

CORRESPONDENCE

60 MYTHENQUAI,
ZURICH,
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The Editor,
T.F.A.

Dear Sir,

Table of Heights and Weights of Nigerian Lives

I have recently had the opportunity of constructing a table of average heights and weights for Nigerian lives. The data, kindly supplied by the Great Nigeria Insurance Company, Lagos, consisted of the heights, weights, ages and sexes of 729 lives who had proposed for assurance and who had been medically examined; of these 63 were females and I excluded these from further consideration. This left 666 male lives, of which 22 had been declined, and the remainder accepted at standard rates or with an extra premium. Heights were normally measured without shoes, and weights were measured with light clothing only (without jacket and shoes).

In order to construct the table I fitted a linear regression formula to the data for the 666 male lives. This was of the form :

$$w = ax + by + c$$

where w is the weight in pounds, x is the age in years and y is the height in inches. The formula that gave the best fit, by a normal "least squares" method, was :

$$w = 0.7664x + 3.7466y - 130.728$$

and the weights given by this formula are tabulated in Table I attached, which ranges from age 22 to age 45 and from 5 ft. 1 in. to 6 ft. 1 in.; into this area fell 90% of the original data. The mean of the data was found at about 5 ft. 7 in., and age 34.

To obtain some idea of the reliability of this regression, I recast the formula to base it on the mean point of the data :—

$$(w - 147.135) = 0.7664(x - 34.1246) + 3.7466(y - 67.1847),$$

and calculated the standard errors of the various parameters :—

Mean weight	. 147.135	S.E. 0.911
Coefficient on age	. 0.7664	S.E. 0.1190
Coefficient on height	. 3.7466	S.E. 0.2803

The coefficients are all "highly significant", though the height is more important than the age. One can take it that in the neighbourhood of the mean the formula is probably accurate to within 2 pounds, but towards the edges of the table it might be as far out as 4 or 5 pounds.

I also tried to fit a regression surface of the type :

$$w = ax + by + cxy + d,$$

but the additional coefficient was very small and quite "insignificant" statistically, so this formula was no improvement on the linear one.

In Table II I show some comparisons with a number of other tables ; three of these are quoted in the Society of Actuaries " Build and Blood Pressure Study, 1959 ", but the Seven British Life Offices table (1921-22) was published in *T.F.A.* vol. 9, p. 304. The weights quoted by the Society of Actuaries were mostly taken with shoes and full clothing, and I have made a deduction of one inch and five pounds to allow for this. It can be seen that the Nigerian weights are very close to the Seven British Life Offices table (indeed the coincidence between these two tables is remarkable ; over the whole area where they overlap the difference between the weights is normally less than two pounds, and on only four occasions reaches four pounds ; for much of the area the weights are exactly the same). These two tables show normally lower weights than any of the American tables, and the latest American table shows weights generally about 10 pounds heavier than those of the Nigerian table.

My thanks are due to the Great Nigeria Insurance Company, Lagos, for providing the data, to the Swiss Reinsurance Company, Zurich, for their assistance in the calculations, and to both these Companies for allowing me to make the results public.

Yours faithfully,

A. DAVID WILKIE.

TABLE I
Average weight for each height and age
Male Nigerian Lives

Age next Birthday	Height												
	5' 1"	5' 2"	5' 3"	5' 4"	5' 5"	5' 6"	5' 7"	5' 8"	5' 9"	5' 10"	5' 11"	6' 0"	6' 1"
	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.
22	8 3	8 6	8 10	9 0	9 4	9 7	9 11	10 1	10 5	10 8	10 12	11 2	11 6
23	8 3	8 7	8 11	9 1	9 4	9 8	9 12	10 2	10 5	10 9	10 13	11 3	11 6
24	8 4	8 8	8 12	9 1	9 5	9 9	9 13	10 2	10 6	10 10	11 0	11 3	11 7
25	8 5	8 9	8 12	9 2	9 6	9 10	9 13	10 3	10 7	10 11	11 0	11 4	11 8
26	8 6	8 9	8 13	9 3	9 7	9 10	9 13	10 3	10 8	10 11	11 1	11 5	11 9
27	8 7	8 10	9 0	9 4	9 7	9 11	10 1	10 5	10 8	10 12	11 2	11 6	11 9
28	8 7	8 11	9 1	9 5	9 8	9 12	10 2	10 6	10 9	10 13	11 3	11 6	11 10
29	8 8	8 12	9 2	9 5	9 9	9 13	10 3	10 6	10 10	11 0	11 4	11 7	11 11
30	8 9	8 13	9 2	9 6	9 10	10 0	10 3	10 7	10 11	11 1	11 4	11 8	11 12
31	8 10	8 13	9 3	9 7	9 11	10 0	10 4	10 8	10 12	11 1	11 5	11 9	11 13
32	8 10	9 0	9 4	9 8	9 11	10 1	10 5	10 9	10 12	11 2	11 6	11 10	11 13
33	8 11	9 1	9 5	9 8	9 12	10 2	10 6	10 9	10 13	11 3	11 7	11 10	12 0
34	8 12	9 2	9 5	9 9	9 13	10 3	10 6	10 10	11 0	11 4	11 7	11 11	12 1
35	8 13	9 2	9 6	9 10	10 0	10 3	10 7	10 11	11 1	11 4	11 8	11 12	12 2
36	8 13	9 3	9 7	9 11	10 0	10 4	10 8	10 12	11 1	11 5	11 9	11 13	12 2
37	9 0	9 4	9 8	9 11	10 1	10 5	10 12	11 0	11 2	11 6	11 10	11 13	12 3
38	9 1	9 5	9 8	9 12	10 2	10 6	10 9	10 13	11 3	11 7	11 10	12 0	12 4
39	9 2	9 5	9 9	9 13	10 3	10 6	10 10	11 0	11 4	11 7	11 11	12 1	12 5
40	9 3	9 6	9 10	10 0	10 3	10 7	10 11	11 1	11 4	11 8	11 12	12 2	12 5
41	9 3	9 7	9 11	10 0	10 4	10 8	10 12	11 1	11 5	11 9	11 13	12 2	12 6
42	9 4	9 8	9 11	10 1	10 5	10 9	10 12	11 2	11 6	11 10	11 13	12 3	12 7
43	9 5	9 9	9 12	10 2	10 6	10 10	10 13	11 3	11 7	11 11	12 0	12 4	12 8
44	9 6	9 9	9 13	10 3	10 7	10 10	11 0	11 4	11 8	11 11	12 1	12 5	12 8
45	9 6	9 10	10 0	10 4	10 7	10 11	11 1	11 5	11 8	11 12	12 2	12 6	12 9

TABLE II
Comparison of heights and weights in various studies

	Age 25				Age 35				Age 45															
	5' 3"		5' 7"		5' 11"		5' 3"		5' 7"		5' 11"		5' 3"		5' 7"		5' 11"							
	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.						
Nigerian lives	8	12	9	13	11	0	11	0	9	6	10	7	11	8	11	8	10	0	10	0	11	1	12	2
Seven British Life Offices (1921-22)	9	0	10	0	11	1	9	7	10	8	11	9	9	12	10	13	12	3	12	10	11	6	12	10
Build and Blood Pressure, U.S.A. (1959)*	9	8	10	8	11	10	10	1	11	2	12	6	10	3	11	6	12	10	10	3	11	5	12	10
Equitable Life, U.S.A. (1940)*	9	6	10	7	11	11	9	12	11	0	12	5	10	3	11	5	12	10	10	3	11	5	12	10
Medico-actuarial, U.S.A. (1912)*	9	2	10	4	11	8	9	7	10	10	12	3	9	12	11	1	12	9	12	3	11	1	12	9

Studies marked * have been adjusted to give heights and weights without jacket and shoes by deducting one inch and five pounds from the heights and weights with shoes and with full indoor clothing.