THE UNIVERSITY *of* EDINBURGH

CANCER SURVEYS IN DEVELOPING AFRICAN COUNTRIES WITH SPECIAL REFERENCE TO IBADAN, NIGERIA.

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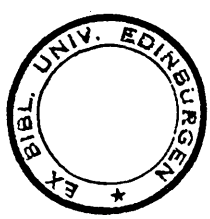

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INTRODUCTION

During the first quarter of this century cases of cancer were rarely reported from Africa. However, with the gradual expansion of medical facilities throughout the continent, single cases began to be replaced by longer series and many measures were made of the local relative frequency of different tumour types. The understandable preoccupation of most medical officers with the diagnosis and treatment of infective and parasitic disease, the absence in most areas of any system of vital registration and the paucity of pathological laboratories, all mitigated against any serious attempts at estimating incidence rates for malignant disease in defined populations. It is only since 1950 that several cancer incidence rate surveys have been undertaken, one of the most recently completed being the survey carried out in Ibadan, Nigeria, in the 3-year period, April 1960 to March 1963.

The first two chapters of this study will consist of a historical review of the major cancer surveys which have been make in various parts of Africa south of the Sahara, from the end of the First World War until the present time. This is not intended as an exhaustive study of all the literature upon cancer which has emanated from Africa; such a task would be enormous, unwieldy and inappropriate. The purpose is rather to trace the development of cancer epidemiology and the extension and refinement of its

techniques, in an environment which has always had difficulties enough to daunt the most intrepid inquirer. In studying some of these early surveys and their more sophisticated successors, it may be possible to discern, among passing preoccupations and the pathological problems which have absorbed succeeding investigators, outlines of the continuing pattern of cancer in Africa.

In the subsequent chapters, dealing with the establishment, running and results of the Ibadan Cancer Registry, attention will be paid to particular local circumstances which may have affected these results and reference will be made to a number of subsidiary sociological inquiries which can contribute to their interpretation.

The results of a socio-medical survey carried out by the writer into prevailing attitudes of the local Ibadan population towards modern and native medicine has already been submitted in the form of a Dissertation for the Diploma in Public Health of Edinburgh University (1964). The present author has also published an account of the epidemiology of Kaposi's Sarcoma in Nigeria (1963). In addition, there have been a number of publications from the Ibadan Cancer Registry (Edington and Maclean, 1962; Edington, Maclean and Okubadejo, 1962; Edington and Maclean, 1964; Edington and Maclean(in press)) of which the writer has been co-author, having contributed largely to the collection and analysis of the data prescribed. When reference is made to any of the above publications, the fact will be indicated in the text in the usual manner.

CHAPTER ONE

RELATIVE FREQUENCY ESTIMATES OF CANCER IN AFRICA

Early in July, 1923, the following letter appeared in the correspondence columns of the British Medical Journal:-

"Sir,

All medical men practising in West Africa can amply confirm Dr. Fouche's[1] remarks with regard to the rarity of cancer in pure negroes ...

... In Northern Nigeria the extreme rarity of carcinoma may be judged by the fact that the only recorded case, at any rate in recent years, was one of carcinoma mammae in an old woman from Sokoto, and this specimen is now in the Museum of the Royal College of Surgeons[2]. In Northern Nigeria, moreover, the women do not commonly cover their breasts and

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1 Dr. Fouche had previously described how, during a period of $6\frac{1}{2}$ years as district surgeon in the Orange Free State, with a native population of 14,000, he had "never seen a single case of cancer in any form in a native". He did, however, admit that he had encountered two cases of carcinoma of the breast in the Western Province of South Africa, pointing out that, "they both belonged to the coloured race peculiar to that part, a race which has lived under civilised conditions for the last 300 years at least".

2 The Curator reports that the specimen, donated by Dr. Sharp from Kaduna, was destroyed when the College was bombed in 1941.

it is therefore more than usually easy to observe cases of this kind among the 9,000,000 inhabitants"[3]

In the forty years since Dr. Sharpe's naive suggestion was put forward, the methodology of cancer surveys in Africa has had to advance to keep pace with the discovery of ever increasing numbers of cases. By 1963, over six hundred patients with malignant disease were being diagnosed by the hospitals of one town in Nigeria. But the process of change was to be a gradual one. Jojot and Laigret, for example, reporting on the first African case of Kaposi's Sarcoma which they had encountered in the French Cameroons (1922), were concerned to emphasise the demonstration which this unusual case afforded that cancer could occur at all in Africa. "It is a diagnosis", they observed, "which, on the whole, one does not consider among the black inhabitants of this region".

Massey. Belgian Congo, 1921

Other writers from West Africa described individual tumours or small groups of cases. Massey (1921), who had been working in Coquilhatville in the Belgian Congo, had come across two cases of cancer of the liver within a month, his first experiences of this condition after fifteen years of medical work. He had performed the

3 My italics

autopsies and found, "both tumours were of the multiple nodular form ... It is evident that they were secondary in origin, although" he adds significantly, "I did not find the primary focus".

Mouchet and Gerard. Belgian Congo, 1919

A previous publication from the Belgian Congo by Mouchet and Gerard (1919), had mentioned sixteen malignant tumours, painstakingly collected from all over the colony during an unspecified period. Among them had been six cases of liver carcinoma (confirmed at autopsy) in young Katangese mine workers. These had been quick growing, rapidly fatal, primary tumours. One of them had actually been first suspected on liver biopsy. The single instance which they had traced of breast carcinoma, it was carefully explained, had occurred in a Lagos woman, not in a native Congolese. These Belgian writers were of the opinion that, "epithelioma is the rarest tumour ever encountered in the Negro".

Macfie. Gold Coast, 1922

Discussing tumours in a paper on the prevalent diseases of the Gold Coast, Macfie (1922) thought that they were probably as common as elsewhere, but sarcomas appeared to be rather commoner and carcinomas were, "said to be rare". He added this perspicacious comment showing that he was fairly in advance of his time, "This

belief may be due to the fact that the hospital clientele represents only a small and selected portion of the total sick".

Meanwhile, Ferguson from Nigeria was issuing extracts from a number of annual sanitary reports (1922, 1924, 1927) with reference to malignant tumours, whilst Stewart, in 1925, and Forde, in 1926, maintained the same habit when occasion arose.[4]

But, although the West African story may have been fragmentary, in South Africa, where medical facilities in the towns were comparable with those available in Europe, pathologists had already begun to notice distinctive features in the cancer spectrum and to speculate upon the causes of what they saw. Watkins-Pitchford (1910) had been engaged in a spirited controvery over the part played by direct sunlight in the initiation of breast cancer, so common in white women and, he averred, so exceptional among their black sisters. He could only recall having seen five cases of cancer of the breast in natives of Natal and Zululand in five years, and two of these were males.

Harvey Pirie. Johannesburg 1921

Addressing the South African Medical Congress in Capetown, J.H. Harvey Pirie (1921) had this discovery to report: "During the three years I have been in Johannesburg, I have been struck with the comparatively large numbers of cases of liver carcinoma met with amongst African natives". He had re-examined all the histological material which had been received by the South

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4 These totalled 14 tumours.

African Institute for Medical Research from 1912 onwards and discovered thirty-six cases which he could unhesitatingly accept as primary liver carcinomas. Such cases had been by far the commonest form of carcinoma in Pirie's African material; cancer of the skin, standing next in order of frequency, had only been diagnosed on fifteen occasions.

Pirie was primarily concerned with a possible association between hepatic carcinoma and schistosomiasis and considered that he had shown this in ten instances. However, the value of his work to-day lies in his early observation of a high relative frequency of primary carcinoma of the liver in natives of South Africa.

Many South African workers were to corroborate his findings during the next ten years.[5] Meanwhile, from French Equatorial Africa, Surmont and Sava, (1927) had collected accounts of six instances of this tumour by European doctors whose experience in their home countries had been so different in this regard. All over Africa, during the nineteen twenties, attention was being diverted from the unreal question of whether cancer could exist among, "primitive races" and beginning to focus upon a pattern of

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5 Oettle (1956) has published a critical review of the South African literature relating to primary carcinoma of the liver.

cancer which seemed peculiar to this part of the world. There was still to be much discussion on the unusual ratio of sarcoma to carcinoma among Africans, but this would take place against a common background of consent, and isolated cases would not for much longer command surprised attention.

Ledentu, French Cameroons 1934

In May 1934, a short article was published in the Bulletin de la Societe de Pathologie Exotique relating to cancer in natives of the French Cameroons. The writer, G. Ledentu, was commenting on the information he had collected after two years of inquiries into possible cases of cancer arising in this part of French Colonial Africa. He contrived to make extraordinarily effective use of the very limited data at his disposal.

Unlike most of his contemporaries, who were still focussing their attention entirely upon the relative prominance of different kinds of tumour, Ledentu related his cases to the populations from which they were derived and was thus able to make an approximation, however rough, of the actual incidence of malignant disease.

He had available two sources of statistics, from hospital units and from doctors in mobile teams who were doing a medical circuit of the rural areas which lay out of range of hospitals. He was able to make estimates of the mortality and morbidity from cancer among hospital patients and also of the morbidity

from cancer in the rural areas and he found, at first to his own surprise, that the incidence of cancer in the rural districts was notably higher than that obtaining among hospital attenders. Thus, the average annual morbidity from cancer in hospital patients (both out-patients and in-patients) was only 7 cases per 100,000, whereas in the rural areas it had amounted to 16 cases per 100,000 individuals who had been examined.

Ledentu went on to offer explanations for this apparent anomaly, saying that the radius of influence of the hospital units was very restricted and that the ignorance and fatalism of the natives often combined to discourage them from seeking assistance at clinics. He had these very significant comments to make, "It is certain that an examination of the entire population, carried out by mobile teams of doctors, allows for patients to be tracked down who would never have spontaneously sought medical advice.

"This is why it seems prudent to admit a provisional figure of 1 case of cancer among approximately 6,000 natives,[6] a proportion which more intensive visiting will, however, no doubt raise still further".

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6 16 per 1000,000

7 My italics

He went on to point out that such a figure was, nevertheless, considerably lower than that obtaining in Europe and that, therefore, cancer was in fact relatively rare among Cameroon negroes.

With regard to the localisation of the cancers which had come to light and on which there was detailed information[8] (63 cases), he drew special attention to hepatic carcinoma. Four cases, or 6.3 per cent of all this series, had been regarded as primary liver tumours. Cancer of the stomach constituted 4.8 per cent of the total (3 cases).

However, skin and subcutaneous tumours had been the most frequently encountered (20.6 per cent), followed closely by breast cancer (17.4 per cent). It was notable that 3 among the 11 breast cancers had been in males (4.7 per cent of all tumours).

There had been 8 tumours of the facial area, of which the greater number (5 cases) were situated in the mandible. This is probably the first reference in the West African literature to what is now called the Burkitt Tumour.

Although genital cancer was apparently rare (especially in males) and there had only been 3 uterine cancers, Ledentu made the point that such figures should be treated with reserve and were probably not indicative of the true situation. He was

8 Most of the diagnoses, apart from some dying in hospital, had not been confirmed histologically. Ledentu himself admitted this defect in the data.

convinced that, had they been feasible, systematic gynaecological examinations would have revealed many more cases of female cancers.

It has seemed justifiable to quote at some length from Ledentu's work, not only because of the relevance of his findings to the study of cancer in neighbouring Nigeria, but because of his early application of simple statistical techniques in the kind of situation which had discouraged most of his contemporaries. This publication is probably the first attempt to estimate the incidence of malignant disease in a defined African population and, as such, is deserving of recognition.

Smith and Elmes. Lagos, Nigeria 1934

Appropriately enough, it was from Nigeria that the first report of a large series of cases of malignant disease came (1934). E.C. Smith and B.G.T. Elmes (subsequently Professor of Pathology at University College, Ibadan) analysed 500 tumours which had been received and histologically examined at the Medical Research Institute, Lagos, over the eight years prior to 1934.

The authors, having prefaced their results with some remarks on the supposed rarity of cancer in Africa, made these astute observations, "We venture to think that, as contact of medical officers with natives increases, so will their trust be gained, and as they gradually become weaned from their inherent beliefs in witchcraft and native medicine, they will consult the doctor more

and more frequently, with a resulting increase in the number of malignant neoplasms recorded". They were unassuming in the presentation of their own material and did not hazard guesses at absolute incidence nor even speculate upon the relative frequency of malignant disease in Nigerian men and women. Their analysis went no further than a classification into morphological types and according to regions of the body, with a short note on age distribution and a discussion upon a number of tumours which they considered of special interest.

Later there will be occasion to refer again to some of Smith and Elmes' results, meanwhile it may be noted that they found that primary liver carcinoma had constituted 6.4 per cent of the total tumours, and tumours of the female genitalia 6.8 per cent. Tumours of the skin were by far the commonest forms of cancer, comprising 18.8 per cent of all the tumour biopsies.

It is particularly interesting to discover that 5.8 per cent of tumours occurred in children under ten years of age, and that one third of these were what the authors described as, "round cell sarcomas of the orbit". In this same age group, there had also been, "a round cell sarcoma of the shoulder in an infant aged three ... two sarcomas of the testis in boys aged six and seven respectively, and a round cell sarcoma of the ovary in a girl aged eight".

They recorded forty melanotic sarcomas, thirty of them being

situated on the foot, and ten cases of Kaposi's Sarcoma (2 per cent).

In discussing twenty-eight bone tumours in the region of the mouth, they described, "three round cell sarcomas of the mandibular and maxillary region occurring in boys with ages varying from ten to twelve, two myeloid sarcomas in boys aged ten and twelve ... a carcinoma in a boy aged ten".

All these findings are not only valuable indicators of the tumours seen in Southern Nigeria thirty years ago, but provide at the same time a preview of the present position, and now familiar syndromes can be glimpsed through an older terminology.

Sutherland Strachan Johnnesburg 1934

A. Sutherland Strachan (1934) in "Observations on the incidence of malignant disease in South African natives", reviewed a ten year series of autopsies at the General Hospital, Johannesburg, from 1924 - 1933. Among 3,851 post mortem examinations on all races[9], 314 tumours had been reported and 64 of these were Bantu cases.

Strachan observed, "The maximum incidence of carcinoma amongst Europeans occurred in the 50 - 59 age group, whilst for natives it is in the 30 - 39 age group". The word, "incidence" was rather loosely employed by this writer who was in fact concerned, like

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9 Europeans comprised 1662, Eurafricans 328 and Bantu 1901 of these autopsies. There were 232 tumours in Europeans, 18 in Eurafricans and 64 in Bantu.

most of his predecessors, with matters of relative frequency, this time the relative frequency of different kinds of tumour found at autopsy in Bantu patients.

But, in spite of Strachan's simple method of sorting his material[10], certain features of the Johannesburg tumours emerge fairly clearly. Thus, tumours of the stomach (43 cases) constituted 18.5 per cent of European tumours, but only 9.4 per cent of the tumours in Bantu patients (6 cases). There were nineteen bronchial carcinomas in Europeans and none in Bantus.

However, as Strachan himself noted, the most striking difference between the races was in respect of carcinoma of the liver. He found thirty seven instances of these liver tumours in the Bantu (57.8 per cent) and in thirty of the cases, "a definite degree of cirrhosis which, it is suggested, may be of aetiological significance". At the same time, only four instances of liver carcinoma were discovered in the very much larger European group[11], (1.7 per cent). Strachan also noted that carcinoma of the liver appeared to occur in natives at a relatively early age. Although his tables do not specifically demonstrate the age distribution of the Bantu heptoma cases, it may be surmised that many of them were among the twenty three carcinomas which were

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10 Into sarcomata, carcinomata and cerebral tumours.

11 Strachan did not clearly state whether or not these were of primary hepatic origin.

cited in Bantu males aged 30 - 39.

Sequira and Vint. Kenya and Tanganyika, 1934

Sequira and Vint (1934), dealing with malignant melanoma in Africans from Kenya and Tanganyika, described sixty seven such melanotic tumours diagnosed by biopsy over eight years. They made reference at that time to a total of 482 tumours of all kinds which had been diagnosed in the Medical Research Laboratory, Nairobi. The authors were aware of the biased picture given by biopsy material at a central laboratory, pointing out that only a minority of tumours seen by medical staff in outlying districts were sent for examination, and also that in some tribes there was difficulty in persuading old people, especially women, to attend hospital. However, in their experience as pathologists, malignant melanoma had been, next to squamous epithelioma, the commonest form of malignant disease in natives of East and Central Africa.

Vint. Nairobi, 1935

Vint followed up this paper in 1935 with a somewhat similar cancer report to that of Smith and Elmes, to whom he referred in his own publication. This was an account of 546 malignant tumours diagnosed from a series of 2,378 histological specimens in Nairobi. Although his main object was to separate carcinomas and sarcomas from several smaller tumour groups, he proceeded to to analyse the site incidence of the sarcomas, and his description displays some interesting aspects. Among the sarcomas there had been fourteen instances (7.8 per cent of all sarcomas) of mouth

and jaw tumours, and seven sarcomas of the face and head region. Here again it is probably the Burkitt Tumour which is being described.

Just as in Lagos and in Johannesburg, liver tumours had been prominent among the Kenya specimens. They constituted 13.7 per cent of all the carcinomas. Out of a total of 38 liver tumours, 31 had been primary liver celled and 7 of bile duct origin.

Vint found that carcinoma of the breast was not uncommon in his case material, with a relative frequency of 9 per cent of all carcinomas, but he had seen only one case of carcinoma of the body of the uterus. Tumours of intestine and stomach had been uncommon but, as noted in his previous paper, skin tumours were frequent and melanomas constituted 10.8 per cent of all tumours.

Vint recognised the unrepresentative nature of these tumours and made no attempt to suggest the actual age of the patients whose biopsies he had examined. He mentioned, however, that there was a prevailing impression regarding the earlier onset of cancer in natives. His final remarks reflect the change which had been taking place in the climate of medical opinion: "These observations provide further evidence against the theory that cancer is rare among indigenous peoples living under natural and primitive conditions. As yet, only a negligible proportion of the population of Kenya live under civilised conditions; but analysis shows that malignant disease is far from rare among them.

The distribution in the body differs materially, however, from that recorded in the European".

Berman. South Africa. 1935 and 1940

In the same year that Vint was writing from Kenya, Charles Berman (1935) offered his view of the situation regarding malignant disease among the Bantu of Johannesburg and the Witwatersrand Gold Mines. This was the most ambitious analysis to date of cancer in South African natives. In common with pathologists elsewhere on the continent, Berman had deplored "the tendency of leading international statisticians to formulate reasons explaining the apparent infrequency of malignant disease in the South African aborigines".[12]

Berman's case material came from two sources, the non-European hospital, Johannesburg, and the non-European hospitals serving the Rand mines. It was essentially an autopsy series of cases, as almost every diagnosis was so confirmed. The period under review was from 1925 - 1933.

His first article was followed up, in 1940, with another analysis of the same material from one particular aspect, "Primary carcinoma of the liver in the Bantu races of South Africa".

12 He recalled the experience of Watkins Pitchford (1925) who had been aware of only seven deaths from malignant disease in three years among the entire Bantu population of 900,000 in Natal and Zululand. Berman stated that Hoffman, writing in 1926, had used this inadequate data in support of his theory regarding the rarity of malignant disease in primitives.

It was, in fact, the predominance of primary liver carcinoma which had been the striking feature of the first report and Berman's mode of presentation, in terms of the familiar relative ratio frequencies, assigned to this tumour a particularly dramatic position. It had evidently constituted 90.5 per cent of all tumours found at autopsy among the Rand labourers[13].

Berman acknowledged that these miners were far from being representative of the general popualtion, being carefully selected young adults, whom he described in his first paper as "aged between 18 and 45 years, the majority being about 30 years." Subsequently he appears to have revised this estimate slightly, mentioning a range of 28 - 45 years in the second article. In this shifting population, the chronically sick were liable to leave work and go home.

Berman indicated what proportions of the mine workers were South African Bantu (65 per cent) and what proportion had come from adjoining Portuguese East Africa (35 per cent). As far as the risk of developing liver cancer was concerned, the Portuguese labourers seemed to be six times more liable to the disease than their South African co-workers.

Gilliam. On Berman's findings. 1954

In 1954, Alexander Gilliam, a leading international statitician, to use Berman's own words, got to work upon his figures in the interest of demonstrating the fallacies of relative ratio frequencies and the superiority of incidence rates for

13 229 out of 253 had been primary liver carcinomas.

cancer surveys. By means of a number of comparisons between calculated crude mortality rates and age specific incidence rates of liver carcinoma in the Bantu[14] and the equivalent rates for contemporary (1930 - 1932) American negroes, Gilliam showed that any statement regarding a supposedly greater risk to primary cancer of the liver in the South African was dependant upon several factors. Firstly, it depended upon whether Berman's sutopsy series had been genuinely representative of deaths in the Bantu mine population; secondly, upon whether the age composition of this population was anywhere near what it was believed to be[15]; and thirdly, it depended upon the reliability of the published incidence figures for cancer of the liver among American negroes. He ended with these words of warning, which could still serve as a motto for African cancer epidemiologists, "Only those in a position to make local and critical appraisal of these factors can estimate the sturdiness of these reeds upon which reliance must be placed."

In his short and succinct critique, Gilliam showed that, even if the Bantu were at a greater risk to primary cancer of the liver than were American negroes, yet the 90 to 1 ratio assumed on the basis of relative frequency data was a gross exaggeration. Furthermore, if risk to this cancer was excessive in the Bantu, then the relative frequency comparison obscured a deficit of

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14 This was possible since Berman had specified a rough figure for the total population from which his South African Bantu cases were drawn.

15 Berman himself appears to have shown some indecision on this point (see p.18 supra)

other cancers among them which was at least of equal epidemiological interest.

Gilliam's statistical treatment of the South African figures, which has been quoted here out of chronological order because of its relevance to Berman's findings, was a most valuable critical exercise. It marked an important stage in the advance from dim clinical intuition towards the scientific analysis of carefully observed data. Yet Gilliam was rather less than fair in implying that Berman had indeed presumed to assess incidence when in fact he had been at pains to point out that, "at present, without vital registration, no reliable or even approximate information on the prevalence of malignancy among South African aboriginals. can be obtained".

des Ligneris. South Africa. 1934

One year after Berman had published his first paper on cancer in South Africa, des Ligneris (1934) also wrote on, "Cancer in South African Natives", basing his conclusions on a series of hospital cases going back for thirty years! The statistics which he had accumulated concerned the Elim Hospital in the Zontpansberg district of the Northern Transvaal from which he had previously, in 1927, supplied information relating to cases of malignant disease occurring since 1906. To the ninety seven cases then described, des Ligneris now added a further eighty four from the same hospital (1926 - 1935).

He supplemented the South African case material with information from Dr. P. Gentil, covering the period from 1928 - 1935 in two mission hospitals in Portuguese East Africa.

The figures were not large, only 181 cases from Elim Hospital over thirty years and 80 cases from the Portuguese hospitals, and des Ligneris admitted the limitations of his material. The diagnosis of cancer was, he recognised, an uncertain one; few natives, as yet, came to consult doctors; it was unwise to generalise from one part of South Affica to another on the basis of results obtained in specific places under special circumstances.

Disregarding his own warnings, however, he went on to state that, "however inaccurate these figures[16] may be, they must be near enough the truth to allow us to state as a fact ... that cancer is decidedly less frequent amongst natives than among Europeans in South Africa and ... (this is) probably the same in all Africa".

He supplied a number of estimations of the ratio of cancer cases to total hospital admissions for all conditions in the Transvaal, the Limpopo Valley, Lourenco Marques and Cairo, citing the low ratios which existed in all these places as evidence for the rarity of malignant disease among the populations concerned.

He embarked upon a theoretical discussion regarding the

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16 i.e. These of Berman and the authors he had quoted, in addition to des Ligneris' own observations.

"incidence" of tumours in Bantus, before taking up the popular controversy over the sarcoma/carcinoma ratio which was exercising so many pathologists of the period. In this connection, des Ligneris had observed a varying ratio of sarcoma to carcinoma evinced by an increase in the numbers of carcinomas in the South African tumours throughout the period he had reviewed. The suggestions which he made to account for this finding are typical of much of the writing of that time. "May it not be possible", des Ligneris hypothesised, "that there are less sarcomata now because natives dress, and thus protect their skin ... whilst, on the other hand, certain forms of carcinoma have apparently become more frequent in recent years, like carcinoma of the womb, which may be due to a slackening of sexual cleanliness; or carcinoma of the stomach, which may be related to adaptation of certain ways of eating in accordance with European methods".

Thus he could not be content with Berman's simple suggestion that "uncivilised people" would be more likely to seek treatment for an external sarcoma than for an internal carcinoma, and was unable to resist the temptation to speculate.

Although he had not himself encountered a high frequency of primary liver cancer, he pondered at some length on the prominence of this form of malignant disease in the Portuguese territories, where Gentil had diagnosed 23 cases among 80 tumours in Africans. Without quoting the actual age distribution of any group of cases

he did, however, imply that liver cancer had been common in young men. He went on to remark (with reference to Berman's findings) that if many mine workers, especially from the Portuguese territories, were being affected with primary liver cancer at an age of 25 - 30, "this undoubtedly indicates that the cause lies back in the days of childhood".

So, despite a tendency to theorise, des Ligneris was eventually precise and sound in his general conclusions. He thought the localisation of cancer in South African natives differed from that in Europeans, that cancer was on the whole less frequent among the Bantu, and that the cause of liver cancer must be sought in early life.

Gelfand. South Africa. 1944

Michael Gelfand (1944) devoted a chapter of his book, "The Sick African", to a consideration of malignant disease in South African natives. His account was in no sense statistical, since he quoted no figures and was simply generalising from his own experience. Nevertheless, he had formed some definite impressions believing, "one can be safe in saying that ... malignant growths are commonly seen in the native ... (although) the localisation of cancer differs considerably and varies in relative frequency from that in the European".

He went on to deal with most forms of cancer in turn, quoting primary liver cancer, carcinoma of the bladder, carcinoma of the

skin (especially epithelioma), hypernephroma, mixed salivary tumours and melanotic sarcoma as being particularly common among natives. Stomach cancer was rare but, he considered, more frequent in town dwellers. Carcinoma of the colon and rectum, carcinoma of the respiratory tract and carcinoma of the cervix, on the other hand, were all less common in natives than in Europeans. As far as breast cancer in females was concerned, although it was not rare, it had been relatively infrequent, whereas Gelfand said that he had encountered many male cases. He stressed that sarcoma of the maxilla was rare, as were gliomas, cancer of the thyroid, the prostate, the larynx, the lip and tongue.

Elmes and Baldwin. Lagos. 1947

The Second World War had almost put a stop to considerations of the cancer rates in Africa, although Findlay (1950) reported that primary carcinoma of the liver had been common among West African troops[17]. 1947 saw a continuation of the Nigerian account which had been initiated in the thirties by Smith and Elmes, when Elmes and Baldwin published an analysis of 1,000 tumours diagnosed in Lagos. The period covered from 1935 - 1944 and the analysis was once more mainly based upon biopsy specimens sent in

17 During medical examination of 227,000 soldiers, mainly from rural West Africa, aged 18 - 40, a total of 36 hepatomas, 1 bile duct carcinoma and 23 other cancers had been discovered. Subsequently Clemmesen (1950) pointed out that in fact this amounted to an incidence rate for, "other cancers" of 10.1 per 100,000 African soldiers per year, whereas the European troops stationed in the same area had an overall incidence slightly higher (12 per 100,000) and no liver cancer. Therefore, the presence of these hepatomas meant that the total incidence rate for all cancers in West African negroes corresponded better with European rates than did that of the white soldiers.

from all over the country, with the addition of a number of local autopsy examinations. This series did not differ materially from the earlier one in terms of the relative frequency of the major tumour types, except that a change in the classification of sarcomas (which were now separated from neuroblastomas, osteoclastomas and Ewing's tumour) made their total contribution now seem smaller (44 per cent in 1935, 20.4 per cent in 1947).

Once again, the prominence of primary liver cancer in Nigeria was apparent (8.1 per cent of total tumours). Kaposi's Sarcoma comprised 2.4 per cent of the total and malignant melanoma 6.2 per cent. The authors devoted some times to a description of the characteristics of these two tumours in so far as this was possible from the information at their disposal. 122 of the tumours (12.2 per cent) had been squamous epitheliomas of the skin and the frequent association of this common tumour with chronic leg ulceration was noted. There had been insufficient clinical data to separate cancer of the cervix in the case of sixty eight uterine carcinomas; altogether one hundred carcinomas of the female genitalia had been diagnosed (uterus, ovaries, vulva and vagina and chorionepithelioma).

Elmes and Baldwin stated that sixty seven of the specimens had come from children under the age of 10 but, unfortunately, they did not analyse the different tumour types individually by age and sex, so it is not possible to form an opinion of the prevalent

tumours in this group of young children. However, from the description of the site incidence of the sarcomas, it can be seen that twenty nine had come from the region of the face and head. Twenty one of the sarcomas were placed under the heading, "round cell"; there were said to have been forty five neuroblastomas, and eight instances of what were taken to be Ewing's tumour of bone. It is easy to imagine examples of what is now known as the Burkitt Tumour in this portion of Elmes and Baldwin's histological material but, in the absence of definite information relating age and site to tumour type, such speculation is bound to remain without clinical supports.

The histological value of this large study is thus to some extent diminished by the limitations inherent in its mode of presentation. As the description was essentially a pathological one, it is not surprising that considerations of site and cellular type should have been pre-eminent. But a little more sorting of the data at that time could have yielded information of even more epidemiological value to compare with our present conception of the cancer pattern in Nigeria.

Geyer. Dakar. 1947

The report of A. Geyer from the Institut Pasteur at Dakar (1947) is considerably more obscure than that of Elmes and Baldwin, principally on account of the unusual histological classification which this writer favoured, but also because of a complete absence

of information on the age and sex distribution of the tumours. Geyer presented 170 malignant tumours pathologically diagnosed during 1944 and 1945.

There had been fifty four cases of cancer of the liver (31.7 per cent), but Geyer was of the opinion that even this high figure did not adequately reflect the frequency of occurrence of primary liver carcinoma in the area drained by Dakar, since many clinical cases and cases diagnosed as cirrhosis had not been included. He was emphatic about the concurrence of liver cancer and cirrhosis declaring, "Once the problem of cirrhosis is solved so also will be the problem of hepatoma".

Second in order of frequency was squamous epithelioma of the skin (called, "cancer malpighian", by Geyer). Most of the thirty four cases[18] of this tumour had been on the legs, on the site of chronic ulcers.

By contrast, there had been very few cases of, "digestive" or of mammary cancer. Sarcomas seem to have accounted for 20 per cent of all tumours; among them were two instances of Kaposi's Sarcoma with glandular metastases. Melanomas were common.

Geyer's experience in French West Africa, therefore, suggested that cancer of the liver was the most frequent pathological diagnosis being made on tumour tissues received for examination at Dakar. The relative frequency of this tumour was, moreover, much greater than had hitherto been reported by other writers from West

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18 20 per cent of all tumours.

Africa.

Clark. Kenya. 1948

From the other side of the continent, meanwhile, Clark (1948) reported on a small series of fifty tumours diagnosed in members of the Wa Kikuyu tribe in Kenya. Based mainly upon biopsies with the addition of seven clinical diagnoses, the series had been collected in the 1944 - 1947 period. As the numbers of any individual tumour were very small, few conclusions can be drawn from them and the age and sex of the cases cited were not mentioned. There had only been two instances of liver carcinoma and one of these was primary in the bile ducts. The principal features of the series otherwise had been the priority of squamous epithelioma of the skin (14 cases) followed by carcinoma of the cervix (5 cases), lymphosarcoma (5 cases), carcinoma of the breast (3 cases), and two cases each of melanotic sarcoma of the foot, and Kaposi's Sarcoma.

Davies. Central Africa. 1948

J.N.P. Davies, who was soon to pioneer the Kampala Cancer Survey, made a preliminary study of the tumour situation in Uganda when he published an article in 1948 on the, "Pathology of Central African Natives". This was a description of the conditions found at autopsy among patients in Mulago Hospital from 1931 - 1947.

In this period there had been 143 canders, of which 85 were carcinomas, 12 were sarcomas, 35 were reticulo endothelial tumours, 7 were gliomas and 4 were teratomas. Among the carcinomas, that of

the liver was the most frequent (29 cases) and carcinoma of the pancreas the second commonest (11 cases).[19] Cancers of the skin had been rare at autopsy but Davies stressed that in clinical practice epithelioma was, "outstandingly the commonset cancer of Africans", although rodent ulcer was rarely seen.

Reticulo endothelial cancers were often found but there was no mention of any jaw sarcoma among the post-mortems. As many as one third of the hepatic tumours in Davies' experience had been secondary, and primary hepatoma did not bulk so large as in other reported African series.

Davies devoted considerable attention to the problem of age assessment in Africans and its bearing on the subject of liability to cancer. With reference to the ages which he supplied for the patients who had come to autopsy, he issued this caution, "It must be remembered that these figures are only approximate and could not possibly bear comparison with European figures". He went on to explain how all the adults' ages which were recorded were only approximate and that in a small number of cases patients had merely been designated as, "old" or, "very old". These had all, for the purposes of the study, been assumed to be over 60 and not over 65.

19 An impression which the incidence survey did not substantiate (see later).

On the other hand, a person whose age was simply given as, "adult" had been regarded as under 60.

Davies was anxious to emphasise that well over half of the autopsies in Mulago had been on cases under the age of 30 and that three quarters of them were on patients under 40. In other words, vast numbers of patients were dying comparatively young. "Only cases with a good chance of being cured can be retained in hospital ... hospitals for the chronic sick simply do not exist ... Any statements made concerning the incidence or alleged rarity of diseases accompanying old age should therefore be accepted with great reservations,"[20] Davies finally warned.

Capponi. French Cameroons. 1953

Capponi's, "Note sur le cancer au Cameroun", (1953) is of special interest since the area of the old Slave Coast from which his cases were drawn has many similarities with southern Nigeria and the hinterland of Lagos. Another relative ratio survey, it was an analysis of tumour biopsies which had been received at the Health Institute of Douala during the period 1946 - 1952. A total of 128 tumours had been diagnosed in Africans and M. Capponi felt constrained to begin with a reference to, "the sarcomatisation index" which prevailed in his area[21].

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20 My italics

21 The proportion of sarcomas and epitheliomas was almost equal, in contrast to the situation in Europe where sarcomas were in a minority.

The classification which he adopted in the main was into what he termed epitheliomata of the skin and viscera, sarcomata of skin and viscera and four nervous system tumours. Even with this very simple system, certain clear features emerged. There was a relatively high frequency of skin cancer[22] and four men from the neighbourhood of Yaounde had been diagnosed as having Kaposi's Sarcoma. There had been four instances of ovarian sarcoma in young girls, one of them aged 8, and there were two orbital tumours and two tumours (of unspecified type) of the maxillae. Capponi had encountered thirteen cases of primary liver cancer (10.2 per cent of total tumours); only one of these was in a woman.

On the other hand, there appeared to have been relatively few tumours of the female genitalia; genital cancers in men were very rare and there had not been a single case of bronchial carcinoma.

Camain. French West Africa. 1954

A year later, in 1954, Camain published details relating to 1,884 tumours in Africans[23] which had been received over twelve years from 1942 - 1953 by the Institut Pasteur in Dakar. This was the diagnostic centre for the majority of biopsies and autopsies

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22 28 cases of squamous epithelioma (21.8 per cent).

23 At the same time he presented the analysis of 252 tumours which had occurred in Europeans. Among them were two cases of Kaposi's Sarcoma.

performed in French West Africa[24].

Three quarters of these French West African cases were derived from Senegal and from Dakar in particular, the remainder came from the French Soudan, Guinee and, to a lesser extent, from the Ivory Coast, Dahomey, Niger, Togo and Haute-Volta.

Camain had observed virtually every type of cancer but the relative percentages of different categories had been very dissimilar in Africans from the proportions known in Europe. Primary cancer of the liver had constituted 26 per cent of the total whilst squamous epithelioma of the skin and saromas of the haemopoietic system had each accounted for 13 per cent of all tumours seen.

He had been struck by the relatively high proportion of sarcomas to carcinomas[25], and he went on to speculate upon the reasons for this apparent anomaly. He quoted Ledentu's belief that Africans died too early to develop carcinomas. This contained a fallacy, since the apparently low average life expectancy of Africans was the result of a very high infant mortality rate. Further more many of the epitheliomas were in relatively younger subjects, particularly in the case of primary liver tumours which were occurring mainly in patients between 25 and 45. Geyer, on the other hand, had attributed the situation to

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24 Geyer's series from Dakar has already been mentioned (p. 26, supra).

25 The ratio of sarcoma to carcinoma had been almost 1 : 4.

the superficial manifestations of most sarcomas and the fact that sarcomas of the haemopoietic system in particular had large, striking metastases, "frequently in the orbital and maxillary regions" whereas deep seated cancers were often far advanced before they appeared as tumours. Camain observed that cancers of cirrhotic livers did not cause enlargement of the liver. Similarly female genital cancers were not evident externally.

Camain himself was of the opinion that multiple assaults, by parasitic and virus infections, upon the reticulo-endothelial system of the African might induce eventual sarcomatous changes. This, in his opinion, could account for the apparent susceptibility of lymphatic as opposed to connective tissue to manifest malignancy.

This observation, or rather speculation, of Camain's is worth recording as it is probably the earliest suggestion of a virus origin for African lymphomas.

In considering individual tumours, Camain drew attemtion to the many manifestations of what he called reticul- and lympho-sarcomas which had metastases in the liver, kidney, cranial bones, orbit and maxilla. He did not mention the age distribution of these cases however.

Mentioning three cases of Kaposi's Sarcoma, he pointed out that it had only accounted for one per cent of all tumours whereas in French Equatorial Africa the proportion was much higher. Camain speculated as to whether this discrepancy might be due to a

difference in the ecology of the equatorial regions as compared with the "tropical" zone around Dakar.

Camain was convinced that the major differences in the manifestations of cancer in Africans and Europeans or Americans was a matter of dissimilarities in their respective environments and that there was no racial explanation of these differences in a genetic sense. His thoughtful and cautious contribution to African cancer epidemiology was a valuable one.

Davies and Wilson. Kampala. 1954

The exhaustive study of cancer in Kampala which was made by Davies and Wilson in 1954 was a prelude to the cancer incidence survey then commencing. As the latter will be the subject of review in the next chapter, it is only necessary now to summarise briefly some of the results of this two year retrospective survey of Kampala hospital cases[26] of cancer during 1952 and 1953. 796 cases had been accumulated during this time and certain types of cancer were regarded by the authors as being definitely more common in Africans than in Europeans.

Most notable among these were carcinoma of the liver and penis. In addition, skin and jaw tumours, salivary and lacrimal tumours, carcinoma of the eye, adrenal tumours, renal teratomas, developmental ovarian tumours, chorionepithelioma and carcinoma of the

26 Over 70 per cent were histologically confirmed.

cervix, as well as lymphosarcoma, were thought to be possibly more common. But lung and intestinal cancers,[27] gliomas and cancers of the mouth and upper air passages seemed rare. Cancer of the female breast was also uncommon in Kampala patients, but it was pointed out that elderly Uganda women were particularly reluctant to attend hospitals.

Chabeuf. Bamako. French Soudan. 1954

The essay by M. Chabeuf in the same year was an indifferent contribution to cancer study in Africa on account of its highly speculative nature. The writer was concerned to establish and discuss differences in the cancer pattern between French Soudan and the Cameroons as he hemself and Capponi had found it.

He made a number of relative ratio calculations for the different territories, but was inclined to take the results as evidence of the actual state of affairs in the areas concerned and did not make sufficient allowance for variations in respect of local medical services.

Much of the paper was taken up with contemplating the possible roles of differing climate, vegetation, diet and culture in producing the variations in the cancer "rates" of these two French West African Territories. But he found himself unable to supply

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27 This was in contrast to the previous autopsy review (1948) when pancreatic carcinoma had been the second commonest tumour (see p. 28 supra)

even elementary information on the age and sex distribution of the cancer cases in either country. Moreover, he ignored the frequencies of the cancers in which he was interested in those African countries which lay outside the French ambit thereby reducing the possible value of broad geographical comparisons.

de Smet. Belgian Congo. 1956

By the time that de Smet published a paper from the Congo in 1956, the previous concentration upon the high proportion of sarcomas in Africans had begun to give way to concern with the relatively high frequency of tumours of the reticulo endothelial and haemopoietic system. Although his paper[29] is in a sense, therefore, a specialised one, it deserves passing mention on account of the references which de Smet made to several cases of what he had taken to be lymphosarcomas, but which previous writers, he explained, had called small round celled sarcomas. These now seem clearly recognisable cases of the Burkitt Tumour.

In this group, he referred to a child aged 3 who was found at autopsy to have unilateral exophthalmos, tumours in the heart, in a kidney, in the liver, spleen and an ovary. There was a boy of 6 with a tumour of the right maxilla, two children with hepatic lymphosarcoma and two further children with abdominal lymphosarcomas. Another boy, aged 9, had similar tumours in the thyroid, liver and kidneys, at post-mortem.

29 "Observations cliniques de tumeurs malignes des tissus reticulo-endotheliaux et des tissus hemolymphopoiëtiques au Congo".

Among de Smet's group of reticulo sarcomas were two further cases which would also nowadays probably be given another name. One was a child of 4 with gross exophthalmos and another a youth of 19 in whom paraplegia had resulted from compression of the spinal cord by an extensive tumour deposit.

In the general section of his report, de Smet commented upon the tumours which had been discovered at autopsy in the Yangambi Medical Centre during 1951. In 366 autopsies on children there had been 9 instances of generalised sarcoma. When he analysed all the 94 cases of malignant disease which had been proven histologically, either by biopsy or autopsy, during 1951, he remarked upon the high relative frequency of sarcomas of the reticulo endothelial system, which had comprised twenty four cases, or 25 per cent of the total. There had also been twelve cases of Kaposi's Sarcoma (11.7 per cent), 15 epitheliomas of the skin (two of them in albinos), and eighteen primary liver tumours (19.1 per cent). Apparently there had been no instance of carcinoma of the uterine body or cervix. De Smet made two further observations, firstly, on the frequent association of cutaneous epitheliomas and chronic ulceration of the leg (30 per cent of cases) and, secondly, on the fact that 50 per cent of the liver cancers had been associated with cirrhosis.

Sankalé et al. French Soudan. 1958

A paper by Sankalé and his colleagues from the French Soudan (1958) covered rather similar ground to that of de Smet, being

primarily concerned with malignant tumours of haemopoietic tissues. The material under review had been received and examined in the central laboratory at Bamako from 1945 - 1957. There had been a total of 344 malignant tumours of all types, 263 of these being epitheliomas. Among 47 tumours of the reticulo endothelial system, the authors drew attention to the relative frequency of lympho-sarcoma in the younger age groups. They instanced four cases of, "osseous lymphosarcoma", one, "osseous reticulo sarcoma", one orbital tumour of this cellular type and another case in which both sides of the jaw had been involved.

Payet et al. Dakar. 1960

Later (1960), Payet and others reviewed one hundred cases of what they termed, "malignant haemopathy" among Africans[30] from the area served by Dakar hospitals. In discussing the principal clinical manifestations, they referred to jaw tumours, which they said had been particularly common in children, but their analysis did not go the length of specifying the actual age or sex of the cases.

Edington. Gold Coast. 1956

G.M. Edington (1956), who subsequently established the Ibadan Cancer Registry, is the author of the only comprehensive publication

30 The two articles quoted here are merely examples of the extensive French literature on this subject. The paper by Payet et al. is followed by a useful bibliography.

on cancer in the Gold Coast (now Ghana). This was another autopsy and biopsy series, relating to specimens coming to the Medical Research Institute, Accra. The autopsies which were reviewed, extended from 1923 - 1955 and the biopsies from 1942 - 1955.

The author freely admitted the limitations of a survey of this nature which he expected would contain an excess of superficial lesions, regarded as treatable by medical officers in outstations, but he hoped that the autopsy material might offset the biopsies by providing a balance of internal cancers.

Edington classified the tumours by age and sex as well as by histological type and in so doing ensured for his data a more lasting value than has accrued to the accounts of less systematically minded pathologists.

He had discovered for re-examination 1,192 malignant tumours. Of 766 carcinomas, 186 (15.6 per cent of all tumours) were in the skin, 91 in the liver (7.6 per cent), 71 in uterus and cervix (5.9 per cent), and 64 in the breast (5.4 per cent). As well as discussing the high frequency of skin and liver cancers, Edington also pointed out that 3.6 per cent of all cancers had been in the stomach.

Among ovarian tumours he mentioned three instances of what he had taken to be dysgerminomas, two of them arising in girls aged 6 years. In these cases the differentiation from anaplastic round cell carcinoma had been difficult and Edington recalled how

similar overian tumours were noted by Davies and Wilson (1954) in Kampala.

The group of 169 sarcomas had included ten cases of Kaposi's Sarcoma and there had been sixteen osteogenic sarcomas. Edington remarked specifically, "The commonest site of the osteogenic sarcoma was in the jaw region and usually occurred in children aged about 7 years."

Tumours of the haemopoietic tissues had constituted 10 per cent of all cases of malignant disease (129 cases) and it is significant to find that, "the commonest sites were the upper abdominal glands and the maxillary region, young children especially being affected".

In the course of a comparison between the relative frequencies of different tumours reported by several writers from West Africa, Edington drew attention to the apparently very high frequency of cancer of the liver in the French territories as reported by Camain. Referring to orbital tumours, he explained that there had been sixteen epitheliomas of the orbital area in the Gold Coast series; these were comparable to Camain's thirty one cases of carcinoma of the conjunctiva and to the twenty one carcinomas of the orbital area reported from Uganda.

Thijs. Belgian Congo and Ruanda Urundi. 1957

One of the largest collection of cases of cancer in Africans to be reported before the results of recent rate surveys were

available was that made by Thijs (1957) in the Belgian Congo and Ruanda Urundi[31]. He analysed 2,536 cases which had been histologically diagnosed at the provincial medical laboratory of Stanleyville between January 1939 and June 1955. Seventy per cent of the material consisted of biopsy specimens, 20 per cent came from autopsies and 10 per cent had been removed at laparatomy. The majority (65 per cent) of the cases had come from rural areas, the rest were in-patients attending town or mining hospitals.

Thijs carried out his analysis according to histological type, sex and ten year age groups and supplied a description of the pathological characteristics and distribution throughout the body of the main tumour groups which he had encountered. Making the customary apologies for the deficiences inherent in his selected data, he added the further warning that the relatively preponderance of surface tumours might be even more exaggerated by the rarity of autopsy on patients who had died with, "obvious" cahexia from disseminated carcinoma. On the other hand, cases of visceral cancer unsuspected during life might be disclosed at post-mortem, and liver cancer had, in a number of instances, been discovered by biopsy.

Regarding the attitude of the Congolese towards European medicine, Thijs was of the opinion that they readily sought help for

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31 Thijs supplied a comprehensive bibliography on cancer in Africa south of the Sahara and in the Belgian Congo in particular.

visible superficial growths as well as for illness in their children. But he believed that old people were often hesitant about trying modern methods, especially in the rural areas where hospitals were relatively inaccessible and unfamiliar.

Among women, the majority of the cancers had been genital (44.6 per cent), uterine cancer being commoner than cancer of the breast. Thijs attributed this finding to the frequent childbearing and prolonged lactation by women in underdeveloped African territories.

The age distribution of cases revealed a peak at a younger age than in Europe; this applied particularly to Kaposi's[32] Sarcoma and primary liver cancer[33], both of which appeared to be very common. But the age distribution of cancer cases was not related by Thijs to that of the population from which they were derived.

Other tumours which seemed unduly common were melanomas, epithelioma of the penis and the vulva, cancer of the male breast, salivary tumours, chorionepithelioma, some ovarian tumours[34] and retinoblastoma. Thijs was struck by the high relative frequency

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32 Kaposi's Sarcoma represented 13 per cent of male tumours and 2 per cent of female tumours.

33 Primary liver cancer represented 16 per cent of male tumours and 4.5 per cent of female tumours.

34 e.g. granulosal cell tumour.

of sarcomas and tumours of the reticulo endothelial system[35]. By contrast, lung and prostatic carcinomas and tumours of the stomach and large bowel had rarely featured in the histological material.

In connection with reticulo endothelial tumours, Thijs' recordings of one case of thyroid lymphosarcoma and seven instances of lymphosarcoma of the ovaries in young girls are of special interest. He encountered a large number (thirty five) of jaw tumours. Twelve of these were in children aged 4 - 13 years and, although he tentatively described them as, "atypical round cell sarcomas", he preferred to reserve judgment on their ultimate classification.

There had been ninety six tumours in young children below the age of 10 years and lymphosarcoma had headed the list, with twenty eight instances. The next most common had been retinoblastoma (twenty two cases) followed by nephroblastoma (eleven cases) and there had been five cases of Kaposi's Sarcoma among these young children.

Prates. Malignant Neoplasms in Mozambique. 1958

As early as 1935, Berman had remarked upon the high relative frequency of primary liver carcinoma among miners from Portuguese East Africa (p. 18), but it was not until 1958 that Prates

35 16 per cent of male tumours and 7 per cent of female tumours.

published the results of a frequency ratio survey of malignant neoplasms in Mozambique which he had undertaken preparatory to his current cancer incidence survey in Lourenço.Marques.

Over a period of thirteen years, from 1944 - 1957, a total of 1,977 malignant tumours had been diagnosed and proven at autopsy or on histological examination in European, African, Asiatic or coloured patients. The majority were in-patients attending the Lourenço Marques hospital (Hospital Central Miguel Bombarda) but specimens had also come in to this central laboratory from all over the province.

Out of a total of 1,273 tumours in Africans there had been 412 cases (32.3 per cent) of primary liver cancer. The frequency of this tumour was particularly high among African males, in whom it had constituted 43.1 per cent of all tumours. The other common tumours in males were carcinoma of the skin (13.9 per cent), lymphoid tissues (8.6 per cent) and urinary bladder (7.9 per cent).

Carcinoma of the uterine cervix was the commonest tumour (20.6 per cent) in African females, followed in frequency by carcinoma of the liver (14.6 per cent), skin (13.9 per cent), and bladder (7.2 per cent). There had apparently been, as else where in Africa to date, a relatively low frequency of breast cancer (7.4 per cent) in African women.

Prates found that primary liver carcinoma was occurring unusually often in young people but declined to conjecture regarding

the age of maximum incidence until the rates survey results should be available[36]. However, he was able to report that already, during the early stages of the rates survey, the intensive search for cancer cases was producing a ratio frequency picture not dissimilar from that of the preceding years.

Prates compiled a number of very useful comparative tables for the commonest African neoplasms, based on published reports from South Africa, the Belgian Congo, Kampala and Nigeria and he also provided an analysis of the tumours which he had encountered in Europeans and other races, as well as in Africans. He concluded that even without well established cancer registries, the available clinical and histological data on tumours from different parts of Africa could provide a useful guide to the relative frequency of various cancers.

Camain and Serafino. Dakar. 1961

There has been still another relative ratio survey from the ex-French colonial territories, in 1961. Camain and Serafino presented the analysis of no less than 4,000 tumours histologically proven at the Pasteur Institut in Dakar between 1942 and 1958. This was, in effect, an extended version of Camain's previous study.

Once again, the importance of primary liver cancer was

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36 Available at time of completing this thesis. See p. 77 infra

reiterated,[37] but what they described as, "other cancers of the digestive system" had together only equalled the frequency of liver cancer alone. The occurrence in males of skin cancers of all types was somewhat higher than these figures (12 per cent). They had noted that breast cancer in women was almost as common (22 per cent) as cancer of the uterus (24 per cent of female tumours).

The authors stressed the urgent necessity for further research into hepatomas, epitheliomas of the skin superimposed on chronic ulceration and, finally, the reticulo sarcomas.

Clifford. Nairobi. 1961

In the course of an account of treatment of cancer of the head and neck, in Nairobi, Clifford (1961) stated, "patients with a primary neoplastic growth of the head and neck area constitute one third of all patients with malignant disease admitted to King George VI Hospital ... Undifferentiated growths of the post nasal spac space form the largest group and involvement of the nose and anterior group of nasal sinuses is second in frequency".

This is a very different situation from the one reported from Uganda. It is understood that a cancer incidence survey is planned for some area of Kenya. Such a survey is essential to extend the cancer map of East Africa.

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37 But these were only quoted as forming 10 per cent of male tumours and 4 per cent of female ones. In the previous study by Camain primary liver cancer had made up 26 per cent of the total.

Burkitt. A Tumour Safari. 1962

Following upon his description in 1948 of the clinical syndrome and tumour which now bears his name, Denis Burkitt, a surgeon from Kampala, embarked upon a "tumour safari" (1962). This was a kind of cancer survey with one sole end in view, the discovery of cases of the Burkitt Tumour syndrome, a condition affecting the jaws of young children in Africa,but also involving many other sites[38].

The information which Burkitt obtained from different parts of East and Central Africa led him to observe that the distribution of the tumour appeared to be limited by altitude but that the critical altitude fell as the distance from the Equator increased. It seemed to him, therefore, that the actual limiting factor must be temperature and he placed the limit at a minimum temperature of about 60°F.

The geographical distribution which he described and which his diagrams illustrate was deduced entirely from personal statements made to him by doctors in fifty six hospitals which he visited, and from written accounts supplied by others. He does not appear to have initiated any search of clinical or pathological records in the areas concerned but to have relied entirely upon individual doctors' experiences. In view of the account by Thijs of the many manifestations of lymphosarcoma and, "small round cell

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38 e.g. kidneys, adrenals, ovaries, liver, thyroid, heart, intestines, extradural space, flat bones. See also Edington and Maclean (1962, 1963) and Chapter VIII infra.

sarcoma" among children of the Belgian Congo and Ruanda Urundi, (see page 43), it is rather surprising to find Burkitt remarking that the condition is, "virtually unknown" in the latter territory. But he is probably quoting from the experience of Clemmesen, Maisin and Cigase[39] in their Congo survey.

Although the tumour syndrome may not have been recognised before 1958, there now seems little doubt that many of the cases of round cell sarcoma of the jaws, sarcoma of the ovaries, lympho-sarcoma in young children and so on, variously described by writers from Smith and Elmes onwards, were in fact cases of the Burkitt Tumour. Instances of this kind have been amply documented in the preceding pages and these probably by no means exhaust all the early references to a condition which has now become one of the central objects of concern for cancer workers in Africa. To elaborate upon the research and theories regarding this tumour would be, however, to depart from the main these of this study and Burkitt's "Safari" is included here simply as an example of a novel type of African cancer survey of the clinical, case history, variety.

Berry. Northern Nigeria. 1964

Recently (1964), C.G. Berry, from the Regional Pathology Laboratory in Kaduna, Northern Nigeria, has published a brief summary of the cases of malignant disease diagnosed there during

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39 See p. 77 infra

the year 1963 - 1964.

There had been 296 malignant tumours in all age groups in this year, the commonest being skin tumours of various types (22.9 per cent). Malignant lymphomata were next in order of frequency (19.8 per cent) and then carcinoma of the breast (5.4 per cent). Liver cell carcinoma had not featured largely in this biopsy[40] series, constituting only 2.4 per cent.

The commonest form of malignant disease in the 0 - 15 age group had been the Burkitt Tumour[41] (48.6 per cent) and most of Berrie's paper is devoted to a consideration of eighteen cases of this condition in respect of the site of the tumour and the age, sex, and place of origin of the patients. It appeared to have been occurring outside the limits of latitude and altitude which Burkitt had hypothesised were necessary.

This finding in itself has been a valuable contribution to the study of cancer in Nigeria and the whole study is an example of the kind of report which could usefully be produced by any well-functioning central laboratory in an African country.[42] Statistics of this kind are an essential corrective to clinical impressions

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40 Liver biopsies are seldom performed outside very well equipped modern hospitals in Nigeria.

41 Burkitt had stated (1962) that the condition was virtually non-existent in the northern parts of this region of Nigeria, but Berrie was inclined to relate scarcity of cases to scarcity of doctors and scarcity of biopsies of any kind in these parts.

42 When the writer was examining the Lagos pathology records in search of Kaposi's Sarcoma cases, out of a total of 358 tumours diagnosed in 1960, breast, cervix and skin cancers had each accounted for 10 per cent of the total. Probable cases of Burkitt Tumour made up 4 per cent whilst primary liver cancer had only been diagnosed three times in the year, representing less than one per cent of all tumours diagnosed in the Lagos laboratory.

or hearsay in assessing the cancer picture in an under-doctored country.

This historical review of the development and direction of some of the earlier cancer surveys in Africa has only gone back as far as 1919 and the reports have varied according to time and place and the personal interests and viewpoints of successive clinicians and pathologists. The data has been gathered and sorted by such widely different methods that in many respects the results are not strictly comparable. It is a great advantage to be able to look at the history of the manifestations of cancer in a defined area. This Davies and his colleagues (1964) have been able to do in studying the records of Mengo Hospital, Kampala, from 1897 - 1956.

Davies et al. Mengo Hospital Records. 1964.

The resultant description of the cancer picture in Kampala over sixty years is too detailed to summarise here, but the conclusions of the authors must be mentioned. Davies and his colleagues considered that a low ratio of cancer cases to total hospital admissions had never constituted sufficient grounds for the claim that cancer was rare in underdeveloped countries. In Mengo hospital, this ratio had remained fairly steady for the entire period yet out of such ratios it had recently been possible to construct annual incidence rates which, in the younger age group, were comparable with those of Norway. During all this time

there had been a very constant pattern of cancer (as evidenced by relative ratio frequencies for different tumours); this pattern, however, being very dissimilar from the European one in respect of the frequency of involvement of certain sites. Davies concluded that there was no evidence that cancer had been uncommon in Uganda at any time since the advent of modern medicine and that the factors causing malignant disease must be embedded in the native way of life.

But he was still left with the difficulty of explaining one of his recent findings, namely, the relatively low incidence of cancer among elderly hospital[43] attenders. In dealing with this problem Davies seems to have implied that, since people, "must" now be living longer due to, "removal of diminution of many of the lethal diseases of previous years", he would have expected any tendency for a high incidence of cancer in old people to have already made itself felt.

In putting forward this view he was evidently altering from the position he had adopted fourteen years previously[44] when he emphasised the very large numbers of deaths then occurring in people below the age of 40. For medical advances such as he cites to have altered the cander pattern, a very considerable time

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43 See next Chapter.

44 See p. 29 supra.

would need to elapse. The main benefits of modern medicine, in the form of immunisation, antibiotics and improved environmental sanitation are of relatively recent arrival in Africa and are as yet very unevenly distributed. They can scarcely have affected the present over-60 cohort whose cancer rates are in dispute, as they certainly were not operative when these people were young - at the beginning of the period of the Mengo hospital records.

Concluding his painstaking piece of local retrospective research, Davies rightly directed attention to what should be the new focus for cancer epidemiology, "the really important and perhaps vital question - the reason for the very different cancer patterns of different communities".

CHAPTER II

INCIDENCE RATE SURVEYS OF CANCER IN AFRICA

The preceding chapter has covered an assortment of African surveys where cancer has been seen in collections of clinical cases or in series of histological specimens. Nearly all these studies, from the early twenties until the turn of the century have, besides being retrospective, had one common feature - the comparisons which their authors made were internal comparisons, in the form of calculations of relative ratio frequencies of different tumour types, or, occasionally, the estimation of the ratio of cancer patients to all patients seen. Only Ledentu[1] and Berman[2] had ventured upon tentative estimates of incidence based upon populations which were, at least roughly, defined. In view of the virtual absence of dependable demographic data from almost all of the territories concerned, this limitation in the application of statistical methods is scarcely surprising.

But, in the course of thirty years, opinion had changed very radically and a period when any instance of malignant disease was thought remarkable had been replaced by an era of widespread

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1 See p. 8 supra

2 In his estimation of the risk to Portuguese East African miners of primary liver cancer (see. 18).

interest, not only in the multiplicity of cancer cases, but more especially in the evident predominance of certain specific types. Pathologists and clinicians throughout the continent were becoming dissatisfied with the persistent uncertainty which their limited observations entailed. However, short of properly conducted rate surveys, there could be no certain way of discovering the actual incidence of, for example, primary cancer of the liver in different age groups or cancer of the breast, in various parts of Africa.

A large number of recent publications have dealt with methods of surveying cancer, and some of them have paid particular attention to the problems encountered in underdeveloped areas.

Following on a symposium held in Oxford in 1950[3] to discuss the Geographical Pathology and Demography of Cancer (1951), there was a further symposium on the epidemiology of lung cancer and then a special group decided to explore the whole subject of the techniques previously utilised for studying the aetiology of diseases on a geographical basis.

The results of their deliberations were published in "Methods of Geographical Pathology", under the editorship of Richard Doll (1959). This book not only makes explicit the value of such

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3 by the Council for International Organizations of Medical Sciences.

epidemiological enquiries and outlines the classical methods - mortality and morbidity records, surveys employing direct examination and registration schemes - but lays down the necessary conditions for the execution of each type of survey as well as their special limitations and fallacies.

With regard to registration schemes, it was pointed out that the medical services must be highly developed and evenly available to the whole community and, secondly, that the disease studied must be one which necessarily brings the patient in contact with the doctor[4]. It went on to stress the necessity for full co-operation from all the organizations which might encounter cases and the importance of keeping the data requested on first notification to a minimum. There should be methods of checking omissions and arrangements for visiting cases whose addresses might be in doubt and for eliminating duplicate registrations.

Although it was not directly stated, the criteria laid down for the use of direct surveys of a population made it appear that cancer was less suitable for study by this method. Indeed it seems obvious that a condition which often affects internal organs and may require histological confirmation is less susceptible to screening techniques than, for example, tuberculosis or many tropical diseases.

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4 In this connection, cancer was regarded as eminently suited to study.

There have been several World Health Organisation publications, for example, Technical Report No. 53 (1952) on the registration of cases of cancer and their statistical presentation; Technical Report No.133 (1957) by the Expert Committee on Health Statistics, which contains sections on the collection of health statistics in underdeveloped areas and on cancer statistics and registries; Technical Report No. 164 (1959) on methods for measuring incidence and prevalence of cancer. The latter report does state that the amount of information about cancer which can be obtained from household morbidity surveys or from the survey of hospital morbidity records will usually be found to be inadequate.

This publication, in reviewing cancer registration schemes, demonstrated how these are of comparatively recent development, even in European countries. In fact, almost all these tumour registers (with the exception of the Danish one) have only been established since the end of the Second World War. It appears, therefore, that in inaugurating several cancer registries in the last fifteen years, African research workers have at least kept pace with the rest of the world.

J. Clemmesen (1950) summarised the essentials of demographic studies of cancer, drawing attention to the limitations as well as the value of cancer epidemiology. Statistics could never provide biological proofs but merely pin-point correlations which later experiments might test. The dependence of cancer demography on a

high standard of accuracy in vital statistics was a further limiting factor. And death certificate data was frequently unreliable on account of wide variation in the quality of diagnosis, and differences in the way of reporting the patients' domicile. Clemmesen considered that extreme caution must be exercised in comparisons between countries based on death certificates, as well as on other sources of medical information, although he was bound to admit that such certificates would in many places continue to be the best available source of information regarding non-hospitalised cases of cancer.

He laid down criteria for the reporting of cancer incidence statistics, insisting that figures for the numbers of cases treated in hospital for each site should be given and that there should be separate age distribution figures for each part of the material as well as for the totals.

The percentage of cases confirmed histologically or by autopsy ought to be given. Clemmesen pointed out that meanwhile such figures could only comprise a portion of the total cases occurring in any population.

Finally, Clemmesen stressed, "It is most important ... that the author ascribes his findings to factors of some established certainty and is reticent in advancing new theories of his own on aetiology of cancer".

Alexander Gilliam (to whom reference has already been made in connection with his critique of Berman's work[5]), had some penetrating observations to make on epidemiology in non-communicable disease (1954) when he warned against the pseudo-scientific methods so often employed in the study of cancer. Dealing with the unrepresentative nature of case history material, he went on to what he regarded as an even more unsatisfactory source of information, autopsies. "Autopsies in most hospitals", declared Gilliam, "represent a sample of a sample of an unknown amount of illness occurring in a population of unknown composition. No-one has yet devised a practical, uniform way to compute incidence from data of that kind".

He advocated the population or direct method, in which, a population whose characteristics are known is studied in whole, or in its subgroups, over a period of time and the occurrence of the disease in question is recorded. But he admitted that by far the largest proportion of evidence to date on the epidemiology of non-communicable diseases had been acquired through case history investigations.

Gilliam discussed the problem of precision of diagnosis, pointing out that a desire for perfection in this matter, by demanding autopsy evidence in every case, must mean that clinically diagnosed cases were ignored. "While one would like to have the diagnostic precision obtained by the autopsy, the diagnosis/

5 See p. 18 supra.

possible from clinical examination by the average practitioner has important epidemiological uses", Gilliam acknowledged.

He was scathing in his judgements upon cancer registries generally, "As most cancer registries operate in practice, the cases recorded are generally as unrepresentative of all existing cases as are those cases which gravitate to some particular hospital".

But Gilliam was anxious not to appear as an advocate of complete epidemiologic nihilism. He regarded as a challenge the fact that no practical way had yet been found possible to make case history material of more general use and was finally hopeful of the possibilities of descriptive epidemiology in indicating at least these segments of the population most likely to benefit from control measures.

From other sources have come more positive suggestions and recommendations. Paul Steiner, famous for his work on "Cancer, Race and Geography" (1954), dealt with the subject in Volume 3 of "Cancer" (1958). He had this to say regarding the glib generalisation that cancer is a disease of civilisation, "It is a disease of civilisation only in that certain circumscribed and, sometimes, specific carcinogenic hazards accompany industrialisation and urbanization and that the lengthened life span prolongs the period of exposure and the risk of carcinogenesis".

Steiner emphasised the importance of specifying rates for each sex and for each age period. The population should be delineated and characterised as accurately as possible and the constituent sites must be given in great detail, "It is impossible to use too many categories but easy to report too few ... readers cannot sub-classify from pooled figures[6]."

Steiner made, like Gilliam, the additional point that it was possible to err in the direction of accurate diagnosis by insisting on histological proof in all cases. Accurate diagnosis of this degree, while preventing over-diagnosis could not prevent under-diagnosis and could not guarantee that all cases had been recognised and registered. He considered the inherent difficulties in schemes of this kind, dependent as they were upon the adequacy both of the population data and the cancer data. But whilst noting that, "The limits of accuracy and completeness in reporting needed to make statistics usable for aetiological studies or, conversely, to render them worthless, have not been determined", he was finally reassuring on the question of the value of geographical studies of cancer. "As was the case in some of the infectious diseases", Steiner recalled, "valuable information on aetiology can be obtained sometimes without accurate total population data. This is fortunate for those geographical studies when areas having unequal medical facilities must be compared".

6 As was shown several timesiin the course of the last chapter, it is these very deficiencies in basic information and classification which have rendered many of the earlier African cancer surveys less useful than they might otherwise have been.

Joseph Gillman (1957) made specific suggestions for work in geographic pathology in Africa, speaking as a member of the African Committee of the International Union against Cancer. He drew attention to practical problems which had been dscussed at symposia held at Kampala and Leopoldville in 1956 (published in 1957), and recommended that the research groups then existing should be consolidated and made the foci from which similar programmes to theirs could be launched in surrounding areas. He looked forward to thus closing the gaps in the cancer map of Africa and wished to see extensive sociological and anthropological studies of the different African populations whose cancer rates were under review.

HIGGINSON AND OETTLÉ. JOHANNESBURG. 1960

But the people interested in the problems of cancer in Africa could not wait for all the deliberations of the experts, the symposia and the recommendations before making a start, "in the field". Higginson and Oettlé, both of them already very familiar with the manifestations of cancer in the South African Bantu (Higginson 1951; Oettlé, 1956), carried out an incidence survey in the Transvaal from 1953 - 1955 and published their results in 1960.

They were aware of the possible sources of error, both in respect of population figures and regarding the complete collection of all cases occurring in Johannesburg. There was also the question of whether the native population of the city were all

prepared to attend hospital when ill.

A number of sociological surveys and a sample census were carried out to determine the characteristics of the Bantu population at risk[7]. In addition to registration of all suspected hospital cases of cancer (ordered by the respective medical superintendents), hospital records were also periodically scrutinised and histological and autopsy reports were checked. Since death certificates were required for all persons dying in Johannesburg, these supplied a further source of information[8] and it was possible, in the South African situation, to order a post-mortem if no doctor had attended a case. The investigators believed that this regulation, to use their own words, "provided a strong inducement for Bantu relatives to call a doctor or to bring the patient to a hospital when the patient was in extremis".

General practitioners treating Bantu patients and who were not in the habit of referring them to hospital, were induced to register these cases, for a nominal fee.

It is neither possible nor profitable to describe at length

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7 This was carried out in only one township (Alexandra) but the writers had reasons to think that this township was similar to other Bantu communities.

8 Possibly of variable value (see Clemmesen, 1950).

the findings of this meticulously executed and carefully analysed survey, but some salient features must be mentioned.

It appeared that cancer in the Bantu had been about half as common as in the United States' population[9]. There was a rise in incidence with age, but the rise was less steep after the age of 55 years. These findings are crucial, as are the author's observations upon them: "While this may reflect an unwillingness of older people to attend hospital, we have no evidence on which to base this conclusion". They mentioned somewhat similar features in elderly United States negroes, but suggested, "the changes in slope in our cases may represent an actual freedom of older age groups from cancer - cohort differences - especially since the most frequent cancers in these age groups in the United States, i.e. stomach, large intestine and breast, are rare tumours in the Bantu".

As far as the incidence of specific tumours was concerned, it was found that carcinoma of the oseophagus and liver were significantly more common in the Bantu than in the Unites States population but other tumours of the gastro-intestinal tract were much rarer.

The frequency of carcinoma of the paranasal sinuses might be related to snuff.

Somewhat surprisingly, in view of the small amount of tobacco smoking, was the finding that, while the number of lung cancers

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9 Crude incidence rate (all sites) for males was 64.8 per 100,000 per annum and 74.8 for females.

observed in Bantu males was significantly lower than expected in United States populations, it was only slightly less than what would have been expected from a Danish population.

Carcinoma of the cervix was the commonest form of malignancy in Bantu females but carcinoma of the uterine body was virtually unknown.

Breast cancer was much less frequent than in the United States.

Most other tumours were less frequent but the incidence of retinoblastomas and nephroblastomas in childhood was not significantly different.

They observed a low relative frequency of skin tumours among the urban Bantu as compared with non-resident Johannesburg patients. But the observed number of cases was closely similar to that expected from the United States negro population,although low when compared with white Americans.

The authors were confident of the overall accuracy of their results and drew attention to the implications for western populations of the prevailing low incidence rates for cancer of the stomach and large intestine in the Bantu. They considered that their results gave further evidence of the importance of environmental as opposed to genetic factors in cancer aetiology. Finally, they noted that,in all but a few cancer types, the distribution of

cancers in Johannesburg residents was similar to that reported from rural hospitals. In other words, the city Bantu of the early 1950's was living a life not very different from that lived in rural areas. Higginson and Oettlé would not expect to detect significant differences in cancer figures[10] for some 20 years.

THE KAMPALA CANCER SURVEY

Many papers have been written in connection with the Kampala Cancer Survey. To start with, a retrospective study was made (see p. 33) of relative frequencies. The incidence rate survey of all hospital diagnosed cases in Kampala and district began in 1954 and a preliminary report was issued by Dr. (now Professor) J. Knowelden in 1957. This described the general methodology of the survey and referred to difficulties with population data[11] and with the identification of patients. Regarding age, Knowelden stated, "Rather crude approximations have often to be accepted."

The preliminary analysis had shown a rise in cancer incidence with age. However, there had been a marked difference between the actual numbers of cases registered in certain of the rural sazas or counties and the numbers which would have been expected on the basis of the age specific incidence rates of the whole district (Mengo).

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10 Since the survey figures for individual tumours were all so small.

11 The 1948 census had used very crude age groupings, viz. 1 - 5, 6 - 15, 16 - 45, 45+ corresponding to young children, school age children, adults of working age, and "old" people.

Kyadondo, the saza in which Kampala lay, had incidence rates $2\frac{1}{2}$ times those of the other sazas. As it seemed that the explanation lay in the readier accessibility of hospitals for people in that county, it was reluctantly decided to confine the incidence study to this relatively small population[12].

When comparisons of these early age specific rates were made with those of Denmark, a surprising similarity in the male rates was found. However, there was a deficiency among the Uganda cancer rates in elderly women. Knowelden observed, "Some under-reporting in old women is to be expected, as it appears to be general for them not to report to hospital when sick so readily as men of the same age."

As far as the comparison of Danish with Kyadondo rates for different cancers was concerned, Knowelden demonstrated an excess, among Ugandan males, of skin, liver, kidney, bladder, penile and lymphatic tumours. All the figures in females were lower than expected at Danish rates except for liver cancer[13].

About the same times, Davies (1957) reported on the results after four years, covering similar ground to Knowelden's account. He considered the implications of the apparent similarity between Kyadondo and Danish rates up to age 45, arguing that if the total incidence of cancer in both places was in fact similar, then the difference in incidence at particular sites assumed a new

12 150,000 - 200,000.

13 Ratio of observed to expected cases was 2 : 1.9.

significance. Davies insisted that it would not be possible to claim that a marked deficiency of any specific type could be the result of under-reporting without postulating that the true incidence of all cancers in Kyadondo was actually higher than that of Denmark.

He proceeded to a direct comparison between the relative frequency of tumours in the total Ugandan survey (all sazas) with that of Harnett's London survey (1952) and commented on most of the items.

Regarding the relative deficiency of female breast cancer,[14] Davies observed, "The deficiency of female breast cancer seems to be greatest in the women over 45 years: how much this is due to the reluctance of older women to seek medical care (and this reluctance is diminishing) and how much it is a genuine deficiency of female breast cancer we cannot yet say".

The order of frequency of tumours in the Kampala survey at this time had been carcinoma of the cervix, penile cancer, skin cancers and lymphatic tumours. Many of the latter had been in young Africans[15]. Jaw tumours of all types had been common and included five round cell sarcomas.

By 1962, Davies, Wilson and Knowelden were able to make a

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14 Davies considered that cancer of the male breast was unusually high in Kampala.

15 Davies cited 114 tumours in children (see later).

statement on the cancer incidence of the African population of Kyadondo, the saza about which they had felt most confident regarding cancer reporting and population data.[16]

Cancer registration had closed in 1960, after continuing for seven years (1954 - 1960 inclusive). The histological verification rate had been between 70 and 80 per cent and there had been scrutiny of the evidence for every clinical case by the cancer committee.

In this paper the authors supplied tables and graphs relating to the age specific incidence rates of cancer (all types) in Kyadondo and comparing them with the figures for Johannesburg, Norway and the United States of America, white and non-white. These were all given in ~~decimal~~ decennial age groups.

The results showed that the rates for both sexes up to the 45 - 54 age group were very similar for Kyadondo, Johannesburg and Norway. American rates were twice as high. After the age of 54, however, whilst the Norwegian and American rates continued to rise steeply, rates in both the African areas levelled off, this phenomenon being more striking in Kampala than in Johannesburg.

The authors discussed their findings at length, drawing attention first to the disparities in overall cancer incidence, before concentrating attention upon what they described as a lack of any evidence of an increase of cancer incidence after the

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16 There had been a census in Uganda in 1959 followed by a 25 per cent sample census in which ages were individually recorded.

55 - 64 decade in men and the 45 - 54 decade in women. There had, on the contrary, been an actual fall in cancer incidence beyond these ages which was, they said, "utterly at variance with the findings in more developed, urbanised communities. For in these, as is well known, the cancer incidence commonly tends to rise with great rapidity in the older age groups in both sexes". They recalled current biological theories which suggested that if everybody reached a sufficiently old age, they would all ultimately develop cancer.

In an attempt to discover the explanation for this surprising finding in a possible deficiency in their registration of hospital cases, they reviewed their methods before concluding, "It seems highly unlikely that any features in our machinery of registration or in our recording of ages tended to diminish the numbers of older patients registered".

They also felt confident that the population data, based upon a 25 per cent sample census, was reliable.

Regarding the attitude of the elderly towards hospitals, they had apparently changed their former stance somewhat, stating, "We cannot find any indication[17] that older patients in the area are reluctant to avail themselves of the hospital facilities."

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17 They did not, however, provide specific evidence for this negative finding.

They made the observation that elderly people constituted a higher proportion of the hospital admissions and of the patients who came to necropsy than they did of the general population. Such old people were not more likely to be excluded from registration. And there had been few cases of clinically unsuspected cancer at autopsy in old people.

On this finding of an apparent drop in the cancer incidence of the older Africans together with this rather special pleading regarding its authenticity, they based their opinions on cancer in civilised communities. In the writers' view, "the remarkably rapid rise in the cancer rate for industrialised communities is not an inevitable biological effect of ageing, but the result of exposure to the cumulative effect of exogenous carcinogenic stimuli".

They observed, with possible justice, how many of the cancers that occurred in the Kyadondo area showed evidence of association with carcinogenic factors in that environment, and ended on a note of hope - "the amount of cancer resulting entirely from preventable factors may be much greater than at present contemplated."

Since then there have been a further two pronouncements by Knowelden and Davies individually, addressing the epidemiological section of the Royal Society of Medicine (1963). The former was

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18 Presumably this was not a reference to statistical correlation.

cautious, admitting that data which stemmed solely from hospital diagnosed cases might be an underestimate. But he believed that the standing of the Kampala hospitals in the eyes of the local populace was high; the standard of clinical diagnosis at the Univerisity hospital was good, and there had been a high rate for histological verification of cases.

As to identifying data on patients, an African social worker had visited homes to check addresses.[19]

Again the levelling of cancer incidence rates in Kyadondo among persons over 54 was described. Knowelden admitted that an apparent deficiency of cancer in an unsophisticated community was always suspicious, whereas an excess could more readily be admitted.

Although age specific rates were not described for individual cancers, Knowelden stated that the age distribution of carcinoma of the ovary and of the cervix followed the same pattern as elsewhere with no evidence of under-reporting in old women. Taking this along with similar behaviour of the age specific rates for bladder cancer in all four populations, led him to conclude that the low rates for gastro-intestinal malignancy, lung cancer and cancer of the breast and prostate were real.

Much of Davies' contribution to the discussion on the same occasion centred upon this discrepancy in the cancer rates for older

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19 The question of age estimation was not specifically referred to.

patients. As this is of crucial importance, it is worth quoting two of his statements: "There was nothing in the mechanics of the survey to lead to failure to register older patients; in fact over-estimation of age by patients was more of a problem ...."

"It was clear that the ages of elderly patients could be estimated with reasonable precision, certainly to within a decade..."

He emphasised the high quality of medical care in what was a well doctored area, the free treatment, the hordes of patients beseiging the hospitals. Moreover, the elderly were, he pointed out, respected and the clan system, "ensures that their needs will be met".

He went on to draw attention to the evidently unusual pattern of cancer in Kampala, a pattern which the Mengo Hospital records showed had been constant for many decades. Davies declared, "There is in Uganda such a different pattern of site and type of cancer that it is not surprising that there are such differences in the rates at the older ages".

He pointed to the low rates of gastro-intestinal and breast cancer which, in other communities, were largely responsible for the rapid cancer incidence rise with age. Claiming that as many as one third of Ugandan women were infertile, Davies said that one might therefore expect a high rate of breast cancer, whereas the contrary had been the case.

He concluded with mentioning some current speculations regarding environmental factors responsible for the unusual local manifestations of malignant disease, quoting climate, parasites, and a diet of plantains.

CANCER SURVEY IN KIVU (BELGIAN CONGO) AND RUANDA URUNDI

Late in 1959 and during part of 1960, a team struggled to complete a cancer survey in the north eastern portion of the Belgian Congo. Dr. J. Clemmesen of the Danish Cancer Registry and Dr. J. Maisin of the University of Louvain were the principal investigators. With them, and responsible for operations in the field, was Dr. P. Cigase. The following account is drawn from their combined report (1962) on Cancer in Kivu and Ruanda Urundi, together with information from an article at present in the press which Dr. Clemmesen has kindly made available.

It was the intention of this team to undertake an entirely different kind of survey from the two which have just been described. Hospital case surveys suffer from the insuperable difficulty of estimating with any degree of accuracy the proportion of total community cases of malignant disease which they represent. This was to be a pilot field survey in an area where the statistical data was comparatively easily accessible, and it was proposed to examine all adults, over the age of 20, in a defined area of Katana. One year later they were to be re-examined and information sought

regarding deaths in the interval.

It was realised that some cancers (e.g. liver) could develop and reach a fatal outcome within one year. Also that this would be essentially a prevalence study since the date of onset of symptoms would probably be impossible to gauge.

Nevertheless, the ultimate curtailment of the operation and its limitation to one survey was the consequence of national rather than medical circumstances, as the unrest which preceded and then succeeded Independence made conditions ultimately impossible.

The study involved physically examining 12,182 men and 13,236 women. Observation and palpation alone were employed except where an abdominal tumour mass suggested that digital examination was necessary. Gynaecological examination of all the women was never seriously contemplated, nor is it probable that it would have been tolerated by the communities concerned.

Any suspected cases were referred to hospital for further observation, having their fares paid as an additional inducement to attend.

During this period, the local dispensary attendants were provided with a list of suspicious symptoms suggesting cancer. They were rewarded if a case referred by them to hospital turned out in fact to have malignant disease.

In the medical survey, a total of 35 cases of cancer was

encountered.[20] Half of these (18) had already attended hospital. Two cases of advanced cancer in old people were discovered in which neither of the sufferers had intended seeking medical advice.

Although the medical survey produced so few cases, the cancer study was enlarged by a review of hospital cases. The records for the whole of Katana for the period 1953 - 1960 and for the delimited cancer incidence area for the period 1956 - 1960 were separately analysed. Cases were classified by site, type, sex and mode of diagnosis. By this means it was possible to review relative frequencies for a total of 201 cases in the cancer incidence area and 390 cases in Katana as a whole. The overall figure for histological diagnosis was 75 per cent. It was somewhat lower for cancer of the liver, at 58 per cent.

Thus a graduation of relative frequency by sites for both men and women was derived:

Men: liver, stomach, Kaposi's Sarcoma, prostate, skin (lower limb)

Women: stomach, cervix, liver, skin, breast

Nowhere are figures provided relating to the age distribution of individual tumours in adults, which is surprising in view of the fact that this particular part of the Congo was said to have been chosen on account of the excellence of its statistical services and every member of the population had an identification card

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20 This figure and the number of persons examined is taken from Dr. Clemmesen's paper (in press).

bearing his age. It was admitted, however, that these ages were often unreliable having been roughly assessed by census clerks. Attention was drawn to the high percentage of gastric cancer, which was relatively higher for the study area than for Katana and which had been one of the features which had prompted the study. The histological verification rate was above average for this tumour (78 per cent in males and 72 per cent in females) and so it was thought unlikely that there had been over-estimation.

Expected annual numbers of cancer cases were computed, by applying the Johannesburg incidence figures to the study area's population. Using this standard of comparison they concluded that the actual numbers observed annually were very deficient.[21]

A notable deficiency in the medical survey itself was the failure to examine children. The main report stated, "an eye was kept on them for eventual tumours by the native in charge of vaccinations ... Children are brought to medical services readily for more trivial diseases than a tumour and there is little doubt that practically no cases ... have passed undetected in children".

In the study of hospital cases it was stated that Kaposi's Sarcoma was, "rather infrequent". On a number of occasions it was discovered that the same patient had visited several hospitals

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21 The observed incidence in Katana was approximately 40 - 45 per 100,000 per year, against 70 - 80 expected.

seeking relief for his chronic complaint and the authors considered that possibly accounts published previously of the frequency of Kaposi's Sarcoma in the Congo had been exaggerated for this kind of reason.

Among children's tumours in hospital in Ruanda Urundi (total 86) nephroblastomas and retinoblastomas had been the most frequent. In their experience the Burkitt lymphoma was rare or absent in both Kivu and Ruanda Urundi.

In spite of the paucity of material and the admitted deficiencies in both the demographic data and the standards of diagnosis, the research team succeeded in producing a massive report which is, however, at times rather obscure. There has possibly been an excess of zeal in the subdivision of cases according to geographical areas of origin, with the result that very small numbers of tumours appear in each sub-category. But if ever another cancer survey is launched in this particular area of the Congo, the exhaustive analysis of these authors will provide a most valuable comparative text.

CANCER IN LOURENCO MARQUES. 1956 - 1961

The report on the Lourenço Marques Cancer Survey has just come to hand at the time of completing this thesis.[22]

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22 A Cancer Survey in Lourenço Marques, Prates, M.D., and Oliveira Torres, F., (1965) In press. Professor Prates very kindly made his own personal copy of this paper available to the writer.

The incidence survey, which covered six years, was accompanied by a large number of sociological studies in the population which have added greatly to the value of the social data on the cancer cases.[23] The whole study has been exhaustively analysed statistically and should provide a model for future surveys of this nature.

Prates' comments and conclusions regarding the accuracy of age estimation in the elderly are a salutary corrective to the over confidence which some African epidemiologists have displayed.

Cancer of the liver was the most frequent tumour in both men (65.5 per cent of all tumours) and in women (31.0 per cent). Prates demonstrated that the unusually high cancer incidence rates in the population of Lourenço Marques, especially among young males, were due to carcinoma of the liver, the incidence of which was seven times higher than in the Johannesburg Bantu and fifty eight times higher than in United States whites.[24]

The incidence of cancer of the cervix was lower in Lourenço Marques than in the Johannesburg Bantu or United States non-whites.

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23 For a complete account of the sociological studies Flegg and Lutz (1959) and Flegg (1961) should be consulted in addition to the report on the Lourenço Marques cancer survey.

24 See also Prates, M.D., Cancer and Cirrhosis of the Liver in the Portuguese East African with special reference to the specific age and sex rates in Lourenço Marques (1961).

Carcinoma of the body of the uterus was rare. Carcinoma of the bladder, however, was common, being next in frequency to liver tumours in males.[25]

Lymphomas and the Burkitt Tumour were also frequent but leukaemia was rarer than in the United States.

Children's cancers, below the age of 10, were about as common as in the United States non-whites. In the 10 - 14 age group the high morbidity from liver cancer was producing cancer incidence rates in both sexes four times higher than in United States non-whites of the same age.

25 Ibid. The rates of cancer of the bladder in the Portuguese East Africans of Lourenço Marques (1962).

FIGURE 1.

PANORAMIC VIEW OF IBADAN WITH THE TOWN HALL ON THE HORIZON

CHAPTER III

IBADAN: THE TOWN, THE PEOPLE AND THE MEDICAL SERVICES

Ibadan was chosen as the site for a cancer incidence survey for a number of special reasons. In the first place, a new Nigerian National Census was due to take place in 1962 which, it was hoped, would supply detailed information on the population at risk. Secondly, although perhaps badly off by European standards, the town was extremely well off in regard to modern medical facilities by prevailing West African standards. Thirdly, Ibadan, although very large, is not typical of African urbanization in the sense, for example, of Johannesburg or Sierra Leone,[1,2] but has rather the form of a huge village, resembling very closely, in its stype of buildings and occupational structure, the large Yoruba settlements which are so characteristic of the Western Region of Nigeria. For these reasons it seemed as though it should be possible not only to obtain reasonable data on population and cancer cases, but to suggest that the resultant incidence figures might broadly reflect the situation in the rest of the Region.

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1 Little, Kenneth, "The Role of Voluntary Associations in West African Urbanization", Amer. Anthropologist, 1957, Vol. 59, No, 4, pp. 579 - 596.

2 Basom, Wm., "Urbanization among the Yoruba", Amer. J. Soc., 1955, Vo. 60, No. 5.

As this account proceeds, these three aspects will all receive attention, the population, the medical services and the character of the town itself. The way of life and general environment of any community will always have relevance to its cancer pattern even if, in the early stages of research, the precise associations which are of significance may not be discernible. No excuse, therefore, is offered for introducing a variety of sociological aspects into a study of African cancer epidemiology. There is always a danger that people unacquainted with a country, or even with a continent, may attribute to the inhabitants of one area habits and ways of life which have been described in connection with some quite different parts. Generalisations come all too easily, and theories regarding, for example, the influence of a particular form of diet on the development of hepatoma, may ignore the wide variations in the basal food stuffs which are favoured by peoples all subject to high liver cancer rates.

IBADAN: THE TOWN

Ibadan lies in the humid tropics, 748 feet above sea level, at a latitude of 07°26'N. and longitude of 03°54'E. (Buchanan and Pugh, 1955). The mean annual humidity at 12.00 G.M.T. is 70 per cent and the daily temperature varies from a maximum of 93.9° F. in March to a minimum of 69.2° F. in January. The wet season lasts from April to October; during this period anything from 40 - 60

inches of rainfall may be recorded. Throughout the dry season, from November to March inclusive, the rainfall does not exceed ten inches.

Ibadan has been continously occupied since the 1820 - 1830 period when it was settled by Yoruba refugees fleeing from the Fulani invaders who had destroyed the towns of the old Oyo empire to the north.

Peter Lloyd, the anthropologist, has described the town as a "city village", having the size of a city but the occupational structure of a village (1960)[3]. Although it is the largest town in this part of Nigeria and the capital of the Western Region, it is in no way unique in its general composition. The Yoruba, who are the dominant tribe of this region, have always chosen to live together in large towns. Forty per cent of the people occupy towns of more than 20,000 inhabitants and over twenty per cent are in towns with over 50,000 inhabitants.

Surrounding the town itself are 3,000 small hamlets, the most distant of which lie as far as twenty miles from the town. Ibadan forms the focus of these hamlets, those further afield owing allegiance to other neighbouring towns such as Abeokuta and Ijebu Ode.

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3 See also Mabogunje, A.L., "Yoruba Towns", Ibadan University Press, 1962.

FIGURE 2.

IBADAN BACK STREET SCENE

There is a continuing relationship between the town and its hamlets since some farmers, living most of the year in small settlements close to their land will return to Ibadan for religious festivals, funerals or other occasions necessitating family reunions. On the other hand, many Ibadan inhabitants travel backwards and forwards to their farms in the surrounding countryside as often as agricultural needs dictate.

This degree of fluidity in the population makes census estimations particularly difficult or, at least, makes their figures no more than a statement of the situation prevailing at the particular time and season of the enumeration.[4]

The typical Ibadan house is a single storied laterite mud building roofed with corrugated iron. Family groups live close together in compounds, the constituent buildings of which originally enclosed open courtyards. These have gradually been obliterated in many parts of the town, leading to considerable overcrowding, as new buildings have been erected on a family's land by its more prosperous sons. Some of the newer houses are in a more elaborate style; they have two or even more stories and boast of decorated balconies and doorways.

The traditional houses are without sanitation, night-soil-men employed by the City Council remove waste buckets at intervals.

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4 See Lloyd, op. cit.

FIGURE 3.

DECORATED DOORWAY OF A BRAZILIAN TYPE IBADAN HOUSE. THIS STYLE OF ARCHITECTURE WAS INTRODUCED TO NIGERIA BY YORUBA SLAVES RETURNING FROM SOUTH AMERICA.

A hole in the side of the wall leads to a common open drain whose contents are particularly offensive during the wet season, when they overflow. Communal taps at intervals provide the water supply. The houses are tightly barred and shuttered against possible thieves at night when the families retire to rest on sleeping mats or beds according to their means.

Some of the newer houses have modern sanitary facilities, as do all the villas in the modern Government housing estate of Bodija in the suburbs. But such houses still form only a small fraction of the living quarters of the Ibadan people. Most of Ibadan life is led out of doors. During daylight hours commerce and cooking, sewing and social intercourse, bargaining and barbering all take place on verandahs, before the house fronts or in the open courtyards of the compounds, to the accompaniment of continual bustle and noise.

IBADAN: THE PEOPLE

In his "History of the Yoruba", published in 1921, Samuel Johnson provided a comprehensive account of the customs, diet and occupations of the Ibadan populace of his day. In many respects the way of life of large sections of the community has not greatly altered. Most men are still farmers, traders or artisans[5] whilst

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5 For an analysis of 2,700 "industrial units" in Ibadan in 1949 - 1950 see Buchanan and Pugh, op.cit., p. 200.

most women engage in marketing and food preparation and, to a lesser extent, since the importation of foreign goods has become general, in traditional skills of dyeing and weaving.

Ibadan's position as the commerical and administrative centre of the Western Region and the site of the University and Univeristy College Hospital has attracted members of the business and professional classes together with their necessary following of office workers. There are also some factory employees, engaged in a tobacco factory, a small plastics factory and a canning factory. But these elements in the population are, as yet, small and the attraction of Ibadan as a potential place for paid employment cannot compare with Lagos.

Diet

Yam and cocoyam, cassava and maize are the staple components of the local diet, with the addition of many kinds of beans and sweet potatoes and a variety of fruits - bananas, plantains, pawpaws, oranges, limes, pineapples. Onions and tomatoes are used too, for cooking with palm oil or groundnut oil in the preparation of stews which are invariably very highly seasoned with red (chilli) peppers.[6]

A large variety of green leaves are gathered for use as vegetables. All these items, together with some rice, make up the main part of the Yoruba diet. First-class protein is scarce and

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6 The Yorubas have a reputation, even within Nigeria, for liking very strongly peppered food.

expensive. In the markets, smoked "bush meat" is on sale - the dried flesh of small animals which the hunters have caught - and imported "stock fish" from Scandinavia is popular but too dear for regular use.

Beef is rarely afforded by the poorer sections of the community. Its quality is inferior as the animals have been driven on the hoof for hundreds of miles from the Northern Region. Rams are slain on ceremonial occasions but otherwise the numerous goats seen about the streets are rarely utilised for food, nor is their milk ever used. No child drinks milk once it has been weaned and eggs are not considered suitable food for them as it is believed such a diet will encourage stealing. Groundnuts are sold in small denominations, a cigarette tin time at a time. They are used as a snack by children and adults but do not constitute a large item in the diet. They are occasionally cooked and eaten along with maize. Groundnut oil is used for cooking on special occasions in place of the cheaper palm oil.[7]

Palm wine is popular among those who cannot afford imported beer. It is generally drunk freshly gathered from the tree, when its alcoholic content is low. Some palm wine is illegally distilled into local gin. Maize beer is also prepared but is less

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7 For an account of the composition and nutritive value of Nigeria's feeding stuffs, the booklet on this subject by V. A. Oyenuga should be consulted. Ibadan University Press, 1959.

often drunk in Ibadan than in the surrounding countryside.

It is very rare indeed to encounter public intoxication although palm wine and beer are freely on sale in innumerable "off licence" booths by the roadside. Small numbers of the wealthy drink spirits, schnapps being specially favoured as a status symbol.

The use of kola nuts as a mild stimulus is universal. It is grown extensively in Yorubaland. Cola acuminata (Yor: obi gidi) which has viscid nuts is popular locally. Cola nitida (Yor: obi gbanja) is exported in large quantities to Northern Nigeria; it has two cotyledons and contains more caffein than the acuminata variety.

Locally grown tobacco is smoked in the pipe by older men and some old women and at times it is chewed or used as snuff. The smoking of cigarettes, which are produced in an Ibadan factory, is severely restricted by considerations of cost and, among the poorer sections of the community, cigarettes are only purchased singly and infrequently.

SOCIAL AND FAMILY STRUCTURE

The polygamous family is still common, resulting in an extended family system with wide ramifications. In traditional society the place of women is by no means subordinate in all spheres as they are responsible for the maintenance of their younger

children and almost all engage in private trading, for which they have a particular aptitude.

Women marry early and their prime desire is for a large family. The barren are despised and will seek any remedy for their shame - prayer, magic, drugs and doctors. Those who do bear many children are still often fated to watch many of them die an early death.[8]

Male children are usually circumcised within a few weeks of birth. This practice is general, not only among Moslems but also among Christians and the few, in Ibadan, who confess to paganism. Female circumcision is not practised among the Yoruba.

Breast feeding is protracted, with an average of 2 - 2½ years but, in the case of male children, they may continue to be given drinks at the breast until the age of 4. Formerly custom forbade sexual intercourse from conception until weaning, thus effecting a natural form of family limitation and spacing. Old Ibadan people deplore the laxity of the modern generation and attribute some children's illnesses to the early onset of a second pregnancy. Some have even recognised Kwashiorker as the disease which the first child gets when the second one is on the way.

RELIGIOUS BELIEFS AND PSYCHOLOGY OF THE IBADAN YORUBA

There is an extensive literature on the subject of Yoruba

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8 For a fuller discussion of the status of women and attitudes to infant mortality, see Maclean (1964) "Attitudes and Beliefs relating to Health and Disease in an Urban West African Society". D.P.H. Dissertation, University of Edinburgh.

religious beliefs but most of it is not relevant to the present study.[9] A background of orisha worship and faith in divination persists in spite of protestations of new allegiance. Traditional modes of behaviour come to the fore especially at times of crisis and serious illness in a family is liable to cause people to resort to remedies which have had to serve their ancestors for untold generations.[10] Trust in divination, fear of witchcraft and curses, and belief in the possibility of averting evil wishes by the use of the proper methods, are all elements of Yoruba psychology, which remain deeply embedded and can be seen even among University students.[11]

THE POPULATION OF IBADAN: THE 1952 AND 1962 CENSUSES

At the outset of the Cancer survey, the Nigerian National Census of 1952 was the only information available on the population at risk to cancer in Ibadan.

Unfortunately, the age groupings which had been employed at that time were very broad and far from ideal for medical statistics.

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9 See Maclean, op. cit.

10 See later section, Chapter VII

11 A student interpreter, who was assisting the author, recounted with obvious credulity several stories of this nature from his own experience.

The youngest group, 0 - 7 years, comprised children under school age, whilst the 7 - 15 group was intended to include older children who might be eligible for schooling. From 16 - 45 was the working spell of an adult's life including, for women, the period of childbearing. In fact, this was a functional division of ages which was more meaningful to the society in which it applied than the quinquennial or decennial groupings beloved by demographers. It is very significant that all "old" people were classed together in the over 45 group, since this is an index of what constituted, by Nigerian standards, old age.

The population of Ibadan was divided according to whether they were, at the time of the Census, residing in the urban or rural area. At that time 459,000 were found to be living in Ibadan, and 338,000 in the adjacent hamlets.[12] (See Appendix I).

The detailed planning and administration of the first post-Independence Census was the responsibility of the respective Regional Governments.[13] The enumeration in Ibadan took place during three weeks in May 1962 and, since intenational age

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12 The 1952 Census, for the whole country, took eighteen months to complete.

13 Aerial maps of Ibadan had been prepared by the Ordinance Survey Department and subdivided according to wards. These maps eventually proved useful in planning the supplementary socio-medical survey on the use of medical services.

groupings had been employed, the results were anticipated with great interest. Vital statistical information would, it was hoped, at last be available in the most usable form. Indeed the timing of the Ibadan Cancer Survey had been planned to coincide closely with this Census.

The size of Ibadan area as an administrative unit had shrunk slightly since the 1952 census. Census officers were intructed to employ a list of famous historical events when attempting to estimate the ages of those many old people who could not furnish an actual birth date.

But although the Census had apparently been well enough planned in theory, very serious practical difficulties arose when the provisional total figures from different regions of Nigeria began to be made public. Representation in the Federal House is dependant upon the population figures for each region and since Nigerian politics are still, to a large extent, dominated by regional considerations of priority, disagreements arose between regional politicians over the authenticity of one another's Census results. These disputations were so serious that eventually the whole Census was abandoned, at a stage when the enumeration had been carried out but before the figures were analysed. The regional government departments were instructed to release no more figures and all information upon the subject ceased.

This was, of course, a most serious set back for the Cancer Survey. No amount of care in the collection of cases could compensate for the absence of up-to-date population figures. However, persistent requests eventually drew from the Regional Census Officer, a provisional total figure for Ibadan urban area. It was stressed that this figure was not, "official" and would be subject to review. It was, nevertheless, the only figure obtainable for the total population of Ibadan and, although not even subdivided[14] according to sex or age, had to form a basis for estimations of the population at risk to cancer.

This total Ibadan population figure for May 1962 was:

479,000

Fortunately for the Survey, there was another source of information regarding the population of Ibadan. Under the auspices of the World Health Organisation, a tuberculosis survey was in process in Ibadan. Dr. Han, the statistician attached to the field survey team, kindly made his results available to the Cancer Registry.

On the basis of the apparent population density of the city as judged from the density of buildings in the aerial survey map, fifty sample areas had been drawn by the statistician from the whole

14 It was possible, however, to obtain the figures for each ward of the city and this was useful later. See Chapter VII.

city, each of these samples containing some 200 houses. A census had then been taken of all persons living in the samples areas and age estimates, in five year groupings up to the age of 19 and ten year groupings thereafter, had been made. The results of the World Health Organization sample survey[15] are given in Table I.

TABLE I

W.H.O. SAMPLE CENSUS IN IBADAN, 1962

Age Group	Male	Female
0 - 29 days	13	19
1 - 11 months	145	137
1 - 4 years	512	520
5 - 9 "	489	576
10 - 14 "	399	394
15 - 19 "	376	257
20 - 29 "	754	871
30 - 39 "	459	559
40 - 49 "	242	296
50 - 59 "	133	116
60 - 69 "	69	48
70 - 79 "	18	13
80 +	1	2
Age unknown	397	263
Total by sex	4,005	4,076

Total Registered - Both Sexes: 8081

15 As these results were supplied to the writer in 1962.

The results of the tuberculosis sample census have been applied to the total population figure for Ibadan to give an appropriate division by sex into

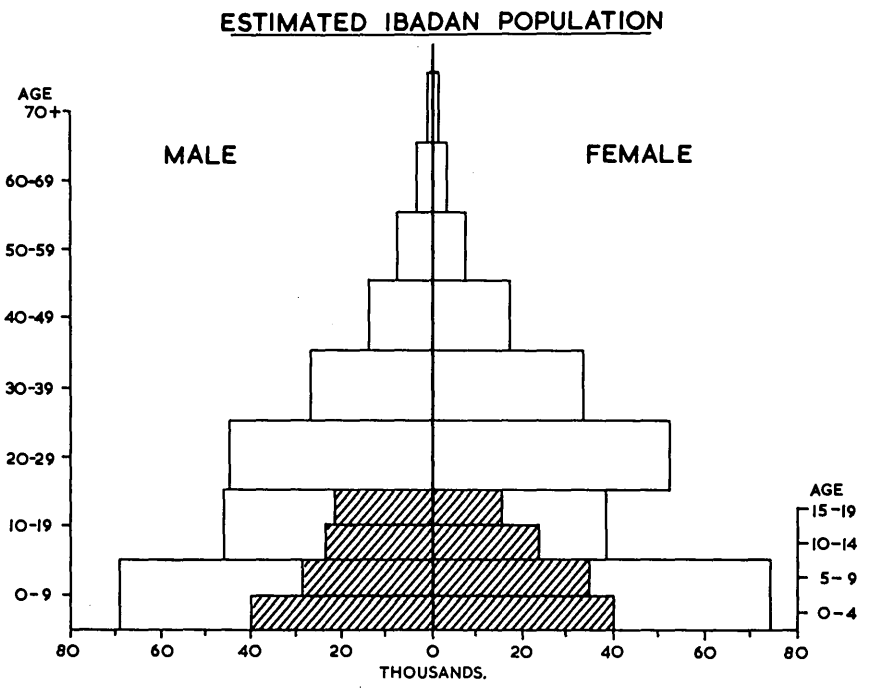
237,000 males

242,000 females

When the proportions in each age group derived from the sample are applied to the totals for males and females, the figures shown in Table II are obtained for the estimated age composition of the Ibadan population.

TABLE II/

FIGURE 4.



POPULATION PYRAMID OF ESTIMATED IBADAN POPULATION

TABLE II

THE ESTIMATED IBADAN POPULATION CALCULATED FROM THE TOTAL 1962 CENSUS FIGURE OF 479,000 AND AND THE W.H.O. SAMPLE CENSUS

Age Group	Estimated Ibadan Population	
	Male	Female
0 - 4 years	40,000	40,000
5 - 9 "	29,000	34,000
10 - 14 "	24,000	23,000
15 - 19 "	22,000	15,000
20 - 29 "	45,000	52,000
30 - 39 "	27,000	33,000
40 - 49 "	14,000	17,000
50 - 59 "	8,000	7,000
60 - 69 "	4,000	3,000
70 +	1,000	1,000
Age unknown	23,000	15,000
Total All Ages	237,000	240,000*

* The discrepancy between the estimated number of women in the Ibadan population (242,000) and the total when the age columns are added (240,000) is accounted for by the fact that each age group is only estimated to the nearest thousand.

It will be noted that there is an "age unknown" residue in both sexes. As it is possible to tell how this age unknown group was distributed throughout the whole population and as it is a relatively small figure, for the purposes of calculation of cancer incidence rates this source of error has been ignored.[16]

For occupational and tribal groupings, there are as yet [17] no more recent estimations than those made at the time of the 1952 census (See Appendix I). It will be seen that Yorubas then constituted almost ninety-five per cent of the total population of the urban area.

Occupational groupings employed in 1952 were very broad. Some further information on occupation can be drawn from the findings of the socio-medical survey in a traditional area of Ibadan.[18]

Before concluding this consideration of the population structure it may be instructive to recapitulate the multiple possible sources of inaccuracy in the available figures. Firstly, there is the peculiar mobility of the Ibadan population, to which reference has already been made above. Secondly, the census on which the

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16 It is important to realise, however, when considering the ultimate results, that age specific incidence rates will be, in consequence, slightly overestimated.

17 A new Census was carried out in 1963 but the analysis has not, at the time of writing, been made public.

18 See Chapter VII and Table XV

figures are based occupied a three week period and, although census officers were told not to include any birth after a certain date and to reckon as alive any dead person who had died after that date it will never be known how far they adhered to the instructions. Thirdly, in spite of much official propaganda in the press prior to the census, a feeling still persisted in some sections of the local population that counting might be connected with subsequent tax assessment. Whilst such considerations might have led some people to evade enumeration there has been, on the other hand, a persistent suspicion in certain circles that results were actually inflated to suit political purposes.

Such are the perils of statistics in a developing country. There is no way of anticipating them, they must simply be accepted. But the estimate of the population of specific districts or wards of Ibadan which was arrived at by the World Health Organization workers as a result of their sample census accorded closely with the census figures given for the same wards.[19] There is reason to believe, therefore, that the 1962 census figure for the total population of Ibadan may be tolerably accurate.

THE MEDICAL SERVICES OF IBADAN

Ibadan is very well off in regard to its modern medical services when compared with any other part of Nigeria except the Federal

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19 e.g. in Ward E_2, the site chosen for the socio-medical survey; the W.H.O. estimate had been 6,164 and the Regional census officer quoted 5,790.

Territory of Lagos.

In 1961 there were 1,079 doctors on the Medical Register in Nigeria but an estimate by the Federal Ministry of Health acknowledged that the total engaged in the practice of medicine at any one time was no more than 700. These had to serve what were then thought to be 34 million people.[20]

The doctor-patient ratio varied from region to region. Thus, in the Northern Region it averaged 1 per 140,000; in the Eastern Region 1 per 46,000; in the Western Region 1 per 25,000 and in the Federal Territory of Lagos, 1 per 2,000.

In 1961, Ibadan had a total of 151 doctors whose allocation can be seen in Table III.

TABLE III

DISPOSITION OF IBADAN DOCTORS, 1961. (TOTAL 151)

University College Hospital	110
Adeoyo (Government) Hospital	23
Private practitioners	9
Jericho (Government) Nursing Home	1
Oke Offa Catholic Mission Hospital	1
Jericho Chest Clinic	2
Administrative and others	5
TOTAL	151

20 The 1963 census, it has lately been announced, puts the total population for all Nigeria at 55 million. Since the smaller figure has been employed in these computations the resulting ratios may well be over-generous.

FIGURE 5.

UNIVERSITY COLLEGE HOSPITAL, IBADAN.
CENTRAL X-RAY AND THEATRE BLOCK

Thus the doctor patient ratio would appear to have been in the region of 1 per 3,300. But in fact the Ibadan hospitals were drawing patients from a wide area of the Western Region of Nigeria and did not merely serve the city's needs.

HOSPITALS IN IBADAN

The University College Hospital opened to patients in 1957, has 490 beds and is staffed and equipped in a manner comparable to any modern teaching hospital. It has, in addition to the usual clinics and ward accomodation, first-rate radiological and pathological departments and facilities for elaborate investigations in many fields of medicine and surgery.

Most patients gain access to the hospital via what has been called the General Practitioner Clinic[21] or the Casualty Department. Obstetric patients go straight to the ante- or post-natal clinics, but all other cases are screened in the Non-Consultative Clinics before being either treated on the spot or referred for specialist opinion. Even before entry to the General Practice Clinic is obtained, however, the waiting patients are superficially screened "on sight" by the doctor in charge of the clinic. If all patients seeking treatment at the University College Hospital were to be seen, the result would be to flood the Non-Consultative Medical Clinic, with

21 Unfortunately so named, as it accentuated the competition which it represented in the eyes of the local private practitioners.

a consequent overall deterioration in the quality of attention and the accuracy of diagnoses. The present system allows for anything up to twenty minutes to be spent by the doctor on one case before deciding on their disposal.

The purpose of the initial screening on the threshold is also admitted to be with the object of introducing more interesting clinical material to what is, first and foremost, a teaching hospital. Young people who look fit or have "minor" complaints are recommended to seek attention elsewhere, although no feverish child is ever turned away whthout, at least, the benefit of an anti-malarial drug.

During the year 1961 - 1962, a total of 33,774 new patients were seen at the non-consultative clinics, whilst 16,404 were seen at Consultative Clinics. Some of the latter[22] had been referred from the Non-Consultative Clinic (37 per cent) or from other consultants (25 per cent) after inital examination, whilst others had come directly from more distant hospitals (22 per cent) or, occasionally, from private practitioners in the town (3 per cent). In June 1961, 10,532 in-patients were admitted.

Since commencing this thesis the figures relating to the Consultative Clinics for the period January 1st to December 31st 1963 have been obtained. These are the only data relating to a

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22 But no ante-natal cases. Most of these were referred from the general ante-natal clinic held at Adeoyo and were cases in whom some abnormality had been detected or anticipated.
The patients not accounted for in the list given here had come from the Casualty Department or miscellaneous sources.

sizeable group of U.C.H. out-patients which are analysed according to sex and are considered important for this reason. The figures are shown in Table IV and it will be seen that only 37 per cent of the total were women.

TABLE IV

CONSULTATIVE CLINICS U.C.H.

NEW PATIENTS. 1963

	Male	Female
S.O.P.	1,497	869
M.O.P	1,500	892
Ophth.	533	277
E.N.T.	383	246
Totals	3,913	2,284

Both Sexes = 6,197

The Government General Hospital of Adeoyo was, prior to the opening of University College Hospital, the largest hospital in the Western Region of Nigeria. With 225 beds, it was staffed, in 1961 with twenty three doctors, including five specialists.

This hospital, in common with others of its kind in the Region, can exercise no discretion over the patients which are seen. The

general out-patient clinics are open throughout, "Government hours", namely from 8 a.m. till 2 p.m. daily, except on Saturdays when they close at noon. During these hours, any patient who presents himself is seen, no matter how briefly or summarily. Excluding ante-natal cases, an average of 100,000 new general out-patients[23] are seen in this way in one year. Some of these are filtered off to specialist surgical, medical or ophthalmic clinics. By comparison with University College Hospital, the facilities and modes of working in Adeoyo appear primitive. However, there is a pathology department[24] and a pathologist and a radiology department without a radiologist.

Reference will be made later[25] to a comparative survey of Adeoyo and University College Hospital out-patients.

Jericho Nursing Home, intended primarily for the use of civil servants and their dependants, has fourteen beds and one medical officer. It uses the diagnostic facilities and the operating theatre of Adeoyo Hospital on occasions.

The Catholic Mission Hospital of Oke Offa has forty beds and one or, in fortunate times, two doctors. It runs a large general

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23 Including children

24 Open for "Government hours"only

25 Chapter VI

out-patients clinic but is recognised as specialising in ante-natal cases and children's diseases. The beds are nearly all maternity ones with the addition of a few cots.

The Ibadan Jericho Chest Clinic has twenty beds available for tuberculosis cases. There is one full time specialist assisted by one or two part-time doctors.

Each of the nine private medical practitioners in town runs a private nursing home or so called, "hospital". There are 130 hospital beds in this category, but the number of patients seen yearly by these practitioners could not be discovered.

The Infectious Diseases Hospital has five beds.[26]

Thus the total hospital or nursing home beds of all types available in Ibadan is around 952. This would amount to a bed patient ratio of approximately 1 : 500. As in the case of the doctor patient ratio, however, this figure is rather misleading, in so far as a fair proportion of the patients using the larger hospitals will have come from beyond Ibadan. This proportion, as will be seen later, is higher among cancer patients than among general out-patients as a whole.

All the hospitals in town were charging fees. In Adeoyo, children under 18 years of age were treated free. Adults attending the general out-patients department could see any doctor or

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26 Usually empty, but at times of epidemics such as the smallpox one of 1957, the "Hospital" is quite inadequate.

consultant any number of times with the same disease, for sixpence, with the additional charge of one shilling for a prescription card.[27] In-patient accommodation in the general medical and surgical wards was at the cost of one shilling per day plus five shillings for fifteen days drugs. Operations were charged for on a scale of magnitude[28], X-rays cost more as they got larger and laboratory investigations added further to the patients' bill.

University College Hospital charged all general out-patients five shillings for all treatment per week but attendance at a consultant clinic ranged from five shillings to ten pounds per month, being based upon patients' means. Children under 16 paid only for their accommodation as in-patients, at half adult rates. This generally amounted to about one shilling per day. Adults paid an inclusive charge for treatment, accommodation and maintenance according to their income, in a range from four to forty shillings per week. The majority of patients were in the lowest range.

At Oke Offa Catholic Mission Hospital most of the charges are irrelevant since they applied to maternity cases. There were only six gynaecological beds, used mainly for miscarriages and for isolating patients. All children under 16 were treated free.

Costs of general practitioners were according to their discretion. To obtain private treatment was, however, generally said to be very expensive.

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27 This might contain several prescriptions.

28 Highest cost was three guineas.

CHAPTER IV

THE ORGANISATION OF THE IBADAN CANCER REGISTRY

Against the sociological and medical background which has just been described, the Ibadan Cancer Registry was inaugurated in April 1960. Professor G.M. Edington, now head of the Department of Pathology at Ibadan University, secured a generous grant from the British Empire Cancer Campaign for the pursuit of a study of the incidence of various forms of cancer in the Ibadan population over a limited period of time.

This grant paid the salary of the writer who, as Senior Research Assistant, was responsible for the design, organisation and running of the Registry as well as for the analysis of the results obtained. In addition, there were on the staff one copy typist and one previously untrained Yoruba girl who acted as interpreter and social worker.

Histological examinations of material from cancer patients and autopsies were carried out by Professor Edington and his staff in the Pathology department, which included the department of Haematology. In the case of patients of Adeoyo Hospital, the pathological diagnoses were made by the Specialist Pathologist there.

All the planning and carrying out of a number of subsidiary sociological surveys as well as the survey of Kaposi's Sarcoma in

Nigeria were the sole responsibility of the present writer.

It is, however, in the nature of things, impossible to complete a survey of this kind without the co-operation of a great number of interested persons. In fact, good public relations are essential to the success of such an enterprise and it is precisely in those areas where public relations were poor that the gaps persist in our knowledge of the Ibadan cancer situation.

At the outset, therefore, an effort was made to attract the attention and enlist the help of representatives of as many medical interests as possible. With this end in view, a large Cancer Research Committee was formed, containing consultants in all the major specialities from both large hospitals and the Mission Hospital as well as the head of the General Practice Clinic. It was the intention that this main committee should hear progress reports at three monthly intervals whilst a smaller sub-committee would meet monthly to review cases in which only a clinical diagnosis of cancer had been made.

Private practitioners in the town were approached and asked to co-operate in the research, but few felt a positive desire to do so. Relations between University College Hoapital and the outside doctors were very strained, since the latter particularly resented the combination of a large, new general out-patient department plus a recent refusal on the part of the hospital authorities to allow them direct access to the diagnostic facilities of the pathological or

radiology departments. They were, therefore, definitely disinclined to assist one department in the pursuits of what they tended to regard as a private research interest. On the other hand, the doctors did maintain reasonably good relations with individual specialists and were in the habit, on occasions, of referring to consultant clinics cases which they felt were beyond their competence to treat.

The ultimate aim of any cancer incidence survey is the enumeration of all new cases of malignant disease arising in a defined population during a specified period of time. This is practically unattainable, even under the best conditions in societies with enlightened populations, with expert and conscientious practitioners, vital statistics and immaculate hospital organisation. How much more difficult, therefore, was it to achieve anything like satisfactory results in a situation similar to that of Ibadan in the early 1960's, without vital statistics, with variable diagnostic facilities, dependant always upon those patients who elected to visit hospital rather than patronise their own local herbalists, diviners or barber surgeons.

The survey had therefore reluctantly to settle for the relatively unsatisfactory but more modest object of enumerating all new cases of cancer[1] diagnosed in residents of Ibadan who attended Ibadan hospitals

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1 Including mixed parotid tumours, adamantinoma, osteoclastoma and secretory ovarian tumours.

during the period from April 1st 1960 until March 31st 1963.

The period of residence which was laid down was for one year prior to first attendance at hospital. This limitation would, it was hoped, exclude these sick people who had come to Ibadan simply in search of treatment.

At the same time, however, whilst carefully identifying the Ibadan cases, all cases of cancer from whatever place or source, if they had been diagnosed in Ibadan hospitals, would be enumerated, as it seemed desirable to achieve, with only slightly more effort, a simultaneous record of the relative ratio frequencies of all the different types of malignant diseases which were encountered.

It should be noted at this juncture that a number of mission hospitals in the Western Region had, over the years, developed the habit of periodically forwarding histdogocial material to the Pathology department at University College Hospital for examination and specialist opinion. And several Western Region Government hospitals looked towards the Adeoyo Pathology Department for a similar service. Specimens of this nature were often accompanied by minimal identifying data, their inclusion, however, would make the final components of the totals for non-Ibadan cases more like the many past African series which were based upon material sent to a central laboratory.

FIGURE 6.

MALE

IBADAN CANCER REGISTRY

(Ibadan Cancer Research Committee) No

This card will be collected by the Secretary.

Please register as soon as possible all known or suspected cases of cancer, including leukaemias, mixed salivary tumours, Hodgkins disease, etc.

Date: Ward

Patient's Name:

Hospital Number:

Address:

Age (Estimated / Stated)

Site of Tumour

Type of Tumour

Method of Diagnosis: (Biopsy / X-ray / Clinical)

Reason for non-admission to hospital if not admitted:

Disease too advanced

Patient told to return

Patient unwilling

Referred to

Signature of Doctor

NOTIFICATION CARD FOR MALE CANCER CASES

METHODOLOGY OF THE SURVEY

The unit of measurement was to be a new case of cancer, not a diagnosis of cancer. This is an important distinction as patients with, for example, carcinoma of the cervix, might have a diagnostic biopsy followed by operation and might subsequently come to autopsy. Or the same patient might attend several different hospitals, sometimes varying the name which they gave[2] to records clerks.

The main means of obtaining the initial information on a possible case of malignant disease was to be notification of the Registry by the use of the card which is reproduced in Figure 6.

With this end in view supplies of the cards, which had been specially designed for the purpose, were placed prominently in every out-patient clinic, ward, radiology and pathology department and in the operating theatres. Every person who might have occasion to diagnose a case of cancer was made personally familiar with the card and with its purpose. Opportunity was taken on this and many subsequent occasions to stress the importance of early notification, at the first suspicion of malignancy, since misdiagnosed cases could subsequently be deleted from the register, whereas a case

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2 This was not a deliberate device on the patient's part designed to deceive doctors. Yorubas are given a number of names at birth by different relatives. The idea of a "Christian" name is meaningless to a non-Christian, and a Moslem may assume a special Moslem name at the time of his conversion. From circumstantial evidence, however, it is usually not difficult to identify patients.

diagnosed and sent home without notification was lost without a trace. It was further emphasised that multiple notification of the same case by several different departments was infinitely preferable to no notification.

The writer or the interpreter, Mrs. Akinpelu,[3] was to visit all wards and out-patients in University College Hospital daily, Adeoyo once weekly and Oke Offa at longer intervals for the purpose of collection completed cards.

Notification cards were filled in numerical order as they were received and all cases of suspected cancer were at the same time entered in sequence into a large register containing name, age, sex, address, diagnoses,[4] and X-ray or histological examination numbers.

An alphabetical cross register of patients was also kept. These cards included the identifying cancer registry number as well as the name and were filed according to the second name which a patient gave.

As information on the patient was accumulated, relating to sociological data, diagnosis, and whether radiological or histological examinations or autopsy had been performed, these details were eventually transferred to a marginal punched card which was

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3 The social worker/interpreter will be subsequently referred to by her name.

4 Including International Classification of Disease number.

marked by hand.[5]

For every Ibadan patient who was definitely diagnosed, a coloured pin was entered upon a large scale map of the city in the approximate neighbourhood of his house. The purpose behind this was an initial suspicion that patients living close to the hospitals might be more inclined to attend than those who lived on the periphery.

Allthese procedures relating to records were carried out both for Ibadan and non-Ibadan patients alike.

Once the registry was aware of a suspected case, Mrs. Akinpelu would try to contact them and carry out a brief interview in Yoruba or English along the lines which are indicated in the sheet in Appendix II. The registrar (C.M.U.M.) or Mrs. Akinpelu were ready at any time to visit a patient in the ward or in an out-patient department or, if necessary, to pursue them home for this purpose. This rather general list of questions was to be asked of every available cancer patient whether or not they came from Ibadan.

Many of the questions related to marital circumstances, child-bearing and child rearing and were consequently of little relevance for most patients. The nutritional data which was requested did not

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5 The benefits of this particular form of record keeping were not realised until eighteen months had passed, necessitating much work in transferring accumulated information on all previous cases on to hand punched cards.

specify quantities used or to what time in the patient's life the information applied. The question about jaundice (called in Yoruba, "yellow fever") was phrased to allow of a wide range of incidents.[6]

The native medicine list comprised a number of well-known herbal mixtures used for such conditions as fever, convulsions and jaundice

When a patient did not know their age, they were presented with a number of events in a historical calender which had been drawn up by a local authority on Ibadan history. The full list of historical events is given in Appendix 3 associated with the estimated ages of patients who could recall individual incidents.

The patient's address was to be the subject of particularly careful questioning and, if they lived in Ibadan, they were asked to locate their dwelling by describing local landmarks since the method of house numbering, designed for tax collection purposes, is extraordinarily confusing and it was thought that it might sometimes be necessary to visit patients at home.

Once all the information from interview sheets had been transferred to the punch cards, these sheets were filed in order.

When a patient came on to the register, from any source, the

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6 It seemed as though patient and questioner were often misunderstanding one another on this item, as some people gave answers like, "Twelve times a year". Some Yorubas regarded inflamed as well as yellow eyes as meaning jaundice.

registrar collected all items of information which were relevant to the establishment of a definite diagnosis. Only when this had been assured were the punch cards completed and filed according to type and site of tumour.[7]

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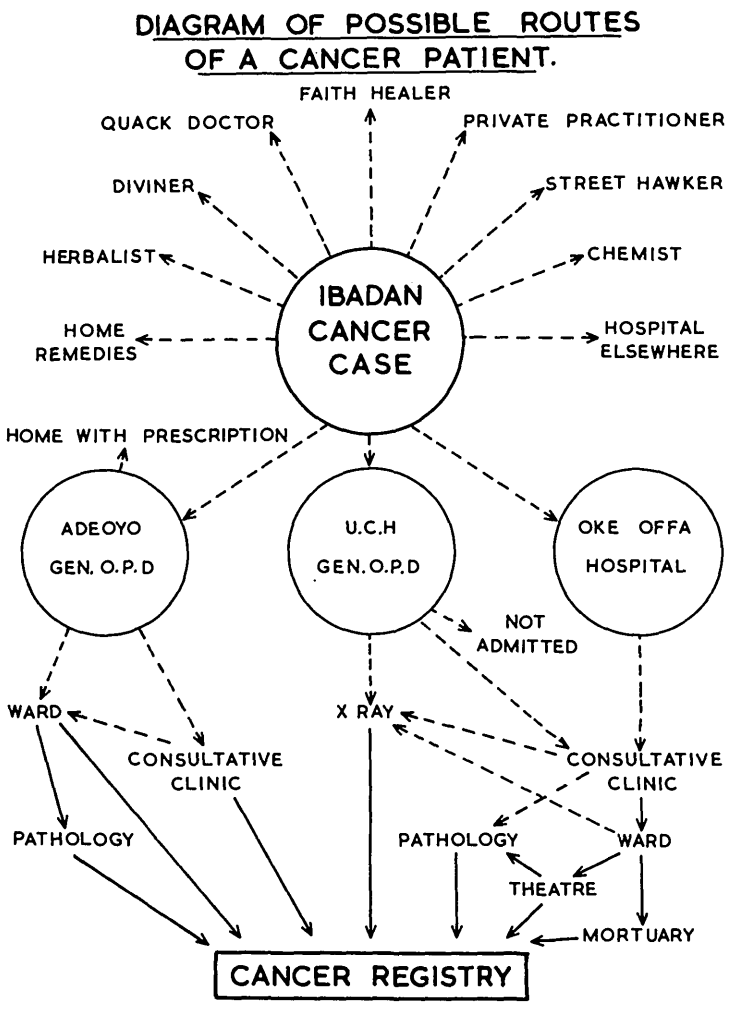
7 International Classification of Diseases, Injuries and Causes of Death, 1948, W.H.O., Geneva.

FIGURE 7.



THE BROKEN LINES INDICATE POSSIBLE OR CERTAIN LOSS OF THE CANCER PATIENT TO THE REGISTRY. A PATIENT MAY BE LOST EN ROUTE FROM ONE HOSPITAL LOCATION TO ANOTHER THROUGH FAILING TO KEEP AN APPOINTMENT OR REFUSING TREATMENT. THE UNBROKEN LINES INDICATE CERTAIN INFORMATION TRAVELLING TO THE REGISTRY ABOUT THE CANCER PATIENT.

DIAGRAM OF POSSIBLE ROUTES OF AN IBADAN CANCER PATIENT

CHAPTER V

PROGRESS AND PROBLEMS OF THE RATE SURVEY

Merely to describe the original methods by which it had been intended to collect information on cancer cases in Ibadan would be to leave an incomplete and misleading impression.

The value of an account like the present one lies not simply in a record of results but in an honest account of the difficulties and deficiencies which were inherent in the actual situation. As Gilliam has observed,[1] with reference to African cancer surveys in general, "Only those in a position to make local and critical appraisal of the factors (involved) can estimate the sturdiness of these reeds upon which reliance must be placed".

The present chapter will therefore attempt to describe the working of the Cancer Registry in practice, as well as providing an intermediate review of the range of malignant conditions which were being met with during the earlier stages of the survey.

The original notification system had been designed without any positive inducements such as, for example, the financial rewards

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1 See p. 19 supra.

offered in some countries. As it had seemed as though the notification of virtually every case would be the responsibility of some member of the staff of an Ibadan hospital, such tangible encouragement was never seriously contemplated. There was at the outset much enthusiasm for the project, so much so that doctors could be heard complaining because they had been ommitted from the main Cancer Research Committee. Early meetings of this body were well attended and large numbers of suggestions of a rather general nature were forthcoming, together with clinical reminiscences on cancer cases seen in earlier Ibadan days.

A more practical urge towards success dominated for a time the more manageable meetings of the sub-committee, whose members expressed a positive determination to ensure notification in their own spheres of influence.

Unfortunately, however, the good intentions of a delegate from one clinical department could not control the behaviour of other members of the same department who were entirely responsible for the cases under their care. Nor were members of the pathology department, in whose premises the registry was situated, in any position to dictate tactics to the heads of clinical departments.

This is not to suggest that there was any positive ill will towards the project or the process of notification, but simply to make clear that not every department had formulated a definite

policy regarding responsibility for notification. Within the departments of medicine and surgery at University College Hospital, for example, although individual consultants looked with favour upon the scheme, few would often actually go the length of completing notification cards, nor did the departmental heads delegate this duty specifically to registrars or housemen.

The situation in the department of obstetrics and gynaecology, however, left nothing to be desired. This department was already running a small register of malignant gynaecological cases for their own purposes, as they were engaged upon research into chorionephithelioma and ovarian tumours.

The head of this department insisted that every case should be notified to the Cancer Registry immediately upon detection in the out-patient clinic by the consultant or registrar who first saw them, cards were to be carefully completed and a dated rubber stamp put on the case folder to indicate that notification had taken place. Frequently the staff of the gynaecological clinic called the registry by telephone to warn that an advanced case of cervical carcinoma was about to be sent home,[2] so that an interview could be conducted on the spot. Furthermore, because of

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2 Every suspected case of carcinoma of the cervix had a biopsy.

the marking of case folders, patients with malignant disease were easy to locate in the wards. There was complete co-operation at every stage and periodic cross checks were made between the data on cancer patients as collected by the Cancer Registry and that which had been carefully sorted and listed in the parent department. It can therefore be said with confidence that every case of malignant disease of the female genital tract which was seen at University College Hospital came to be registered.

The head of the general out-patients clinic at University College Hospital was equally conscientious and imbued the rest of the staff with the necessity of notification at this, the earliest stage, of a patient's passage through University College Hospital. By this means many cases were traced which escaped subsequent notification in a surgical or medical consultant clinic.

A very large number of cases of malignant disease underwent X-ray examination at some point in their observation and the radiology department was very efficient in the matter of supplying notifications.

Naturally, the pathology department took a particular interest in supporting the project and those cases which were not actually notified on a card could be easily discovered by the regular scrutiny which took place of pathological reports and autopsy records.

In fact, although daily visiting of the wards and out-patient clinics did not bring in as many notifications as had been hoped for, there were many other means of discovering the presence of suspected cancer cases. The nursing staff were extremely co-operative and soon learned to report any hints they had picked up regarding possible cases, these suggestions could then be checked by a study of the case notes.

A further source of information was the records officer, who undertook to supply lists of cancer cases admitted to the wards from consultant clinics. The quality of his secretarial staff was rather variable and the time between the production of such lists was sometimes rather lengthy. Nevertheless in certain instances they supplied invaluable clues. And the disease index which was slowly being built up in the records department was also periodically checked against the Cancer Registry's lists of particular tumour types.

The haematology department worked very closely with the Registry, as it had a special research interest in leukaemia and the chemotherapy of malignant lymphomas.

Scrutiny of the operating lists, casual conversations, simple observation of patients, none of these means were neglected in seeking out cases which had entered University College Hospital. Yet in spite of all these intervening sources of data it was occasionally the case that a patient was only discovered to the Registry after autopsy.

The only possibly serious gap in knowledge of cancer cases coming to University College Hospital may have been among patients with advanced breast cancer seen once at a consultant surgical clinic and sent home without further investigation or treatment. In spite of the help given by the nursing sister in the surgical out-patients' department, these were very busy clinics, she could not persuade some members of staff to fill in notification cards and some cases might have escaped her attention or that of her less interested subordinates. Cases of advanced prostatic malignancy, though sometimes also diagnosed on clinical grounds alone, generally reached the radiology department in the process and so were picked up.

Continual efforts were made to maintain interest in the cancer survey in different quarters. To this end circulars were issued from the Registry at regular intervals, reporting on progress and reiterating the importance of early notification. Three monthly "statements of account" were presented to the Cancer Research Committee, in which the current totals for each type of cancer and the relative ratio frequencies were set out. In spite of this, the tendency continued in some quarters to assume that all cases would eventually be bound to gravitate towards the pathology department in the process of diagnostic investigations. But this was not necessarily the case since, when an unfavourable histological report was received, it might be decided to discharge a hopeless case of

malignant disease forthwith and, although the patient could be indexed as an example of a particular tumour, they might by then be beyond the reach of interview and the confirmation of their age and address.[3]

Such was the situation at University College Hospital where, whatever the minor failures in organisation, cases nevertheless were being discovered in relatively large numbers at a steady rate.

The staff at Adeoyo Hospital was very much smaller and easy to contact individually. At informal weekly meetings all consultants were most co-operative and only too willing to describe any cases they had recently encountered in ward or clinic. The pathologist laid his records open to inspection and on occasions proffered slides for comment. Operating lists here were also regularly scanned.

In the general out-patient department of Adeoyo, however, where doctors[4] were engaged in the rapid disposal of large numbers of patients, the impression had always prevailed that cases of malignant disease were extremely rare in Ibadan. So indeed it seemed to be in their experience since they evidently did not find occasion, or time, to complete any notification cards.

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3 Those cases only discovered following autopsy naturally represented the ultimate in this category since by then all hope of obtaining accurate social data had to be abandoned.

4 Some of them were local private practitioners who took clinics on a sessional basis.

The record system at Adeoyo was of such a primitive and disorganised nature that no useful purpose could be served by examining it. It seemed, however, that cancer cases reaching the consultant clinics or, through them, the wards or pathology department, were certainly being reported to the Registry. Mrs. Akinpelu, who accompanied the registrar on these weekly visits, carried out interview in the wards and also questioned the ward sisters or orderlies regarding cases which might have passed through their hands.

The doctor at Oke Offa seldom encountered gynaecological conditions of such seriousness that it was necessary for him to seek an outside opinion. In these cases, however, there was an arrangement whereby cases were referred to the University College Hospital Department of Obstetrics and Gynaecology and so came to the notice of the Registry.

There was frequent contact between the doctors at the chest clinic and Jericho Hospital and the registrar of the cancer survey. No case of cancer was in fact ever reported through either of these small medical units.

Members of the sub-committee whose purpose it had been to consider individual clinical diagnoses of cancer began to lose interest in a task which was largely superfluous. Cases in real doubt could always be the subject of special discussion between the cancer registrar and the consultant concerned. As it seemed impossible to maintain anything like full attendance at these sub-committee meetings, their gatherings became gradually more infrequent and

after eighteen months had ceased altogether, with no regret on the part of anyone concerned.

The survey had become much less of the passive waiting for cases to be registered which had originally been envisaged and had taken on the form of a very active search for any word or trace of cancer patients seen by the medical personnel of Ibadan's hospitals. Constant vigilance was necessary, not only to ensure detection from the various clues which were received but to substantiate the evidence in each particular instance.

It appears, in retrospect, as though much of the energy employed in the attempted interview of all kinds of patient, from within or beyond Ibadan whether suffering from common cancers or with very rare tumours, was misdirected. The basic aim was, after all, primarily to carry out an incidence survey. The elementary form of questionnaire upon which interviews was based did not derive reasonably from specific hypotheses regarding possible carcinogens and was being applied to a variable proportion of cases.[5] Moreover, and this is most important, since no controls were used there was to be at the end no means of finding out whether the sociological data obtained from cancer patients was in any way unusual.

In the application of the questionnaire, a number of points emerged. Firstly, many Yorubas, especially old people, could see

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5 Final percentage of Ibadan cases in whom an interview was completed was 35.5.

little value in the exercise and either refused flatly to co-operate[6] or else were difficult to bring to the point. Furthermore, it was precisely these elderly persons for whom the calender had been devised who were least inclined to co-operate upon its contents and, in this respect, old women showed notably less interest in and regard for local history than their male counterparts.

Children could not be directly questioned and their parents' visits were sporadic and liable to pass without the nursing staff contacting the registry.

Some patients again were simply too ill to talk by the time they were located, whilst a few spoke neither Yoruba nor English.

It was no part of the purpose of the survey to carry out follow-up studies on cancer cases but in a number of instances patients were sought at home to elucidate some point. A most distressing state of affairs was brought to light. Patients with hopeless malignant disease would be discharged from hospital, possibly after a palliative operation or sometimes simply a biopsy. Whilst in hospital they had at least benefitted from drugs and dressings. Subsequently they might be given appointments to attend surgical out-patient clinics when new prescriptions would be issued. But as their condition worsened they were unable to come up to the

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6 Particularly old women.

hospital and, since none of the private practitioners were in the habit of visiting anyone at home they were obliged to rely for their last days upon local remedies or such mild analgesics as chemists or street hawkers purveyed.

The discovery of one individual patient in the town took, on average, a whole morning's searching. Although those cases which were visited were given drugs and dressings, it was reluctantly realised that the proper care by the small Registry staff of all registered patients after their discharge would have been so time consuming as to deflect the survey entirely from its original aim.

REVIEW OF PERIOD APRIL - DECEMBER, 1960

By the end of December 1960, the situation could be reviewed and in the Annual Report of the Department of Pathology (1960) an account was provided of the first nine months working of the registry.

During this time, 640 cases of suspected malignant disease[7] had been notified. 418 of these were histologically proven to be malignant and a further 39 were accepted on clinical and radiological ground. That is to say, out of 457 cases of malignant disease, 91 per cent were histologically confirmed. It was considered that the clinical findings in the remaining 183 patients

7 From within Ibadan and beyond it.

did not justify their inclusion in the register, some had been notified from the general out-patients' clinic on an early suspicion of malignancy which later investigations had not sustained.

Most cases which were suspected of malignancy were admitted for observation and treatment. There had, however, been 92 cases (14 per cent) which did not get beyond the out-patient clinics.

Some of these were in an advanced stage of disease when first seen and a clinical diagnosis of advanced carcinomatosis was followed by the decision that a bed could not be spared for them. Others were referred to a consultant clinic from the general out-patients' clinic but defaulted and did not continue their investigations. A few, offered admission and possible operation, refused such treatment.

Many of these ninety-two cases were not sufficiently investigated for the diagnosis to be firmly established and consequently were not included in the register. It is important to bear in mind the existence of such a group of out-patients with varying tentative diagnoses, whose inclusion, on less strict criteria, might have raised the final estimated incidence rates for cancer.

The largest single group who did not enter hospital, however, were patients with advanced carcinoma of the cervix and in all of these the clinical diagnosis was confirmed by out-patient biopsy and they took their place in the register.

The larger categories into which the ninety-two non-admitted

cases could be divided were, twenty-nine cases of abdominal malignancy, ranging from suspected hepatomas, through possible Wilm's tumours to carcinoma of the rectum; nineteen cases of advanced carcinoma of the cervix; ten cases of breast cancer of whom some were too advanced for operation whilst others declined it; seven jaw tumours of various sorts, mainly lymphosarcomas (Burkitt Tumours).

Appendix 4 lists the ninety-two cases of malignant disease, in order of presentation, which had been suspected of malignant disease in the period April - December 1960 but not admitted to hospital.

Regarding the 457 cases which were finally accepted by the end of December 1960 as having malignant disease, out of 418 histologically proven, 154 had come from Ibadan. Of the remaining 39 patients whose tumours were diagnosed clinically or on a combination of clincal and radiological evidence, 14 had been Ibadan residents. (Overall percentage from Ibadan = 38). Details are given in Table V.

TABLE V/

TABLE V

ANALYSIS OF 39 PATIENTS* SUFFERING FROM A MALIGNANT CONDITION DIAGNOSED CLINICALLY AND RADIOLOGICALLY, APRIL - DECEMBER, 1960

Carcinoma of prostate	8
Carcinoma of breast	9
Lymphosarcoma	4
Carcinoma of stomach	4
Secondary malignant deposits in bone	4
Ca. thyroid with secondaries	1
Osteogenic sarcoma of femur	1
Carcinoma of mouth and tongue	2
Carcinoma of pharynx	1
Carcinoma of rectum	1
Carcinoma of colon	1
Carcinoma of head of pancreas	1
Carcinoma of bladder	1
Adamantinoma	1

*From Ibadan and beyond

In Appendix 5 may be found the preliminary analysis according to type and site of tumour of 418 tumours registered and confirmed histologically in this early nine month period. Table VI summarises some of the data at that time with reference to source of cases and whether they were histologically confirmed or not.

TABLE VI

IBADAN CANCER REGISTRY 1st APRIL - 31st DECEMBER 1960

SOURCES AND MODES OF DIAGNOSIS OF CASES

Total suspected cases notified to Registry	= 640	
Total cases in whom diagnosis was confirmed	= 457	
Of these, number histologically confirmed	= 418	(91.2%)
Number clinically diagnosed	= 39	
Total cases from Ibadan	= 168	
Of these, number histologically confirmed	= 154	(91.6%)
Total number of cases accepted from Adeoyo Hospital	= 36	
Number of Ibadan cases from Adeoyo Hospital	= 15	

By now, however, a surprising state of affairs was revealed. Although there had been 457 cases of reliably diagnosed cancer, only 36 of these (7.9 per cent) had come through Adeoyo Hospital. In fact, only 15 of the 168 Ibadan cases of cancer had been recognised in that

hospital over the whole nine month period. This was a situation which would require explanation.

At the same time, on the basis of the total number of Ibadan cases so far diagnosed and on the assumption that the total population was probably close on half a million people, the annual crude incidence rate for all forms of cancer could only be in the region of 44 per 100,000. Unless cancer was indeed very much rarer in the Ibadan African population than in Western communities, this must be regarded as a minimum estimate even when the differing age structure was taken into consideration. Obviously it was going to be important to try to discover whether Ibadan people were making full use of their hospitals and to form an impression of how far they were continuing to employ alternative local methods for treating illness.

CHAPTER VI

THE INITIAL SUBSIDIARY SURVEYS

In the last two chapters of this study the objects, organisation and methods of the Ibadan Cancer Survey were described and two aspects of the results obtained at the end of nine months were given prominence. The first of these was the surprisingly small number of cases of cancer which apparently were being diagnosed in Adeoyo hospital, although it received many more general out-patients than University College Hospital.[1] The ratio of notifications per 10,000 new out-patients had been thirty-five at University College Hospital and only five at Adeoyo.

Secondly, although it was realised that the population structure of Ibadan contained a preponderance of young people and that therefore crude cancer incidence rates were not particularly instructive, there remained the suspicion that possibly large numbers of patients were choosing not to attend hospital. It became a matter of some urgency to investigate this aspect of community behaviour, even although it would not be within the power of the medical personnel to alter it.

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1 In nine months about 80,000 general out-patients had been seen at Adeoyo compared with 20,000 at University College Hospital.

During 1961, therefore, a comparative survey was undertaken of general out-patients attending Adeoyo and University College Hospital, with the aim of discovering the types of conditions which were being diagnosed in the two institutions and thereby possibly throwing some light on the disparity between them. It seemed important to discover whether the range of complaints which induced some patients to visit University College Hospital was any different from those which prompted attendance at Adeoyo.

This survey and some of the conclusions which were drawn from it will now be described, making no attempt to disguise the deficiencies of method from which it suffered.

METHOD AND SCOPE OF COMPARATIVE SURVEY OF OUT-PATIENTS

There were no adequate records available on Adeoyo out-patients. It was therefore decided to observe them directly, and to this end Mrs. Akinpelu arranged to be present at a succession of general out-patient sessions.

As each new patient came forward to be seen by the doctor in charge, their age, sex and residence were recorded. The doctor, after his examination or questioning of the patient, supplied a diagnosis and informed Mrs. Akinpelu whether he intended to refer the case to a specialist clinic.

A total of 489 cases were surveyed in this way, 200 of them were seen in the paediatric clinic whilst the adults came from the general medical out-patients clinic (about 200) and the casualty department (about 100). These proportions were thought to be the ones which prevailed among Adeoyo out-patients as a whole.[2]

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2 According to the judgement of a Nigerian medical consultant who had worked there for many years.

The Adeoyo survey took place early in July 1961 and for purposes of comparison the records of the first 489 general out-patients who had been seen in the non-consultative clinics at University College Hospital during July 1960 were examined and analysed.

The University College Hospital case records were reasonably detailed and were often supplemented by the results of laboratory and X-ray investigations. The diagnosis was invariably clear and, if it had not been expressed in words, could be deduced from the contextual material. However, the diagnosis in the University College Hospital cases was sometimes only established after a number of attendances whereas with the Adeoyo patients the condition had to be named on first sight.

In Table VII can be seen an analysis of the two groups of out-patients according to their reported residence, whilst their age distribution is shown in Table VIII.

TABLE VII

RESIDENCE OF OUT-PATIENTS SURVEYED IN U. C. H. AND ADEOYO

	Ibadan		Non-Ibadan		
	No.	%	No.	%	Total
U.C.H. general out-patients	406	83	83	17	489
Adeoyo out-patients	465	95	24	5	489
TOTAL	871	89%	107	11%	978

Erratum: Page 132 appears to be missing but this is due to an error in page numbering.

TABLE VIII

AGE DISTRIBUTION OF OUT-PATIENTS SURVEYED IN U.C.H. AND ADEOYO

Age	ADEOYO			U.C.H.
	Casualty and Gen. M.O.P.D.	Ch.O.P.D.	Total	Gen.O.P.D.
0 - 4	1	164	165	148
5 - 9	3	28	31	38
10 - 14	58	3	61	27
15 - 19	87		87	32
20 - 24	42		42	41
25 - 29	29		29	62
30 - 34	21		21	25
35 - 39	26		26	29
40 - 44	11		11	23
45 - 49	5		5	18
50 - 54	6		6	16
55 - 59	1		1	10
60 - 64	3		3	13
65 +	1		1	7
Totals	294	195	489	489

As there had been discussion elsewhere in Africa[3] as to whether elderly women are less likely to attend hospital than are elderly men, the older patients were analysed according to sex.(Table IX/)

3 See pages 65, 67, 69 supra.

TABLE IX

SEX OF OLDER OUT-PATIENTS (over 40 years)

ATTENDING ADEOYO AND U.C.H.

Age Group	ADEOYO			U.C.H.		
	M.	F.	Total	M.	F.	Total
40 - 44	8	3	11	12	11	23
45 - 49	-	5	5	11	7	18
50 - 54	3	3	6	9	7	16
55 - 59	1	-	1	6	4	10
60 - 64	2	1	3	8	5	13
65 +	-	1	1	4	3	7
TOTALS	14	13	27	50	37	87

Since neither of the groups of out-patients were random samples it is not possible to make statistical comparisons between them. However, within the small Adeoyo group of adult out-patients, who were simply seen in order of presentation at the clinic, there was virtually no difference in sex of the patients whereas the University College Hospital group did contain a higher proportion of elderly men

than elderly women.[4]

REFERRAL OF PATIENTS

Out of the 489 Adeoyo patients, only 33 (7 per cent) were referred to other clinics or directly admitted to the wards. The diagnoses of all thirty three were carefully considered, as it was among such cases that instances of malignant disease might have been found. However, there were only two cases which could have seemed even faintly suspicious, one was a case of inguinal adenopathy in a boy aged 16, and the other was a child said to have a hard mass below the right jaw.

The proportion of University College Hospital patients who were referred was very much higher, 36 per cent (179 cases). The actual diagnoses in these cases were not analysed since it was already well-known to the Cancer Registry that virtually all cancer cases suspected in the General Out-patients Department subsequently reached a consultant clinic.

DIAGNOSES OF PATIENTS

The diagnoses provided by each group of patients were classified according to an adaptation of the International Intermediate List of 150 Causes (1948). The results are seen in Appendix 6.

But before comparing the commoner diagnoses which were current in either hospital, it should be recalled that these two sets of

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4 See also p. 94 supra

out-patients were not in fact strictly comparable. In the one case, as has been already explained, all patients who attended Adeoyo in search of treatment were seen in order of arrival, until the day's session ended at 2 p.m. Whilst at University College Hospital, on the other hand, there had already been a deliberate selection from among the waiting patients of those who appeared most obviously in need of attention, with the dismissal of all those whom cursory questioning and observation suggested were malingering or only mildly ill. The principles underlying this selection were the degree of the patients' need, the availability of sufficient doctors in the clinic to examine each one adequately and, finally, the interest which their condition promised as subject matter for teaching students.

This "sorting" had effect not only upon the conditions ultimately diagnosed at University College Hospital but also upon the age distribution of the patients, since those schoolboys and young persons who turned up with minimal symptoms were summarily dealt with, whereas ill-health in an older person was more seriously regarded from the outset.

Another evident result of selection is the marked difference in the total patients seen in the two hospitals over a comparable period of time (cf. 80,000 : 20,000 in nine months).

But even if it were supposed that the Adeoyo out-patients were

diluted as much as four times by minor complaints, it is surprising to find tuberculosis being diagnosed thirty two times at University College Hospital as compared with four times at Adeoyo.

The groups of patients covered by the survey had unfortunately been much too small to produce significant numbers of diagnoses of malignant disease. At the rate of 5 per 10,000 cases, which was calculated for Adeoyo on the basis of the first nine months of the survey, no instance of cancer could be expected to be found. On the other hand, the total cancers disclosed in these 489 University College Hospital out-patients in July 1960 turned out to be even higher than expected[5] since five malignant neoplasms were diagnosed in this group.

Among University College Hospital out-patients it will be noted that there were seven diagnoses of some type of heart disease and five diagnoses of hypertension, whilst there were apparently no instances of cardiovascular disease among Adeoyo out-patients. Peptic ulcer was suspected six times at University College Hospital and never at Adeoyo. Intestinal obstruction and hernia, seen eleven times at University College Hospital, was only seen once at Adeoyo.

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5 At the rate of 35 per 10,000 out-patients, only 1 - 2 cases would have been expected.

If the figures are looked at from the opposite point of view, noting diagnoses of minor complaints, the situation is as might be expected. Thus at Adeoyo, there were 47 cases in Class A43 (which includes "worms") as compared with 13 cases at University College Hospital. "Malaria" is diagnosed at Adeoyo without the benefit of blood films. In the Adeoyo out-patient group it featured 55 times in contrast to 19 cases at University College Hospital.

Cancrum oris never appeared among the diagnoses in Adeoyo children although "thrush" was often mentioned. Children attending University College Hospital showed five instances of cancrum plus three cases of stomatitis.

CONCLUSIONS

Even when allowance is made for the element of pre-selection of University College Hospital patients, it does appear that a larger range of serious diagnoses were being entertained at U.C.H. than at Adeoyo. Unfortunately it is not possible to say with certainty whether differences were reflecting the types of clinical material presenting at the two hospitals or differences in the degree of diagnostic acumen. In view of the greater leisure and facilities for investigation which the U.C.H. out-patient doctor could command it would, however, be foolish to disregard the aspect of more accurate diagnosis.

Closely related to this is the matter of referral of patients. Very few of the Adeoyo out-patients were being referred to consultants and possibly few deserved it. But the more detailed examination of all Adeoyo out-patients, had it been feasible, might have uncovered more clinical problems deserving of specialist attention.

Without a knowledge of the numbers and ages of patients turned away from U.C.H., it was not possible to judge the significance of the wider spread of the U.C.H. patients in the direction of the older age groups. But if this finding did represent a real difference in the ages of patients seeking treatment at U.C.H. it might help to account in part for the larger number of malignant tumours being discovered there.

Finally, it is tempting to speculate as to what the result might be if all patients coming to U.C.H. were able to receive the amount of detailed investigation which at present is the privilege of only a fortunate few. The present rule of thumb methods of choosing patients to be seen in the clinics at U.C.H. can provide no indication of the actual state of health or disease of the disappointed aspirants for attention. And it is not known what happens to those who are turned away, whether they resort to native medicines, or go to Adeoyo, or try again to secure entry to U.C.H. by subsequent journeys to its portals.

INVESTIGATION OF OUT-PATIENTS' ATTITUDES TO MODERN MEDICINE.

The next problem confronting the survey was how to discover the attitude of the Ibadan population to modern medicine. Although all Ibadan hospitals were visibly beseiged by patients each day, there was no knowledge available about the sick population who might never be demanding hospital treatment.

The town was singularly fortunate in its medical facilities by African standards but still underdoctored and badly served by European standards, as was witnessed, for example, by the plight of discharged cancer cases. Did the community feel the benefits more than the defects of the current medical system, were they grateful for help or critical of the multiple failings of the modern doctors? Particularly in the sphere of cancer, it would not be surprising if the essential helplessness of science had been perceived by people whose opinion was likely to be based on empirical evidence of total cures. Conditions for which the hospitals had been able to establish no successful reputation might well be still receiving treatments of a more traditional variety.

It was at first thought that the conduct of a proper survey of the Ibadan population in their own homes would be beyond the resources of the small Cancer Registry staff. As an interim measure, therefore, it was decided to make use of that portion of the population which was daily presenting at the hospital gates, the general out-patients.

It was fully realised that this would be a highly selected group, in so far as they had already all demonstrated their preference for modern medicine. But a small pilot study of this kind might at least uncover something of the patients' previous experience of hospitals and serve as an indication of the habitual reactions of themselves and their families in the face of illness.

METHOD OF SURVEY

Approximately 250 patients attending the general out-patients department at U.C.H. were interviewed. These were patients who had passed the sorting process and were waiting to be seen by a doctor. Groups of 20 - 25 were seen on ten successive week days in October 1961. Only Ibadan residents were interrogated but otherwise no conscious selection was exercised and the patients were seen in the order in which they happened to be waiting in the queue.

The questionnaire which was used, and which it is to be found in Appendix 7, did not pretend to be comprehensive and the questions were made as few and as simple as possible in order to avoid ambiguous replies. Nevertheless, the quality of the answers seemed to vary with the patients' intelligence. There were also some who resented the whole process, which they regarded as totally irrelevant to their purpose.

The questions were put, in Yoruba, by Mrs. Akinpelu who had by

now gained considerable experience in interviewing.

RESULTS

A total of 246 completed replies were obtained. 179 adults had attended on their own behalf. Children up to the age of 14 totalled 67; in these cases the parent or relative accompanying the child was presented with the questionnaire.

TABLE X

SEX DISTRIBUTION OF OUT-PATIENTS IN ATTITUDE SURVEY

	M.	F.	Total
Adults	80	99	179
Children 0 - 14	38	29	67
Totals	118	128	246

TABLE XI/

TABLE XI

PREVIOUS HOSPITAL EXPERIENCE OF ADULT PATIENTS OR ADULTS ACCOMPANYING CHILDREN

	No.	% of total
First visit to U.C.H.	174	71
Previous experience of U.C.H.	72	29
Previous visit(s) to other hospital(s)	114	46
Previous visit(s) to Adeoyo hospital	74	30
Previous visit to hospitals other than Adeoyo*	43	17.5

*e.g. Oke Offa, hospitals in other towns, private clinics

Apparently the group had a wide experience of hospitals since about thirty per cent reported previous visits to Adeoyo or to U.C.H. Some had been to other hospitals in addition to, or as an alternative to, Adeoyo. Among these, the most commonly cited was the local Catholic Mission Hospital. A few had attended the clinics or private hospitals of general practitioners in Ibadan or elsewhere whilst some had experience of other Government hospitals in the Western Region.

DECISION TO VISIT HOSPITAL

The question was asked since there was a belief current in U.C.H. that Yoruba women could make no important decision of this kind without their husband's consent. The replies to this question are summarised in Table XII. It will be seen that in over half the cases a mother had decided on her own accord to take her child to hospital.

TABLE XII

DECISION PROMPTING HOSPITAL ATTENDANCE OF OUT-PATIENTS

Adults	No.	%
Own decision	77	43
*Advice of relative or friend	102	57
Total	179	100%
Children (0 - 14 years)	**No.**	**%**
Mother's decision	36	54
Father's decision	24	36
Parents' joint decision	7	10
Total	67	100%

* 33 of these were wives who had come on the advice of their husbands.

FAMILY AND FRIEND'S EXPERIENCE OF HOSPITALS

Out of 246 people interviewed, 215 (87 per cent) could recall a member of their family attending hospital. 209 (85 per cent) knew of a friend or friends who had been to hospital. The replies relating to previous attendance of parents at hospital were unfortunately confused, since it appeared that in some cases the parent of a child patient was regarding him or herself as the designated parents, whereas the question had really been intended to refer to the (elderly) parents of adults.

This confusion arose as the result of inadequate definition of the question in the first place and demonstrates the importance of proper care in the preparation of questionnaires of this kind, especially if the inquiries are going to be made in a foreign language.

BEHAVIOUR IN ILLNESS

This question elicited a variety of replies. 76 (31 per cent) of those who were asked admitted to the use of local remedies in their households. Almost twice as many people (147 persons, or 60 per cent) reported that they were in the habit of buying proprietary drugs in the event of illness. Febrifuges, such as A.P.C. and codeine, and antimalarials were frequently specified. A mentholatum ointment by the name of Zorro was apparently very

popular and was liable to be applied to any area or orifice.

Fifty seven people (24.5 per cent) declared that they personally would elect to attend hospital if they became ill.

All these findings are summarised in Table XIII.[6]

TABLE XIII

REPORTED BEHAVIOUR IN THE EVENT OF ILLNESS OF MEMBERS OF RESPONDENTS HOUSEHOLD

	No. of times reported	% of total reports
Use of local medicine	76	30
Use of proprietary drugs	147	60
Attendance at hospital	57	24.5

LIMITATIONS OF THE PILOT STUDY

The limitations of any such set of simple questions given to this kind of group are clear. The behaviour of people in illness is not uniform but dependent upon a number of factors such as the severity of the illness, whether the hospital has a reputation for curing such complaints, a person's previous experience of hospitals

6 The categories are not mutually exclusive.

and medicines, the nearness of the hospital and the likelihood of gaining entry and so on.

It is, moreover, probable that patients waiting within the hospital precincts might well feel reluctant to admit to the use of local remedies which they believed to be disapproved.

Nevertheless, the survey did indicate that this group of people at least were in the habit of making fairly extensive use of available modern medical facilities, to judge by their replies [7] on the subject of previous hospital experience.

But the study could not be expected to reveal anything about the behaviour of the general population of Ibadan, since this out-patient group might well be exceptional both in their use of proprietary European medicines and in their decision to seek hospital help when illness affected their families. Indeed it might have been their own or their friends' previous favourable experience of hospitals which now prompted hospital attendance. Someone who had never had previous occasion or inclination to try this new kind of relief might be less inclined to do so with the advent of serious illness in old age.

It was clear, therefore, that any kind of comprehensive answer to the questions presented to the Registry could never be found upon the hospital premises. The next chapter will describe some of the results which were obtained when this socio-medical inquiry was carried a logical stage further.

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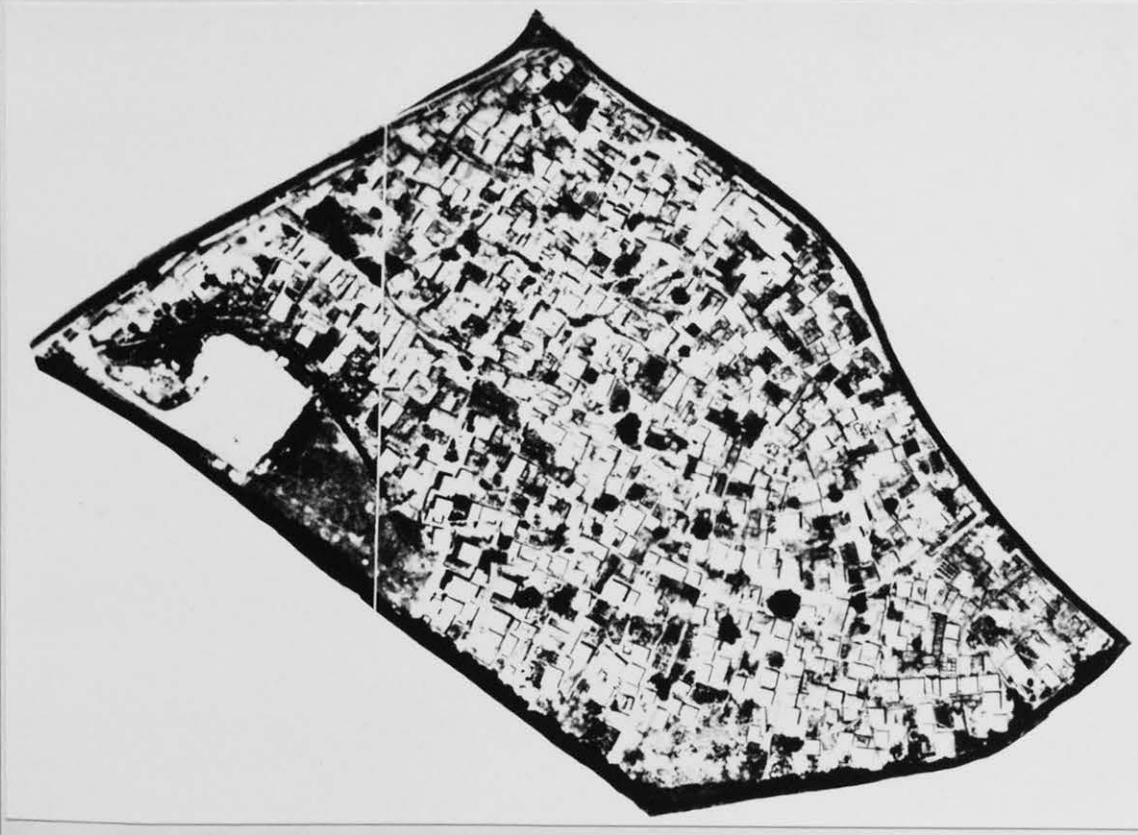
7 These replies were supported by actual names of hospitals.

FIGURE 8.



AERIAL VIEW OF DISTRICT E2, IBADAN WHERE THE ATTITUDE SURVEY ON MEDICAL HABITS TOOK PLACE.

CHAPTER VII

HOSPITALS OR HEALERS ?

AN ATTITUDE SURVEY IN IBADAN

By early 1963 it was possible to undertake in the town of Ibadan itself a study on the subject of local medical practices and the extent to which hospitals were being used as compared with traditional means of treatment.

The study, which began on a modest scale, enlarged as it proceeded and has been reported in detail elsewhere (Maclean 1964). Meanwhile these aspects which are of particular relevance to the cancer survey and the question of the behaviour of potential patients will be described in this chapter.

SURVEY IN DISTRICT E_2, IBADAN: METHODOLOGY

Early in 1963 a survey was undertaken of all the households in a defined rating district or ward of Ibadan with a view to assessing their behaviour in illness. The district was deliberately chosen as being probably representative of the traditional part of the town, lying to the east in the area known as "Old Ibadan", where

the wide expanse of low corrugated roofs stretches unbroken by the modern buildings which define the city's commercial and administrative centre on the south. Apart from the houses being rather more crowded, the architecture and disposition of the dwellings here is in every way similar to that seen in many other large Yoruba villages or conurbations of the Western Region of Nigeria.

The population at the abortive 1962 census had been provisionally placed at 5,790. At about the same time, the W.H.O. tuberculosis survey team had estimated its population at 6,164. An aerial map of the area revealed 528 roofed buildings. The area was subdivided into 21 segments,[1] each containing about 25 houses and each segment was allotted to a student interviewer.[2] The students were instructed to question the household head from each house or compound, or, in his absence, a responsible adult, male or female.

Preliminary identifying data regarding the informant and his age and occupation was followed by a series of questions on the use of native medicines generally, their preparation and source, and

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1 The map segments were enlarged, mounted and had marked upon their margins notes to help in the identification of each individual section. This involved careful preliminary surveying of the area.

2 These were Yoruba students of sociology and economics at Ibadan University who had been instructed in the purpose and method of the interview.

who was the family authority on the treatment of illness. Next came specific questions regarding the treatment of convulsions in children, and the treatment of fever, jaundice and smallpox. The respondents were also asked for their own views regarding what diseases hospitals could treat and which particular hospitals they or their families patronised and for what reasons. Information was obtained regarding their use of local healers, their familiarity with private practitioners (European trained) and whether they ever went to the faith healers of an Apostolic Church sect whose adherents in Ibadan are on the increase. Finally they were questioned regarding the permission, if any, which might be necessary before a mother decided to take a child to hospital. The questionnaire which was used in this survey can be seen in Appendix 8.

SURVEY OF SECONDARY SCHOOL CHILDREN IN IBADAN

To provide a contrast with the situation obtaining among the traditional compounds of E_2 district, it was decided to investigate the habitual behaviour in illness of those families who could afford secondary education for their children. Fourteen secondary schools were approached for their co-operation and the purposes of the enquiry was explained to the headmasters and mistresses concerned. The schools varied widely both in respect of their physical structure and amenities and their educational standards. One was the Government grammar school for boys, the others were privately run or supported by religious organisations of many differing inclinations from Catholic and Moslem to the African Separatist churches.

Questionnaires were issued to those pupils in the highest two forms of the schools whose families were resident in Ibadan. The pupils were first asked to furnish their parents' occupations and subsequent questions covered roughly similar ground to that of the adults' questionnaire except that they were fewer in number.(See Appendix 9).

RESULTS OF ATTITUDE SURVEYS

A total of 506 interviews took place in E_2, 400 of the informants were men and 106 were women. When the members of both sexes are grouped according to educational level, i.e. literate or illiterate, they can be compared with the group which Leighton et al. interviewed in the course of a psychiatric survey of Yorubas in the Abeokuta area some ninety miles south of Ibadan[3]. Leighton and his colleagues used two categories for educational level, namely, "some ordinary education", i.e. formal schooling, and "no ordinary education". The comparison is made in Table XIV.

Table XIV/

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3 Leighton, Lambo, Hughes, Leighton, Murphy, Macklin. "Psychiatric Disorders among the Yoruba", 1963, Cornell University Press.

TABLE XIV

COMPARISON OF EDUCATIONAL LEVEL OF INFORMANTS IN TWO IBADAN ATTITUDE SURVEYS

Educational level	Date and place of survey and sample size											
	Ibadan, 1963 Total 506				Yoruba Village, 1961 * Total 262				Abeckuta, 1961 * Total 56			
	M	%	F	%	M	%	F	%	M	%	F	%
Illiterate	233	58	91	86		82.5		96		49.5		83
Literate	130	33	5	5		17.5		4		50.5		17
Unknown	37	9	10	9		-		-		-		-
Total	400	100	106	100	138	100	124	100	33	100	44	100

* From "Psychiatric Disorders of the Yoruba", Leighton, Lambo, et al. Table VII, p. 160.

It will be seen that the people in the E_2 district of Ibadan resemble closely those in the small Abeokuta sample in respect of the percentage of illiterate persons in the group. The men in the Ibadan survey appear to have been more literate than the Abeokuta area villages but not so literate as the men of Abeokuta town. The group from Abeokuta town was, however, a small one (33 males) and the difference is not significant ($p > 0.1$). The occupations of the informants in E_2 are given in Table XV.

TABLE XV

OCCUPATIONS OF INFORMANTS IN DISTRICT E_2, IBADAN

Occupation	Men		Women	
	No.	%	No.	%
Trader	59	14.8	90	85.0
Farmer	90	22.5	1	0.9
Housewife	0	0	7	6.6
Artisan	121	30.5	4	3.8
Yoruba occupation *	11	2.8	1	0.9
Herbalist or native doctor	12	3.0	0	0
Clerk or teacher	31	7.7	0	0
Other	62	15.5	2	1.9
Not stated	14	3.5	1	0.9
Totals	400	100.3	106	100.0

* e.g. drummer, dyer of indigo cloth, goldsmith, masquerader.

A total of 282 pupils in the highest two forms of all Ibadan high schools were from Ibadan homes. The occupations of their fathers are shown in Table XVI and those of their mothers in Table XVII.

TABLE XVI

OCCUPATIONS OF FATHERS OF 282 IBADAN SECONDARY SCHOOL CHILDREN

Occupation	No.	% of all Fathers	
Farmer	33	11.7	
Trader	50	17.7	39.3
Artisan, driver, contractors, other unskilled occupation	28	9.9	
Teacher	16	5.7	
Doctor	6	2.1	
Civil servant, politician, Chief, pastor, engineer, lawyer, high grade secretarial occupation	125	44.3	52.1
Not stated	24	8.5	
Total	282	99.9	

TABLE XVII

OCCUPATIONS OF MOTHERS OF 282 IBADAN SECONDARY SCHOOL CHILDREN

Occupation	No.	% of all Mothers
Trader	172	60.9
Other unskilled occupation	22	7.8
Housewife	13	4.6
Teacher, nurse, or skilled occupation	48	17.1
Not stated	27	9.6
Total	282	100.0

It will be observed that only 31, or 7.7 per cent of all the men in E_2 were what could be called "white collar workers", the remaining 355 being all in unskilled occupations[4]. By contrast, 52.1 per cent of the fathers of secondary school children belonged to the professional classes.

As far as the women were concerned, 85 per cent of those in the traditional area were traders and nearly 61 per cent of the school children's mothers were also engaged in trade. On the other hand, 17.1 per cent of the mothers of this privileged group had an

4 It is probably a safe assumption that those who did not state their occupation did not have one of any note.

occupation which had involved a certain amount of training subsequent to what had been at least a basic education in school. In the case of those mothers simply notes as "housewives" it is very probable that they did not have any training of this nature and, as in the case of the men, the mothers whose occupation was not stated were most probably actually in the unskilled category.

HOUSEHOLD USE OF NATIVE MEDICINES

The reported use of native medicine in the E_2 households is given in Table XVIII.

TABLE XVIII

REPORTED USE OF NATIVE MEDICINES IN DISTRICT E_2, IBADAN

	No.	%
Always	59	11.6
Sometimes	293	57.9
Never	153	30.2
No reply	1	0.2
Total	506	99.9

When the people who admit to using native medicines, "sometimes" are added to those who declared that they, "always" used them, it transpires that 69.5 per cent of these Ibadan households are still employing traditional modes of healing. This is a higher proportion

than that quoted by Leighton for the Abeokuta area, where 35 - 44 per cent had bought native medicines in the preceding.year. The Ibadan question did not, however, specify the precise period to which the enquiry was relating. The Ibadan proportion is very much higher than the figure obtained by Ioné Acquah in Accra in 1955,[5] when 93 per cent of people questioned had declared that they sought only scientific treatment when ill. But the author of the Accra survey did acknowledge that this result was probably an exaggeration due to concealment of the true state of affairs by shamefaced informants.

Table XIX supplies a comparison between the habitual use of native medicine as reported from the traditional compounds of Old Ibadan and the households of secondary school children.

TABLE XIX

REPORTED USE OF NATIVE MEDICINE BY TWO IBADAN GROUPS OF FAMILIES

	Types of Family			
	School children's homes		E_2 Households	
	No.	%	No.	%
Never	110	39.0	153	30.2
Sometimes	166	58.8	293	57.9
Always	6	2.1	59	11.6
No reply	0	0	1	0.2
Total	282	99.9	505	99.9

5 Ioné Acquah, "Accra Survey".

It will be noted that almost 60 per cent of both types of family, those of the educated élite and those of the less privileged poor, "sometimes" have recourse to native treatments.

USE OF NATIVE REMEDIES AND AGE

When the reported employment of traditional methods is considered in relation to the age of the male informants in E_2 district it is clear that the proportion of men asserting the invariable use of native medicines in their households rises with age, conversely the numbers who say that native medicines are never used in their compounds are highest among the younger men. (Table XX)

TABLE XX

USE OF NATIVE MEDICINES IN E_2 DISTRICT ACCORDING TO AGE OF INFORMANTS (MALE)

Use of Native Medicines		AGE GROUPS						All ages	
	Age NK.	20 - 34		35 - 50		50 +			
	No.	No.	%	No.	%	No	%	No.	%
Always	1	10	8.7	15	9.3	26	20	52	13
Sometimes	1	64	55.1	99	61.2	70	60	234	58.5
Never	0	41	35.6	48	29.7	25	20	114	28.5
Total	2	115	99.4	162	100.2	121	100.0	400	100.0

PERSONAL KNOWLEDGE OF LOCAL MEDICINE

260, or 65 per cent of the male informants said that they themselves prepared native medicines for the family when required. Only 26, or 24.5 per cent of the women who were interviewed were personally in the habit of preparing household remedies.

USE OF NATIVE MEDICINES AND LITERACY

Replies to the questions regarding the use of native medicines have been analysed according to the level of literacy of the informants in E_2 and the results drawn up in Table XXI. None of those who had received a post primary education said that they "alway" used native medicines at home but over 12 per cent of the illiterate group used traditional methods alone. However, this result is not statistically significant

Apart from this finding, it may be observed once more that about 60 per cent of this population, regardless of their degree of education, are still accustomed to using native drugs.

TABLE XXI/

TABLE XXI

REPORTED USE OF NATIVE MEDICINES IN E_2

ACCORDING TO LITERACY OF INFORMANTS

	Always		Sometimes		Never		Total
	No.	%	No.	%	No.	%	
Illiterate	41	12.7	195	60	88	27.2	324
Prim. Sch.	10	9	57	53	41	38	108
Beyond Prim.	0	0	18	67	9	33	27
Other or N.K.	8	17	25	53	14	30	47
Total	59		295		152		506

In Table XXII the same procedure is adopted for the school children's families, analysing household usage of native remedies according to the father's literacy. There was no significant difference in the practice obtaining in the households of literate and illiterate fathers.

TABLE XXII/

TABLE XXII

REPORTED USE OF NATIVE MEDICINES BY CHILDREN OF LITERATE AND ILLITERATE FATHERS

	Use of Native Medicine			
	Never	At Times	Always	Total
Literate Fathers	67	70	2	139
Illiterate Fathers	36	74	3	113
Total	103	144	5	252

There is, however, a highly significant relationship between the behaviour obtaining in the households of children whose mother has had some training for a job and those whose mothers are unskilled. This is brought out in Table XXIII, when the observed difference in proportions of households never using native medicines is more than four times its standard error.

TABLE XXIII/

TABLE XXIII

OCCUPATION OF MOTHERS OF 282 IBADAN SCHOOL CHILDREN AND HOUSEHOLD USE OF NATIVE MEDICINE

Use of Native Medicines in Households	Mothers' Occupation			
	Skilled (48)		Unskilled (234)	
	No.	%	No.	%
Sometimes	17	35.5	155	66.5
Never	31	64.5	79	33.5
Total	48	100.0	234	100.0

CONSULTATIONS WITH NATIVE HEALERS

51 per cent of the families in the traditional area reported that members of their family had consulted native healers, whereas only 27 per cent of the school children gave answers to this effect.

THE EXTENT TO WHICH HOSPITALS ARE USED

The information obtained demonstrated the very widespread use of all these modern medical institutions by the people in E_2 district. In the course of 506 interviews, only 47 people, 9.3 per cent, stated that no-one in their family had ever been to hospital. Eleven of these were adherents of a faith healing cult and four

were native doctors. The results obtained from adults and school children on this question are compared in Table XXIV. There is a remarkably close correspondence in the reported use of hospital facilities by the two groups.

TABLE XXIV

REPORTED FAMILY USE OF HOSPITALS

	School children		Adults in E_2	
	No.	%	No.	%
Ever been to hospital	263	94.5	459	90.3
Never been to hospital	15	5.4	47	9.3
Totals	*278	99.9	506	99.6

* Four children did not answer this question

Most families were found to be patronising several hospitals. In fact Adeoyo was the one which got the most single loyalty but even more families had had experience of both Adeoyo and U.C.H.

PERMISSION FOR TAKING CHILDREN TO HOSPITAL

Contrary to views which have been previously expressed, e.g. by MacGregor (1958), it was not said to be invariably necessary for a

mother to obtain her husband's permission to take a child to hospital. 51 of the women (48 per cent) in E_2 declared that permission was unnecessary and their opinion was upheld by 43 per cent of the men. Some men even remarked that no time should be wasted over seeking permission. However, the majority of men did consider that it was proper for them to be previously consulted

OPINIONS REGARDING HOSPITALS

Opinions amongst adults on the reputation of the two main hospitals for curing specific complaints varied. Some challenged, "How should I know", or "The doctors only know", whilst others were prepared to grant to either or both a knowledge of cures for all diseases. 20 per cent volunteered the view that U.C.H. was for, "serious cases", and 16 per cent were of the opinion that Adeoyo doctors dealt with, "less serious illness". Others perceived a particular skill in the treatment of traumatic or surgical cases by hospitals in general.

THE TREATMENT OF SPECIFIC COMPLAINTS

Responses to the question on the treatment of children's convulsions revealed that 251, or very nearly 50 per cent, of all the households in the traditional area were in the habit of employing a particular native medicine for fits or convulsions. The mixture cited is called, "Agbo tutu", the cold medicine. This

popular household remedy is prepared in a number of different ways but the two basic ingredients are cow's (or occasionally human) urine and tobacco leaves. The latter are steeped while green in the urine for at least 24 hours and the resulting liquid is kept handy in a large pot for use when necessary. This concoction is not merely used in the emergency treatment of convulsions but is taken regularly by many people who also administer it to their young children as a prophylactic. It would be interesting to investigate its possible pharmacological effect. One of the native doctors volunteered the information that, "Agbo tutu causes sleep", and indeed Ibadan paediatricians are familiar with the sight of comatose children smelling strongly of urine when they are brought into the out-patients department.

About 20 per cent of school children reported that native medicines, either alone or with patent medicines, were used in their families for fits.

Against fever, European medicines have proved their worth and almost everyone is familiar with some common febrifuges. However, 35 per cent of people in E_2 still use their own herbal treatments, infusions of one kind or another, powders and salves. An informant remarked, "There are eleven different kinds of fever", but declined to elaborate on his modes of dealing with his defined categories. Only 20 per cent of school children had witnessed the use of native

remedies for fever.

The adults in E_2 were generally familiar with jaundice but 60 per cent of the school children knew nothing about it. (It is tempting to speculate on the possible effect of better sanitation in the wealthier households in decreasing the incidence of infective hepatitis, which is known to be common in the Ibadan population). Approximately as many groups of households in the old town would elect to use native as European treatment for this symptom. Many different preparations were quoted in this connection. One informant said that the patient should take no oil or fat while the jaundice lasted.

Small pox was the subject upon which Ibadan people were most knowledgeable, although a few expressed fear at the very mention of such a dread disease and preferred to avoid all discussion for risk of angering the smallpox god.

The range of treatments is indicated in Table XXV. Incidentally, although most people were aware of the "official" necessity of notification, this did not dispel their distrust of European treatments nor their shrewd perception that such regimes provided no cure for smallpox.

Table XXV/

TABLE XXV

TO ILLUSTRATE THE VARIETY OF TREATMENTS SUGGESTED FOR SMALLPOX

	Response		
	Male Respondents	Female Respondents	Total
Native ointment	159	23	182
Hosp. treatment alone	135	33	168
Hosp. plus ointment	12	2	14
Herbal treatment	41	4	45
Palm wine	18	3	21
Prayer	12	7	19
No treatment known	56	34	90
Total	*433	106	539

* Some of the men suggested several treatments concurrently.

A special ointment was highly recommended and also a medicinal soap, but most people emphasised the danger of washing the patient too soon and attributed to this practice the signal failure of treatment. Others considered the failure of hospital hospital/ methods was due to injections, though the Yoruba type of injection (gbere) was sometimes advised, consisting in this case of

cuts on the chest into which a specific powder was rubbed.

Most people recommended palm wine, both as a drink for the patient who, they said, should not be offered water, and to placate the spirits of the smallpox deity. Some advocated a sacrifice to Shopanna, an offering of beans cooked with corn to be placed outside with the palm wine.

An old woman declared categorically that smallpox was caused by an evil spirit. It would be useless, she said, to treat the smallpox alone, since only through appeasing the spirit by performing certain rituals could relief be obtained. Incantations were frequently specified as a necessary adjunct. "Shopanna will surely kill the patient if any treatment other than the appropriate native ointment is used", one old man stated.

In response to a subsequent question about what conditions were best treated at home, 97 people quoted smallpox in this category. Many other symptoms and ailments were quoted as being particularly suitable for local attention. For example, 26 people indicated that mental illness could receive no benefit from European doctors. "Giri", variously translated as convulsions or tetanus, was quoted by 88 people as an example of an affliction which should have home therapy. Eight warned of the inadvisability of taking to hospital those whose illness was due to witchcraft. Other complaints due for home treatment were impotence, barrenness, swollen testicles, gonorrhoea and disorders of menstruation, all

related to the reproductive system whose correct functioning is a matter of universal concern.

CONCLUSIONS

One ground for criticism of this survey lies in the fact that it was not carried out on a random sample of Ibadan inhabitants. However, the absence of any satisfactory sampling frame made this impossible and it seemed worthwhile to use the method of contrasting groups which had been deliberately chosen on account of their difference.

In the beginning of Chapter II it was emphasised that Ibadan is a town in the traditional Yoruba pattern. The style of houses of the particular area surveyed and the occupations and level of literacy of its inhabitants compare closely with those of other Western Region towns such as Abeokuta. On the other hand, the second group of Ibadan people whose habits were investigated represent the emerging middle class, an élite group whose ultimate influence upon the nation's development is out of all proportion to their small numbers.

It appears that those town dwellers who are still, in a real sense, rooted in tradition have not yet completely abandoned their local remedies in the face of the benefits which the two large hospitals and other clinics can offer. On the contrary, almost 60 per cent of people of every grade of literacy were reporting the

occasional use of native medicines in their homes, although the use of such measures, "always" was most common among the older men. However, at the same time, over 90 per cent of informants were accustomed to using European proprietary medicines and there was a similar widespread use of the hospitals, only 9 per cent of people stating that no-one in their families had ever been to one.

Whilst 65 per cent of the men said that they were responsible for the preparation of medicines for the family, only 24 per cent of the women adopted this role. Women appeared to be less often involved in the personal treatment of illness but almost half of them assumed direct responsibility for taking their children to hospital. In fact some of the old men, who themselves had scant regard for hospitals, deplored their lack of control over the womenfolk in this matter.

On studying the school children's group, an unexpected result was obtained. Practically the same proportion of these children's families were using native medicines, "at times" as were the households in the traditional area of town. Moreover, there was no significant difference in the reported use of native medicines between children whose fathers were literate and those who were illiterate. But on the other hand, there was a striking association between the use of native medicines in the élite households

and the professional status of the mother. 66 per cent of the families where the mother was unskilled were still using native medicine on occasions, but only 33 per cent of families where the mother had received training for a profession continued to maintain this habit.

There are, of course, possible fallacies in depending upon the evidence of school children, especially when some of them were completing questionnaires in a school environment which was known to be hostile to "primitive" practices. However, in the first place, the pupils were allowed if they wished to remain anonymous and, secondly, any falsification would tend to be in the direction of underreporting of native remedies and the figure for the percentage of families using these methods on occasion is already as large as that obtained in the traditional area of town. Further, any tendency to understatement need not be expected to upset the relationship revealed between mother's occupation and family medical habits.

It is probably safe to see in these results the gradual change in women's roles in Ibadan. Formerly women were regarded with ambivalence. They were to an extent subjugated in the domestic milieu whilst at the same time their potentialities were acknowledged in the widespread belief in witchcraft. "The witches are our mothers", as a Yoruba man has said. This is not the place

to explore witchcraft beliefs nor their multiple anthropological interpretations. These beliefs have not yet lost their profound hold upon the African imagination.

But the Nigerian woman is now primarily concerned to obtain what is best for her children. Regardless of men's metaphysics, she will rush to attend antenatal clinics, she will take her sick baby to the paediatrician, she will try for her family not merely the rituals and mixtures approved by the old people of the compound, but also the chemist's patent medicines and the hospital doctor's drugs. When she has received her share of Western style education her intimate control over household affairs will often entail a complete embargo upon traditional remedies. Her commonsense empiricism is undisturbed by considerations that traditional society may be, according to the sociologists, "disintegrating" around her. It is important to realise, however, that the women with an advanced education are still in a very small minority and that older women, beyond the stage of having young children to care for, may still be clinging to traditional methods in the case of their own illness.

FIGURE 9.

INGREDIENTS OF MAGIC MEDICINES FOR SALE IN AN IBADAN MARKET

IBADAN LOCAL HEALERS[6]

There are two broad divisions of native Yoruba healers into the onishegun, who are primarily herbalists, and the Babalawo, or priests of the Ifa cult, who specialise in a form of psychotherapy. The latter employ a number of systems of divination and tend to be consulted for mental complaints. However, it is not correct to erect a firm division between the two types of practitioner or their patients, since the herbalist may employ divination, although it is not his speciality, and the babalawo often advises the employment of certain herbal materials as part of his regimen for cure. Herbalists who have tried several mixtures empirically in a case will, if the patient is not recovering, suspect supernatural or human malevolence and have recourse to divination to indicate its source.

Consultations with native doctors are disconcerting to a Western diagnostician, since the healer is expected to sense his patient's trouble and any questioning relates to the circumstances attendant upon the onset of symptoms rather than to the symptoms themselves. The Yoruba patient is apt to regard such enquiries as, "What is the matter with you ?" as a confession of incompetence, since he quite logically regards the discovery of his illness as the doctor's business.

Both kinds of healers undergo a prolonged apprenticeship before starting to accept patients. The herbalist generally

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6 This is a summary of one aspect of the subject of traditional methods of treatment used in Ibadan which was described at much greater length by the author elsewhere (1964).

begins by assisting in the collection of plants and later observes their preparation and use in different circumstances. The members of the profession take their calling seriously and have associations to protect and further their interests.

A locally published medical literature in pamphlet form is available in Ibadan. These booklets deal with a wide range of remedies for all human ills from cures for barrenness and recipes for success in life and love to vermifuges, ointments and inhalations. The prescriptions represent a fascinating combination of empiricism and sympathetic magic, drugs which may possibly have some pharmocological action[7] being mixed, in a strictly regulated or ritual manner, with other ingredients which bear a close symbolic affinity to the organ or illness treated. For example, one cure for guinea worm involves the employment of coiled white threads. The use of Yoruba medicines is almost invariably accompanied by incantation, a verbal formula which defines in simile the purpose of the particular preparation. Thus, in the case of the remedy for guinea worm, the white threads are ultimately inserted into a snail shell which is then buried, to the accompaniment of these words, "I bury the dead of the guinea worm in my body, let it never attack me again, because the dead never rise into the world again".

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7 The Department of Chemistry and of Pharmacology at the University of Ibadan are both engaged in investigations into this aspect of herbal medicines.

Even herbalists who might, technically, be judged illiterate are concerned to preserve their knowledge for posterity. One Yoruba onishegun is at present accumulating a stack of notebooks filled with prescriptions which he dictates to his school girl daughter.

In the course of the investigation described above, twelve native doctors were found in the group of 400 Ibadan men from E_2 district. Ioné Acquah found 274 native medical practitioners in Accra in 1955. No attempt was made to enumerate all the herbalists and healers in Ibadan, although signboards advertising their presence are a common sight. Eight of the native doctors were over the age of 50. The estimated total male population over the age of 50 in Ibadan at this time was 13,000. There were possibly, therefore, up to 250 native doctors in this age group practising in Ibadan in 1963.

In addition to the herbalists and diviners there is also a group of Hausa[8] barber surgeons, who practice blood letting and uvulectomy in addition to their traditional barbering trade. Cupping, using a cow's horn in which a vacuum has been created by sucking through a hole in its tip, is a popular remedy for pains, strains and swellings of any portion of the anatomy. The operation is performed in public, in the open air, at a cost of from six to twelve pence, according to the barber's estimate of his patient's

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8 Belonging to a Northern tribe,

purse.

Faith healers of several religious sects are gaining adherents. They forbid the use of any drugs or hospital treatment, commanding their followers to rely solely upon the power of prayer and consecrated oil or water.

One further group is the "quack" doctors who, armed with syringes and the vocabularly of modern medicine, adminster dubious mixtures and sometimes lethal injections to the gullible at considerable cost.

CHAPTER VIII

SUBSIDIARY SURVEYS OF MALIGNANT DISEASE

The primary object of the cancer survey in Ibadan was the establishment of minimum age specific incidence rates for cancer in the Ibadan population as a whole. Naturally, however, the mechanism which had been set up for recording cases and obtaining the maximum information about every kind of malignant disease had provided an excellent opportunity for considering certain special aspects of the prevailing pattern of cancer in Nigeria and these opportunities were not neglected.

RETICULO ENDOTHELIAL TUMOURS

During 1960 and 1961, out of 1,038 tumours which had been accepted by the Registry as definitely malignant, 233 or 22.4 per cent had been tumours of the reticulo endothelial system. In a paper published in 1964, Edington and Maclean classified and described the characteristics of these 233 reticulo endothelial tumours. The striking feature had been the predominance of what was then still called childhood lymphoma (the Burkitt Tumour). Sixty seven cases of this tumour had been encountered (28.8 per cent of reticulo endothelial tumours). At that time childhood lymphoma ranked as the third commonest form of malignant disease

in the Cancer Registry.[1]

The age distribution of reticulum cell sarcoma and Hodgkin's disease were described, the peak incidence of the former had occurred in the third decade[2] whereas Hodgkin's disease was affecting on the whole, a younger group of patients.

A comparison was made between the proportions of all tumours which various types of reticulo endothelial tumours represented in reported series from elsewhere in West and Central Africa.

TABLE XXVI/

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1 Cases drawn from Ibadan and beyond.

2 In contrast to Lumb (1954) Parker and Jackson (1939) and Symmers (1958) who had all found the peak incidence in the sixth decade.

TABLE XXVI

RELATIVE RATIOS OF RETICULO-ENDOTHELIAL TUMOURS IN PARTS OF WEST AND CENTRAL AFRICA

Time and Place	Ibadan Nigeria 1960-61	Lagos Nigeria 1935-44	Ghana 1923-55	Dakar 1950-55	Belgian Congo 1939-55
Total tumours reviewed	1,038	100	1,193	3,967	2,536
Mode of diagnosis	Autopsy, biopsy, clin.	Biopsy	Autopsy, biopsy	Biopsy	Autopsy, biopsy
"Lymphosarcoma" (all types)	112	53	45[2]	245	164
% of all tumours	10.8%	5.3%	3.8%	6.2%	6.5%
Adult lympho-sarcoma	45	?	?	?	?
% of all tumours	4.3%				
Childhood lymphoma	67	?	?	?	?
% of all tumours	6.5%				
Reticulosarcoma	35	-	22	192	98
% of all tumours	3.4%	-	1.9%	4.8%	3.9%
Hodgkin's disease	29	-	30	83	55
% of all tumours	2.8%	-	2.5%	2.1%	2.2%
Myeloma	-	-	7	10	
%of all tumours	-				
Leukaemia	57		7 Fig.not accurate		
% of all tumours	5.5%		N.A.		
Total R.E. tumours	233	53	104	527	317
% of all tumours	22.5%	5.3%	8.7%	13.3%	12.1%

[1] 10 cases of childhood lymphoma

[2] includes lymphatic leukaemia.

The comparison was not a very valid one since it was only lately that childhood lymphoma or the Burkitt Tumour had been recognised as a definite clinical and histological entity. Reference has been made already[3] to the various guises under which this tumour can be discovered in the descriptions of earlier writers.

101 NECROPSOES ON TUMOURS OF THE RETICULO-ENDOTHELIAL SYSTEM IN IBADAN

All the childhood lymphoma or Burkitt Tumour cases seen in Ibadan fell into a distinctive histological group with a characteristic distribution of lesions throughout the body and these aspects were given special attention in another publication from the Ibadan Cancer Registry (Edington, Maclean and Okubadejo, 1964).

This was a review of 101 necropsies performed upon patients with malignant disease of the reticulo-endothelial system at U.C.H. Ibadan during the years 1958 - 1961. Out of a total of 2,164 necropsies carried out in the pathology department over this period there had been 308 instances of malignant disease. The necropsies on reticulo-endothelial tumours had therefore constituted 4.7 per cent of all necropsies and as much as 32.7 per cent of the necropsies on cases of malignant disease.

The senior author (G.M. Edington) classified the tumour sections

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3 Chapter 1.

without reference to age or post-mortem findings, as had been done in classifying the additional surgical biopsies for the analysis already described above. The separation into histological tumour type resulted in the distribution of cases seen in Table XXVII, using a modification of Gall and Rappaport's classification. (1958)

TABLE XXVII

CLASSIFICATION OF 87 RETICULO-ENDOTHELIAL TUMOURS SEEN AT NECROPSY IN IBADAN, 1958-61

TYPE OF TUMOUR	GRADE	No. of Cases
Lymphosarcoma	Grade III	1
	Grade IV	18
	Childhood lymphoma	35
Reticulum-cell sarcoma	Grade II	13
Hodgkin's disease	Grade III	16
	Grade IV	1
Mixed cell types	Grade II	2
Unclassified		1
Total		87

For a discussion of the detailed histology reference to the original paper is recommended, here it is intended to do no more than

mention the distribution throughout the body of the childhood lymphomas.

The consideration of the post-mortem material permitted a description to be made of the associated involvement of several different sites by this tumour. Although it is widely known nowadays as a jaw or facial tumour, it is perhaps not so well appreciated that the Burkitt Tumour can concurrently affect many other organs. Table XXVIII indicates the situation which was found in Ibadan.

TABLE XXVIII/

TABLE XXVIII

TEN CASES OF FACIAL CHILDHOOD LYMPHOMA (BURKITT TUMOUR) WITH A LESION IN MANDIBLE, MAXILLA, OR ORBIT, TO DEMONSTRATE WIDESPREAD ASSOCIATED INVOLVEMENT OF OTHER ORGANS

Case	Site in face	Age group	Sex	Other sites affected
1	Max. and mand.	5 - 9	F	Heart, kidneys, ovaries, spleen
2	Bridge of nose	5 - 9	F	Heart, ovaries, abd. and ing. glands
3	Max. and mand.	5 - 9	F	Kidneys, ovaries, adrenals, abd. glands, spleen, liver, stomach
4	Orbit	5 - 9	F	Ovaries, spleen, liver retro-peritoneal mass
5	Mandible	5 - 9	M	Spleen, kidneys, abd. glands
6	Max. and mand.	10 - 14	F	Kidneys, breast, uterus
7	Max., mand., vault of skull	10 - 14	F	Thyroid, ovaries, kidneys, adrenals, heart, spleen, liver
8	Max. and mand.	10 - 14	M	Thyroid, kidneys, heart, stomach, pancreas
9	Max. and mand.	10 - 14	M	Cerv. glands, kidneys, palate, pharynx, dura mater, parotid, skin
10	Mandible	10 - 14	M	Heart, spleen, liver, abd. glands

Burkitt* (1958) suggested that lymphosarcoma of the jaw in children was not found in association with deposits in peripheral glands and spleen, and that the facial type could be distinguished from the clinical variety which presented as a retroperitoneal mass. This distinction could not be sustained in Ibadan.

Mediastinal adenopathy was found in seven subjects (20 per cent of childhood lymphomas). Cardiac involvement was commonly found in association with mediastinal glandular enlargement. Table XXIX shows the other organs affected in association with mediastinal adenopathy:-

TABLE XXIX

ORGANS AFFECTED IN SEVEN CASES OF CHILDHOOD LYMPHOMA WHICH SHOWED MEDIASTINAL ADENOPATHY

Case No.	Sex	Age Group	Other Deposits
1	M	5 - 9	Pharynx, cervical glands, abdominal glands, kidneys, spleen, liver, stomach
2	M	5 - 9	Cervical, axillary and inguinal glands, mesenteric and abdominal glands, kidneys, paravertebral
3	M	5 - 9	Kidneys, abdominal glands, spleen
4	M	5 - 9	Salivary gland, cervical axillary and inguinal glands, retroperitoneal mass, tonsils, liver, heart
5	F	5 - 9	Ovaries, kidneys, adrenals, pituitary, dorsal vertebrae, femur
6	M	10 - 14	Diaphragm and heart
7	F	10 - 14	Heart

* See also Burkitt and O'Connor (1961)

Occasion has been found previously[4] to refer to instances of ovarian lymphosarcoma among descriptions of tumours by earlier West African writers. Brew/Jackson and (1960) reported six cases of this tumour from Ibadan. A further eleven instances came to light among these autopsies, bringing the total observed in Ibadan during the years 1958 - 1961 up to seventeen cases. The involvement of kidneys and adrenals was twice as common in cases with ovarian deposits as in cases without this feature.

The series of post-mortems revealed only one case of a tumour deposit within the brain. In fact, the necropsy findings do not adequately emphasise the frequency of paraplegia from cord compression as a manifestation of the Burkitt Tumour. After two and a half years there had been eighteen such cases in the Cancer Registry. They commonly took the form of a large paravertebral tumour, extending widely through the tissues around the spine and often involving the spinal dura mater.

The total pattern of organ involvement in childhood lymphoma in Nigeria had confirmed the predeliction for certain organs already noted by other writers (Davies and Davies, 1960; Burkitt, 1958, 1961, 1962; Lothe and Somers, 1960; O'Conor and Davies, 1960). The jaw,

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4 Chapter II.

ovaries, heart, kidneys and paravertebral tissues were predominantly affected, but scarcely any organ or tissue, with the exception of the lungs, seem to be immune.

Meanwhile, Watson-Williams (1962) had reported the frequent finding of diffuse bone marrow involvement in these children although there had been no case of terminal leukaemia.

LEUKAEMIA IN IBADAN

From the beginning of 1920 to the end of 1962, the number of cases of leukaemia diagnosed in Ibadan had amounted to eighty-four. Forty-one of these were in-patients who were resident in Ibadan. These have all been classified in Table XXX, according to type and sex and whether they came from Ibadan or not.

Using the information on the age and sex distribution of the Ibadan cases shown in Table XXXI together with the estimated Ibadan population in the corresponding age groups (Table II), estimates were made of the annual age specific rates of leukaemia. These rates are shown separately for males and females in Table XXXII which also makes comparisons with the age specific rates for the Burkitt Tumour in Ibadan during the same period and the age specific rates for leukaemia mortality in United States non-Whites in 1958 (Mitsuo Segi and Minora Kurihara, 1962).

TABLES XXX, XXXI, XXXII/

TABLE XXX

CLASSIFICATION OF 84 TYPES OF LEUKAEMIC DISEASE (INCLUDING MYELOMA) DIAGNOSED IN IBADAN, 1960-62

Type of leukaemia	Number of cases					
	Ibadan residents		Others		Total	
	M	F	M	F	M	F
Acute leukaemic reticuloendotheliosis	-	1	-	1	-	2
Acute monocytic	5	1	1	-	6	1
Acute myeloid	1	5	2	1	3	6
Acute lymphatic	2	-	1	-	3	-
Acute 'blast' leukaemia	3	1	2	-	5	1
Aleukaemic leukaemia	-	-	-	1	-	1
Subacute myeloid	-	-	-	1	-	1
Chronic myeloid	6	3	11	4	17	7
Chronic lymphatic	7	5	5	8	12	13
Plasmacytoma	1	-	2	-	3	-
Multiple myeloma	-	-	2	1	2	1
TOTALS	25	16	26	17	51	33
					84	

TABLE XXXI

CLASSIFICATION OF 41 CASES OF LEUKAEMIA IN IBADAN PATIENTS, 1960-62, BY TYPE, AGE AND SEX

Type of leukaemia	No. of cases																			
	Age 0-4		Age 5-9		Age 10-14		Age 15-19		Age 20-29		Age 30-39		Age 40-49		Age 50-59		Age 60-69		Total all ages	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Acute leukaemic reticuloendotheliosis														1						1
Acute lymphatic	1		1																2	
Acute myeloid				1	1					3								1	1	5
Acute monocytic				1	3		1				1								5	1
Acute 'blast' leukaemia					1		1				1							1	3	1
Chronic myeloid										1	4	1	2			1			6	3
Chronic lymphatic											2		2	2	1	2	2	1	7	5
Plasmacytoma											1								1	
TOTALS	1	-	1	2	5	-	2	-	-	4	9	1	4	3	1	3	2	3	25	16

TABLE XXXII

COMPARISON OF THE AGE SPECIFIC INCIDENCE RATES FOR LEUKAEMIA AND THE BURKITT TUMOUR IN IBADAN 1960-62 WITH THE AGE SPECIFIC MORTALITY RATES FOR LEUKAEMIA IN U.S. NON-WHITES (1958)

AGE GROUPS	Age specific rates per 100,000 per year					
	IBADAN				U.S. Non-white (1958)	
	Leukaemia		Burkitt Tumour		Leukaemia	
	M	F	M	F	M	F
0 - 4	0.83	0.00	2.50	0.83	2.35	2.37
5 - 9	1.14	1.96	21.82	9.80	1.90	1.76
10 - 14	6.94	0.00	15.27	10.14	1.56	2.29
15 - 19	3.33	0.00	1.51	4.44	2.25	2.22
20 - 29	0.00	2.56	1.48	0.00	2.95	1.25
30 - 39	11.11	1.01	0.00	0.00	3.72	2.95
40 - 49	9.00	5.88	0.00	0.00	4.10	4.42
50 - 59	4.16	14.28	0.00	0.00	8.85	7.23
60 - 69	16.66	33.33	0.00	0.00	19.37	12.71
70+	0.00	0.00	0.00	0.00	21.85	10.26
All ages	3.51	2.10	5.06	2.75	4.61	3.60

Although the incidence of leukaemia in younger children in Ibadan appeared to be low, the Burkitt Tumour had attained remarkably high incidence rates. There had been only four instances of leukaemia recorded in Ibadan children under 10 years of age over a period of three years and the Burkitt Tumour was being diagnosed five times as often as leukaemia among Ibadan children. It was expected that children with gross tumours were probably more likely to be brought to hospital than those who simply had an insidious wasting disease. Possibly cases of acute leukaemia, with its rapidly fatal outcome, could less easily afford the delay in treatment spent over a search by the parents for local remedies.

On the other hand, Ibadan children when ill are given much attention by their anxious mothers who may even bring them to hospital against the wishes of the older generation.[5] It may therefore be the case that the age specific rates in the younger groups does reflect the true situation regarding leukaemia which may indeed be rare among Ibadan children. (Edington and Maclean, 1964a; 1964c).

PRIMARY CARCINOMA OF THE LIVER

The figures relating to the incidence of primary liver carcinoma in Ibadan will be set forth in the next chapter. Meanwhile some aspects of the subject will be summarised from an account presented by the writer to the Ibadan Clinical Society in December 1961.

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5 See p. 165

The material reviewed at that time had accumulated for some years previous to the establishment of the Cancer Registry, it consisted of sixty-three cases of primary cancer of the liver diagnosed in the pathology department of University College Hospital in the three years 1958, 1959 and 1960. This included patients from outside Ibadan as well as residents of the town.

Hepatoma had constituted seven per cent of all tumours histologically diagnosed and was the second commonest carcinoma seen, being exceeded only by carcinoma of the cervix. However, as far as all types of malignant disease were concerned, lymphosarcomas[6] had been the commonest and primary liver tumours were only third in order of frequency.

Among autopsies conducted at University College Hospital instances of primary liver cancer had comprised eighteen per cent of all tumours seen.

A comparison was made between the relative frequency of hepatoma among series of tumours reported from elsewhere in Africa and in Nigeria. This is shown in Table XXXIII.

TABLE XXXIII/

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[6] Both adult lymphosarcoma and childhood lymphoma combined.

TABLE XXXIII

TO SHOW THE RELATIVE FREQUENCY OF PRIMARY CARCINOMA OF THE LIVER AMONG ALL TUMOURS (BOTH SEXES) IN SEVERAL AFRICAN SERIES

Place	Author	Period	Percentage of all tumours
Kenya (biopsies)	Vint	1928-34	7
Dakar (autopsies and biopsies)	Geyer	1944-45	32
	Camain	1942-53	26
	Camain and Serafino	1942-58	7
Johannesburg (cancer survey)	Higginson and Oettlé	1953-55	14
Mozambique (autopsies and biopsies)	Prates	1944-57	32
Congo (autopsies and biopsies)	Thijs	1939-55	10
Ghana	Edington	1923-55	7
Kampala (cancer survey)	Davies and Wilson	1954-57	7
Lagos (mainly biopsies)	Smith and Elwes	1927-34	6
Lagos (mainly biopsies)	Elwes and Baldwin	1935-44	8
Ibadan (autopsies and biopsies)	1958-60	1958-60	7
Ibadan (autopsies only)		1958-60	18
*Ibadan (cancer survey)		1960-63	8

* The hepatomas in the three years of the Cancer Survey were all histologically proven

However, as was pointed out in Chapter 1, some of these tumours had been diagnosed only at autopsy whilst some had included biopsy specimens also. That the difference can be an important one is shown from the University College Hospital figures.

At the same time attention was drawn to the situation in Bahia, Brazil, a place with strong Yoruba connections when many Nigerian customs are still maintained among the present day descendants of Yoruba slaves. At the Aristides Maltez Hospital in Bahia,[7] there had only been two cases of primary cancer of the liver in eight years out of a total of 457 malignancies in Negroes.

LIVER CARCINOMA AND CIRRHOSIS

Regarding the association of carcinoma of the liver with cirrhosis, in the Ibadan material it had been noted that the situation appeared very different according as to whether autopsies or biopsies were considered. Thus, among the autopsies on carcinoma of the liver, cirrhosis had been present in eighty-seven per cent of cases. The situation was reversed when biopsies were considered alone, as in these cases eighty-eight per cent had no apparent cirrhosis and cirrhosis had been observed in only twelve per cent of the biopsies. It was obvious that the scanty material obtained at liver biopsy, and the tendency for the needle to penetrate soft rather than tough portions of liver, made this type of procedure unsatisfactory for assessing the degree of

7 Personal communication from Dr. Luiz de Oliverira Neves.

association of liver cancer with cirrhosis.

HEPATOMAS IN CIRRHOTIC LIVERS

During 1960 a total of 857 autopsies were performed at University College Hospital. Among the necropsies there had been twenty-five instances of cirrhosis of the liver and in twelve of these cases a hepatoma had been present. In this group of autopsies, therefore, practically fifty per cent of cirrhotic livers had been the seat of a primary cancer.

SEX RATIOS

Opportunity was taken to compare the sex ratio of all autopsies at University College Hospital with that in liver cirrhosis and in hepatoma. During 1960 in the Pathology Department the overall sex ratio at autopsy had been 1.1 males to 1.0 females. For cirrhosis of the liver at post-mortem, there had been nineteen males to three females and for hepatoma four males to one female.

CIRRHOSIS AND LIVER SIZE

Over the full three year period, the average size of cancerous livers which were also cirrhotic had been

2,839 Gm

whilst the average weight of livers with primary cancer in the absence of cirrhosis had been

4,545 Gm

PATHOLOGY

The gross pathological anatomy will not be described here, except to remark that lung metastases had been common and intra-peritoneal haemorrhage from a tumour nodule had been fairly frequent as the cause of death.

Using Steiner's classification of histological types[8], there had been sixty hepatocellular carcinomas, two cases of choloangio-cellular carcinoma and one case of cholangiolocellular carcinoma. The overwhelming preponderance of carcinomas derived from the liver parenchyma had been indisputable.

The histopathology of these tumours is a subject in itself and will not be explored here. It should be recorded, however, that the tumours presented a wide range of appearances not only between cases but also often between different areas of the same growth.

KAPOSI'S SARCOMA IN NIGERIA

The remaining survey which was completed during the period of cancer registration in Ibadan related to Kaposi's Sarcoma. (Maclean, 1963).

This condition, which was at one time thought to affect mainly middle Europeans and Italians, had gradually been recognised as being relatively common on the African continent. Between 1922 and

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8 Steiner, P., in "Modern Trends in Pathology", 1959, p. 162. See also Cirrhosis and Primary Cancer of the liver in trans-Saharan Africa. Acta. Un. int.Cancr 1961, Vol 17, 593 - 603.

1961, close on 800 African cases had been reported and it had been suggested, by Camain (1954), Quénum (1957) and Davies (1959) that the disease was commoner in those moist tropical areas of Africa which adjoined the Equator.

When the tribal distribution of the cases diagnosed up until the end of 1962 in the Ibadan Cancer Registry were examined, it appeared that only three out of a total of eleven patients had been Yorubas. This was in contrast to the cancer patients as a whole, of whom over eighty per cent were Yorubas from the Western Region.

It was decided to collect information on cases diagnosed elsewhere in Nigeria and over a longer period of time in order to discover whether there had indeed been an unusual distribution of the disease throughout such an extensive territory.

Accordingly, the files of the Federal Pathology Laboratory in Lagos and the Northern Region Pathology Laboratory in Kaduna were scrutinised[9] as well as the pathology records at University College Hospital,[10] and reply-paid questionnaires were sent to the seventy-seven mission and government general hospitals throughout Nigeria which had over ninety beds.

By this means information was obtained on a total of sixty-eight cases whose sources are indicated in Table XXXIV.

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9 With the kind permission of the Federal Special Pathologist and the Northern Region Specialist Pathologist.

10 1958 was chosen as the start of the series as the first full year for which records were available at University College Hospital, but the Northern Region Laboratory had only been situated in Kaduna since 1959.

TABLE XXXIV

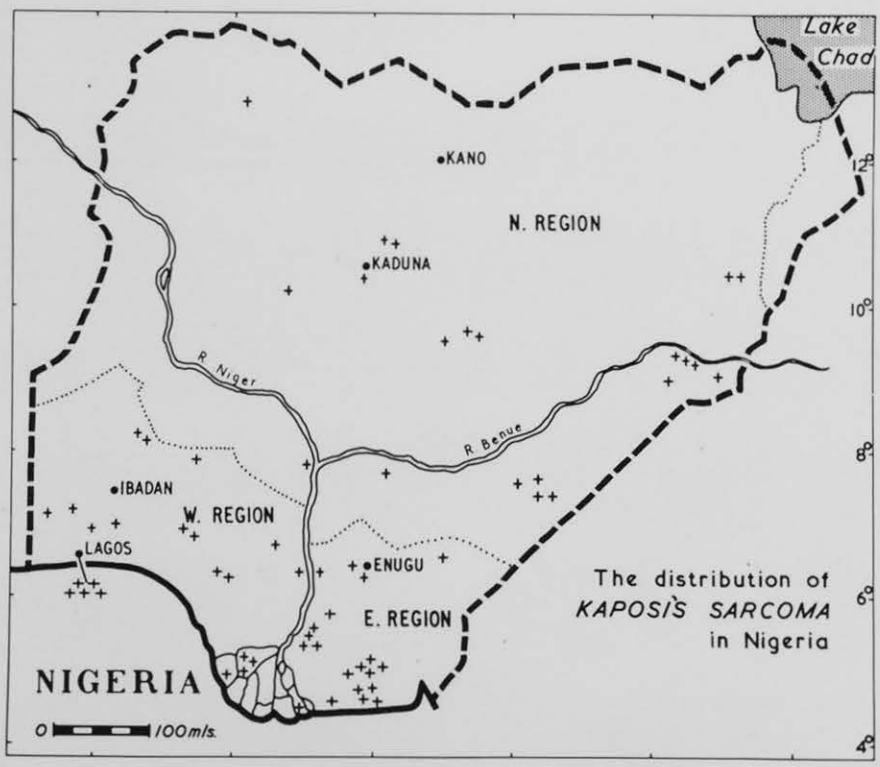
THE SOURCES OF 68 DIAGNOSES OF KAPOSI'S SARCOMA IN NIGERIA

Place	Period	Number of Cases
Ibadan	1958 - 1962	17
Lagos	1958 - 1961	25
Kaduna	1959 - 1962	16
Other hospitals (all regions)	1958 - 1962	10
Total		68

It was not possible to relate the cases to defined populations in which they had occurred. But the tribal origin of the cases of Kaposi's Sarcoma was compared with the tribal composition of the Nigerian population at the 1952 Census. The result of this comparison is shown in Table XXXV.

TABLE XXXV/

FIGURE 10.



TO ILLUSTRATE THE DISTRIBUTION OF KAPOSIS SARCOMA THROUGHOUT NIGERIA

TABLE XXXV

THE TRIBAL ORIGIN OF KAPOSI'S SARCOMA CASES COMPARED WITH THE TRIBAL COMPOSITION OF THE NIGERIAN POPULATION

Tribe	No. of Kaposi's Sarcoma cases	Percentage of Kaposi's Sarcoma cases	Percentage of total population
Ibo	20	29.4	17.4
Main Northern Tribes	12	17.7	34.8
Yoruba	11	16.2	16.2
Ibibio	6	8.8	2.5
Edo	5	7.3	1.6
Unspecified Tribes	14	20.6	26.5
Non-Nigerians	-	-	0.1

GEOGRAPHICAL DISTRIBUTION OF CASES

This was known in sixty-three out of the sixty-eight cases and is demonstrated on the map in Figure 10.

OCCUPATION

Most of the cases whose occupation was known were peasant farmers or artisans but there was one civil servant, one electrical generator operator and one school boy.

THE RELATIVE FREQUENCY OF KAPOSI'S SARCOMA

The frequency of Kaposi's Sarcoma in different parts of Nigeria was compared with the frequency of squamous epithelioma of the skin in the same sources of records. Thijs had observed, in 1957, that Kaposi's Sarcoma was as common as squamous epithelioma in the Congo, and Oettlé (1962) had noted that it was the commonest skin tumour among Bantu in the Transvaal. The situation regarding Nigeria is detailed in Table XXXVI.

TABLE XXXVI

THE RELATIVE FREQUENCY OF KAPOSI'S SARCOMA AND SQUAMOUS EPITHELIOMA OF THE SKIN AMONG TUMOURS IN NIGERIA

Place	Time	Total tumours	Kaposi's Sarcoma		Squamous epithelioma of skin	
			No. of cases	Per cent of total tumours	No. of cases	%
Lagos	1935-44	1,000	24	2.4	231	23.1
Lagos	1960	358	13	3.6	33	9.2
Kaduna	1961	395	10	2.6	55	13.9
Ibadan	1960-62	1,934	11	0.6	45	2.3

Tumours of the skin had apparently assumed a much greater importance in Lagos twenty five years previously than they did in Ibadan during the 'sixties. Up until 1945, skin tumours, excluding malignant melanoma, had been the commonest form of malignant disease diagnosed in the Lagos laboratory, whereas its present importance in Ibadan was minimal.

CLINICAL FEATURES

Clinical data was complete only for the Ibadan cases.

The preponderance of male cases was clear. Sixty out of the sixty eight cases were men (89 per cent).

The age distribution of the forty five cases in which this information was available can be seen in Table XXXVII.

TABLE XXXVII

THE AGE DISTRIBUTION OF 45 CASES OF KAPOSI'S SARCOMA

Age Group	No. of Cases
0 - 14	3
15 - 19	2
20 - 24	3
25 - 29	5
30 - 34	3
35 - 39	6
40 - 44	9
45 - 49	5
50 - 54	4
55 - 59	3
60 - 64	2

FIGURE 11.

KAPOSIS SARCOMA IN A YOUNG IBO MALE. U.C.H. 1959.

The mode of presentation of the disease in patients coming to University College Hospital did not differ from what has been reported elsewhere in Africa. (e.g. Lothé 1963). Vegetating, vascular nodules, mainly upon the extremities, were often accompanied by oedema of the part. Pain was not a marked feature but the chronicity and disabling nature of the multiplying lesions caused patients to travel long distances in search of cure.

In one case, a man from Southern Nigeria who had long worked upon geological surveys in the Northern Region, the condition appeared to be regressing without specific therapy.[10] Eventually his legs showed a woody induration and hard nodules round the ankles.

One fatal case came to autopsy, revealing widespread involvement of viscera, heart, trachea, the lower lobe of one lung, as well as infiltration of the paratracheal nodes and skin nodules on the legs.

The Ibadan cases did not include any instance of the childhood form of the disease, described from Uganda (Davies and Lothé, 1962) in which there is massive involvement of lymphatic nodes and lesions about the eyelids.

Over the series as a whole, the site from which a biopsy had been taken was given in sixty four instances. Whilst this cannot indicate the extent of the disease present in particular cases, it

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10 Haylock (1963) has described the radiographic features of some Ibadan cases and the results of intra-arterial mustine therapy.

does give an impression of the relative frequency of involvement of different parts of the body. The information so obtained is detailed in Table XXXVIII.

TABLE XXXVIII

THE SITE OF LESION IN 64 CASES OF KAPOSI'S SARCOMA

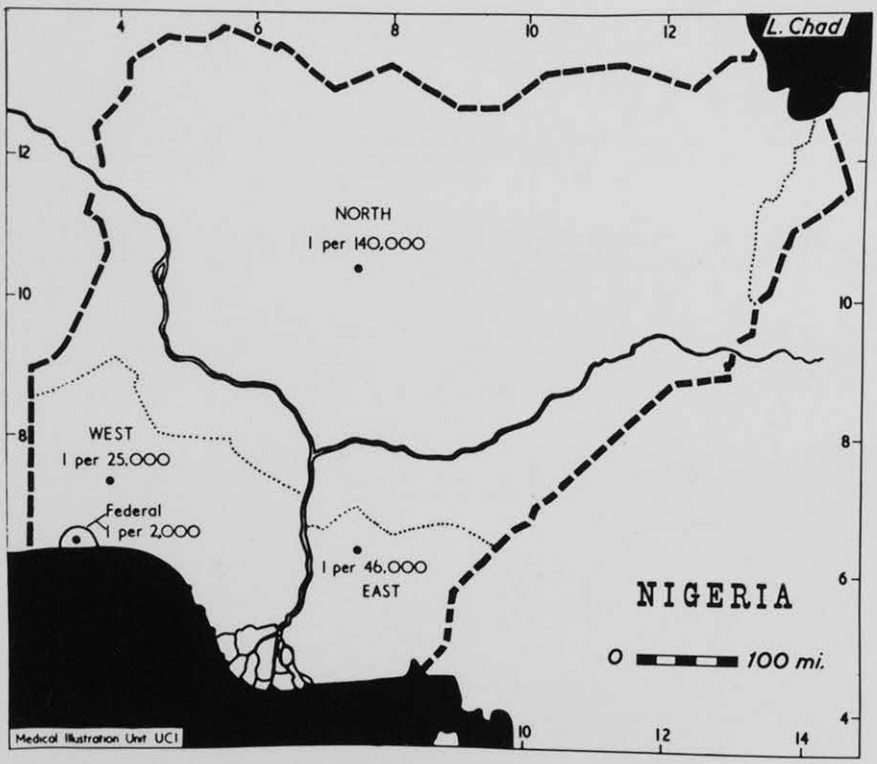
Site of Lesion	No. of times affected
Lower limbs, one or both	47
Upper limbs, one or both	12
Head and neck	6
Trunk	5
Penis and scrotum	5
Lymph nodes	2
Viscera	1

HISTOLOGY

The slides of all the Lagos and Kaduna cases were personally examined as well as those in the University College Hospital pathology laboratory.

The lesions were composed of proliferating bundles and whorls of pale spindle cells. These were not, in most cases, markedly malignant in aspect and were interspersed with narrow blood-filled spaces. The thin walled vessels were of varying

FIGURE 12.



DOCTOR PATIENT RATIOS THROUGHOUT NIGERIA

dimensions and the proportion of vascular to spindle-celled elements varied from case to case.

There were a few specimens in which the dense nuclei and mitotic figures of the ramifying spindle cells conveyed an impression of very active growth, but in other cases lacunae-like blood spaces occupied a tissue consisting of much looser strands of spindle cells.

It appeared as if the presence of a fibrous capsule and thrombosis in the vessels of the tumour might be associated with clinical regression of lesions.

Although successive biopsies from one case varied as much as biopsies from different subjects, the main histological features were still clearly recognisable.

THE MEDICAL SERVICES OF NIGERIA

The doctor:patient ratio in different parts of Nigeria has a bearing upon the apparent frequency of Kaposi's Sarcoma throughout the country. This is accordingly set out in Table XXXIX.

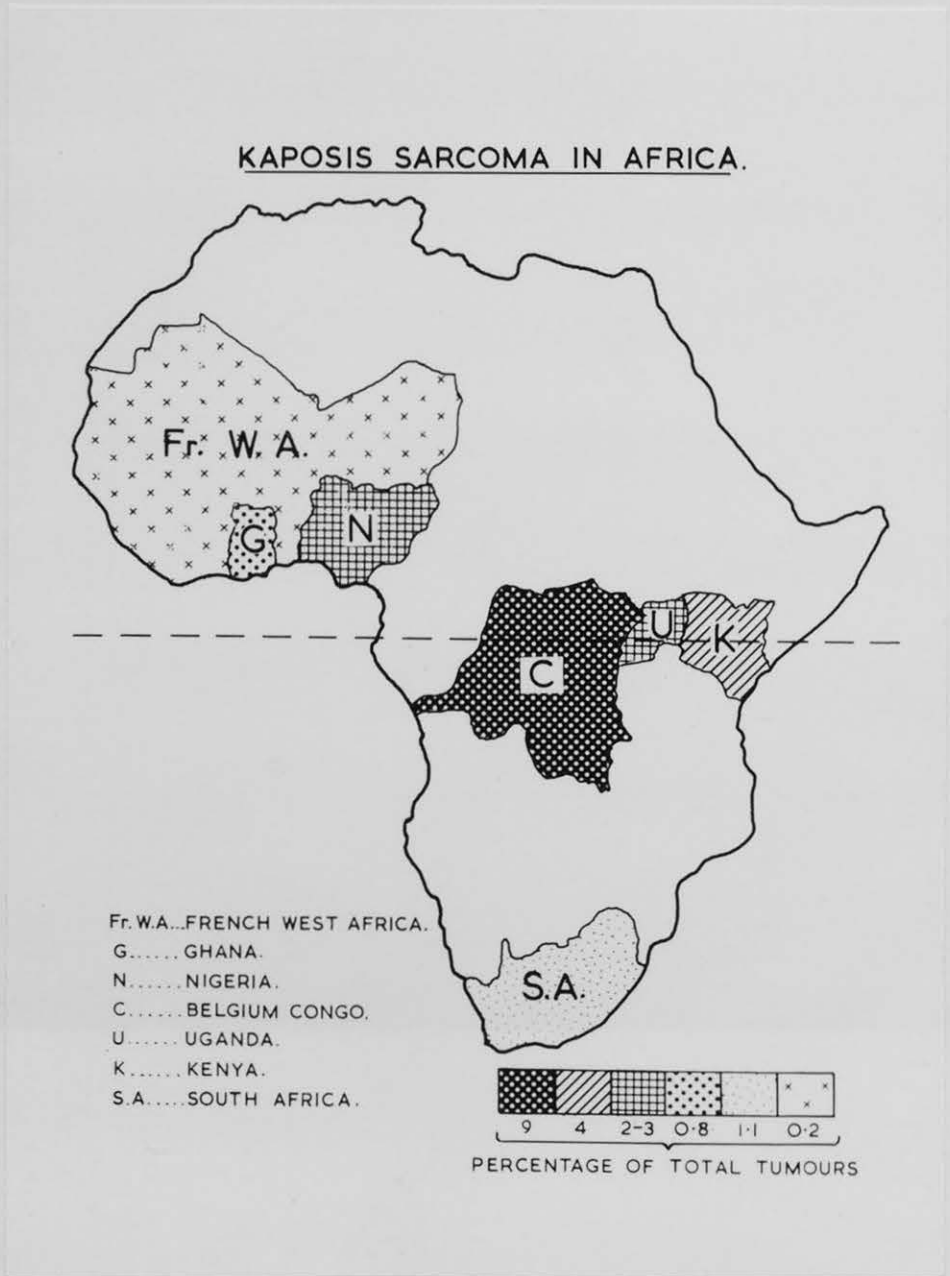
TABLE XXXIX

THE DOCTOR:PATIENT RATIO THROUGHOUT NIGERIA (1962)

Region	Doctor:patient ratio
Northern Region	1 per 140,000
Western Region[11]	1 per 25,000
Eastern Region	1 per 46,000
Federal Territory of Lagos	1 per 2,000

[11] Ibadan, as the site of University College Hospital with 120 doctors, has the effect of raising the ratio for the whole Western Region of Nigeria.

FIGURE 13.



KAPOSIS SARCOMA IN AFRICA.
RELATIVE FREQUENCY AMONG ALL TUMOURS (AFTER LOTHE, 1963)

CLIMATE

Since climate has been implicated by the writers who were quoted earlier, a note on this subject is not out of place. For part of the year Northern Nigeria enjoys the dry Harmattan wind which blows off the Sahara. Although the day temperatures in the North are on the whole higher than in the Southern Regions, the temperature drops at night, sometimes to below freezing point in the extreme North-east.

By contrast, the forest zone of Southern Nigeria has a very high humidity and almost unvarying high temperature. This combination of heat and humidity is most marked along the swampy coastal belt extending to the east and west of the Niger Delta.

DISCUSSION AND CONCLUSIONS

Although rare in American negroes, Kaposi's Sarcoma has now been frequently demonstrated in Africans. It has been shown in South Africa that it is twenty times as common in the Bantu as in the white population (Murray, 1953; Murray and Lothé, 1962). Attention has already been drawn in Thijs' observations in the Congo.

It appears to be no rarity in Nigeria, a portion of the old Slave Coast from which many of America's negroes originally derived. Therefore, one would expect eventually to implicate some factor in the African environment, some aspect of geography rather than genetics.

However, it is not sufficient to blame simple climatic conditions

since the disease is seen in African countries with widely differing ranges of temperature and humidity. For example, there are many cases in the temperate Union of South Africa, far removed from equatorial heat.

As far as Nigeria is concerned, an apparent concentration of cases in the south of the country might tempt speculation regarding possible association of the disease with such factors as high rainfall, dense vegetation, low altitude or relative proximity to the Equator.

But the areas in which most cases were diagnosed were also the best served medically, having a high ratio of doctors and two well-established pathology laboratories. Northern Nigeria, containing over half the population of Nigeria, has a scattered population and medical facilities which are widely acknowledged to be grossly inadequate. Many people live far away from those doctors and hospitals which are available. Groups of cases of Kaposi's Sarcoma came, significantly enough, from areas around hospitals which have been accustomed to make regular use of the Kaduna laboratory.

So the disease is certainly known in the dry Northern Region of Nigeria and, in view of the considerations which have been cited regarding medical facilities, it would not be surprising if the cases histologically diagnosed are actually only a fraction of those which exist in the population as a whole.

The situation respecting Kaposi's Sarcoma in Nigeria is a useful demonstration of the frequent fallacies of relative ratio figures. From Table XXXVI it can be seen that Kaposi's Sarcoma had formed only 0.6 per cent of all tumours in the Ibadan Cancer Register. One reason for this lies in the fact that cases presenting at all government hospitals and most mission hospitals in the Western Region have hitherto been diagnosed in the Lagos laboratory. And the range of relative frequencies for all tumours diagnosed in Ibadan is different from that seen in either Lagos or Kaduna. These latter two centres are still dependent upon the interests, facilities and efficiency of over-worked medical officers in remote general hospitals and the material collected contains relatively more superficial biopsies than is the case in Ibadan, a modern teaching hospital.

The change in the relative frequency of squamous epithelioma in Lagos over a period of time reflects the expansion of medical facilities which has been taking place in the area served by this laboratory. It would not be correct, on the basis of these relative frequency figures, to conclude that squamous epithelioma of the skin is now commoner in Northern than in Southern Nigeria or that any change had occurred in the actual incidence of the disease in the hinterland of Lagos.

There appear to be anomalies in the tribal distribution of cases, but these can probably be explained on a similar basis.

It may be that there are fewer Northerners because there are less Northern hospitals and rather more Ibos because the multiple mission hospitals of the Eastern Region are making full use of the Lagos laboratory.

The large numbers of Ibibios may be associated with the presence of a well-known mission hospital. However, the Ibibios are regarded by some ethnologists as a semi-Bantu group, whereas most other Nigerian tribes belong, broadly speaking, to the West Sudanic language group of Negro peoples (Greenberg, 1949). It is just possible that this is connected with a real difference in relative susceptibility.

The situation is such a complex one that the only honest conclusion is an admission of continued ignorance regarding the present true incidence of Kaposi's Sarcoma throughout Nigeria. Experience with this condition reflects the picture of malignant disease as a whole throughout the continent. With the extension of modern medical facilities more and more cases are diagnosed and differences in apparent "incidence" may, in many cases, be simply a function of differences in the rate of medical advance.

Awareness that the disease exists is a further stimulus to its diagnosis by perceptive clinicians. Only if the diagnostic facilities in different areas are comparable and potential patients equally ready and able to attend hospital can even tentative conclusions be drawn from comparisons of a relative ratio type.

Neither is it profitable to speculate on the importance of outdoor occupations as a contributory cause in countries where most of

life is lived out of doors and the majority of the population derive, of necessity, their living from the land.

Even the type and amount of clothing worn may vary according to circumstances. Thus the Yoruba farmer, for example, who tends his land wearing a minimum of ragged garments, has an elaborate form of traditional dress for use in the extensive leisure periods between planting and harvest.

There is at present no evidence to point to a specific initiating agency which can be inducing this mysterious condition. Since Kaposi described, "idiopathic multiple pigment sarcoma" from Vienna in 1872, the disease has provoked endless discussion on its histology, its tumour status and its possible aetiology.

However, in spite of the continued uncertainty regarding its actual incidence in different parts of Africa, the opportunities which frequent cases offer for detailed study of Kaposi's Sarcoma in the African context may hold out hope for the eventual discovery of its causes or cause.

CHAPTER IX

THE RESULTS OF THE THREE YEAR CANCER INCIDENCE SURVEY IN IBADAN

By the end of March 1963 the survey was complete. During this time a total of 1920 cases of malignant disease had been diagnosed 648 of these were in residents of Ibadan, according to the definition, and of these 318 were males and 330 were females.

During 1961, 202 cases were registered and in 1962 the number was 223. There did not seem, therefore, to have been much variation over the period of registration and the level of notification and of case finding by all the various methods seem to have been reasonably constant.

HISTOLOGICAL DIAGNOSIS RATE

The overall histological diagnosis rate was 89.1 per cent (577 cases).

In Table XL details are given of all the cases which were not histologically confirmed.

TABLE XL/

TABLE XL

CLINICAL AND X-RAY DIAGNOSES ON IBADAN CANCER CASES

1960 - 1963 (TOTAL 71)

Clinical Diagnoses:		
Ca. breast		27
Abd. malignancy		11
Ca. bladder		2
Liver tumour		1
Ca. penis		1
Burkitt Tumour		1
Generalised		1
	TOTAL	44
X-Ray Diagnoses:		
2° bone deposits		6
Ca. bladder		1
Ca. colon		1
Cerebral tumour		3
Burkitt Tumour		6
Stom. and oesophagus		10
	TOTAL	27

Relative Ratio Frequencies

All the tumours seen in both Ibadan and non-Ibadan patients have been tabulated according to type and site of tumour and sex and the relative ratio frequencies have been calculated for each tumour. The results are shown in Table XLI.

TABLE XLI/

The non-Ibadan figures represent the kind of material which might be expected from a central laboratory since they contain a proportion of specimens sent to the pathology department at University College Hospital from outlying mission hospitals.

The Ibadan figures, on the other hand, relate/to actual patients seen and examined in Ibadan hospitals.

There are no great differences in the two groups, but those which do exist relate to a higher frequency of tumours of the skin, soft tissue sarcomas, cases of unspecified malignancy and secondary glandular tumours in the non-Ibadan group. Among the Ibadan cases there was, by contrast, a higher frequency of stomach, breast and prostate carcinomas. Carcinoma of the cervix represents a roughly similar proportion of both series (18 per cent), being the commonest single tumour diagnosed in either group.

TABLE XLI

THE NUMBERS AND TYPES OF TUMOURS DIAGNOSED IN IBADAN AND NON-IBADAN PATIENTS OF BOTH SEXES AND THE RELATIVE RATIO FREQUENCES (R.R.F.) OF OVER ONE PER CENT IN BOTH GROUPS. APRIL 1960 - MARCH 1963

INTERNATIONAL CLASSIFICATION NO.		IBADAN				NON-IBADAN				TOTAL	
		MALE (318)		FEMALE (330)		MALE (610)		FEMALE (662)		Total	R.R.F.%
		No.	R.R.F.%	No.	R.R.F.%	No.	R.R.F.%	No.	R.R.F.%	1920	-
140	Lip	1	-	-	-	1	-	-	-	2	-
141	Tongue	1	-	-	-	1	-	-	-	2	-
142	Salivary gland	5	1.6	3	-	10	1.6	17	2.6	35	1.8
144	Mouth	4	1.3	-	-	2	-	4	-	10	-
145	Oropharynx	-	-	-	-	3	-	-	-	3	-
146	Nasopharynx	2	-	-	-	-	-	3	-	5	-
147	Hypopharynx	-	-	-	-	1	-	-	-	1	-
150	Oesophagus	3	-	1	-	3	-	1	-	8	-
151	Stomach	28	8.5	14	4.2	30	4.9	11	1.7	83	4.4
152	Small intestine	-	-	-	-	-	-	1	-	1	-
153	Large intestine	4	1.3	4	1.2	11	1.8	7	1.1	26	1.4
154	Rectum	6	1.6	5	1.5	5	-	8	1.2	24	1.3
155	Primary liver + G.B.	42	13.2	9	2.7	69	11.3	17	2.6	137	7.2
156	Secondary liver + G.B.	2	-	4	1.2	10	1.6	8	1.2	24	1.3
157	Pancreas	8	2.5	5	-	5	-	7	1.7	25	1.3
160	Nose and sinuses	8	2.5	-	-	13	2.1	15	2.3	36	1.9
161	Larynx	4	1.3	-	-	9	1.5	1	-	14	-
162	Lungs, bronchi pleura	5	1.6	5	1.5	10	1.6	4	-	24	1.3
170	Breast	-	-	55	16.7	5	-	72	10.1	132	6.9
171	Cervix	-	-	59	17.9	-	-	121	18.3	180	9.4
172	Corpus uteri	-	-	1	-	-	-	6	-	7	-
173.2	Chorionepithelioma	-	-	13	3.9	-	-	41	6.2	54	2.9
173	Sarcoma of uterus	-	-	1	-	-	-	6	-	7	-
175	Carcinoma of ovary	-	-	15	4.3	-	-	23	3.5	38	2.0
175(b)	Secretory ovarian tumour	-	-	16	-	-	-	17	2.6	33	1.7
176	Vulva and vagina	-	-	2	-	-	-	20	3.0	22	1.2
177	Prostate	18	5.7	-	-	18	3.0	-	-	36	1.9
178	Testis	3	-	-	-	3	-	-	-	6	-
179	Scrotum and penis	1	-	-	-	5	-	-	-	6	-
180	Kidney	4	1.3	2	-	9	1.5	10	1.5	25	1.3
181	Bladder	10	3.1	5	1.5	23	3.8	5	-	43	2.3
190	Malignant melanoma	3	-	3	-	8	1.3	13	2.0	27	1.4
191	Skin and appendages	7	2.2	2	1.4	30	4.8	17	2.1	56	2.9
192	Retinoblastoma	4	1.3	1	-	1	-	1	-	7	-
193	Brain and C.N.S.	4	1.3	-	-	3	-	3	-	10	-
194	Thyroid	5	1.6	11	3.3	6	-	15	2.0	37	1.9
195	Neuroblastoma	1	-	2	-	-	-	-	-	3	-
196	Bone tumours	7	2.2	3	-	23	3.8	19	2.9	52	2.7
197	Kaposi's sarcoma	-	-	-	-	12	2.0	-	-	12	-
197(b)	Soft tissue sarcoma	8	2.5	6	1.8	37	6.1	23	3.5	74	3.7
198	2° tumours, glands	6	1.9	4	1.2	22	3.6	20	3.0	52	2.7
199	Unspecified malignancy	17	5.3	15	4.5	20	3.3	18	2.7	70	-
200	Reticulum cell sarcoma	5	1.6	12	3.6	35	5.8	20	3.0	72	3.7
200.1	Burkitt tumour	36	11.3	20	6.4	68	10.6	45	6.8	169	8.9
	Adult lymphosarcoma	18	5.7	14	4.2	50	8.2	16	2.4	98	5.1
201	Hodgkin's disease	13	4.1	2	-	21	3.5	7	1.1	43	2.3
203,204	Leukaemia and myeloma	25	7.6	16	4.5	28	4.6	20	3.0	89	4.6
	TOTAL	318		330		610		662		1,920	

Since the majority of the non-Ibadan cases were also actual patients attending the Ibadan hospitals the differences between the two groups are not as marked as would have been the case if one series had consisted entirely of biopsy specimens. However, the findings do demonstrate that the more inaccessible, internal tumours which require refinements of advanced surgical techniques for their discovery were being more frequently diagnosed in the local patients.

The foregoing table shows that the commonest tumours which appeared in the register in order of frequency were carcinoma of the cervix, the Burkitt Tumour, primary carcinoma of the liver and gall bladder, carcinoma of the breast and carcinoma of the stomach. However, if all the reticulo-endothelial tumours, including the Burkitt Tumour, are considered together they totalled 471 and, with a relative frequency of 24.3 per cent, were by far the commonest tumours encountered.

Table XLII summarises the principal neoplasms in order of relative frequency among Ibadan patients.

Figures 14, 15, 16, 17 and 18 make some graphic comparisons between the situation in Ibadan in 1960 - 1963 and that reported by Harnett in his London survey (1952) and from the United States by Segi et al. (1960).

TABLE XLII/

TABLE XLII PRINCIPAL NEOPLASMS IN ORDER OF RELATIVE FREQUENCY, IBADAN, APRIL 1960 - MARCH 1963

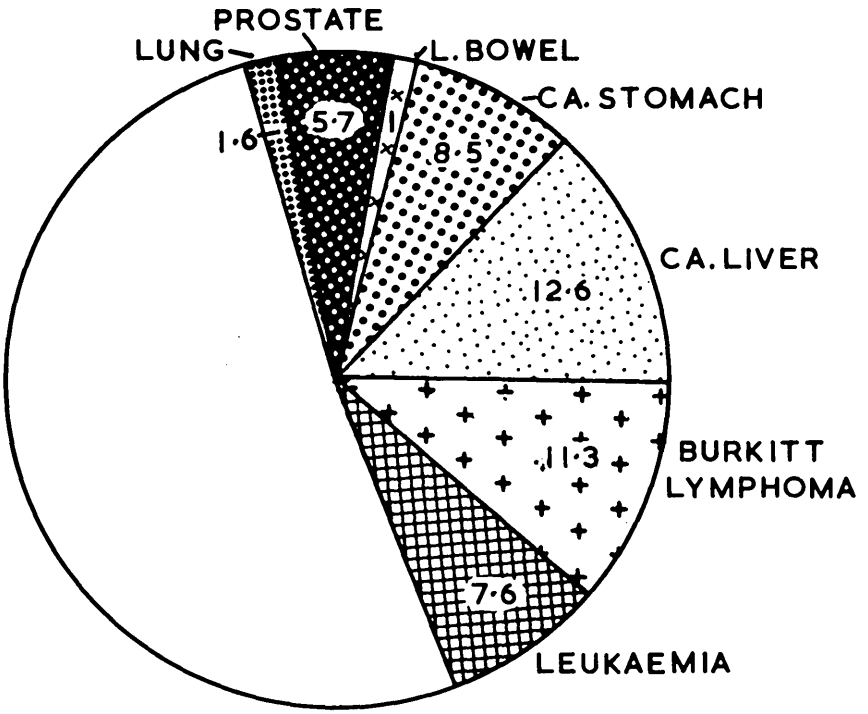
IBADAN MALES	
Type and site of tumour	Percentage of all male tumours
Primary liver tumours	13.2
Burkitt Tumour	11.3
Ca stomach	8.5
Leukaemia	7.6
Ca prostate	5.7
Adult lymphosarcoma	5.7
Hodgkins Disease	4.1
Ca bladder	3.1

IBADAN FEMALES	
Type and site of tumour	Percentage of all female tumours
Ca cervix uteri	17.9
Ca breast	16.7
Ovarian tumours	9.4
Burkitt Tumour	6.4
Leukaemia	4.5
Adult lymphosarcoma	4.2
Ca stomach	4.2
Chorionepithelioma	3.9
Ca thyroid	3.3
Reticulum cell sarcoma	3.6
Primary ca liver	2.7

IBADAN RESIDENTS BOTH SEXES	
Type and site of tumour	Percentage of all tumours
Ca cervix uteri	9.1
Burkitt Tumour	8.8
Ca breast	8.5
Primary tumours liver and G.B.	7.9
Ca stomach	6.3
Leukaemia	6.0
Adult lymphosarcoma	4.9
Ca prostate	2.8
Reticulum cell sarcoma	2.6
Ca thyroid	2.5
Ca bladder	2.3
Hodgkins Disease	2.3

FIGURE 14.

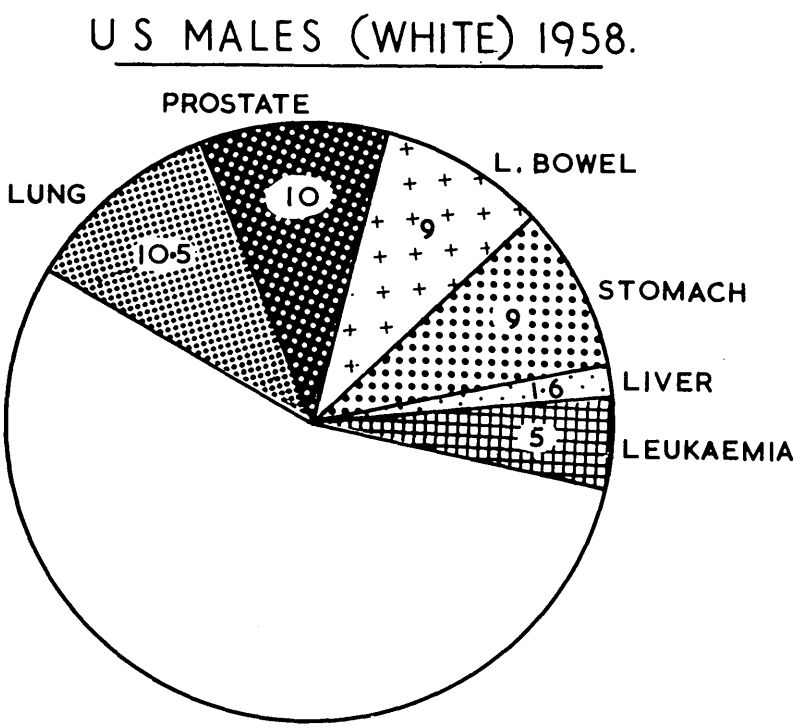
IBADAN MALES. 1960-63.



SELECTED TUMOURS AS A PERCENTAGE OF TOTAL TUMOURS.

SELECTED IBADAN TUMOURS AS A PERCENTAGE OF TOTAL TUMOURS.
MALES 1960-63.

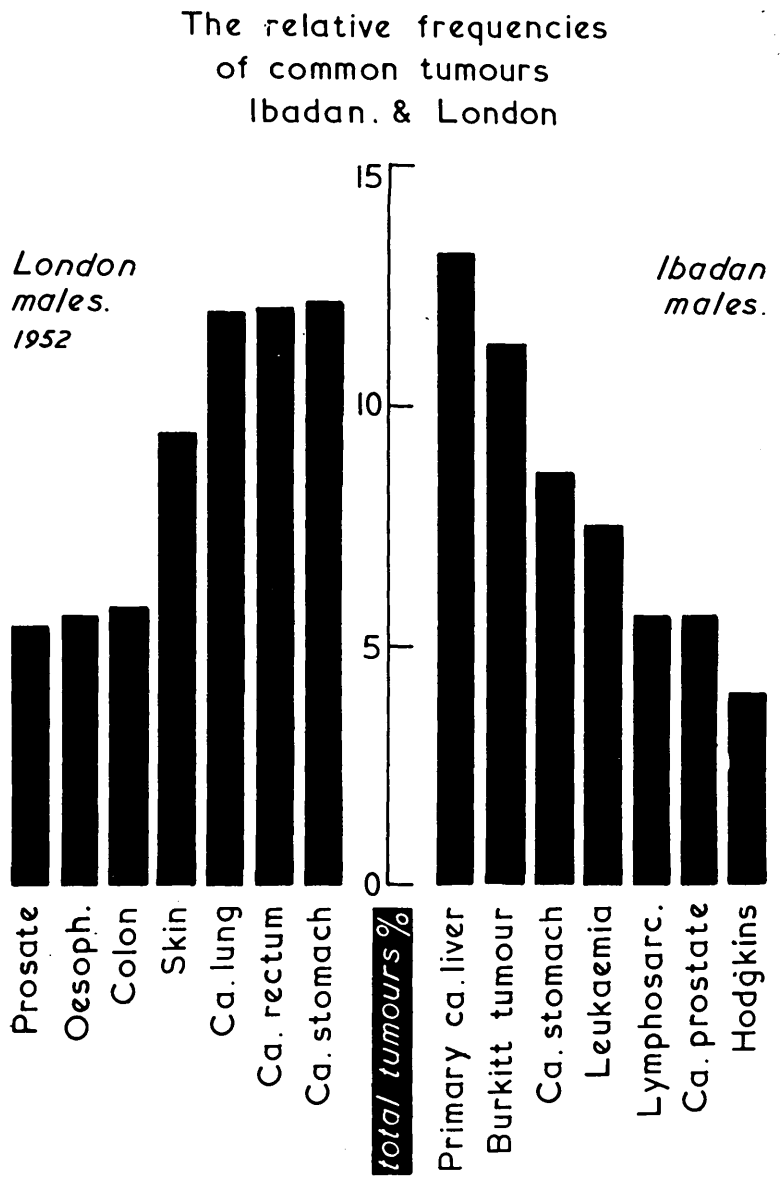
FIGURE 15.



SELECTED U.S. TUMOURS
AS A PERCENTAGE
OF TOTAL TUMOURS.

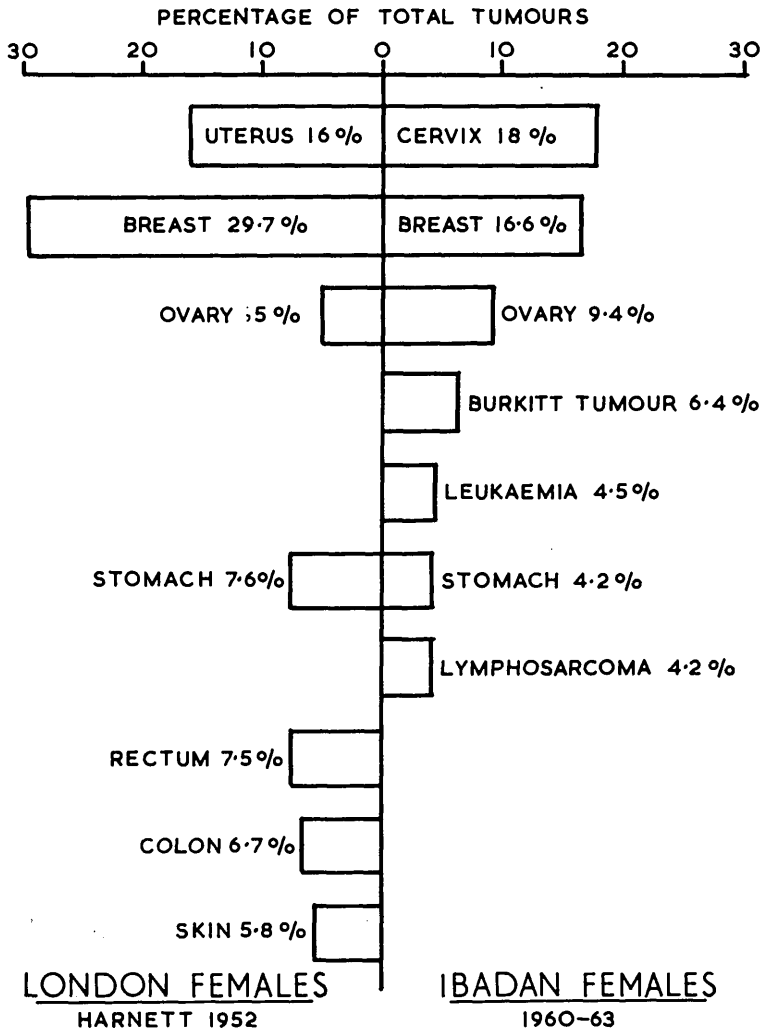
SELECTED U.S. TUMOURS (WHITE MALES)
AS A PERCENTAGE OF TOTAL TUMOURS (SEGI)

FIGURE 16.



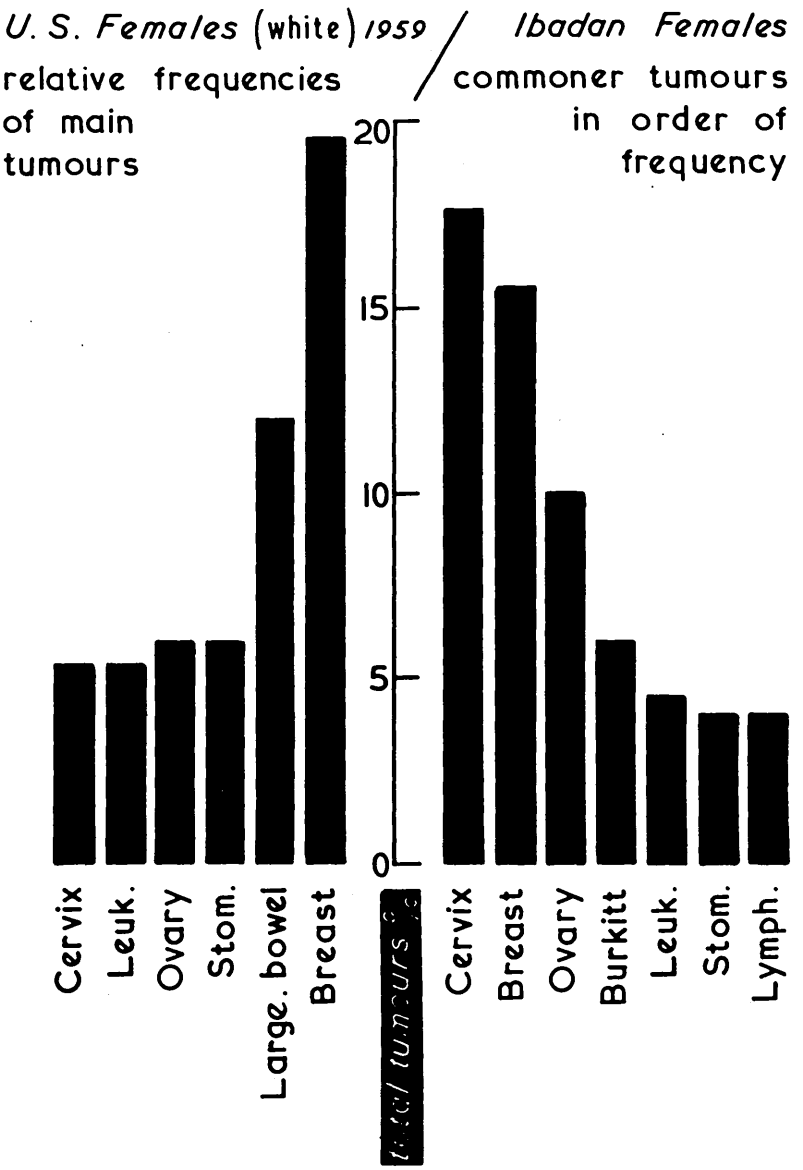
THE RELATIVE FREQUENCY OF COMMON TUMOURS, IBADAN AND LONDON MALES.

FIGURE 17.



THE RELATIVE FREQUENCY OF SELECTED TUMOURS, IBADAN AND LONDON FEMALES.

FIGURE 18.



A COMPARISON BETWEEN THE RELATIVE FREQUENCIES OF COMMONER TUMOURS IN U.S. WHITE FEMALES AND IBADAN FEMALES.

The population data

This has been discussed in Chapter III (p89 et seq). Knowelden and Oettlé in 1962 proposed a Standard African Population for use in comparisons of incidence figures from different African territories.

The percentage of the Standard Population in each age group is shown in Table XLIII and compared with the percentages which were found in the W.H.O. sample census. The Standard Population over-simplifies the youngest age groups in the population, making each five year group up to the age of 19 of equal size.

TABLE XLIII/

For the purposes of the calculation of age,sex specific incidence rates in the Ibadan population, the figures which have been used are those which were calculated from the total 1962 census figure of 479,000 by applying to it the proportions which obtained in the W.H.O. sample. (Table II p.95 supra).

The incidence of malignant disease in Ibadan residents

The total of 648 malignant tumours diagnosed represents a crude annual incidence rate of approximately 45 per 100,000[1]. This is the same

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1 Crude annual incidence for males = 45.0/100,000

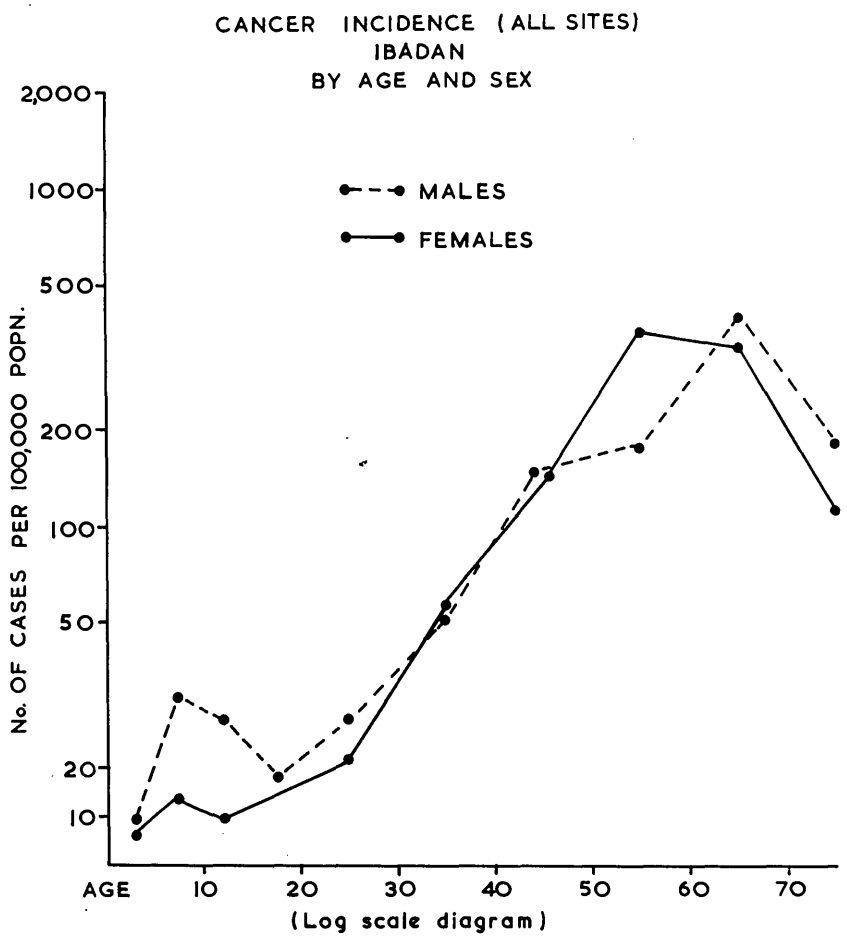
for females = 45.5/100,000.

TABLE XLIII

COMPARISON OF THE PERCENTAGES OF DIFFERENT AGE GROUPS IN THE IBADAN POPULATION (W.H.O. CENSUS) WITH THE STANDARD PERCENTAGES IN THE ~~SOUTH~~ AFRICAN POPULATION

AGE GROUP	PERCENTAGE OF W.H.O. SAMPLE		PERCENTAGE OF AFRICAN STANDARD POPULATION	
	M.	F.	M.	F.
0 - 4	16.7	16.6	10.0	10.0
5 - 9	12.2	14.1	10.0	10.0
10 - 14	10.0	9.6	10.0	10.0
15 - 19	9.4	6.3	10.0	10.0
20 - 29	18.8	21.4	20.0	20.0
30 - 39	11.5	13.7	20.0	20.0
40 - 49	6.0	7.2	10.0	10.0
50 - 59	3.3	2.8	5.0	5.0
60 - 69	1.7	1.2	3.0	3.0
70 +	0.4	0.4	2.0	2.0
Age unknown	9.9	6.4		

FIGURE 19.



IBADAN ANNUAL CANCER INCIDENCE RATES
(ALL SITES) PER 100,000 POPULATION
BY AGE AND SEX (LOG. SCLAE DIAGRAM)

Facing P. 218

figure as was calculated in December 1960 after the survey had been running for nine months.

It suggests that the incidence of malignant disease in the population is very low. But this is to ignore the age structure of a population in which sixty per cent of persons are under the age of 30 and only some two per cent are over 60 years of age.

Table XLIV shows the annual age specific incidence rates per 100,000 of all types of malignant disease in the Ibadan population

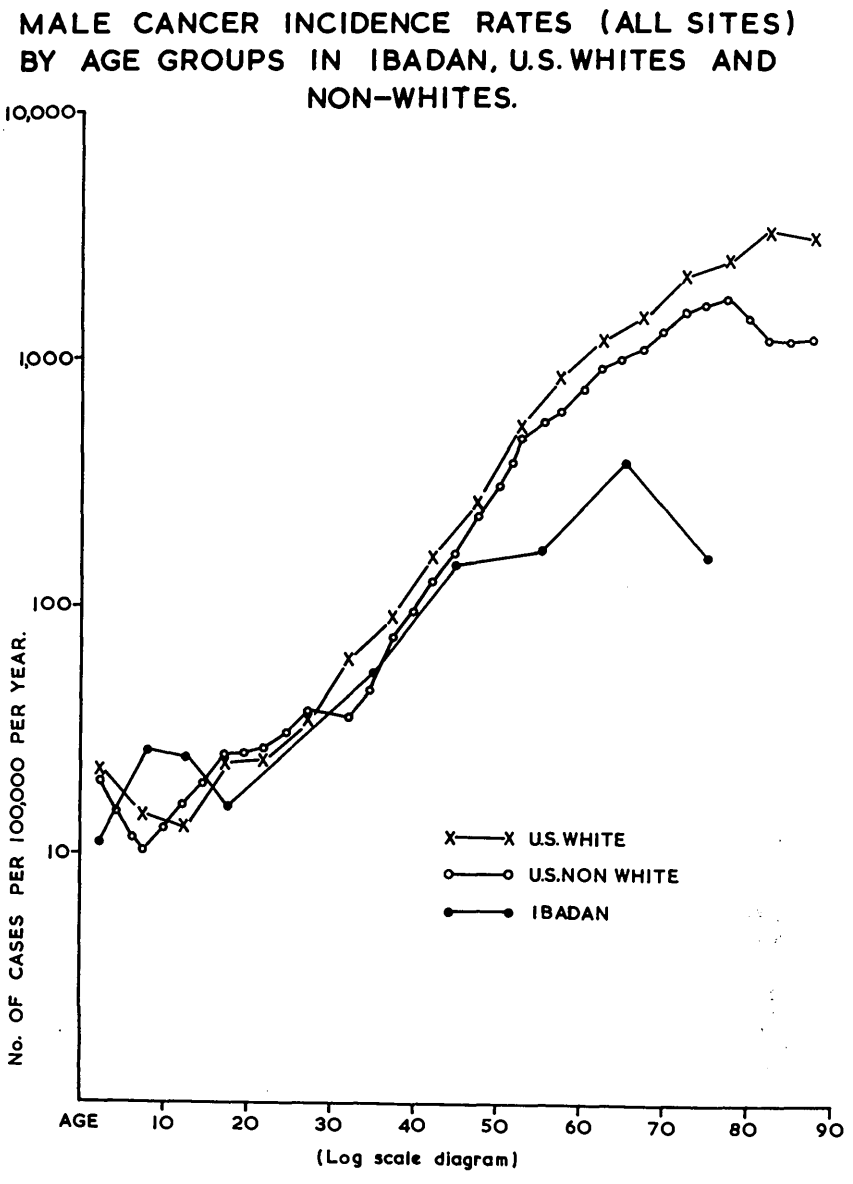
TABLE XLIV/

Figure 19 illustrates the Ibadan age sex cancer incidence rates (all sites).

In Figures 20 and 21 the annual age specific rates per 100,000 of malignant disease in Ibadan in males and females separately are compared with the cancer morbidity rates for Unites States whites and non-whites, 1947 (Dorn and Cutler, 1955).

It will be seen that in the 0 - 4 age group the Ibadan rates are lower than those in the United States, the difference can be attributed to the relative infrequency of leukaemia in young Ibadan children. However, the rates in the next quinquennium, age 5 - 9, in males in Ibadan are nearly twice as high as those in United States whites and almost three times as high as the rates in United States non-whites. It is from this age group that the Burkitt Tumour takes its largest toll in Ibadan.

FIGURE 20.



MALE CANCER INCIDENCE RATES (ALL SITES) IN IBADAN, 1960-63 AND U.S. WHITES AND NON-WHITES, 1947 (LOG. SCLAE DIAGRAM).

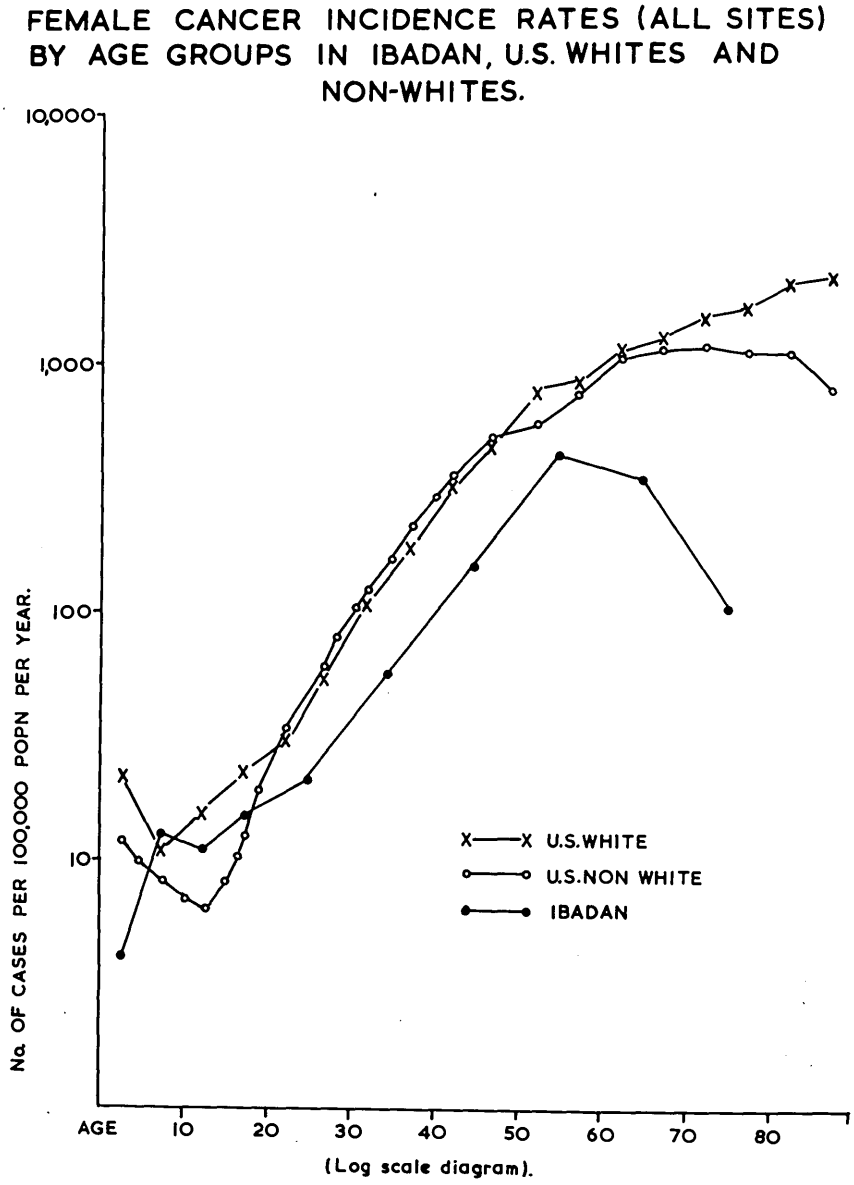
Tang P219

TABLE XLIV

THE ANNUAL AGE SPECIFIC INCIDENCE PER 100,000 POPULATION OF MALIGNANT DISEASE (ALL TYPES) IN IBADAN, 1960-63

Age group	Estimated Ibadan population		Total malignancies (3 years)		Annual age specific incidence per 100,000	
	Males	Females	Males	Females	Males	Females
0 - 4	40,000	40,000	14	5	11.66	4.16
5 - 9	29,000	34,000	25	14	28.73	13.72
10 - 14	24,000	23,000	19	8	26.41	11.59
15 - 19	22,000	15,000	11	6	16.66	15.55
20 - 29	45,000	52,000	36	34	26.66	21.15
30 - 39	27,000	33,000	47	55	58.02	56.56
40 - 49	14,000	17,000	64	81	152.38	158.82
50 - 59	8,000	7,000	41	86	170.83	409.52
60 - 69	4,000	3,000	48	30	400.00	333.00
70+	1,000	1,000	5	3	166.00	100.00
Age N.K.	23,000	15,000	8	8	11.59	17.7
All ages	237,000	240,000	318	330	45.00	45.5

FIGURE 21.



FEMALE CANCER INCIDENCE RATES (ALL SITES) IN IBADAN, 1960-63 AND U.S., 1947 (LOG. SCALE DIAGRAM)

Until the 40 - 49 decade has been passed the Ibadan rates for males approximate closely to those of the United States and the rate of increase or slope of the curve is also similar.

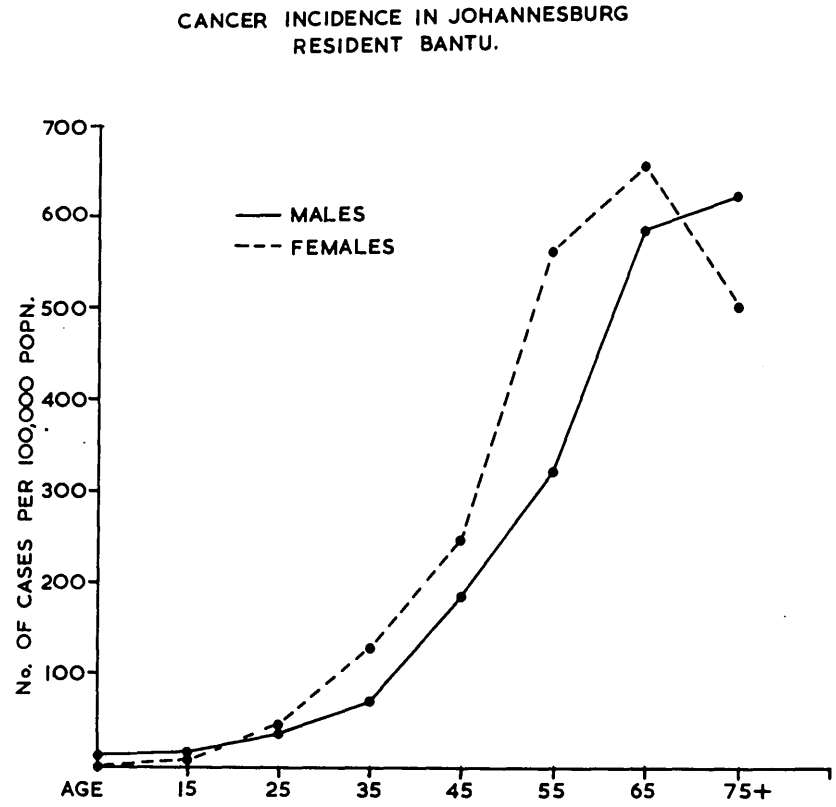
In females in Ibadan the incidence rates lag further behind the corresponding United States female rates in whites and non-whites In the 50 - 59 age group, however, the three rates were closely approximate again although the Ibadan rates are still the lowest.

After the age 50 - 59 decennium the Ibadan rates for females begin to descend, contrasting sharply in this respect with the United States white rates which continue to rise. There is a terminal drop, however, in the over 80 age group among United States non-white females.

The Ibadan male rates rise more slowly than do the United States rates after the age of 40 - 49. A final drop in Ibadan male rates is observed over the age of 70, whereas the United States male white rates continue to rise to a plateau in the 80 - 90 age group, by the age of 80 the United States non-white male rates have dropped in a manner similar to the Ibadan male rates of fifteen years younger.

A direct graphical comparison has not been made on the same figure between the incidence rates calculated by Higginson and Oettlé for Johannesburg and the Ibadan rates because of the fact that the available Ibadan population data was in different ten year

FIGURE 22.



CANCER INCIDENCE RATES (ALL SITES) IN JOHANNESBURG BANTU
(HIGGINSON AND OETTLE, 1960)

groupings from those employed in the Johannesburg study. It will, however, be recalled that the South African workers found a steady increase in cancer incidence with age, but that the rise was less steep than in the United States, especially after 55 years of age (see Figure 22).

With regard to Prates' findings in Lourenço Marques, the rise in the curve of cancer incidence there was similar to that in the U.S.A. and South Africa. However, the height of the curve was different in Lourenço Marques, being much lower in females and much higher in young males (under 45 years). But the older males in Lourenço Marques showed lower age specific rates. The situation regarding young African males in Lourenço Marques was quite exceptional. Details of the cancer incidence and Prates' commentary, especially in relation to the role of liver cancer in the overall incidence picture, are to be found in his forthcoming paper which deserves the most careful study.[2]

From Kyadondo, Davies et al. (1962) had found that after the age of 45 - 54 the African incidence rates, which had previously been close to those of Johannesburg but only about half those of the United States, had levelled off. Indeed the female rates showed a steep drop after the age of 65.

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2 A Cancer Survey in Lourenço Marques (1965). In press.

IBADAN TUMOURS BY AGE, SEX, TYPE AND SITE

Table XLV details all the Ibadan cases. It will be noted that the total numbers of malignant tumours in any age group in Ibadan was small. It has therefore been decided for primary comparative purposes to use indirect standardisation, and calculate how many cases of certain tumours might have been expected in the various age groups of the Ibadan population if that population had been subject to the cancer morbidity rates prevailing in the U.S. population in 1947 (Dorn and Cutler, 1955).

TABLE XLV/

TABLE XLV

NUMBERS OF NEW CASES OF MALIGNANT DISEASE DIAGNOSED IN IBADAN RESIDENTS (BOTH SEXES) APRIL 1st 1960 - MARCH 31st 1963

International List No. 7th Revision	N.K		0-4		5-9		10-14		15-19		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70-74		75+		TOTALS	
SITE	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
140 Lip																											1								1	
141 Tongue																									1										1	
142 Salivary glands																			1	3	2						2								5	3
143-4 Other mouth															1		1		1										1						4	
146 Nasopharynx																			1										1						2	
145,147,148 Other pharynx																																				
150 Oesophagus	1																			1			1				1								3	1
151 Stomach		1									1		1			2	1	1	4	2	6	3	3	1	3	1	4	2	4	1			1		28	14
152 Duodenum, small intestine																																				
153 Colon															1				1	1	1	1		1	1						1				4	4
154 Rectum							1								2			1		1	2	2			1										6	4
155 Liver, primary	1								2		3		4		4		7	2	8		3	3	2		3	3	5								42	8
155.1 G.B. Extra hepatic ducts																										1										1
156 Liver 2°		1															1							3					1						2	4
157 Pancreas											1		1		1		2	1	1		1	2	1	1		1									8	5
160 Nasal sinuses			1								1				1		1		1		2		1												8	
161 Larynx																			1				1		1		1								4	
162,163 Bronchus, lung											1				1		1	2				2	1				1	1							5	5
170 Breast		1											4			4		11		7		4		14		4		3		3					55
171 Cervix uteri		1																8		8		13		13		8		3		3		1	1		59
173 Other specific uterine tumours including chorionepithelioma										1		3		2		2		4		3																15
174 Unspecified uterine tumours																																				
175 Ovary						1						1		5		4		2		4		1		6		4		2		1						31
176 Other F. genital																								2												2
177 Prostate																					1		2		4		4		4		3				18	
178 Testis	1										2																								3	
179 Penis																							1												1	
180 Kidney			2	1	1												1						1												4	2
181.0 Bladder										1									3			1	1	2		1	4		1		1				10	5
190 Melanoma of skin											1						1					1		1					1	1					3	3
191 Other skin tumours	2										1	1	1		1						1	1					1	1							7	3
192 Eye			3	1	1																														4	1
193,223,227 Brain C.N.S.			1	2	2				1																				1						5	2
194 Thyroid		2						1			2	1		1			1	1	2	1				3					1						5	11
195 Other endocrines																																				
196 Bone						1				1	1	1	4						1		1														7	3
197 Connective tissue+muscle	1		2						2	1		1	2	1				1			1			1					1						8	6
200 Lymphosarcoma and reticulosarcoma		1	1						1		3	3		5	4	1	3	2	3	4	1	2	4	5	2	2		1	1						23	26
201 Hodgkin's disease							2		2		2		1		1				2		1	1	1			1			1						13	2
203 Multiple myeloma																	1																		1	
202,205 Other reticuloses, Burkitt tumour			3	1	19	10	11	7	1	2	1		1																						36	20
204 Leukaemia			1		1	2	5		2					4	3	1	5			1	4	2		3	1		1	3	1						24	16
198 2° tumours in L. glands	2													1				1	2	2			1						1						6	4
199 2° tumours, unspecified 1° site		1				1							1		2	2		1	3	3	2	1	3	3		1	3	2	2	1					17	15
TOTALS	8	8	14	5	25	14	19	8	11	6	20	11	16	23	22	16	25	39	35	41	29	40	24	59	17	27	28	18	20	12	4	2	1	1	318	330

These comparisons have been made in Tables XLVI to L. The tumours chosen for comparison of actual and expected numbers of cases are cancers of the liver, stomach, breast and cervix, which are the commonest carcinomas in the Ibadan population.

TABLES XLVI, XLVII, XLVIII, XLIX, L/

It will be observed that the actual number of cases of carcinoma of the liver occurring in Ibadan males is much higher than would be expected in a similar population of American white or non-white males. The actual cases of primary liver cancer in Ibadan females is also higher in Ibadan than would be expected but the difference is not so striking.

Carcinoma of the stomach is found with the expected frequency until the age of 50 years but thereafter it is much rarer than would be expected since the actual numbers of cases are only about half those expected at United States rates.

Carcinoma of the breast and cervix would appear to be considerably less common in Ibadan than in the United States in all age groups. The Ibadan women appear to approximate more closely to United States white women than to United States non-whites.

TABLE XLVI

A COMPARISON BETWEEN THE ACTUAL NUMBER OF CASES OF CARCINOMA OF THE LIVER SEEN IN IBADAN IN 3 YEARS AND THE NUMBERS EXPECTED IN THE IBADAN POPULATION AT U.S. WHITE AND NON-WHITE RATES (DORN AND CULTER, 1955)

Age group	Estimated Ibadan population		Actual cases of ca. liver in Ibadan in 3 yrs.		Expected numbers of cases at U.S. rates in 3 yrs.			
					U.S. White		U.S. Non-white	
	M	F	M	F	M	F	M	F
0 - 4	40,000	40,000	0	0	0.5	0.0	0.3	0.0
5 - 9	29,000	37,000	0	0	0.0	0.2	0.0	0.0
10 - 14	24,000	23,000	0	0	0.1	0.0	0.0	0.0
15 - 19	22,000	15,000	2	0	0.0	0.0	0.0	0.6
20 - 29	45,000	52,000	7	0	0.3	0.3	0.0	0.8
30 - 39	27,000	33,000	11	2	0.4	0.0	1.9	1.5
40 - 49	14,000	17,000	11	3	0.9	1.0	3.7	1.0
50 - 59	8,000	7,000	5	4	2.4	1.6	3.6	2.3
60 - 69	4,000	3,000	5	0	2.9	1.5	1.3	0.8
70+	1,000	1,000	0	0	1.0	1.1	0.8	0.1
Age N.K.	23,000	15,000	1	0	0.0	0.0	0.0	0.0
TOTAL ALL AGES	237,000	240,000	42	9	8.5	5.7	11.6	7.1

TABLE XLVII

A COMPARISON BETWEEN THE ACTUAL NUMBER OF CASES OF CARCINOMA OF THE STOMACH SEEN IN IBADAN IN 3 YEARS AND THE NUMBERS EXPECTED IN THE IBADAN POPULATION AT U.S. WHITE AND NON-WHITE RATES (DORN AND CULTER, 1955)

Age group	Estimated Ibadan population		Actual cases of ca. stom. in Ibadan in 3 yrs.		Expected number of cases at U.S. rates in 3 yrs.			
					U.S. White		U.S. Non-white	
	M	F	M	F	M	F	M	F
0 - 4	40,000	40,000	0	0	0	0	0	0
5 - 9	29,000	34,000	0	0	0	0	0	0
10 - 14	24,000	23,000	0	0	0	0	0	0
15 - 19	22,000	15,000	0	0	0	0	0	0
20 - 29	45,000	52,000	2	0	0.6	0.5	2.4	0.8
30 - 39	27,000	33,000	1	3	2.8	1.4	3.4	5.6
40 - 49	14,000	17,000	10	5	6.5	4.6	9.9	6.2
50 - 59	8,000	7,000	6	2	14.0	5.7	28.1	9.0
60 - 69	4,000	3,000	8	3	20.0	7.0	29.3	11.3
70+	1,000	1,000	1	0	1.9	5.0	6.2	4.4
Age N.K.	23,000	15,000	0	1	0.0	0.0	0.0	0.0
TOTAL ALL AGES	237,000	240,000	28	14	45.8	24.2	79.3	37.3

TABLE XLVIII

A COMPARISON BETWEEN THE ACTUAL NUMBERS OF CASES OF CARCINOMA OF THE CERVIX IN IBADAN FEMALES IN 3 YEARS AND THE EXPECTED NUMBER IN THE IBADAN FEMALE POPULATION AT U.S. WHITE AND NON-WHITE RATES (DORN AND CULTER, 1955)

Age group	Estimated Ibadan population (females)	Actual cases of ca. of cervix in Ibadan in 3 yrs.	Expected number of cases at U.S. rates in 3 yrs.	
			U.S. White	U.S. Non-white
0 - 4	40,000	0	0.0	0
5 - 9	34,000	0	0.0	0
10 - 14	23,000	0	0.2	0
15 - 19	15,000	0	0.1	0.6
20 - 29	52,000	0	6.1	23.5
30 - 39	33,000	8	28.1	73.6
40 - 49	17,000	21	34.4	57.8
50 - 59	7,000	21	19.1	32.4
60 - 69	3,000	6	7.4	18.7
70+	1,000	2	2.3	5.3
Age N.K.	15,000	1	0.0	0.0
TOTAL ALL AGES	240,000	59	97.7	211.9

TABLE XLIX

A COMPARISON OF THE ACTUAL NUMBER OF CASES OF CARCINOMA OF THE BREAST SEEN IN IBADAN FEMALES IN 3 YEARS AND THE NUMBERS EXPECTED IN THE IBADAN FEMALE POPULATION AT U.S. WHITE AND NON-WHITE RATES (DORN AND CULTER, 1955)

Age group	Estimated Ibadan population (females)	Actual cases of ca. breast in Ibadan in 3 yrs.	Expected number of cases at U.S. rates in 3 yrs.	
			U.S. White	U.S. Non-white
0 - 4	40,000	0	0	0
5 - 9	34,000	0	0	0
10 - 14	23,000	0	0	0.9
15 - 19	15,000	0	0.3	1.2
20 - 29	52,000	4	9.1	5.4
30 - 39	33,000	15	45.3	38.8
40 - 49	17,000	11	59.9	42.4
50 - 59	7,000	18	36.0	26.1
60 - 69	3,000	6	20.9	16.7
70+	1,000	0	9.4	6.0
Age N.K.	15,000	1	0.0	0.0
TOTAL ALL AGES	240,000	55	180.9	137.5

TABLE L

A COMPARISON BETWEEN THE ACTUAL NUMBERS OF CASES OF ALL TYPES OF CANCER SEEN IN IBADAN IN 3 YEARS AND THE NUMBERS EXPECTED IN THE IBADAN POPULATION AT U.S. WHITE AND NON-WHITE RATES (DORN AND CULTER, 1955)

Age group	Estimated Ibadan population		Actual cases of cancer of all types in Ibadan in 3 yrs.		Expected number of cases at U.S. rates in 3 yrs.			
					U.S. White		U.S. Non-white	
	M	F	M	F	M	F	M	F
0 - 4	40,000	40,000	14	5	27.9	25.4	24.6	14.6
5 - 9	29,000	34,000	25	14	13.5	11.5	9.3	8.4
10 - 14	24,000	23,000	19	8	10.0	11.3	11.6	4.5
15 - 19	22,000	15,000	11	6	16.5	9.9	16.9	6.0
20 - 29	45,000	52,000	36	34	41.5	69.0	41.5	74.3
30 - 39	27,000	33,000	47	55	64.1	151.0	49.4	125.2
40 - 49	14,000	17,000	64	81	91.8	201.6	83.8	207.0
50 - 59	8,000	7,000	41	86	157.2	157.2	131.5	139.6
60 - 69	4,000	3,000	48	30	160.3	104.5	121.2	100.2
70+	1,000	1,000	5	3	73.4	52.3	47.5	64.8
Age N.K.	23,000	15,000	8	8	0.0	0.0	0.0	0.0
TOTAL ALL AGES	237,000	240,000	318	330	656.2	793.7	537.3	744.6

THE CRUDE ANNUAL AND AGE SPECIFIC RATES OF INDIVIDUAL TUMOUR TYPES IN IBADAN

In this section only a selection of tumours will be considered since in most cases the total numbers are so small as to make the calculations meaningless.

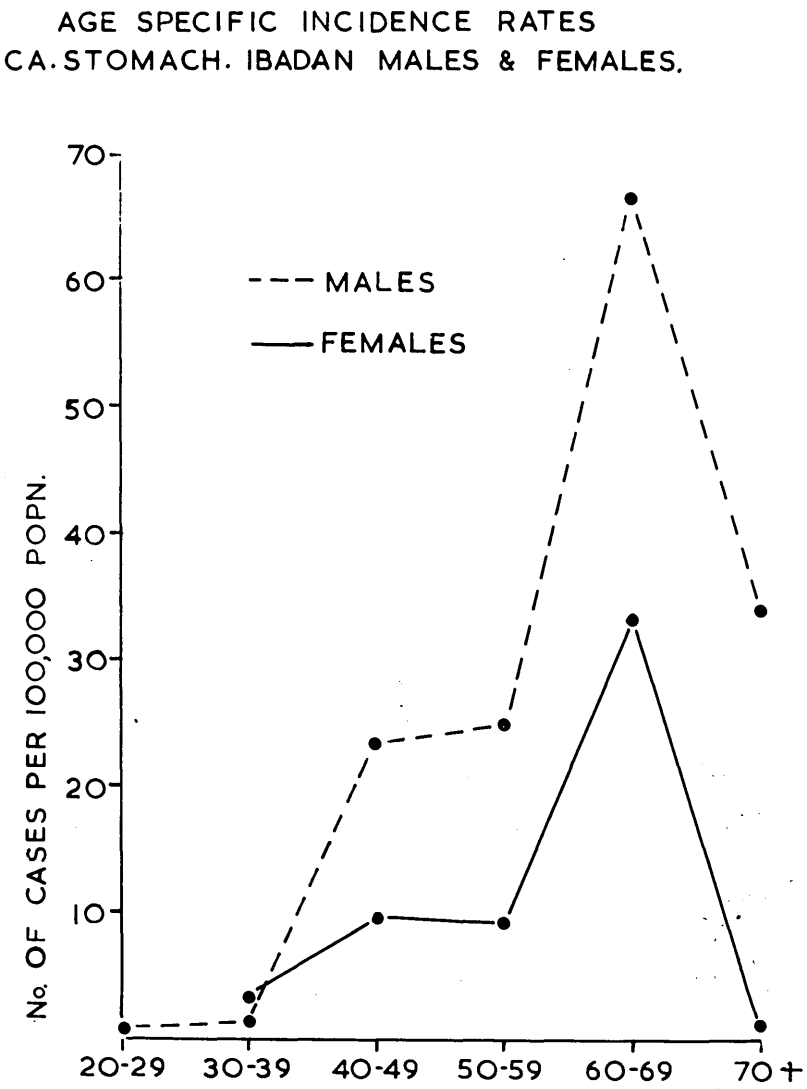
It is not intended to discuss the histology of individual tumours in any detail but where appropriate a note may be made regarding the sites of the tumour or any unusual features of interest.

TUMOURS OF THE STOMACH

One of these was a sarcoma. For the calculation of age specific rates only carcinomas have been considered. The results are shown in Table LI and Figure 23.

TABLE LI/

FIGURE 23.



THE ANNUAL AGE SPECIFIC INCIDENCE RATES
OF CARCINOMA OF THE STOMACH, IBADAN, 1960-63

TABLE LI

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF STOMACH TUMOURS* (151)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
20 - 29	1 + 1*	0.7		
30 - 39	1	1.2	3	3.0
40 - 49	10	23.8	5	9.8
50 - 59	6	25.0	2	9.3
60 - 69	8	66.6	3	33.3
70 +	1	33.3		
"Adult"			1	
TOTALS ALL AGES	28		14	

Crude incidence rate per 100,000/yr. (all stomach tumours)

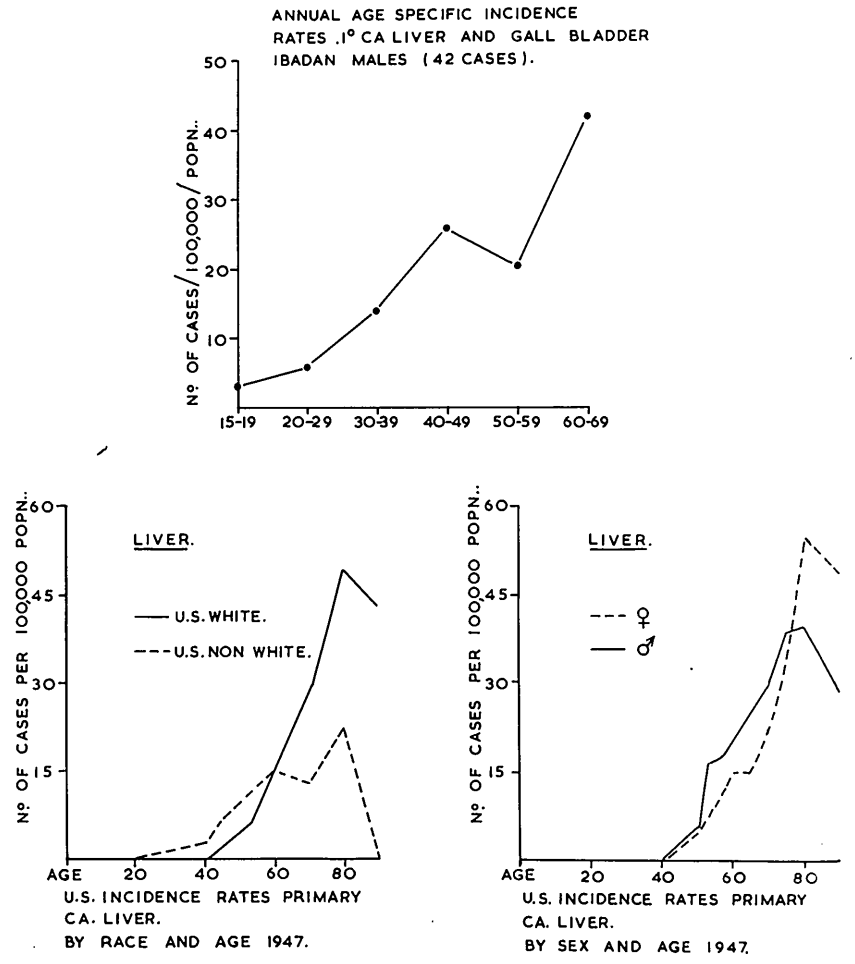
Male = 3.9

Female = 1.9

Combined = 2.9

*Cases include one sarcoma but the age specific rate (20 - 29) is calculated for carcinoma only.

FIGURES 24, 25, 26.



ANNUAL AGE SPECIFIC INCIDENCE RATES OF PRIMARY CARCINOMA OF THE LIVER IN IBADAN MALES, 1960-63 and U.S. MALES, 1947 (DORN AND CUTLER)

Primary carcinoma of the liver and gall bladder

There were 42 primary liver carcinomas in men and 8 in women. In addition there was one female case of carcinoma of the gall bladder.

Table LII and Figure 24 illustrate the incidence rates which, it will be seen, rose steeply with age apart from a drop in the 50 - 59 male group..

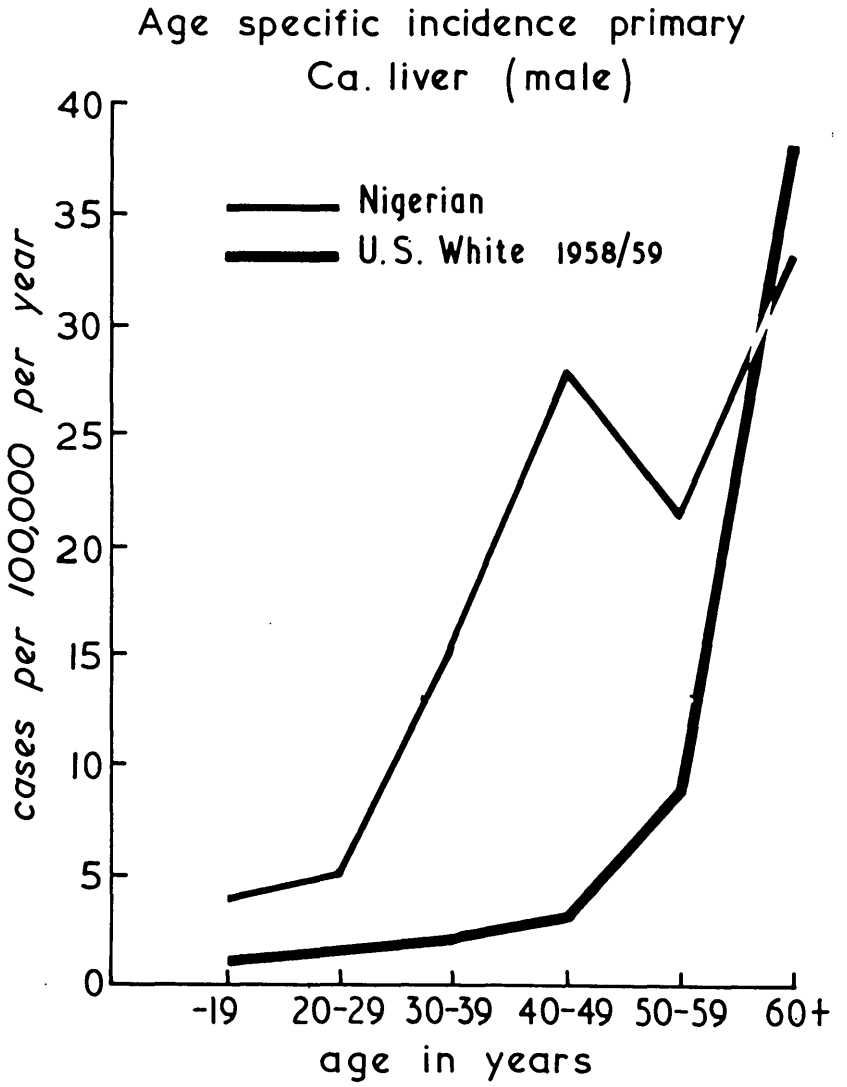
The striking feature is the high incidence at the younger ages, although these do not rise to the heights recorded by Prates in Lourenço Marques.

In Figures 25 and 26 the 1947 United States liver cancer morbidity rates for whites and non-whites and for males and females are reproduced. (Dorn and Cutler).

A further comparison is provided in Figure 27 where the Ibadan incidence rates are shown alongside the mortality rates from cancer of the liver in United States whites 1958/59 (Mitsuo Segi and Minora Kurihara).

TABLE LII/

FIGURE 27.



ANNUAL AGE SPECIFIC INCIDENCE RATES FOR PRIMARY CARCINOMA OF THE LIVER IN IBADAN MALES, 1960-63 AND MORTALITY RATES FOR PRIMARY CARCINOMA OF THE LIVER IN U.S. WHITES, 1958-59 (SEGI)

TABLE LII

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF PRIMARY CARCINOMA OF LIVER AND GALL BLADDER (155)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
15 - 19	2	3.0		
20 - 29	7	5.2		
30 - 39	11	13.6	2	2.0
40 - 49	11	26.2	3	5.9
50 - 59	5	20.8	4	19.0
60 - 69	5	41.7		
70 +	0			
"Adults"	1			
TOTALS ALL AGES	42		9	

Crude incidence rate per 100,000 per year

Male = 5.9

Female = 1.2

Combined = 3.5

Carcinoma of the pancreas

Table LIII indicates the incidence rates for carcinoma of the pancreas.

TABLE LIII

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF CARCINOMA OF THE PANCREAS. (157)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
20 - 29	2	1.48		
30 - 39	3	3.70	1	1.01
40 - 49	2	4.76	2	3.92
50 - 59	1	4.16	2	9.52
TOTALS ALL AGES	8		5	

Crude incidence rate per 100,000 per year

Male = 1.1

Female = 0.7

Combined = 0.9

Carcinoma of lungs, bronchi and pleura

There were only five lung tumours in males and five in females. The male cases were:

2 adenocarcinomas, one affecting the upper lobes of both lungs,

1 oat cell carcinoma of the right lung in which the primary was thought to be tracheal,

1 anaplastic carcinoma of the right bronchus,

1 case of a poorly differentiated carcinoma in a cervical lymph gland in association with a pleural effusion on X-ray and a clinical diagnosis of carcinoma of the lung.

The female cases were:

1 mesothelioma of the pleura,

1 spheroidal cell carcinoma of the bronchus,

3 adenocarcinomas of bronchi.

Thus half the cases seen in Ibadan were adenocarcinomas. This is of some interest in view of the postulated relationship of cell type to the aetiology of lung cancer (Doll, Hill and Kreyberg, 1957).

TABLE LIV/

TABLE LIV

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF CARCINOMA OF LUNGS, BRONCHI AND PLEURA (162)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
20 - 29	1	0.7		
30 - 39	2	2.5	2	2.02
40 - 49			2	3.92
50 - 59	1	4.2		
60 - 69	1	8.3	1	11.11
TOTALS ALL AGES	5		5	

Crude incidence rate per 100,000 per year

Male = 0.7

Female = 0.7

Combined = 0.7

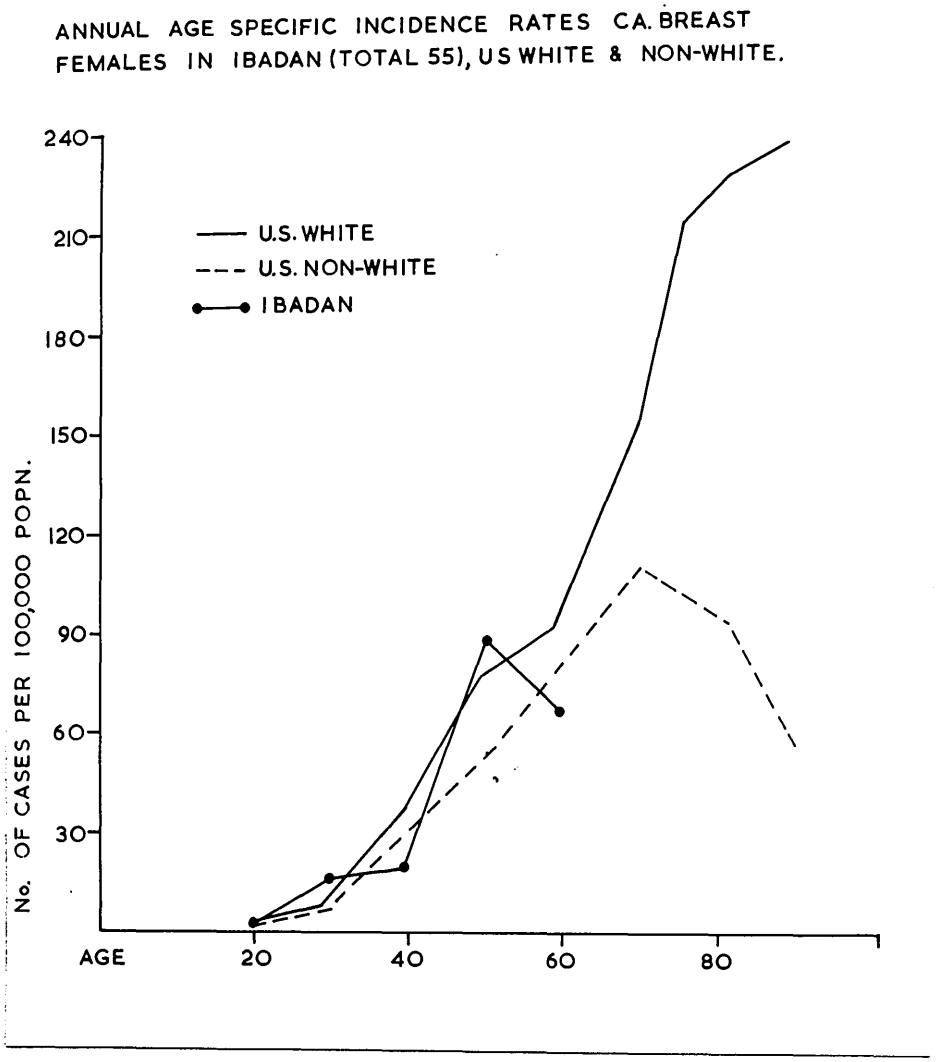
Carcinoma of the breast

There were no male cases in Ibadan in three years. 27 of the 55 female cases were clinically diagnosed.

The age specific incidence rates for the 55 female Ibadan cases are shown in Table LV and in Figure 28, which also includes the United States rates (Dorn and Cutler) for comparison.

TABLE LV/

FIGURE 28.



ANNUAL AGE SPECIFIC INCIDENCE RATES OF CARCINOMA OF THE FEMALE BREAST, IBADAN 1960-63 AND U.S.A., 1947 (DORN AND CUTLER)

TABLE LV

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN FEMALE POPULATION OF CARCINOMA OF THE BREAST (170)

AGE GROUP	Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE - SPECIFIC RATE
20 - 29	4	2.6
30 - 39	15	15.2
40 - 49	11	21.6
50 - 59	18	85.7
60 - 69	6	66.7
Age N.K.	1	
TOTALS ALL AGES	55	

Crude incidence rate per 100,000

per year = 7.6

Carcinoma of the uterine cervix

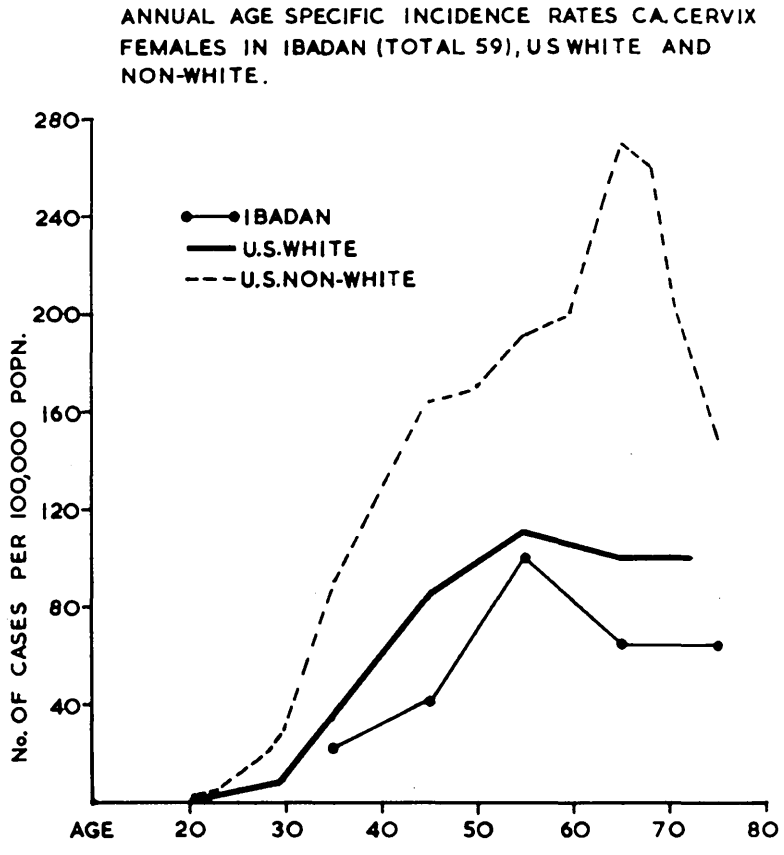
The age specific incidence rates are shown in Table LVI and Figure 29 compares the Ibadan and United States rates.

There was no instance of carcinoma of the uterine body in Ibadan in three years.

The only other uterine tumours in the series, apart from chorionepitheliomas, were a sarcoma and a haemangiopericytoma.

TABLE LVI/

FIGURE 29.



ANNUAL AGE SPECIFIC INCIDENCE RATES OF CARCINOMA OF THE CERVIX, IBADAN 1960-63 AND U.S.A. 1947 (DORN AND CUTLER)

TABLE LVI

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN FEMALE POPULATION OF CARCINOMA OF THE CERVIX UTERI (171)

AGE GROUP	Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
30 - 39	8	24.2
40 - 49	21	41.2
50 - 59	21	100.0
60 - 69	6	66.6
70 +	2	66.6
"Adult"	1	
TOTALS ALL AGES	59	

Crude incidence rate per 100,000 per year = 8.1

Chorionepithelioma

The age specific incidence rates for this tumour are shown in Table LVII.

TABLE LVII

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN FEMALE POPULATION OF CHORIONEPITHELIOMA (173)

AGE GROUP	Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
15 - 19	1	2.2
20 - 29	5	3.2
30 - 39	5	5.0
40 - 49	2	3.9
TOTALS ALL AGES	13	

Crude incidence rate per 100,00 population per year = 0.9

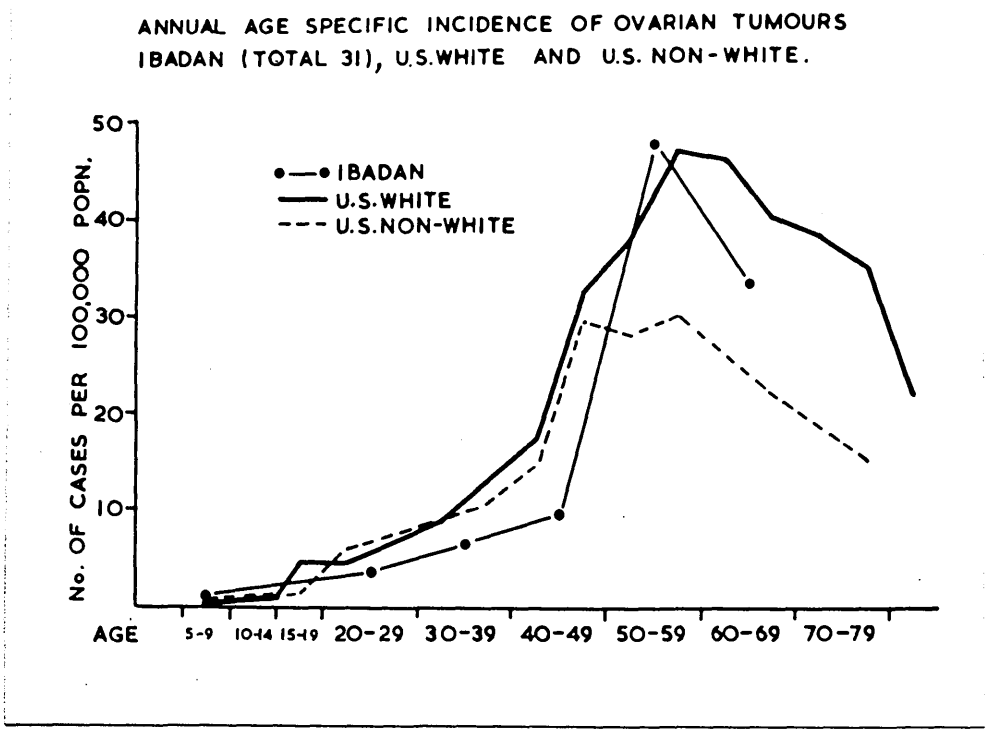
Ovarian Tumours

There were 31 ovarian tumours in three years. 15 of these were adenocarcinomas and the remainder consisted of 10 granulosal cell tumours, 5 thecomas and 2 malignant teratomas.

The incidence rates for ovarian tumours of all types are shown in Table LVIII and Figure 30, which includes a diagram of the United States rates for cancer of the ovary. It will be seen that the Ibadan rates are not dissimilar from those of the United States white females. There is a drop in incidence rates both in Ibadan and United States women after the age of 60.

TABLE LVIII/

FIGURE 30.



ANNUAL AGE SPECIFIC INCIDENCE RATES OF CANCER OF THE OVARY, IBADAN, 1960-63 AND U.S.A., 1947 (DORN AND CUTLER)

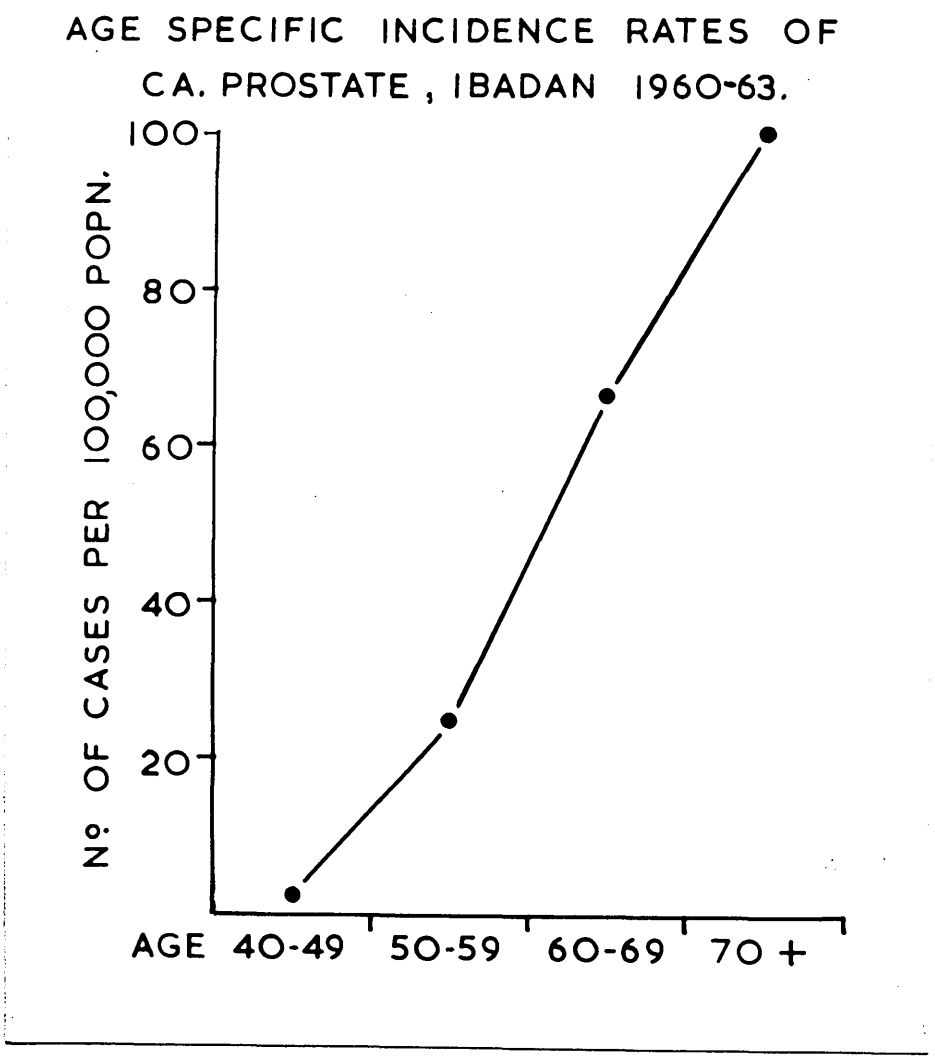
TABLE LVIII

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN FEMALE POPULATION OF OVARIAN TUMOURS (175)

AGE GROUP	Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-
5 - 9	1	1.0
10 - 14	0	
15 - 19	0	
20 - 29	6	3.8
30 - 39	6	6.1
40 - 49	5	9.8
50 - 59	10	47.6
60 - 69	3	33.3
TOTALS ALL AGES	31	

Crude incidence rate of all ovarian tumours per 100,000 per year = 4.3

FIGURE 31.



ANNUAL AGE SPECIFIC INCIDENCE RATES OF CARCINOMA OF THE PROSTATE, IBADAN 1960-63

Carcinoma of the prostate

The figures relating to 18 prostate carcinomas are demonstrated in Table LIX and Figure 31. Six of these cases were diagnosed on clinical and X-ray findings. The incidence rates, though low, rise with age.

TABLE LIX

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN MALE POPULATION OF CARCINOMA OF THE PROSTATE (177)

AGE GROUP	Males	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
40 - 49	1	2.4
50 - 59	6	25.0
60 - 69	8	66.6
70 +	3	100.0
TOTALS ALL AGES	18	

Crude incidence rate per 100,000 per year

= 2.5

Carcinoma of the Bladder

There were 10 cases in men and 5 in women. The age specific incidence rates are calculated in Table LX.

TABLE LX

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF CARCINOMA OF THE BLADDER (181)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
15 - 19			1	2.22
40 - 49	3	7.1	1	2.0
50 - 59	1	4.2	3	14.3
60 - 69	5	41.6		
70 +	1	33.3		
TOTALS ALL AGES	10		5	

Crude incidence rate per 100,000 per year

Male = 1.4

Female = 0.7

Combined = 1.0

Skin tumours and malignant melanoma

There were only one or two skin tumours in each age groups, the crude incidence rate was only 0.7 per 100 000 per year and skin carcinomas accounted for only 1.4 per cent of all tumours.

It is of some interest to record the sites and histological diagnoses of the ten cases of carcinoma of the skin encountered in residents of Ibadan in three years:

1 sq. cell carcinoma of heel,

1 epithelioma of anus,

2 sq. cell carcinomas of jaw

1 sq. cell carcinoma of the gluteal area

1 sq. cell carcinoma of face

2 sq. cell carcinomas of unspecified site

1 basal cell carcinoma of face

1 sweat gland adenocarcinoma

Thus there was only one definite case recorded in Ibadan in which the squamous epithelioma had been on the lower leg.[3]

Five of the six malignant melanomas were on the foot or lower leg and there was one melanoma of the eye.

---

3 In the non-Ibadan cases, which are not described separately in this study, there occurred 3 squamous cell carcinomas of the face in albinos. A Lebanese hotelier aged 60, who had lived in Nigeria since adolescence, developed a squamous epithelioma of the skin, requiring amputation above the knee.

Carcinoma of the thyroid

This tumour was twice as common in women as in men but the total cases were small. The age specific rates are indicated in Table LXI.

TABLE LXI

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF CARCINOMA OF THE THYROID (194)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
10 - 14			1	1.4
15 - 19			0	
20 - 29	2	1.5	2	1.3
30 - 39	1	1.2	1	1.0
40 - 49	2	4.8	1	2.0
50 - 59			3	14.3
60 - 69			1	11.1
Age N.K.			2	
TOTALS ALL AGES	5		11	

Crude incidence rate per 100,000 per year

Male = 0.7

Female = 1.5

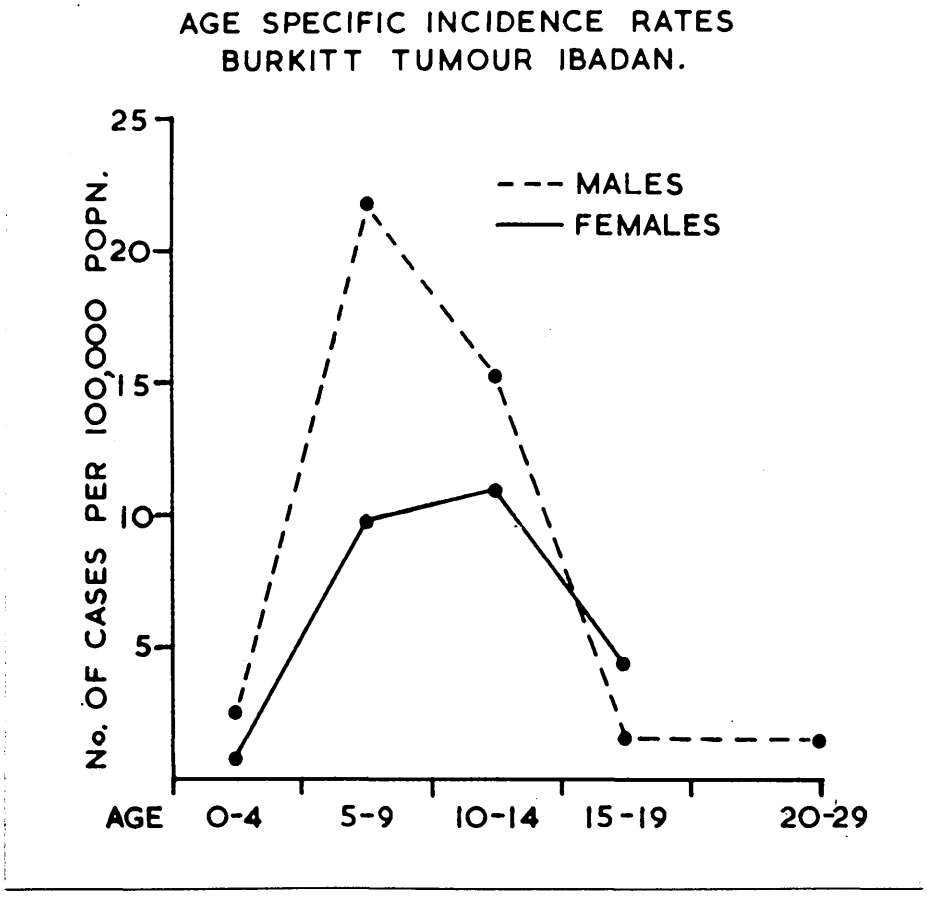
Combined = 1.1

The Burkitt Tumour

Table LXII indicates the age specific rates of the Burkitt Tumour in the Ibadan population to which reference has already been made in the last chapter. This information is presented graphically in Figure 32. The exceedingly high incidence rates in boys between the ages of five and fourteen will be noted. There can no longer be any doubt of the importance of this tumour among Ibadan children.

TABLE VXII/

FIGURE 32.



ANNUAL AGE SPECIFIC INCIDENCE RATES OF THE BURKITT TUMOUR, IBADAN, 1960-63.

TABLE LXII

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF THE BURKITT TUMOUR OR CHILDHOOD LYMPHOMA (202)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
0 - 4	3	2.5	1	0.8
5 - 9	19	21.8	10	9.8
10 - 14	11	15.3	7	10.1
15 - 19	1	1.5	2	4.4
20 - 29	2	1.5		
TOTALS ALL AGES	36		20	

Crude incidence rate per 100,000 per year

Male = 5.1

Female = 2.8

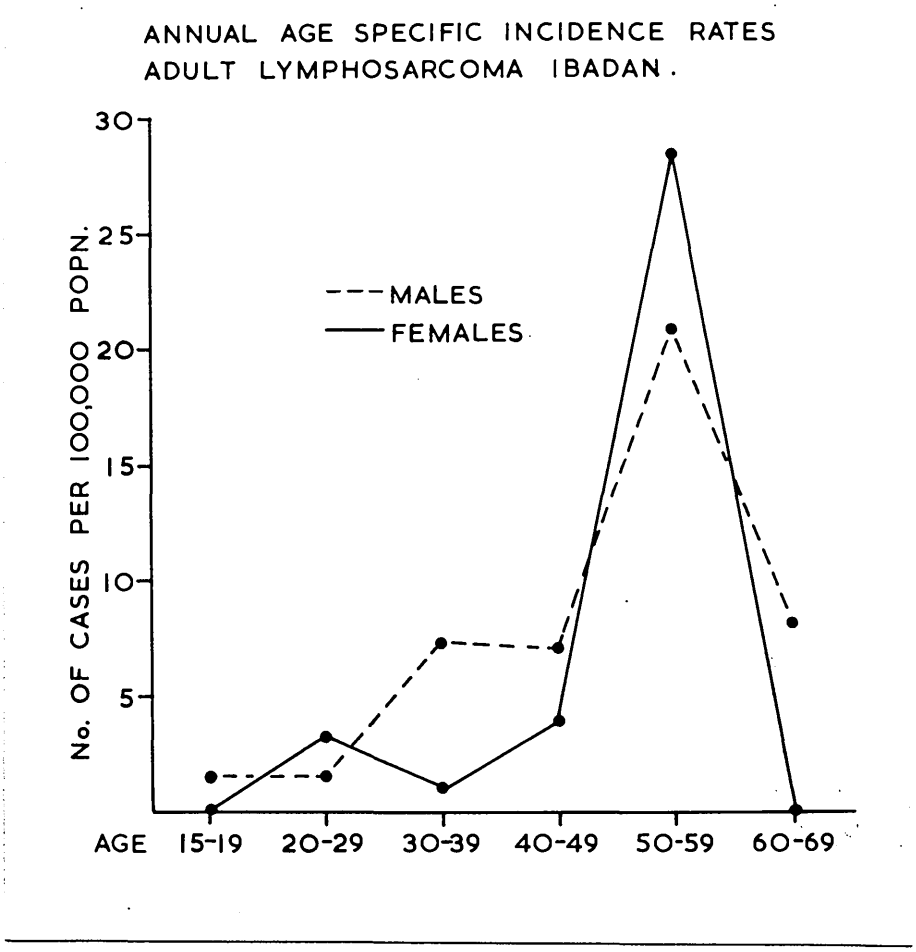
Combined = 3.9

Adult lymphosarcoma

Cases put under this heading were clearly differentiated histologically from the Burkitt Tumour. The incidence rates appear in Table LXIII and Figure 33.

TABLE LXIII/

FIGURE 33.



ANNUAL AGE SPECIFIC INCIDENCE RATES OF ADULT LYMPHOSARCOMA, IBADAN, 1960-63.

TABLE LXIII

THE ANNUAL AGESPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF ADULT LYMPHOSARCOMA (200.1)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
15 - 19	1	1.5		
20 - 29	2	1.5	5	3.2
30 - 39	6	7.4	1	1.0
40 - 49	3	7.1	2	3.9
50 - 59	5	20.8	6	28.6
60 - 69	1	8.3		
TOTALS ALL AGES	18		14	

Crude incidence rate per 100,000 per year

Male = 2.5

Female = 1.9

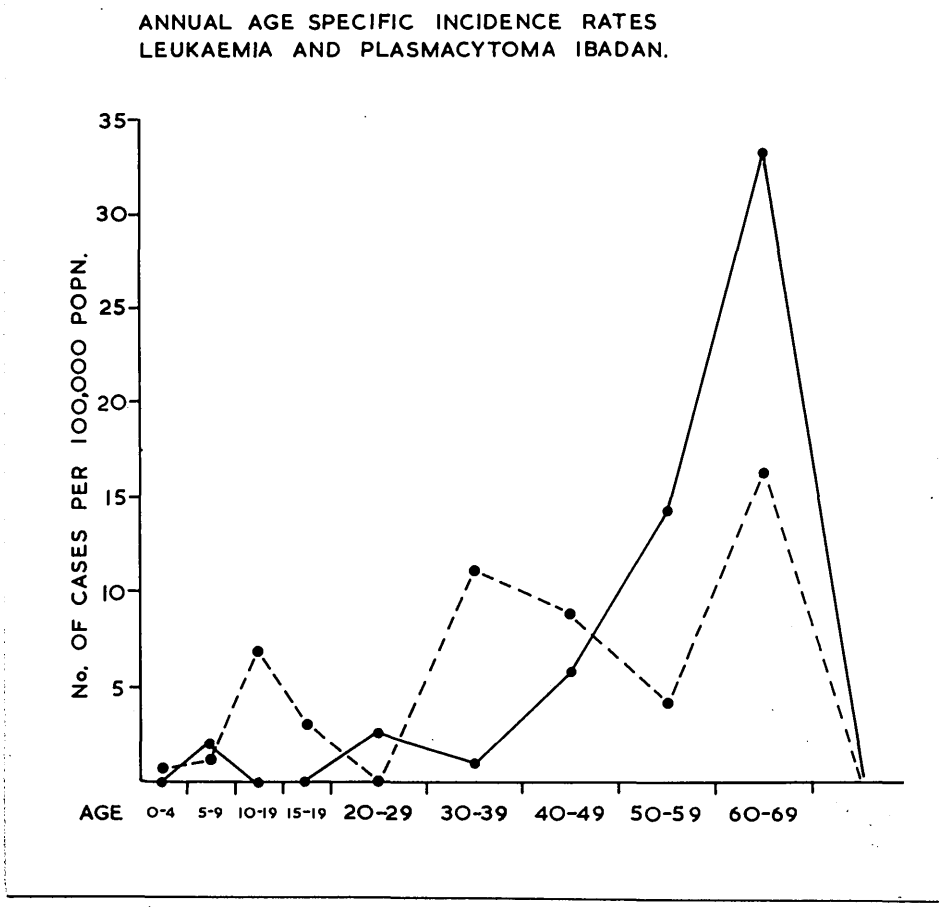
Combined = 2.2

Leukaemia and plasmacytoma

Reference has already been made to leukaemia in the Ibadan population in Chapter IX. The age specific incidence rates are reproduced in Table LXIV and in Figure 34.

TABLE LXIV/

FIGURE 34.



ANNUAL AGE SPECIFIC INCIDENCE RATES OF LEUKAEMIA AND PLASMACYTOMA
IBADAN, 1960-63

TABLE LXIV

THE ANNUAL AGE SPECIFIC INCIDENCE RATES PER 100,000 IBADAN POPULATION OF LEUKAEMIA AND PLASMACYTOMA (204 and 203)

AGE GROUP	Males		Females	
	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE	TOTAL CASES IN 3 YEARS	ANNUAL AGE-SPECIFIC RATE
0 - 4	1	0.8	0	0.00
5 - 9	1	1.1	2	2.0
10 - 14	5	6.9	0	0.0
15 - 19	2	3.0	0	0.0
20 - 29	0	0.0	4	2.6
30 - 39	9*	11.1	1	1.0
40 - 49	4	9.0	3	5.9
50 - 59	1	4.2	3	14.3
60 - 69	2	16.6	3	33.3
TOTALS ALL AGES	25*		16	

Crude incidence rate per 100,000 per year

Male = 3.5

Female = 2.1

Combined = 2.3

* Includes one plasmacytoma

Tumours in children

As can be seen from Table LXV the Burkitt Tumour accounted for the vast majority of tumours diagnosed in Ibadan children under the age of 15 during the period of the survey.

At the same time a wide range of other conditions were encountered which have been analysed in terms of their relative frequency.

TABLE LXV/

TABLE LXV

85 TUMOURS IN IBADAN CHILDREN AGED 0 - 14

Int. List no.	Type of tumour	No. of cases in 3 yrs.	% of total
202	Burkitt tumour	51	60.0
204	Leukaemia	9	10.6
192	Retinoblastoma	5	5.9
193	Cerebral tumours	5	5.9
180	Wilms tumour of kidney	4	4.7
201	Hodgkin's disease	2	2.3
197	Sarcomas of connective tissue	2	2.3
200	Reticulum cell sarcoma	1	1.2
196	Osteosarcoma	1	1.2
160	Sq. cell carcinoma of maxilla	1	1.2
175	Gran. cell tumour of ovary	1	1.2
194	Thyroid carcinoma	1	1.2
154	Carcinoma of rectum	1	1.2
199	Unspecified malignancy	1	1.2

In Table LXVI a comparison is made between the relative frequencies of various tumours in children under the age of 10 in three African towns, Ibadan, Johannesburg and Lourenço Marques.

TABLE LXVI/

TABLE LXVI

TUMOURS IN AFRICAN CHILDREN AGED 0 - 9 YEARS

Type of Tumour	IBADAN 1960-63 TOTAL = 55		JO'BURG 1953-55 TOTAL = 49		LOURENCO MARQUES 1956-61 TOTAL = 67	
	No.	%	No	%	No	%
Lymphomas	34	62.0	6	12.2	32	47.6
Eye	4	7.3	11	22.4	11	16.4
C.N.S	4	7.3	3	6.1	2	3.0
Leukaemia	4	7.3	8	16.3	2	3.0
Kidney	4	7.3	13	26.5	1	1.5
Liver	0		0	0.0	5	7.5
Ovary	1	1.8	0	0.0	0	0.0
Conn.tissue	2	3.6	0	0.0	6	9.0
Bone	0		0	0.0	6	9.0
Nasalsinus, ca.	1	1.8	0	0.0	0	0.0
Misc.	1	1.8	8	16.3	2	3.0

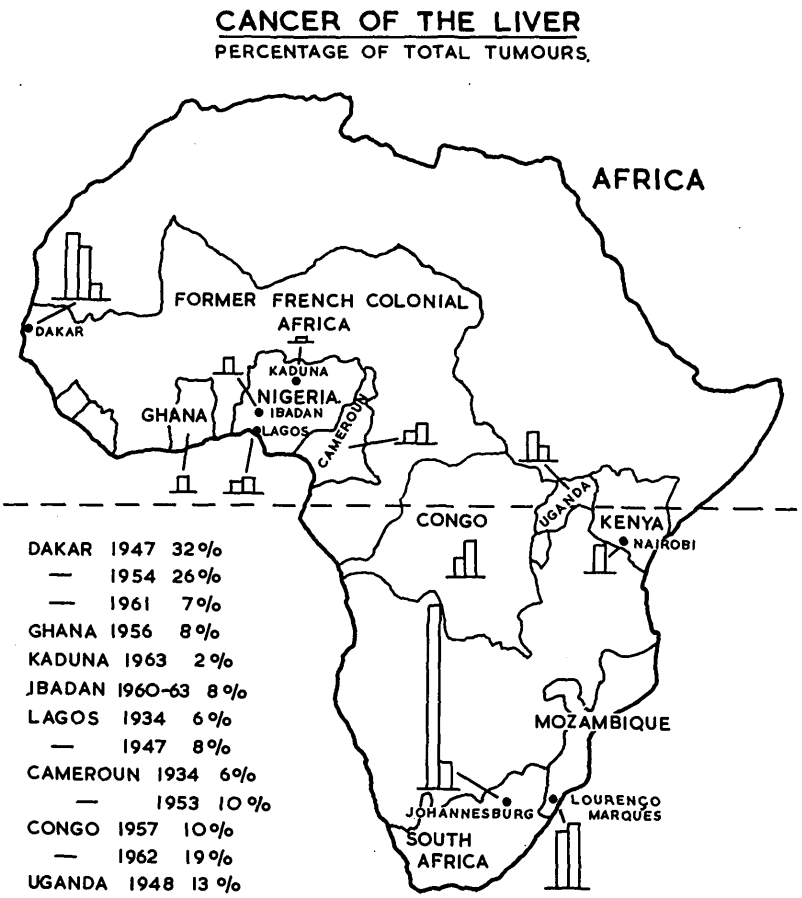
CHAPTER X

Until ten years ago the cancer map of Africa was still in confusion. Here and there, it is true, giant trees seemed to tower above the surrounding jungle of thick bush and creepers but there was no way of telling whether they were permanent features of the landscape or short-lived wonders of the uncharted forest.

Numerous clinicians and pathologists had addressed their minds to this subject, describing in considerable detail the situation close at hand, cataloguing the cancers they had encountered and ranging them in groups according to a variety of shared characteristics. In this way some peculiar features of the African cancer landscape had been established. It had at least become clear that the types of growth occurring on this continent, though not unfamiliar to the European expert, were surprising in their degrees of relative importance and that tumours regarded as rarities in Europe and America must be accepted as commonplace upon the African scene.

The multiplication of relative ratio surveys in the second quarter of this century was therefore an invaluable and essential prelude to the subsequent study of cancer in defined African populations and the signposts which were erected by these early workers have pointed the way for the later enquiries. Primary

FIGURE 35.



TO ILLUSTRATE THE VARIATIONS OVER TIME IN CARCINOMA OF THE LIVER AS A PERCENTAGE OF TOTAL TUMOURS IN SUCCESSIVE AFRICAN CANCER SURVEYS.

TO ILLUSTRATE THE VARIATIONS OVER TIME IN PRIMARY CARCINOMA OF THE LIVER AS A PERCENTAGE OF TOTAL TUMOURS IN SUCCESSIVE AFRICAN CANCER SURVEYS

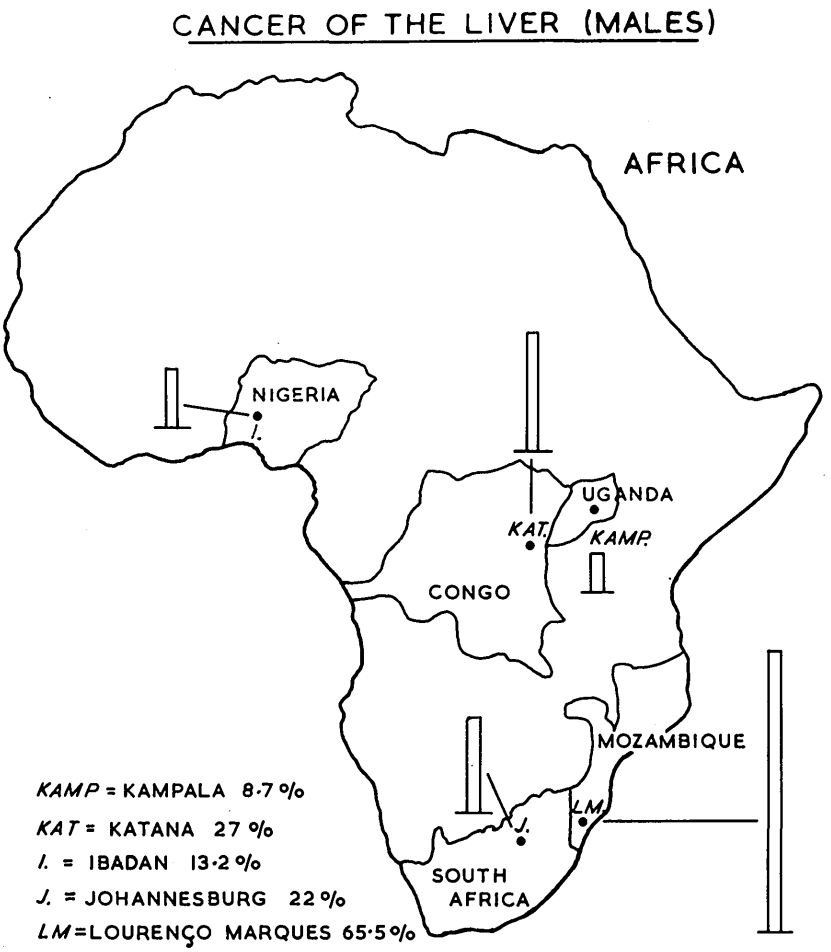
cancer of the liver, the reticuloses in general and the Burkitt Tumour in particular, Kaposi's Sarcoma and malignant melanoma had all caught the attention of observant clinicians and pathologists who had not expected their discovery in such large numbers. Skin tumours were frequently reported from all over Africa, nasopharyngeal carcinomas featured in Rhodesian experience, doctors in Ruanda Urundi found stomach cancer to be common among their patients.

The fundamental inadequacies of this kind of survey have repeatedly been exposed. An apparent excess of some tumour may simply be due to deficient diagnosis of other types. Percentages fluctuate and are redistributed in relation to changes in the entire socio-medical environment, causing certain tumours to assume pre-eminence for a time before subsiding into positions of lesser importance as cancers previously hidden in the population are brought to medical attention and recognised for what they are.

It would be superfluous to enunciate once more the fallacies inherent in these survey methods, many aspects having already been demonstrated and dealt with in the first chapter of this thesis. However, a number of illustrations may serve further to establish the point and, for this purpose, it is instructive to look at the situation in relation to one or two specific tumours.

In Figure 35 an illustration is provided of the way in which

FIGURE 36.



TO ILLUSTRATE THE RELATIVE FREQUENCY OF CANCER OF THE LIVER AMONGST ALL MALE TUMOURS IN FIVE AFRICAN SURVEYS IN THE DECADE 1953–1963.

TO ILLUSTRATE THE RELATIVE FREQUENCY OF PRIMARY CARCINOMA OF THE LIVER AMONGST ALL MALE TUMOURS IN FIVE AFRICAN CANCER SURVEYS IN THE DECADE 1953-63

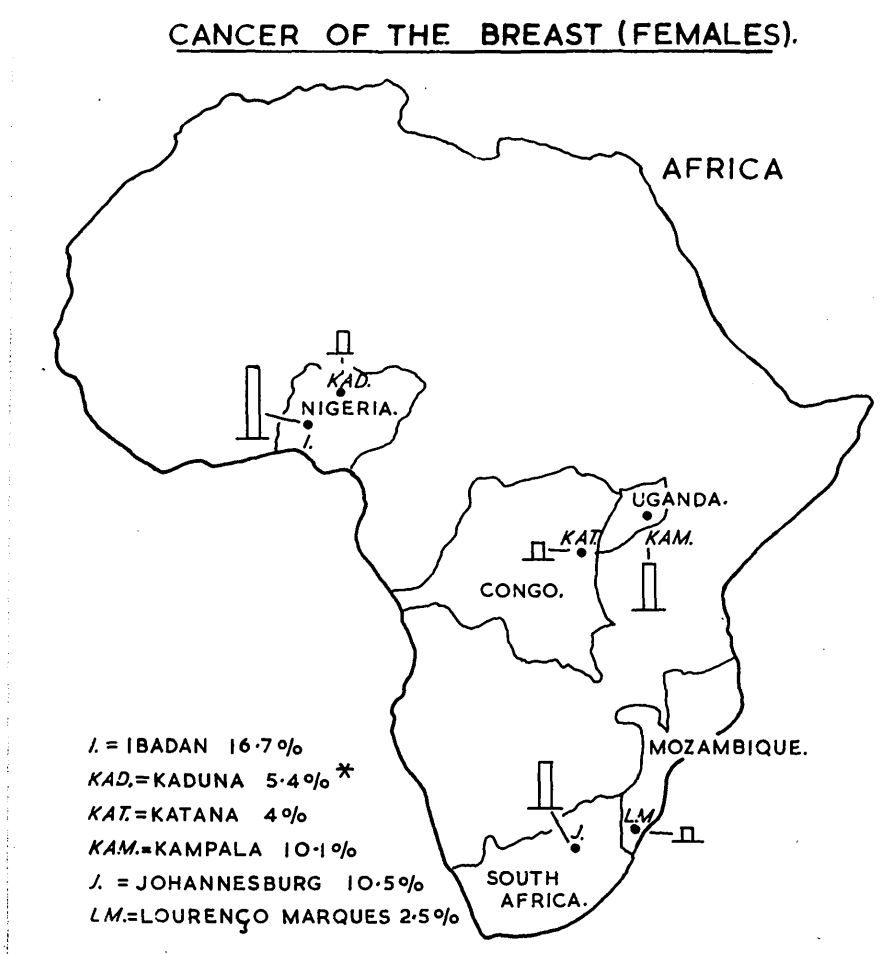
primary cancer of the liver has fluctuated in terms of its relative frequency among all tumours in a number of African cancer surveys. The tumour has not only varied from place to place but also in the same territory from one period to another in the accounts of one or another author. It is perhaps a little unfair to include Berman's figure of 90 per cent for liver cancer in young Witwatersrand miners.[1] But this example does serve to establish the general theme, that circumstances alter cases or results and that extreme caution must be exercised in the interpretation of this kind of data. To perceive in these bizarre fluctuations a reliable reflection of the permanent underlying cancer pattern in the populations concerned is an expression of naivety.

Yet the writings of African cancerologists have abounded in such oversimplifications, as insecure statistical bases have been called upon to support elaborate edifices of inspired etiological theory. The most cautious researchers, however, have always recognised the limitations of their methods and material, being content to describe clinical findings without presuming to pronounce upon their cause or significance.

---

1 It is interesting, however, to compare Berman's calculation that Portuguese East African miners were six times more liable to develop liver cancer than their South African co-workers with Prates' recent demonstration that crude rates for cancer of the liver in Lourenço Marques are seven times higher than in Johannesburg.

FIGURE 37.



TO ILLUSTRATE THE RELATIVE FREQUENCY OF CANCER OF THE FEMALE BREAST AS A PERCENTAGE OF TOTAL FEMALE TUMOURS IN RECENT AFRICAN CANCER SURVEYS

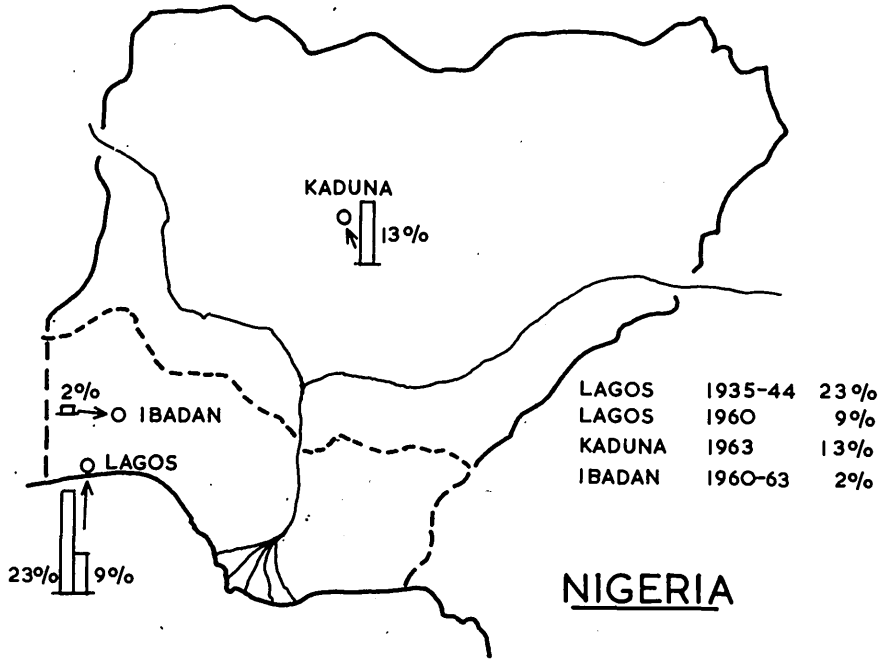
The position of primary carcinoma of the liver relative to other tumours in the five recent cancer incidence surveys has been depicted in Figure 36. These were all surveys consisting in the main of hospital diagnosed cases, with the addition in Johannesburg of some notifications through death certificates and from private practitioners. Only time can show whether the positions established during the last decade will be maintained or whether even this tumour may decline a little in relative importance as other malignant conditions, at present evading medical notice, come to light in larger numbers in these divergent geographical areas.

The present situation in regard to cancer of the breast, expressed as a percentage of all female tumours, can be similarly portrayed, as in Figure 37. In all the African incidence surveys this cancer has appeared to be less common than in corresponding United States populations. Yet in Ibadan it is now the second commonest tumour in women and the third most common diagnosis among tumours of both sexes. This is not a difficult cancer to detect, cases which do reach medical attention are moreover almost uniformly far advanced. Again it may be surmised that the position may alter with changes in the readiness of African women to attend hospitals for treatment and that the relative ratios now obtaining may prove in time to be far from constant.

The geographical pathology of Kaposi's Sarcoma has already

FIGURE 38.

SQUAMOUS EPITHELIOMA OF SKIN AS A PERCENTAGE OF TOTAL TUMOURS.



TO ILLUSTRATE THE DIFFERING RELATIVE FREQUENCY OF SKIN CARCINOMA IN NIGERIA AT DIFFERENT PLACES AND TIMES.

SQUAMOOS EPITHELOIMA OF THE SKIN AS A PERCENTAGE OF TOTAL TUMOURS NIGERIA 1935-63.

provided an example of the many variables in the Nigerian cancer scene. Turning to squamous epithelioma of the skin, it can be seen in Figure 38 how this tumour varies in apparent significance from one part of Nigeria to another and how its relative importance has changed in Lagos over the years. Again this is a tumour which, in spite of what seemed to be its relatively high importance in numerous of the earlier African cancer surveys, is nevertheless not as common in the African as in the white races. In Ibadan city its place is negligible (crude incidence less than 1 per 100,000). The other two Nigerian towns from which relative frequency figures have been drawn collect their case material from a wide surrounding rural area. The Ibadan relative frequency figure of 2.4 per cent for skin cancers[2] is close to that of the same group of tumours in the Johannesburg resident Bantu (2.6 per cent). Higginson and Oettlé found, however, a higher relative frequency of skin cancers in the rural areas beyond the city.

Whilst one set of variables operates to influence the validity and usefulness of relative ratio studies of cancer, another group comes into play to militate against the success of cancer incidence surveys. The component factors are well known and their effects

---

2 excluding Kaposi's Sarcoma but including sqamous carcinoma, rodent ulcers and melanomas.

are not confined to studies in underdeveloped or developing territories. But the extent to which they affect the results does vary according to the stage of social and economic development of the countries oncerned. As Dorn and Cutler (1955) have pointed out, "The number of diagnosed cases of cancer in any population depends not merely upon the number of persons with cancer but also upon the training and ability of practising physicians, the quality of available diagnostic techniques and facilities, and the readiness with which persons seek and obtain medical care". Furthermore, even in advanced countries there is often a discrepancy between cancer incidence rates obtained by a system of registration which depends upon notification by hospitals and private doctors and one which also takes into account the mortality evidence of death certification.

However, even vital statistics which incorporate all the available sources of information may by no means encompass the cancer situation nor reflect it accurately. Steiner (1952) believed that official vital statistics could be increased by as much as 20 per cent to allow for the errors in diagnosis which necropsy studies revealed.

Merely to envisage an overall increase in official cancer incidence figures is, however, to oversimplify the problem, since some cancers may be featuring too often in uninformed diagnoses.

Clemmesen (1965) for example, considers that the true incidence of gastric cancer appears to fall, as accurate diagnostic techniques come to be more generally used and the employment of the term as a convenient label for terminal cachexia declines.

If questions of this kind are still not finally settled even in those countries with vital statistics and advanced medical facilities, the situation is enormously more complex where the elementary features of the population at risk are not reliably known. In the face of these peculiar difficulties different cancer epidemiologists in Africa have adopted a number of policies, according to their assessment of the reliability of available population estimates and the time and resources at their disposal to establish independant censuses. Thus in Uganda and in the Congo the workers concerned accepted the official figures as a basis for their calculations. In Johannesburg, after carrying out a survey in one township, Higginson and Oettlé decided to accept the available census estimates for the whole metropolitan area. In Lourenço Marques, on the other hand, Flegg and Lutz (1959) carried out a special demographic survey, this exercise being simply one example of the meticulous thoroughness which has characterised the whole Mozambique cancer survey.

It would be inviduous to criticise the methods of other workers in a field whose difficulties are only too clearly appreciated. Considerations of time, money and trained or untrained staff all determine the number and extent of the subsidiary

investigations which can be undertaken in the course of a limited cancer survey in Africa. However, there has at times appeared to be a degree of overconfidence regarding the accuracy of age-reporting in elderly Africans from those very areas in which the collection of basic population data has not been the responsibility of the cancer team. Clemmesen and his co-workers were encouraged to begin their field survey in a particular area of the Congo because of the detailed census information already available from the civil authorities, but they felt bound to point out the dubious quality of the age estimations made by census clerks. Pronouncements from Kampala have, over the years, expressed an increasing satisfaction with the accuracy of the ages of elderly Africans in the area of the cancer survey[3] although it is not easy to perceive how the actual situation can meanwhile have altered to any appreciable extent.

The population data on Ibadan is admittedly open to criticism on a number of counts. In the first place, its collection was not the responsibility of the cancer registry and the results of a current W.H.O. sample census have therefore had to be accepted at their face value. It is peculiarly unfortunate, though not perhaps without significance,[4] that 8 per cent of this sample census were quoted as being of, "age unknown" and it is not known whether this group were predominantly elderly or not. If, for example, these persons

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3 See pages 29, 65, 67, 69, 72. supra.

4 As a further practical demonstration of the difficulty of African age estimations.

were all in fact in the over-60 age groups it would have the effect of still further lowering cancer incidence rates in the older ages in Ibadan. Since there is now no way of discovering how this "age unknown" group were actually distributed throughout the population, this factor has been ignored in subsequent calculations, but its influence must be kept in mind.

Reference has already been made to the political manoevures which militated against the success and accuracy of Nigerian national censuses. In respect of one district (E_2), however, where a check was made by comparing the W.H.O. estimate with the total population figure supplied by the Census Officer, the correspondence was reasonably close.

There is still the matter of the seasonal movements of the farming elements in the Ibadan population between the town itself and the surrounding countryside, a peculiarity of the local situation which is bound to affect any census estimation as much as it affects the enumeration of potential cancer patients. So far there has been no sociological or demographic study specifically designed to describe the fluctuations in population which it is suspected must be taking place.

The pyramid which has been constructed from the available information on the Ibadan population approximates fairly closely to the Standard African Population. It is clear, however, that the population structure of Ibadan differs from that of a town like Lourenço Marques, for example, which contains a large element of young migrant labourers

The second large factor in the Ibadan situation which has to be taken into consideration when contemplating the results of the three year cancer survey is the matter of the registration of cancer cases. Whilst this is closely bound up with the associated factor of the local population's readiness to seek modern medical care, it will be separately dealt with since it effectively concerns the degree of complete collection of cancer cases diagnosed in Ibadan hospitals.

This was essentially and of necessity a survey of hospital cases and in consequence its already limited value as an index of cancer in population of the town must have been still further reduced by any inadequacies in case collection.

The evidence on this aspect of the subject has already been led in an earlier chapter[5]. Confidence can be expressed in the collection of information on cases which had once reached the wards of U.C.H. and of Adeoyo; there is, furthermore, little doubt of the accuracy of reporting of genital cancers in female U.C.H. out-patients; most cases suspected in the general out-patients department of U.C.H. were also notified. A number of gaps in the evidence still remain. The first two areas of uncertainty are in the general out-patients attending Adeoyo hospital among whom, it is suspected, there may have been undiagnosed cases.[6] The same suspicion attends the procedure at U.C.H. whereby patients desiring to attend the general out-patient

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5 Chapter V

6 In fact the whole question of the markedly different ratios of cancer patients to all out-patients at both hospitals in Ibadan has not yet been satisfactorily explained. Whilst hesitating to attribute these differences entirely to variations in diagnostic capacity, it is difficult to credit the patients with the ability to decide whether their sickness is malignant and therefore needs attention at U.C.H. rather than at Adeoyo.

department are deemed, on cursory inspection, to be worthy of this privilege or not.

As far as specialist clinics are concerned, personal contact with the few Adeoyo consultants probably ensured their conscientious reporting of cases which had come to their notice. Clinics at U.C.H. however, were larger, more frequent, attended by more doctors. The degree of direct co-operation from busy consultants running clinics at U.C.H. was, with the notable exception of the gynaecology department, of variable quality. It is therefore more than possible that some cases in the surgical and medical clinics were being given a label of advanced malignant disease and sent home, without the formality of notification.

Whilst it is true that some such presumptive cases might be insufficiently investigated to establish a primary site of cancer, their loss must have had the effect of lowering the overall cancer incidence rate in the Ibadan population.

This leads to the question of whether or not a high histological diagnosis rate is an unmitigated good in this kind of situation. The rate of histological confirmation in Ibadan was higher than that in Dorn and Cutler's American study (1955). This is because the Ibadan survey is so largely based upon hospital admissions and, in particular, on patients admitted to the University College Hospital Ibadan, a teaching institution of repute. Whilst, therefore, the histological diagnosis rate is in one sense a reflection of the high medical

standards of the hospital most concerned with Ibadan cancer patients' reception, at the same time it has depended upon ignoring some out-patients on whom special investigations were not regarded as justified and who were lost to registration. Their loss was due in some instances to the general policy of demanding accurate diagnosis before inclusion of cases on the Register and, in other cases, to the clinician's decision to despatch a patient back home without ensuring simultaneous notification of the patient to the registry.

This leads to the third major factor upon which a survey of this nature, in these particular environmental circumstances, is continually dependent, the readiness of the cancer patient to come for treatment. Tentative studies of this subject have now been undertaken in connection with two other cancer surveys as well as the Ibadan one, but it would not be justifiable to generalise from experience elsewhere. As far as Ibadan is concerned, the surveys would seem to suggest that, whilst most people are aware of the benefits of hospitals, this has not yet by any means caused the older members of the community to abandon traditional medicine. The influence towards a complete rejection of the old methods would seem to lie chiefly with the best educated mothers in the community. It will be some time before their influence upon their families can show itself in a general increased readiness to seek early hospital treatment on the part of a new generation of ageing persons.

At no time should sight be lost of the fact that this survey is based upon people who come to hospital. They have a wide range of alternatives open to them which may be tried singly or in succession[7] and the time spent in search for a cure outside hospital may lead them to eventual confinement and death at home. Alternatively, if hospital help is sought at a late stage of the disease, they may be discarded as incurable (with or without notification) or an operation may be offered whose nature is too radical to persuade acceptance. Even within hospital, that is to say, some patients may abscond before contacting an agency which will be certain to notify them to the cancer registry.

It is possible that more, vital time may be lost by those patients whose illness derives from an internal cancer than from one whose outward manifestations are obvious both to the sufferer and to his friends. Such hidden cancer might then be less likely to reach hospital at a stage when admission for investigation and treatment seem advisable.

There is evidence, from the data on the consultative clinics at U.C.H. and from the out-patient surveys, that fewer women than men are attending hospital. This does not take into account the gynaecological or antenatal clinics and it has been explained how the former are productive of many genital cancers. However, the numbers

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7 See Figure 7

of other tumours diagnosed in women are less than they might be if the sexes were coming to the surgical and medical clinics in equal numbers.[8]

In retrospect it is easy to see that the failure to establish a number of sociological base lines by the use of control groups was a most serious defect in the Ibadan study. Without information on such things as diet, tobacco and drinking habits, average number of pregnancies and the duration of lactation in the general population, any knowledge about these matters among cancer patients is rendered valueless. Moreover, the number of completed interviews was very small. Serious attempts were made, however, to estimate ages and the great majority of patients were personally seen by the Yoruba assistant to the registry. Her assessments, with or without the use of the historical calendar,[9] might at least be expected to be reasonably consistent. But, as Prates has pointed out, age assessment in hospital is often rendered much more difficult by the debilitation and emaciation attendant upon terminal malignant disease, leading to possible overestimation of the ages of the very ill patients who were unable to be interviewed.

It is, however, impossible to tell in what direction most of the age judgements of the Yoruba assistant to the registry diverged from

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8 Hospital admissions are not a useful index of use of hospitals by men and women since the number of available beds for each sex are administratively fixed and can always be filled from the many requiring ward treatment.

9 which had notably less success when presented to old women.

those made by the assistants employed upon the W.H.O. census. Whilst, in one sense, Nigerian women who are past the menopause are all regarded as "old" there is no means of knowing into which decennial group this would cause them to be placed by the enumerators. In a society where the old are revered there may even be a tendency for the elderly to exaggerate their ages. But the very absence of any objective measurement, which is the cause of the existing confusion, means that the argument can never be satisfactorily resolved, as least as far as this generation of Ibadan old people is concerned. It is more honest to admit that there must be inaccuracies in age reporting, both in the general population and in the cancer patients in hospital and to refrain from further speculation upon the matter.

This reconsideration of the quality of the data used in computing the Ibadan cancer incidence rates has seemed essential in order once again to define those areas in which confidence can be expressed from the areas of continuing uncertainty.

Turning to the annual age specific incidence rates for all types of cancer three main features are discernable, firstly, the high cancer incidence in the male 5 - 9 age group; secondly, the close correspondence of the Ibadan and U.S. male rates until after the 40 - 49 decennium, with rather less close approximation for women; thirdly, the final drop in Ibadan incidence rates for both sexes in the terminal decades.

In other words, as far as the behaviour of the later incidence rates is concerned, the Ibadan picture is remarkably similar to that obtained elsewhere in Africa. Whilst declining to comment upon the situation in other African towns where circumstances may be radically different, it would seem that the considerations set out in the foregoing pages can be called upon to explain these findings in Ibadan. Even in cancer incidence figures from developed countries a drop in the oldest age groups is often found and debate continues as to whether this is a true reflection of the rates or an artifact arising from underdiagnosis or false age reporting or both. In the Ibadan context where "old age" comes relatively early it is not surprising to observe the same phenomenon, particularly when there is reason to believe that old people are less inclined to use the hospitals.

This is not to cast doubt upon recent views expressed by Richard Doll (1962; 1965) on the mechanisms of carcinogenesis and his considered opinion that an increase in liability to cancer is not the inevitable concomitant of ageing. The statistical bases for cancer studies in Africa are at the present time so fundamentally insecure that the kind of judgements which can be made, for example, following careful cohort studies[10] are out of the question. In these circumstances the energy expended upon speculation would be better employed in sociological and demographic studies or in experiments designed to

10 Such as that of Case (1956) on Cohort Analysis of Cancer Mortality in England and Wales 1911 - 1954.

test specific hypotheses on African carcinogenesis.

The significance of apparently low cancer rates in the elderly, based upon very small numbers of cases in very small groups of old people is, moreover, less interesting than the phenomenon of high cancer rates in young children and the high incidence of cancer of the liver in relatively young men. Although in Ibadan the situation in regard to liver cancer is not so striking as that which has been demonstrated in Lourenço Marques[11] there is nevertheless now no doubt that this tumour is occurring with a frequency far in excess of that for the United States and that the incidence rises with age. Recalling Ledentu's observations of thirty years ago, it can be confidently said that the cause of this tumour, whatever its nature, must start to operate upon some Nigerians at a very early stage of life.

Prates has dealt with a number of possible associated factors in liver cancer in Lourenco Marques without being able to demonstrate any significant connections apart from that between some cases and cirrhosis. This field is wide open to further research. But retrospective studies of diet, alcohol consumption etc. in cases of liver cancer and controls are liable to even more serious difficulties in Africa than those which beset case history studies in other countries. Prospective studies on sample communities which can be

11 The numbers in the youngest age groups in Ibadan residents were not very high, but among non-Ibadan residents was a schoolboy aged 14 from a neighbouring Yoruba town (Oyo) and the typist to the Cancer Registry (aged 18) died of this tumour in 1962 during the course of the survey.

kept under medical observation for the necessary number of years would be more reliable though very expensive in terms of time, staff and money and the communities would need to be very large. Whatever factor or factors are at work must be common to widely differing parts of the African environment (Steiner, 1959).

At present the information on liver cancer incidence has not even been subdivided by the broadest parameters of class. With the rapid economic development of parts of West Africa it may before very long be possible to group patients socially, proceeding from that stage to the finer differences which characterise their ways of life apart from the simplest occupational and educational criteria. In this connection it is suggested that Lagos, whose rapid expansion has already led to a wide gulf between rich and poor, might offer more useful Nigerian contrasts than Ibadan, although the practical difficulties of carrying out socio-medical studies of this type would be enormous.[12]

The second form of malignant disease which dominates the Ibadan cancer scene is the Burkitt Tumour. In this case it is not possible to make comparisons with the U.S.A. or Europe since the tumour is peculiar to Africa and comparisons with leukaemia may or may not be appropriate. This tumour is occurring in alarming numbers in very young children. Whilst investigations are in progress into the cells

12 Lagos has large numbers of private doctors who are patronised by the wealthier Nigerians. Statistics would be particularly to obtain.

in tissue culture (Pulvertaft, 1964) and into a possible virus aetiology (Epstein, Achong and Barr, 1964) the scope of epidemiology in this field has not yet by any means been exhausted. Thus Berry's report from Northern Nigeria (1964) would seem to suggest that the geographical extent of occurrence of this tumour is wider than Burkitt had originally envisaged. A detailed study of the cases occurring throughout Nigeria or some other African country which experiences a variety of climatic conditions might prove a useful exercise although, once again, it would necessarily be dependent upon cases which had reached medical attention.

Many of the remaining tumours have been dealt with in previous chapters. Their individual occurrence is in general less than would be expected in the U.S.A. and the total result has been to produce crude cancer rates for all sites which are lower than those of Kampala, Johannesburg or Lourenço Marques.

As Knowelden has acknowledged,[13] an apparent deficiency of any cancer or cancers in an unsophisticated community cannot command the respect which is due to the demonstration of an excess incidence. Cancers which are already very prominent in the Ibadan context, such as those of the breast and cervix, are still deficient by American standards, as is also carcinoma of the stomach, whilst many other tumours which are common in Europe and America are here being encountered in very small numbers.

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13 See p. 71 supra.

It would seem prudent to await the results of further studies at a stage when more hospitals with advanced technical and clinical standards are available[14] before making final pronouncements although, of course, by the time that stage is reached, other environmental changes may already have modified the cancer pattern. Judging by present developments in Nigeria, however, it would seem more likely that the rate of establishment of modern medical services may for some considerable time to come outstrip the changes in the lives of the majority of ordinary Ibadan citizens. Meanwhile only the conscientious maintainance of cancer registration will allow for eventual comparisons to be made between today's tentative minimal incidence rates and the future picture of cancer in the city of Ibadan.

14 A new goverment Hospital in Ibadan to replace Adeoyo is already envisaged.

SUMMARY

A review is presented of the major cancer surveys conducted in trans-Saharan Africa since the end of the First World War, starting with the more numerous relative ratio or frequency studies before proceeding to the four recent incidence rate surveys which have taken place in Johannesburg, Kivu and Ruanda Urundi, Kampala, and Lourenco Marques.

An account is then given of the three years cancer incidence rate survey in Ibadan, Nigeria, which extended from April 1960 until the end of March 1963.

In describing the organisation and running of the Ibadan survey particular attention is paid to a number of sociological studies designed to elucidate special local circumstances which might be affecting the validity of the eventual results. One of these subsidiary surveys was concerned with the attitude of the population towards modern medical facilities and the extent of their continued reliance upon traditional modes of treatment.

Studies of prominent local tumours made in the course of the main survey also receive individual mention. Among them was an attempt to assess the prevalence of Kaposi's Sarcoma throughout Nigeria, an exercise which served to demonstrate the complexities of epidemiology in such a setting.

The incidence rate survey in the town of Ibadan showed low crude annual rates of approximately 45 per 100,000 of the population for all cancers in both sexes. However, during much of their life span

Ibadan people seem to have age specific cancer incidence rates which are only slightly lower than those of the U.S.A., with the notable exceptions of the 5 - 9 age group and the over-fifties. Young male children have a very high incidence of the Burkitt Tumour, making the overall rates for this age much higher than those in the United States whilst in older people in Ibadan the cancer incidence rate, which had been rising with age, falls off steeply.

Apart from the Burkitt Tumour and tumours of the reticulo-endothelial system generally, the striking feature of the Ibadan cancer scene is the high incidence of primary liver celled carcinoma among males.

Finally, attention is drawn to the unsatisfactory nature of relative ratio surveys in a continent with rapidly developing medical services and suggestions are made regarding the interpretation of some of the Ibadan incidence survey results. It is emphasised that caution must still be exercised even when considering cancer incidence rates if these have been based entirely upon hospital diagnosed cases, drawn from a population whose ages are not accurately known and whose elderly members may be disinclined to come to hospital.

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The clinicians, radiologists, pathologists and nursing staff of the two major Ibadan hospitals have all contributed to the outcome by their help in referring patients to the Registry.

Dr. Han of the World Health Organisation and the Western Region Census Officer both supplied population data which made possible the calculation of cancer incidence rates and Dr. Han also advised on the conduct of the E_2 survey.

Mrs. Akinpelu, with her intimate knowledge of the town and its people, was an indispensable assistant, interpreter and interviewer. Typists in the Registry gave devoted service, especially Mr. Hilaroy Ikazabo who died of primary liver carcinoma during 1962.

The students of Ibadan University who undertook household interviews and those who acted as translators and interpreters had a vital role. After Professor A. Taylor, of Ibadan University, had made the preliminary overtures to them, principal teachers in

Ibadan sedondary school co-operated freely and gave the survey of schoolchildren their time and attention.

In carrying out the survey of Kaposi' Sarcoma the co-operation of Dr. C. G. Berry, the Northern Region Specialist Pathologist and Dr. P. Grasso, the Federal Specialist Pathologist was essential. At the same time, many medical officers in remote hospitals assisted by replying to postal enquiries.

The Medical Photographic Departments of Ibadan University and Edinburgh University have combined to produce the figures which illustrate the text and Mr. Frank Speed and Mr. T. C. Dodds deserve special mention in this connection.

The ordinary people of District E_2, Ibadan are to be congratulated on their forbearance in the face of an unaccustomed barrage of questions from strangers. Schoolchildren, marketwomen, Hausa barbers, herbalists and diviners have all supplied invaluable information upon medical practices in the city.

Finally, I would like to thank my husband for sustaining my enthusiasm during the long process of analysis and description of this survey and for providing a secure domestic background to all my academic work.

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APPENDIX 1

December 1952 Census Western Region of Nigeria

Excerpts relating to Ibadan population

IBADAN * DIVISION 1952

POPULATION:

Both sexes	796,942
Males	409,336
Females	387,606

*Ibadan division is divided into three areas, Ibadan district rural area which comprises the hamlets round Ibadan city, Ibadan district urban area (which has shrunk slightly since the 1952 census) and Ibarapa district.

POPULATION 1952

Ibadan District Urban Area

Both sexes	459,196
Males	237,054
Females	222,142

Ibadan District Rural Area

Both sexes	286,252
Males	144,860
Females	141,392

Ibarapa District

Both sexes	51,494

Ibadan District Urban Area, 1952

Age and Sex Distribution

Age Groups	Males	Females
0 - 6	81,682	78,252
7 - 14	49,475	44,054
15 - 49	86,664	81.694
50 +	19,233	18,142
Total	237,054	222,142

Ibadan District Urban Area, 1952

Occupations

Total Males	237,054
Agriculture	51,134
Craftsmen	28,510
Trading and clerical	31,575
Admin., professional, technical	12,701
Other occupations	22,875
Other males not working	90,259
Total Females	222,142
Agriculture	45,996
Trading and clerical	64,620
All other females	111,526

Ibadan District Urban Area, 1952

Tribal Groups

Total population both sexes	459,196
Yoruba	434,732
Ibo	7,335
Hausa	5,263
Edo	3,500
Nupe	2,177
Urhobo	1,055
Ibibio	943
Fulani	275
Tiv	173
Other Nigerian tribes	3,111
Non-Nigerians (African)	430

APPENDIX 2

(INTERVIEW SHEET USED FOR CANCER CASES)

B.E.C.C. RESEARCH PROJECT. SURVEY ON PATIENTS

AGE: AGE GRP.: CA. REG. NO.:

HOSP. NO.:

SEX: U.CH. ADEOYO X-RAY NO.:

INPATIENT OUTPATIENT HIST. NO.:

NAME: P.M. NO.:

WARD OR CLINIC:

CONSULTANT:

IBADAN TOWN ADDRESS:

NEAREST LANDMARK:

IBADAN FARM ADDRESS:

TRIBE: Yor. Ibo. Beni Hausa Other:

PLACE OF ORIGIN OF FATHER:

ADDRESS IF NOT IBADAN:

OCCUPATION:

IBADAN RESIDENTS ONLY: DO YOU REMEMBER:

(1) Basorun Fajimi ('97 - '02)

(2) Bale Dada Opadere ('04 - '07)

(3) Basorun Apampa ('07 - '10)

(4) Irawo Oniru (1910)

(5) Bale Akintayo (Elenpe) ('10 - '12)

(6) Bale Irefin (Oke-Offa) ('12 - '14)

(7) Bale Shittu ('14 - '25)

(8) Influenza (Gaga) (Sept./No. 1918)

(9) Great water flood at Ogunpa (1924)

(10) Bale Oyewole (Wonkuku) ('25 - '30)

(11) Dearth of salt (1939)

MARITAL AND FERTILITY DATA:

is marriage (1) Monogamous (2) Polygamous

Male:

is patient circumcised Yes No

Married woman:

is husband circumcised Yes No

Male Child:

When was he circumcised, Age 1 week 3 months 1 year 2 years.

WOMEN ONLY

AGE AT MARRIAGE:

HOW LONG FROM MENARCHE TO MARRIAGE: 1 year 2 years 5 years 10 years

HOW LONG SINCE MENOPAUSE: 1 year 5 years 10 years

CHILDREN:

	LIVING	DEAD
	(1) Age	Age when it died
	(2) Age	Age at death
	(3) Age	"
	(4) Age	"
	(5) Age	"
	(6) Age	"
	(7) Age	"
	(8) Age	"
	(9) Age	"
	(10) Age	"
	(11) Age	"
	(12) Age	"

NO. OF MISCARRIAGES:

HOW LONG DID YOU GIVE BREAST: (1) To Boys

(2) To Girls

ANY TWINS AMONG CHILDREN:

NUTRITIONAL DATA:

Do you take:	Beer	Palm-wine	Other alcohol
Do you take:	Snuff		
	Smoke Tobacco	Pipe	Cig.
	Chew Tobacco		
	Chew Kola:	Obigidi	Gbanja

FOOD:	Yam	Gari	Agidi
	Amala	Plantain	Eba
	Maize	Ewa	Groundnuts
	Fish	Eggs	Milk
	Bread		

PREVIOUS ILLNESS: Jaundice - Once per year

More often

Less often

One time only

PRESENT ILLNESS: When did first symptom start ?

NATIVE MEDICINES:

(1) Epo Igi isin	(6) Ewe alubosa
(2) Ewe Ifinrin	(7) Ewe oruwo
(3) Ewe Igan	(8) Ito malu
(4) Ewe okan	(9) Erele ewe Ibepe
(5) Ewetabu tutu	(10) Kaunbilala

WAS NATIVE MEDICINE TAKEN: (1) for this illness

(2) for other illness

(3) for every sickness

DO YOU USE MEDICINE FROM CHEMIST: Yes No

GENETIC DATA

BLOOD GROUP

GENOTYPE

FINAL DIAGNOSIS

CLIN./X-RAY HISTOLOGICAL

TREATMENT

ANY CLINICAL NOTES

APPENDIX 3

DATE	IBADAN HISTORICAL EVENT	APPROX. AGE IF EVENT IS RECALLED
1905	Great conflagration in Ibadan	60 - 65
1910	Halleys Comet (Irawo Oniru)	55 - 60
1910	Opening of St. Peter's Church, Aremo	
1910 - 1912	Bale Akintayo or Elenpe	55 - 60
1912 - 1914	Bale Irefiner or Oke-Offa	50 - 55
1914 - 1925	Bale Shittu or Oma Ane	40 - 55
1914 - 1919	World War I	45 - 50
1918	(Sept./Nov) Influenza (Gaga)	50
1919	Adubi war in Abeokuta	45 - 50
1924	(Oct.) Great flood at Ogunpa	40 - 45
1925	Bale Shittu deported forcibly to Oyo (May)	40 - 45
1925	(Dec.) Adeoyo Hospital opened	40 - 45
1925 - 1930	Bale Oyewole or Womkuku	35 - 40
1929	First visit of Air Force planes	40 +
1930	Abasi Alesinloye installed Bale	35 +
1936	Abasi Alesinloye installed Olubadan (July)	30 - 35
1937	First Oba's Conference, at Oyo	25 - 30
1938	Second Oba's Conference, at Ife	
1939	Third Oba's Conference, at Ibadan	
1939	Dearth of Salt or Salt Rationing	25 - 30
1951	First Regional Election	
1956	Second Regional Election	
1957	Lalupan Train Disaster	
1958	Alhagi Adelabu Riot	
1959	Federal Constitutional Election	

APPENDIX 4

IBADAN CANCER SURVEY: APRIL - DECEMBER 1960

92 CASES SUSPECTED OF MALIGNANT DISEASE BUT NOT ADMITTED

Ca. Reg. No.	Diagnosis and Remarks
2	? Lymphosarcoma
21	Ca. ex., too advanced
24	Advanced jaw tumour
25	Advanced jaw tumour
61	Ca. breast in lactating mother, refused operation
62	Advanced Ca. cx.
63	Advanced Ca. cx.
65	Advanced Ca. cx.
88	Advanced Ca. breast
106	Clinical diagnosis of hepatoma
112	Osteogenic sarcoma femur, patient defaulted
114	? Hepatoma, patient defaulted
117	Advanced Ca. cx.
120	Ca. breast, lost between clinics
126	Abdominal malignancy, defaulted
133	? Abdominal malignancy, defaulted
137	? Hepatoma, defaulted
153	Probably jaw sarcoma, too advanced
159	Inoperable retroperitoneal sarcoma, biopsied at Ife hospital

Ca. Reg. No.	Diagnosis and Remarks
165	Squamous ca. heel, refused treatment
172	Jaw tumour and other bone tumours, probably lymphosarcoma
176	Ca. prostate, defaulted
182	? Abd. lymphosarcoma, too advanced (child)
185	Prostate, defaulted
208	Ca. breast, inoperable
216	Advanced mixed salivary tumour
217	Widespread abd. malignancy, patient living too far away from O.P. treatment
220	Ca. cx., too advanced
222	Ca. cx., advanced
229	? Wilm's tumour, too advanced
231	? Ca. rectum, defaulted
242	Ca. breast, refused admission
245	Ca. bladder, clinical and x-ray, too advanced
247	Ca. cx., too advanced
271	? Hepatoma, refused admission
273	? Hepatoma or liver secondaries, advanced
275	Inoperable ca. tongue, clinical diagnosis
282	? Hepatoma, too advanced
293	Anaplastic antral tumour, too advanced
342	Inoperable rectal ca.
311	Child, advanced lymphosarcoma clinically
337) 343) 353)	Advanced ca. cx.
380	2° in spine
389	Child, lymphosarcoma jaw
394	Reticulum cell sarcoma, gland biopsy
396	Child, sarcoma, of femur
399	2° in spine, refused admission
401	Ca. breast, advanced

Ca. Reg. No.	Diagnosis and Remarks
402	? Reticulosis, refused admission
411	Advanced ca. rectum
417	Child, maxillary lymphosarcoma
420	Ca. cx., advanced
425	? Hepatoma, boy, sent home to die
438	Ca. cx., advanced
442	Ca. stomach on x-ray
445	Chest 2° on x-ray
447	Clinically ca. rectum
451	Child, abdominal malignancy
454	Advanced abd. malignancy
461	Chest 2° on x-ray
479	Ca. stomach (x-ray), too advanced
480	Ca. cx., advanced
488	Sarcoma of tonsil, too advanced
489	? Hepatoma, refused biopsy
499	Ca. cx., too advanced
505	Multiple abd., 2°
528	Clinically advanced Ca. rectum
529	Clinically advanced Ca. breast
533	Ca. cx., advanced
537	Ca. cx., advanced
553	Fibrosarcoma tibia (x-ray)
554	Widespread lymphosarcoma
561	Ca. cx., advanced
567	Liver 2° , advanced
577	Ca. both breasts
578	Liver 2° , ca.
579	Anaplastic ca. in gland, defaulted

Ca. Reg. No.	Diagnosis and Remarks
586	Ca. breast
590	? Sarcoma shoulder, defaulted
591	Advanced oral Ca.
593	Clinically Ca. colon
599	Clinically Ca. caecum, defaulted
610	Clinically Ca. stomach
617	Jaw tumour, did not come to ward
623	? Hepatoma, advanced
624	Ca. cx., advanced
633	Ca. breast
638	Carcinomatosis pelvis

APPENDIX 5

IBADAN CANCER SURVEY: APRIL - DECEMBER 1960

418 CASES FROM IBADAN AND BEYOND REPORTED TO REGISTER AND SUBSEQUENTLY CONFIRMED HISTOLOGICALLY

*Classification S.A. Int.	Type and site of tumour	Male			Female			TOTAL
		Ibadan cases	Other cases	Any range	Ibadan cases	Other cases	Any range	
2 / 198,199	Metastatic	2	10	32-70	2	6	30-50	20
10 / 191	Basal cell ca. skin	-	-	-	-	1	60	1
11 / 191	Squamous cell ca. skin	1	6	29-50	1	3	34-60	11
13 / 191	Ca. skin appendage	-	1	27	-	-	-	1
14 / 170	Ca. breast	-	-	-	3	11	28-60	14
12 / 190	Malignant melanoma	1	-	65	2	4	47-65	7
15.1 / 140	Squamous cell ca. lip	-	-	-	-	1	60	1
16 / 179	Squamous cell ca. penis	-	1	40	-	-	-	1
18 / 176	Squamous cell ca. vulva	-	-	-	1	4	35-60	5

* At this time the classification recommended by the South African Institute for Medical Research was being employed as well as the International Classification.

Classification S.A. Int.	Type and site of tumour	Male			Female			TOTAL
		Ibadan cases	Other cases	Any range	Ibadan cases	Other cases	Any range	
21/196	Osteogenic sarcoma	-	1	6	-	-	-	1
23/225	Osteoclastoma	-	-	25	-	2	32-45	3
26/196	Jaw, adamantinoma	1	5	13-50	-	1	35	7
27/197	Fibrosarcoma	1	7	4-45	2	8	12-40	18
28/173	Myosarcoma (1 uterus 1 stomach)	1	-	29	-	1	40	2
30/160	Nose (1 plasmacytoma, 1 carcinoma)	-	1	38	-	1	40	2
31/160.2	Sinuses, ca.	2	2	30-55	-	4	28-54	8
33/143	Oropharynx, ca.	-	2	39-48	-	-	-	2
36/161	Larynx, ca.	2	2	35-50	-	1	40	5
37,38/162,163	Lung, ca. (5 diagnosed from 2°, + 3 verified at P.M., + 1 doubtful case)	3	4	35-65	1	1	40-48	9
39/162.2	Pleura (1 fibrosarcoma 1 mesothelioma)	-	-	-	1	1	A-35	2
47/197	Kaposi sarcoma	-	1	A	-	-	-	1

50/

Classification S.A. Int.	Type and site of tumour	Male			Female			TOTAL
		Ibadan cases	Other cases	Any range	Ibadan cases	Other cases	Any range	
50 204.3	Acute leukaemia	4	3	10-35	1	1	8-15	9
51 204.1	Chronic myeloid leukaemia	2	5	26-45	-	2	29-39	9
52 204.0	Chronic lymphoid leukaemia	4	2	28-68	1	3	30-45	10
54 203	Multiple myeloma (2 plasmacytomas)	1	1	35-38	-	-	-	10
55 200.1	Lymphosarcoma	8	18	7-70	3	10	4-60	39
	(Sites: generalised							15
	glands							9
	ovaries							2
	stomach							1
	thigh							1
	jaw							2
	liver							1
	orbit							5
	nasopharynx							2
	small intestine)							1
56 201	Hodgkin's disease	5	5	5-67	1	2	12-28	13
57 200.0	Reticulum cell sarcoma	7	7	3-58	3	3	15-58	20
61 143,144	Ca. floor of mouth	1	-	38	-	-	-	1
62 142	Salivary tumours (6 ca., 7 mixed)	3	4	18-62	2	4	7-45	13
63 150	Oesophagus, ca.	1	-	60	-	-	-	1

64/

Classification S.A. Int.	Type and site of tumour	Male			Female			TOTAL
		Ibadan cases	Other cases	Any range	Ibadan cases	Other cases	Any range	
64 151	Stomach, ca. sarcoma lymphosarcoma	5 1	7 -	35-65 29	5 -	3 -	30-60 - 26	20 1 1
66 153,154	Large intestine, ca.	5	2	33-65	5	2	28-60	14
67 155	Liver tumours: Primary hepatomas Cholangocarcinoma Secondary ca.	11 1	14 -	16-62 70	1 -	4 -	24-50 -	30 1 4
68 155	Biliary tract, ca.	-	1	33	-	2	33-35	3
69 157.1	Pancreas, ca.	3	2	20-70	2	3	18-56	10
70 180	Kidney tumours: Nephroblastoma Hypernephroma	- -	1 1	6 54	- -	2 3	1½-3 40-50	3 4
71 181	Bladder, ca.	3	4	35-70	1	1	42-50	9
72 178	Testis, seminoma	1	1	21	-	-	-	1
73 177	Prostate, ca.	4	10	45-75	-	-	-	14
74 175	Ovarian tumours: (thecoma, granulosa cell, adenocarcinoma)				5	9	21-60	14 4 4 6

75/

Classification S.A. Int.	Type and site of tumour	Male			Female			TOTAL
		Ibadan cases	Other cases	Any range	Ibadan cases	Other cases	Any range	
75 / 171	Cervix, ca.				18	22	22-65	40
76 / 172	Corpus uteri, ca.				-	1	60	1
77 / 176	Vagina, ca.				-	2	A-48	2
79 / 173.2	Chorionepithelioma				3	11	20-48	14
78 / 176	Vulva, ca.							5
81 / 194	Thyroid, ca.	2	-	20-40	3	2	18-50	7
96 / 192	Retinoblastoma	1	1	2-3	1	-	1	3
		87	131	-	69	142	-	429
	Cases entered in two categories, deducted	1	7	-	1	2	-	11
	T O T A L S	86	124	-	68	140	-	418

APPENDIX 6

CLASSIFICATION OF TWO GROUPS OF 489 CASES SEEN AT U.C.H. AND ADEOYO GENERAL OUT-PATIENTS DEPARTMENTS

INTERNATIONAL LIST NUMBER	CAUSE GROUP	U.C.H.	ADEOYO
A1 - A5	Tuberculosis	32	4
A11	Gonococcal infection	6	5
A12, 13	Typhoid + Paratyphoid	3	1
A16 (a)	Bacillary dysentery	2	1
A16 (b)	Amoebic dysentary	4	-
A16 (c)	Unspecified dysentery	2	19
A22	Whooping cough	7	-
A28	Acute poliomyelitis	2	1
A30	Late effects of polio	1	-
A32	Measles	7	2
A34	Infectious hepatitis	5	3
A37	Malaria	19	55*
A43	All other diseases classified as infective and parasitic (including worms')	13	47
A46	Malignant neoplasm of stomach	1	-
A52	Malignant neoplasm of cervix	1	-
A53	Other malignant neoplasms (2 hepatomas, 1 nephroblastoma)	3	-
A58	Leukaemia	1	-
A60	Benign neoplasms	7	1
A61	Goitre	1	-
A64	Malnutrition	21	21
A65	Anaemias	14	7

INTERNATIONAL LIST NUMBER	CAUSE GROUP	U.C.H.	ADEOYO
A70	Vasc. dis. affecting C.N.S. (1 subarachnoid, 1 cerebrovasc.acc.)	2	-
A71	Non-meningococcal meningitis	1	-
A73	Epilepsy	2	1
A74	Inflamm. eye diseases	13	8
A77	Otitis media and mastoiditis	4	5
A78	All other diseases of C.N.S. (including, at U.C.H.: 1 parkinsonism, 1 amytotrophic lat.scl. 1 spastic paraplegia	12	5
A81	Arteriosclerotic and degenerative heart dis.	3	-
A82	Other diseases of heart	4	-
A84	Hypertension	5	-
A87	Acute upper respiratory infections	13	11
A89	Lobar pneumonia	8	-
A90	Broncho pneumonia	13	-
A93	Bronchitis, chronic and unqualified	11	39
A95	Empyema and lung abcess	1	-
A96	Pleurisy	1	-
A97	All other resp. dis.	13	10
A98	Diseases of teeth	2	2
A99, 100	Peptic ulcer	6	-
A101	Gastritis (including 'dyspepsia')	-	7
A103	Intestinal obstruction and hernia	11	1
A104	Gastroenteritis and colitis (including 'diarrhoea')	35	32
A108	Acute nephritis	2	-
A109	Nephrotic syndrome	3	-
A114	Other dis. of G.U. system	6	9
A115	Sepsis of puerperium	1	-

INTERNATIONAL LIST NUMBER	CAUSE GROUP	U.C.H.	ADEOYO
A118, 199	Abortion	6	3
A120	Various obst. and gyn. conditions	25	10
A121	Infections of skin and subcut. tissues (including 5 pyomyosites) at U.C.H.)	70	65
A122	Arthritis	6	-
A123	Muscular rheumatism	4	11
A124	Osteomyelitis	2	-
A126	All other diseases of skin and musculockeletal syst.	1	-
A134	All other defined diseases of infancy (including 1 tetanus, 1 mumps, 1 imperforate anus, 1 meningomyelocoele)	6	-
A137 (a)	P.U.O.	3	8
A137 (b)	All other ill-defined causes of morbidity (including, at U.C.H., 5 cancrum oris., 3 stomatitis)	14	33
AN148	Burns	-	2
	Various injuries	4	39
	Sterility and infertility	9	-
	N.A.D.	13	20
	TOTALS	489	489

APPENDIX 7

QUESTIONNAIRE

SURVEY OF IBADAN RESIDENTS ATTENDING U.C.H. GENERAL OUT-PATIENT DEPARTMENT

AGE: SEX: DISTRICT OF IBADAN:

1. Is this your first visit to U.CH.?
2. Have you ever been to another hospital ? Yes No
3. If "Yes", which other hospital have you been to ?
4. How long were you sick at home before coming to hospital ?
5. Did someone advise you to come to hospital ? Yes No
6. If "Yes", who was this person ?
7. Has anyone in your family ever been to hospital ? Yes No
8. If "Yes", did they recover ?
9. Have any of your friends been to hospital ?
10. When someone in your family is sick do you try (a) local medicines ?
    (b) European medicines ?
    (c) visit hospital ?
11. Would your mother or father come to hospital if they were sick ?

APPENDIX 8

QUESTIONNAIRE

SURVEY OF MEDICAL HABITS IN IBADAN DISTRICT E.2

Having found the house number see whether the senior member of a household is at home. If the family head is not available talk to any responsible adult. Explain that you want to learn what Ibadan people do nowadays when they are ill. Make it clear that you are not concerned with health authorities, nor taxation, nor the census and that you are not interestedin politics:

Date:

Time of commencement of interview:

Information regarding Informant

Name:

Approx. age: Sex:

Address:

Position in family:

Occupation:

Educational level:

Questionnaire

1. Do you use native medicines for illness in this family ?

   (a) always

   (b) at times

   (c) never

2. Do you ever use European medicines for illness ?

   Yes

   No

3. What are the namesof European medicines which you use ?

4. What are the names (Yoruba) of some common native medicines ?

5. Where do you obtain these medicines ?

   (a) from the market

   (b) from street hawkers

   (c) from the bush.

6. Do you (a) prepare these medicines yourself ?

   (b) have them prepared for you by someone else ?

7. What person in this family knows most about the treatment of illness ?

8. What treatment would you give a child with convulsions?

9. What treatment would you give for fever ?

10. What is the correct treatment for jaundice (yellow fever) ?

11. How would you treat small pox ?

12. What are the illnesses which it is best to treat at home ?

13. What are the illnesses which hospital doctors can treat ?

14. Do you go to seek the advice of local healers when you are ill ?

    sometimes

    never

15. Do any of your family use faith (prayer) healing ? (Divine healing)

    Yes

    No

16. Have any of your family ever been to a private doctor in Ibadan ?

    Yes

    No

17. Has anyone in the family been to hospital in Ibadan ?

    Yes

    No

18. Which hospital(s) did they go to ?

19. Why did they choose that one ?

20. What illnessesdo you think U.C.H. doctors can treat ?

21. What illnesses do you think Adeoyo doctors can treat ?

22. If your parents are dead - did they die

    (a) at home ?

    (b) in hospital ?

23. Whose permission must be obtained before taking a child to hospital ?

Comments

The interviewer should record here his impressions of the reaction of the informant to the questionnaire.

Time of completion of interview:

APPENDIX 9

QUESTIONNAIRE ON FAMILY MEDICAL HABITS

Ibadan Secondary School Students

(only to be answered by pupils whose families live in Ibadan)

Introduction

We are trying to discover the different kinds of treatment which Ibadan people use when they become ill. It will help us a great deal if you would answer these questions. When you are answering the questions try to describe what is done in your family, do not bother to tell us what you think other people might do. If there is a choice of answers on the paper please put a ring round the correct reply.

General Information

Name: Age: Sex:

Address:

School:

Standard:

Occupation of father:

Occupation of mother:

Questions

1. Does your family ever use native medicines ?

   Never

   At times

   Frequently

2. Does your family ever use European medicines ?

   Yes

   No

3. What are the names of some European medicines ?
4. What illnessesare treated by local medicines ?
5. Tell in your own words who they treat fever in your family.
6. How would they treat fits in your family ?
7. How would they treat jaundice in your family ?
8. Has anyone in your family ever consulted a local healer ?

   Yes

   No

9. Has anyone in your family ever been to a general practitioner in Ibadan ?

Yes

No

10. Has anyone in your family ever been to hospital ?

Yes

No

11. Who has been to hospital from your family ?

12. If anyone in your family has been to hospital, which one did they go to ?

13. If you were sick would you go to hospital ?

Yes

No

14. Whose permission would you seek before attending hospital ?