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### **Urbanization of Developing Populations: Bearing of Rise in Privilege on the Prevalence of Diseases of Nutritional Deficiency and Excess<sup>1</sup>**

A. R. P. WALKER

Medical Research Council Human Biochemistry Research Unit, South African  
Institute for Medical Research, Johannesburg

#### *I. Introduction*

At present, there are very roughly 15 million Negroes, 4 million Whites, 2 million Coloureds (Eur-Africans), and three-quarters of a million Indians in South Africa. The local situation is therefore very favourable for studying changes in a variety of variables as they are affected by rise in privilege [11].

It is well known, of course, that throughout the world the standard of living of all populations has risen considerably during the last generation. For Whites, this has meant consumption of a richer diet, and the acquiring of larger houses, more cars, modern appliances, and other possessions. For the less privileged, the principal alteration affecting health has been the change from an insufficiency of food, at least in respect to calories. Nevertheless, it must be recognised that, until recently, there were large segments of White populations in many countries among whom there was widespread poverty and high prevalences of diseases due to undernutrition and malnutrition. In Britain after World War I, a major report entitled 'Poverty, Nutrition, and Growth' depicted the adverse living conditions among the slums in large cities. Similar drawbacks were common in the USA, especially in the southern States. In South Africa, at much the same period, the 'Poor White' problem was one of national concern.

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It is proposed to describe briefly some aspects of the health picture of South African Negroes, in relation to: (1) diseases of deficiency, and (2) conditions or diseases of excess which are linked with urbanization and the adoption of the diet and manner of life of Whites.

## *II. Diseases Linked with Nutritional Deficiency and Malnutrition*

### **A. Protein-Calorie Malnutrition (PCM)**

As in other underprivileged populations, PCM is a major health problem among very young Negroes [3] and may affect about 5% of those under 5 years of age [7]. Surprisingly, much the same prevalence has been found in urban and rural populations. In segments which have risen markedly in privilege, e. g., families of teachers, mortality rates of children 1–4 years old are lower than the average. This is the nutritionally sensitive age period, and the improvement is definitely linked with lower prevalences of PCM. Further, Negro nursery schoolchildren who received two extra meals each school day were found to have no stigmata of PCM, and were taller and heavier than their contemporaries in the general population. The main obstacle to improvement is ignorance, not poverty, and only intensive health education and the provision of more clinics for the young will promote significant decreases in PCM prevalence.

### **B. Pellagra**

Since maize is the staple cereal for Negroes, pellagra is a serious health problem, as it is in similarly placed populations elsewhere. As with PCM, until it is appreciated by Negroes that a dietary deficiency is involved and that simple local preventive measures are feasible, a major reduction cannot be expected in the prevalence of pellagra. Local measures, for example, would be to encourage a daily intake of approximately 50–60 g of groundnuts or other legumes (beans, cowpeas, etc.). Meanwhile, nation-wide supplementation of maize with niacin and riboflavin is being planned, and is likely to be implemented [2]. Enriched maize meal, which should reach the great majority of Negro consumers since the additional cost will be extremely small, should result in a decreasing prevalence and intensity of pellagra.

### **C. Rickets**

Rickets is a problem in young children in many large population centres, especially in developing countries. Surprisingly, in country areas of the

Transvaal, a higher prevalence of the sequelae of rickets has been found than would be predicted in view of the annual average of 9 h sunshine *per diem*. The reason for this apparent lack of vitamin D is not clear. To throw light on the situation, nutritional, biochemical, and clinical studies are being pursued in the four main ethnic groups. Early findings in schoolchildren are greater prevalences of knock-knee and bowing than were expected. Thus far, rise in privilege does not appear to be an influencing factor.

#### D. Scurvy

This disease is almost the least of nutritional problems in Negroes. Among very young children and school pupils, it is very rarely encountered, and is seldom seen among adults [1].

#### E. Iron-Deficiency Anaemia

In country areas, where iron food preparation vessels are usually employed, iron-deficiency anaemia in school pupils is rare; even in urban areas, where iron intake is lower, anaemia remains uncommon [6]. However, in random groups of pregnant women, iron-deficiency anaemia is increasing, although present in only about 5–10% [5].

### *III. Conditions or Diseases Linked with Nutritional Excess*

#### A. Overweight

Among Negroes living in remote country areas, gain in weight with age is slight. Yet, among those in urban areas, gain in weight with age is very marked [11]. Similar observations have been made in other parts of Africa. In studies made on Zulu in Zululand compared with Zulu in Durban, the differences in weight of young middle-aged women was 10–15 kg [8]. Among Venda in the Zoutpansberg compared with those in Johannesburg, and Tswana in Rustenburg region compared with Tswana in Johannesburg, differences in weight were about 5–10 kg.

Reports have indicated that about half of middle-aged adults in the USA, Britain, and Australia are overweight when judged against desirable weights recommended in 1959 by Metropolitan Life Insurance Company. In investigations in Johannesburg, among groups of the general middle-aged Negro population the proportion overweight was roughly 35–50%. But among the segment in regular employment and in sedentary occupations, e. g., teachers and clerks, the proportion was 50–60%. Yet, physical activity

is not necessarily lower in urban than in rural areas; energy expenditure by Venda was found to be greater in Johannesburg, although associated with higher mean weight [4].

### B. Hypertension

Among Negroes living in remote rural areas, blood pressures have been found to be low, and to rise little with age [11]. But when country people have settled in or have been brought up in urban areas, blood pressures are much higher and rise markedly with age [10]. Similar observations have been made elsewhere. The increase in prevalence of hypertension was noted for Zulu in Durban and, to a lesser extent, for Venda and Tswana in Johannesburg, compared with corresponding populations in the respective country areas. Among groups of middle-aged Zulu in Durban, about half were found to have a diastolic pressure of 90 mm Hg or more; in USA Whites of the same age, the proportion is roughly a third. The divergence in blood pressures of rural and urban Negroes has been ascribed to failure to adapt to stresses of life [8]. In the country, blood pressures may differ from region to region; proportions with values above the cut-off point cited may vary from 10–40%. The reason is not differences in salt intake, which was found to be fairly constant, namely, 8–12 g *per diem*.

### C. Coronary Heart Disease (CHD)

Coronary heart disease is virtually absent in Negroes in country areas. While CHD is beginning to occur in large centres of population, it remains very rare. The best perspective of the disease in urban areas may be reached by considering the Negro population of three-quarters of a million in Soweto, Johannesburg, and calculating how many cases of CHD would be expected to occur annually in a *White* population of the same size and age structure. Employing information published on several series of Whites overseas, then among the segments of ages 50–59, 60–69, and 70+ years, about 1,200 cases of sudden deaths from CHD would be expected annually. At Baragwanath Hospital (2,300 beds) there are still only 2–3 deaths annually from CHD. The rarity of the disease has been confirmed from electrocardiogram studies on large random groups of middle-aged and elderly Negroes investigated in both rural and urban areas [9, 13]. We are unable to explain why CHD remains rare since, among urban Negroes in Johannesburg, increasing proportions have relatively high serum cholesterol levels, are hypertensive, overweight, pursue sedentary occupations, smoke increasingly, and hold responsible jobs [12].

#### *IV. Comment*

In the near future, among Negro populations in urban areas in South Africa, the rise in socio-economic level accompanied by advances in health education will undoubtedly lower prevalences of nutritional deficiency diseases to the extent that they will no longer be major public health burdens. Simultaneously, there will undoubtedly be an increase in conditions or diseases linked with nutritional excess, such as overweight and hypertension. These and their ramifications (diabetes, cardiovascular and cerebral vascular diseases) now account for over half of the morbidity and mortality prevailing in White populations. The latter have ample exposure to health education, the adoption and practice of which may lessen or retard the occurrence of these diseases; yet few persons take any avoiding action. It is questionable, therefore, whether health measures or recommendations directed at Negroes will arrest the rising intensity of risk factors to health which are now becoming increasingly apparent in these people.

The information given concerns South African Negroes. However, the trend of changes shown by them, accompanying urbanization and sophistication of diet and manner of life, is likely to be much the same as that of all other similarly placed populations.

#### *Conclusions*

In South Africa, Negroes may be observed in all stages of transition, from primitiveness to sophistication, in respect to diet and manner of life. With urbanization, despite rise in privilege, protein-calorie malnutrition as well as pellagra remain major health problems. Simultaneously, with increasing means, there are marked rises in prevalences of overweight and hypertension; coronary heart disease, however, is still rare.

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Author's address: Dr. ALEXANDER R. P. WALKER, The South African Institute for Medical Research, P. O. Box 1038, *Johannesburg* (South Africa)