

THE PHYSICAL DEVELOPMENT OF A PRIVILEGED GROUP OF AFRICAN CHILDREN

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The height (body length) and the weight of children depend on a number of factors of which the most important are age, heredity and environment. In under-developed areas the exact age of the children is often unknown and this may be one of the reasons why few attempts have been made to establish height and weight standards for African children.

All available data indicate that the height and weight standards of African children are below those of White children in this country, in North America and in Great Britain.¹⁻³ This may be due to heredity or environmental factors. Growth is retarded by adverse environmental factors, especially nutritional deficiencies, chronic infections, parasitic infestations (malaria, hookworm disease), or repeated attacks of acute debilitating illnesses (diarrhoeal disorders). Hitherto it has been impossible to gauge to what extent adverse environmental factors are responsible for the smaller stature of African children.

We were fortunate in having access to a well-defined group of African children from an environment where growth-retarding influences were probably not greatly different from those obtaining in average White families in this country or in socio-economically advanced populations overseas. The heights and weights of these African children are presented in this paper and they are compared with those of 'superior' White American children.⁴

MATERIAL AND METHODS

The study is based on the heights and weights of 72 African boys and 71 African girls under the age of 11 years whose mothers are fully qualified nursing sisters employed by the City Health Department of Johannesburg. The exact birth date of all the children is known. The families concerned could be considered to be a privileged group, because their incomes assured adequacy of food, and the training of the mothers made it likely that the food was reasonably nutritious and varied. Furthermore, personal hygiene and sanitation were superior to that of the average African population and, finally, it was unlikely that debilitating illnesses of the

children would have remained unnoticed or untreated for any length of time.

The tribal distribution of the parents was as follows: Xosa 20, Sotho 18, Zulu 11, Swazi 6, Tswana 5, Mopedi 3, and Morolong 1. In a further 13 families the father's tribal origin differed from that of the mother's.

Excluded from the series were all children under 1 year of age, because most of the mothers were still on maternity leave, and all children who were not living with their parents, in nearly all instances because they were at boarding schools. No children were excluded because of ill-health or stunting of growth.

The heights and weights of the children were compared with the Iowa City standards of 'superior' American children.⁴

The heights of the mothers were compared with the average height of White Canadian women between the ages of 20 and 40 years.⁵

RESULTS

Fig. 1 shows that the weight/age and height/age distribution of the 72 boys compare favourably with those of 'superior' American children.

Fig. 2 shows that the weight/age values of the 71 girls are throughout slightly below the American standards while the height/age values of the girls fall slightly below American standards only after the age of 5 years.

The heights of the mothers are shown in Table I. The average height was 62.3 inches (range 56—68 inches). The average height of Canadian women between the ages of 20 and 40 years is 62.7 inches.

COMMENT

The number of children in this survey was insufficient for the calculation of height and weight curves, and for this reason the data of each child were entered on growth charts based on the measurements of a group of 'superior' American children. With minor exceptions the heights and weights of the privileged African children tally with their White American counterparts. In a recent survey,⁶ the heights and weights of

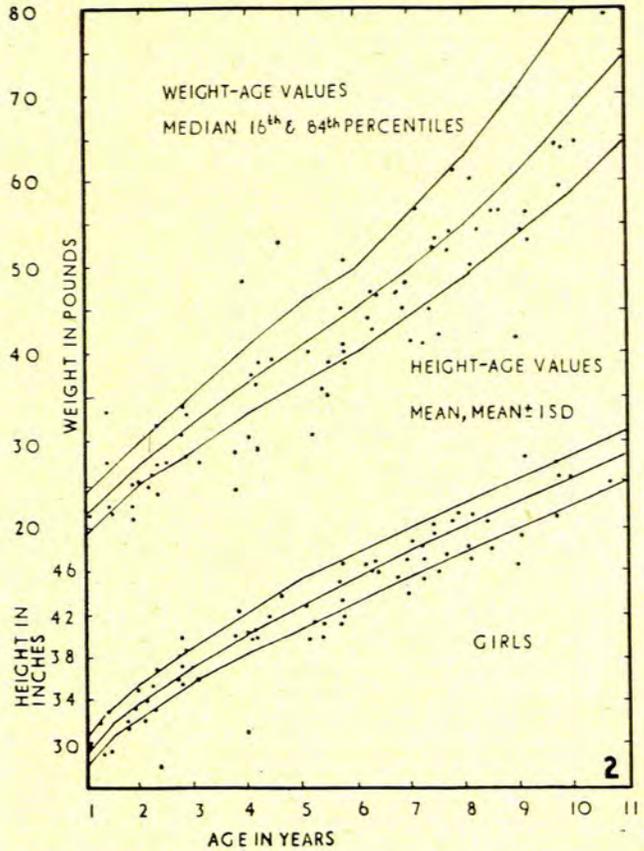
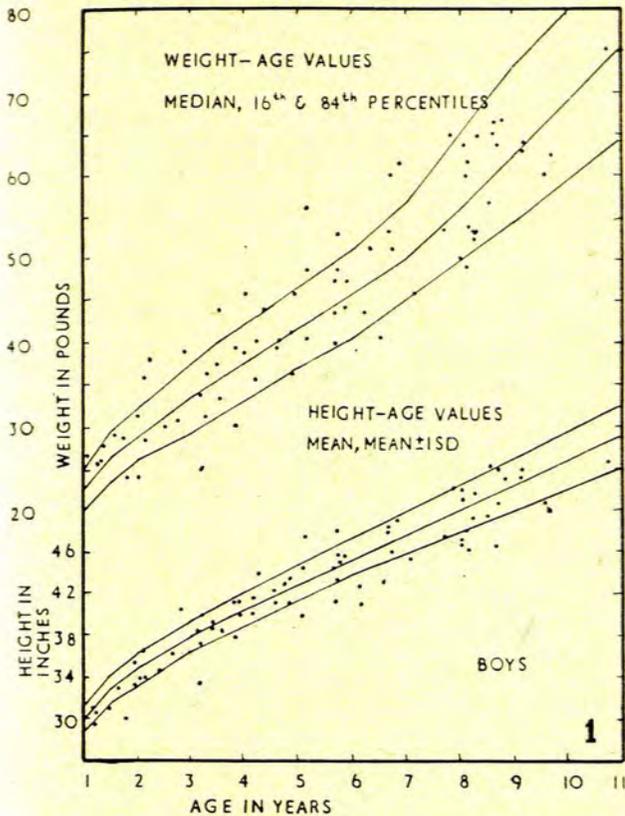


Fig. 1. Weight/age and height/age distribution of 72 African boys (each boy represented by a dot), from privileged families. The line represents a standard of American boys from privileged families.

Fig. 2. Weight/age and height/age distribution of 71 African girls (each girl represented by a dot), from privileged families. The line represents a standard of American girls from privileged families.

TABLE I. HEIGHT DISTRIBUTION OF THE MOTHERS

Height in inches (to nearest inch)	Number of mothers in each group
56	1
57	1
58	0
59	3
60	6
61	7
62	13
63	17
64	9
65	10
66	7
67	2
68	1

White South African children were found to be a little below the American standards.

Previous reports¹⁻³ have always stressed that the growth of African children was retarded compared with White South African children. An investigation just completed in Johannesburg⁷ confirms the accuracy of these observations. Our survey indicates that this stunted growth is due to environmental factors. The important influence of environment on growth is well known. Greulich⁸ has shown that Japanese children from the West Coast of America are substantially taller and heavier than those in Japan. Bakwin and Patrick⁹ found that American Negro infants seen at out-patient

departments were retarded in development compared with standards of White American infants, but there was no difference between the two racial groups if children from well-to-do families were weighed and measured.

The main environmental factors causing retardation in growth in Africa are poor nutrition, chronic diseases, or frequent attacks of acute debilitating illnesses. In Uganda, Welbourn¹⁰ has shown that there is a marked falling-off in the rate of growth after the age of 9 months. This phenomenon is usually attributed to nutritional factors, but tropical diseases no doubt also play a part in the retardation of growth of children in Central Africa.

In this part of Africa the most prevalent debilitating chronic infection is tuberculosis, but repeated attacks of diarrhoea or chronic salmonellosis may also be of significance. It is not possible to state accurately to what extent these infections retard the growth of local African children, but there is no doubt that they are of minor importance compared with nutritional deficiencies.

We should like to suggest that the Iowa growth charts can be used in nutrition surveys in this part of Africa to detect inadequacies of the diet. The ages of local African children are known with sufficient accuracy, at least in urban areas, to promise reliable results.

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REFERENCES

1. Kark, S. L. and Le Riche, H. (1944): *Manpower*, 3, No. 1, p. 10.
2. Kark, E. (1953): *S. Afr. J. Med. Sci.*, 18, 109.
3. Botha, J. F., Clarke, D. and Jokl, E. (1945): *S. Afr. Med. J.*, 19, 381.
4. Jackson, R. L. and Kelly, H. G. (1945): *J. Pediat.*, 27, 215.
5. Le Riche, H. and Pett, L. B. (1955): *S. Afr. Med. J.*, 29, 164.
6. Lurie, G. M. and Ford, F. J. (1958): *Ibid.*, 32, 1017.
7. Griffiths, J. Personal communication.
8. Greulich, W. W. (1958): *Science*, 127, 515.
9. Bakwin, H. and Patrick, T. W. (1944): *J. Pediat.*, 24, 405.
10. Welbourn, H. in Brock, J. F. and Autret, M. (1952): *Kwashiorkor in Africa*, p. 13. *Wld Hth Org. Monograph Series*.