12	9
100-	5	4	41	15
110-	29	4	58	21
120-	51	14	51	33
130-	74	21	50	18
140-	74	29	36	27
150-	29	17	13	18
160-	17	14	15	11
170-	4	10	5	6
180-	1	8	4	8
190-	2	2	2	5
200-		2	4	2
210-		1	1	1
220-		2	0	0
230-			0	0
240-			1	0
250-				0
260-(270)				1
Total	288	129	295	179

A comparison of the mean measurements of the urban and rural populations indicates that urban men were taller and heavier than rural men at 15, 16, and 17 years, but the numbers measured were few. From 20 to 30 years, differences were small, but after the age of 30 urban men were taller and substantially heavier. Heights of urban and rural women did not differ greatly; their weights were similar until 30 years, but at later ages urban women were considerably heavier than their rural counterparts. The differences in mean weights between rural and urban populations do not necessarily imply that there were similar differences in muscularity, skeletal development, or fatness, because heights also differed.

An index of "stoutness" was calculated for each individual in our sample by dividing his weight by that of the standard weight for his height derived from men and women age 20 to 29 in Britain as recorded by Kemsley, Billewicz, and Thomson (1962). The medians of the indices for each age interval are given in Table IV. In general, both rural and urban males were considerably stouter at age 30 than they were at age 15, probably because of muscular development. After age 30, the rural men varied little but older urban men were somewhat stouter. The most noticeable feature among the women was that those in the town, in contrast to those in the country, were stouter in later life.

The weight distributions (Table III) at ages 35 to 54, when mean heights within the age groups are nearly constant, indicate that the higher means of the urban populations are mostly due to a general

TABLE IV

MEDIAN INDICES OF OBSERVED WEIGHT TO STANDARD WEIGHT FOR HEIGHT*

Sex	Male		Female	
	Rural	Urban	Rural	Urban
Age (yrs)				
15-	95.4	95.0	100.9	99.6
20-	105.8	102.4	102.2	100.0
25-	108.2	110.1	104.8	103.1
30-	106.2	109.8	111.3	103.9
35-	107.7	111.5	110.2	113.0
40-	108.2	110.9	109.5	113.3
45-	107.1	112.2	107.0	123.7
50-	107.7	112.2	110.8	108.1
55-	103.3	113.4	108.1	121.8
65-(75)	100.9	98.8	102.2	112.4

* The index was calculated for each individual in our sample by dividing his weight by that of the standard weight for his height derived from males and females aged 20 to 29 in Great Britain (Kemsley, Billewicz, and Thomson, 1962).

tendency to be heavier, but, in the case of urban males, the higher mean is also partly due to the presence of a few very heavy individuals. The weight distributions suggest that obesity was not uncommon in women; 15 per cent. of rural and 29 per cent. of urban women weighed more than 150 lb.

Several factors may be responsible for the differences in size between rural and urban Jamaicans. The greater height of urban men may have been due to better standards of living during their period of growth, but the possibility of a tendency for taller men to migrate from the country into town cannot be discounted. The most probable explanation of the greater stoutness of urban people in middle age is that they are less active physically than those in rural areas. An increase in weight with age is characteristic of technically-advanced countries. For example, although in 1955 an average American woman of 52½ years was 0.2 in. shorter, she weighed 22 lb. more than a woman 30 years younger (Hathaway and Foard, 1960). In less advanced countries, at least among the peasants, this increase in weight with age does not occur, *e.g.*, in Vietnam (ICNND, 1960b). Our Jamaican urban and rural populations might be comparable to these "advanced" and "less-advanced" societies in respect of weight changes with age.

A comparison of the adult physiques of the many races of the human population is of great interest, but it is not always easy to determine the relative importance of heredity and environment in giving rise to differences. Weight, and to a lesser degree height, is obviously related to many environmental factors, such as diet, disease, and physical activity. Nevertheless, comparison of results, even if not entirely accurate, may show major differences likely to be due to race.

In Figs 3, 4, and 5, the mean heights and weights of rural Jamaicans at various age intervals are compared with those of Americans in 1955 as obtained by a survey by the United States Department of Agriculture (Hathaway and Foard, 1960) and with those of Britons in 1943 (Kemsley, 1950). The heights and weights of most groups of Jamaicans were considerably lower than those in the USA. The British figures probably underestimate the position to-day, because most of the subjects in the 1943 survey came from industrial regions where size may be smaller than in rural areas. Also the great improvement in living standards which has occurred since the growing period of many of the 1943 adults has almost certainly resulted in a greater mean height of younger adults. Rural Jamaican women were taller than British women in 1943, but the men were approximately the same height. This difference in the relative size of the sexes amongst Europeans and Africans has been noted previously in schoolchildren in Jamaica (Ashcroft and Lovell, in press). The cause may be racial or there may be some factor in the environment of the West Indies which favours females.

FIG. 3.—Mean heights of United States, British, and rural Jamaican adults.

Many small-scale studies on the size of racial groups have been carried out; Bean (1931) refers to nearly four hundred. Table V (overleaf) shows mean

FIGS 4 and 5.—Mean estimated nude weights of United States, British, and rural Jamaican men and women.

heights and weights and the ratios of height to weight of adults in a selection of countries. In some of these investigations mean measurements of "adults" were recorded without specifying age. If the measurements were presented in age intervals, then those for the 20 to 24 age group were put into Table V because by this age maximum heights have been attained and the increase of weight with age, which occurs in technically-advanced countries, has not yet occurred. The Jamaican data represent means of rural and urban subjects in the 20 to 24 age group. Although all the

TABLE V

HEIGHTS (in.), WEIGHTS (lb.), AND WEIGHT: HEIGHT RATIOS OF ADULTS FROM VARIOUS COUNTRIES

Sex	Male			Female		
	Height	Weight	Wt Ht × 100	Height	Weight	Wt Ht × 100
Country						
USA	69.5	160	230	64.2	128	199
Canada	68.0	154	226	62.8	124	197
Kenya						
(Masai)	67.8	133	196	62.8	127	202
Nigeria (1)	67.5	129	195	63.0	112	178
Jamaica	67.0	135	201	62.5	117	187
UK	67.0	132	197	62.3	117	188
Guatemala						
(Spanish)	66.5	145	218	—	—	—
Nigeria (2)	65.8	128	195	62.0	110	177
Uganda						
(Baganda)	65.7	125	190	—	—	—
Gambia	65.6	121	184	62.2	115	185
Kenya						
(Kikuyu)	64.7	114	176	60.2	100	166
Burma	63.5	108	170	59.5	94	158
Thailand	63.4	112	177	59.6	96	161
Ecuador	62.1	126	203	57.6	113	196
Vietnam	62.0	105	169	58.0	91	157
Java	61.8	102	165	58.2	91	156
Guatemala (Indians)	61.7	119	193	—	—	—

USA: Hathaway and Foard (1960).

Kenya: Orr and Gilks (1931).

Nigeria: Nicol (1959).

Canada: Pett (1955).

UK: Kemsley (1950).

Guatemala: Méndez and Behrhorst (1963).

Uganda: Coles (1957).

Gambia: McGregor and Smith (1962).

Burma, Thailand, Ecuador, Vietnam: ICNND (1963, 1962, 1960 a, b).

Java: Bailey (1962).

data in Table V are not strictly comparable, some consistent trends are revealed. Peoples with the smallest average height come from south-east Asia (Burmans, Thais, Vietnamese, Javans) and Amerindians in South America (Ecuadoreans and Guatemalans). Amerindians are heavier for their height than Asians, confirming the impression that the former are short and stocky and the latter short and slight. Americans head the Table for both height and weight. Other Caucasians (Canadians, British, and Guatemalans of mainly Spanish origin) are relatively tall as are Africans (Masai from East Africa, Nigerians from two areas, Jamaicans, Gambians, Kikuyu). These facts suggest that the potential stature of Caucasians and Africans is similar, but it must be remembered that both ethnic groups are heterogeneous. The continent of Africa especially contains many races showing great variations in physique (Seligman, 1930).

SUMMARY

- (1) Heights and weights of a random sample of 2,536 Jamaican adults, aged 15 to 74 years, were measured in an urban and in a rural area.
- (2) Urban and rural women were the same height but urban men were slightly taller than rural men. Urban but not rural persons tended to be heavier with age from 30 to 50 years; for this the greater physical activity in the country than in the town may be responsible.
- (3) Although comparisons with other races may not be strictly valid, it seems that Jamaicans, like some other ethnic groups originating from Africa, possess a height potential similar to that of Caucasians and greater than that of races from South-east Asia and South America.

We wish to thank Mr O. R. Pinnock and Mr Emerson Simons for their help in the survey.

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