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Malignancies in Mainland Tanzania: Squamous Cell Carcinomas¹

C. ANDERSON

Abstract

From a total of 1527 squamous cell carcinomas diagnosed histologically at the Central Pathology Laboratory, Dar es Salaam, Tanzania, from 1966 to 1969, the figures for the squamous cell carcinomas of skin and of cervix uterus were studied in relation to geographic origin, demographic origin and age incidence. A significantly high incidence of squamous cell carcinomas of cervix uterus was found in the Wayao compared to the other seventeen most populous ethnic groups of Tanzania. The potential importance of this finding is stressed. The figures relating to squamous cell carcinomas of skin revealed no significant geographic or demographic difference in incidence.

During the years 1966 through 1969, a total of 1527 squamous cell carcinomas obtained from various parts of the body were diagnosed histologically at the Central Pathology Laboratory of the Ministry of Health and Social Welfare of the United Republic of Tanzania. The biopsies were remitted to the above-named center from the various medical units, both Governmental and Private which are scattered throughout Tanzania's mainland. The object of this exercise was to try to assess the incidence of the most frequent of these tumours in the different ethnic groups inhabiting the mainland. Comparable figures for the islands of Zanzibar and Pemba are not available for this period.

Materials and Methods

During the years in question the Central Pathology Laboratory (C.P.L.) performed the histological examination of all surgical biopsies taken in the mainland of the country. The biopsies were fixed in 10% neutral formalin at the place of origin and then remitted in adequately sealed containers to the C.P.L. where upon arrival they were post-fixed in formol-corrosive, dehydrated, embedded in paraffin wax, and cut and stained with hematoxylin and eosin. In September 1968 the request forms for histological examinations were modified and standardised to include name and age of the patient, sex, ethnic origin, present residence, name of hospital remitting the biopsy and space for a short clinical summary. It is mainly based on data acquired during this

¹ This study was supported in part by a grant from Dr. C. Muir of the International Agency for Research on Cancer.

latter period that the demographic incidence is discussed. The incidence of tumours was assessed against the proportional population of each of the eighteen most populous ethnic groups of the country. Relative population composition figures were obtained from the African Census Report 1963, and unofficial up-to-date figures on population estimates obtained from the Central Statistical Bureau. The demographic distribution of the population in Tanzania mainland was obtained from A. J. NSEKELA (1965). The figures in this paper refer to African patients only.

Results

Table 1 and Figure 1 show the differences in number, site and sex for the 1527 squamous cell carcinomas diagnosed histologically at the C.P.L. during 1966 to 1969. It was considered that only sufficient tumours – an analysis of which would prove to be significant – existed in the group comprising those arising in skin and in cervix uterus. The

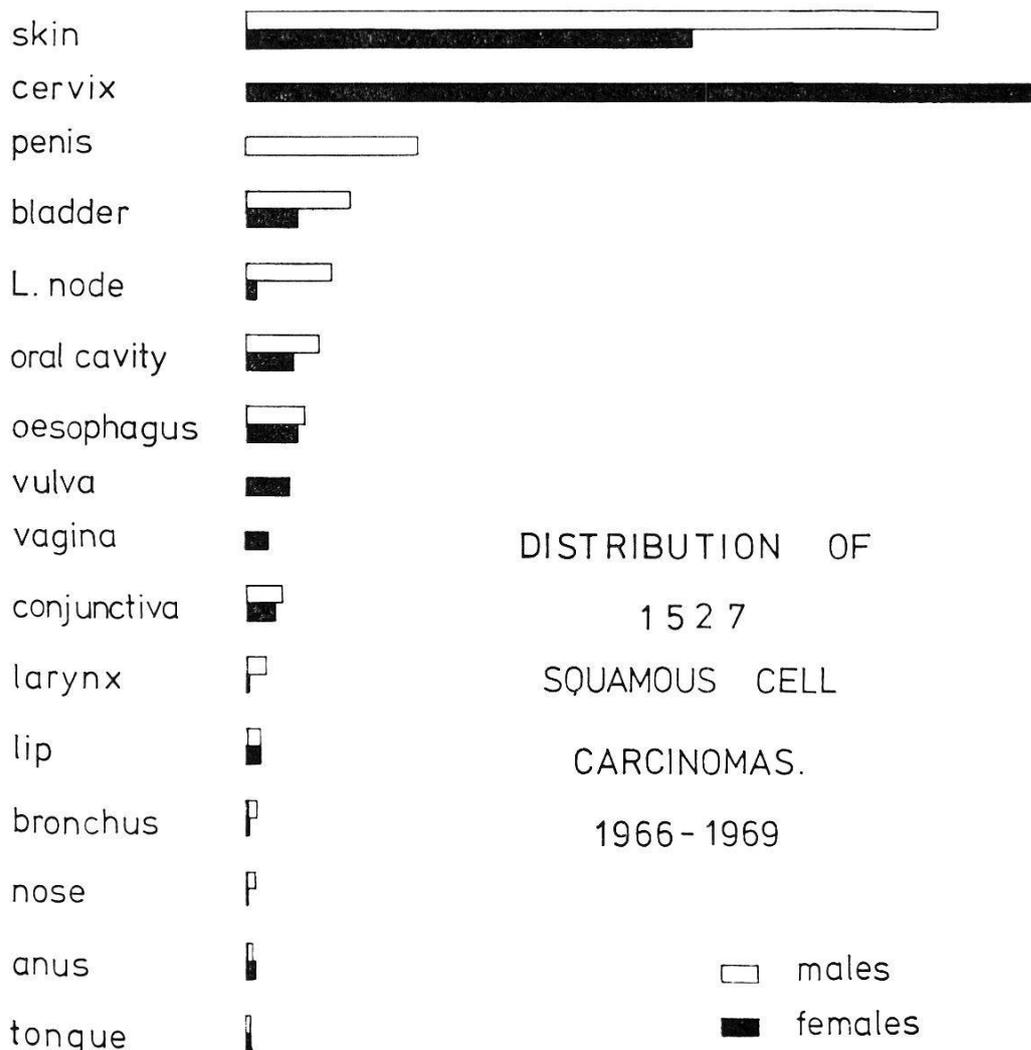
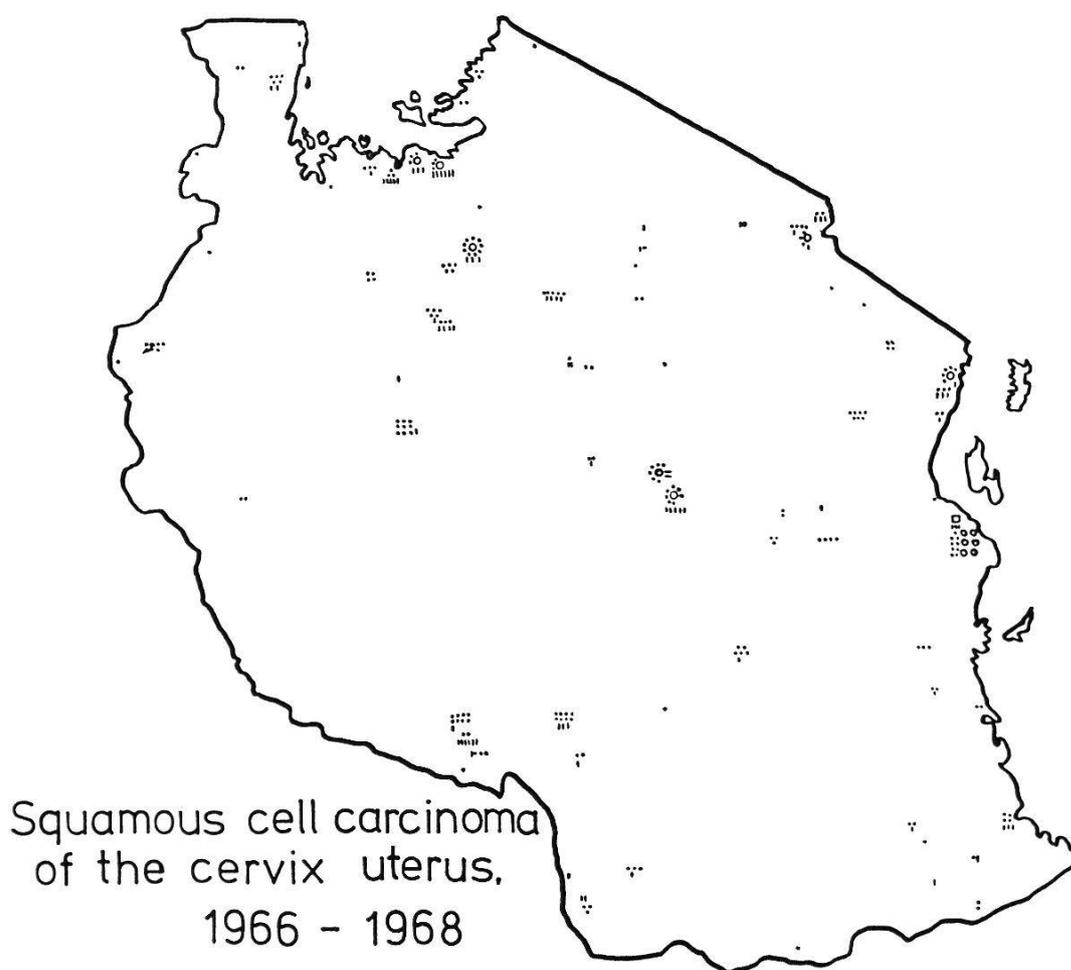


Fig. 1

Table 1. Squamous cell carcinomas distribution of 1527 cases, 1966–1969

Site	Males	Females
Skin	393	256
Cervix	–	431
Penis	84	–
Urinary bladder	55	26
Lymph node	40	26
Buccal mucosa	32	28
Tongue	3	4
Larynx and trachea	11	2
Bronchi	6	2
Oesophagus	47	5
Vulva	–	24
Vagina	–	7
Conjunctiva	20	16
Anus	4	5
Totals	695	832

*Fig. 2.* The geographic distribution of the tumours according to the different medical centres remitting biopsies to the C.P.L. Circles and squares = 20 cases.

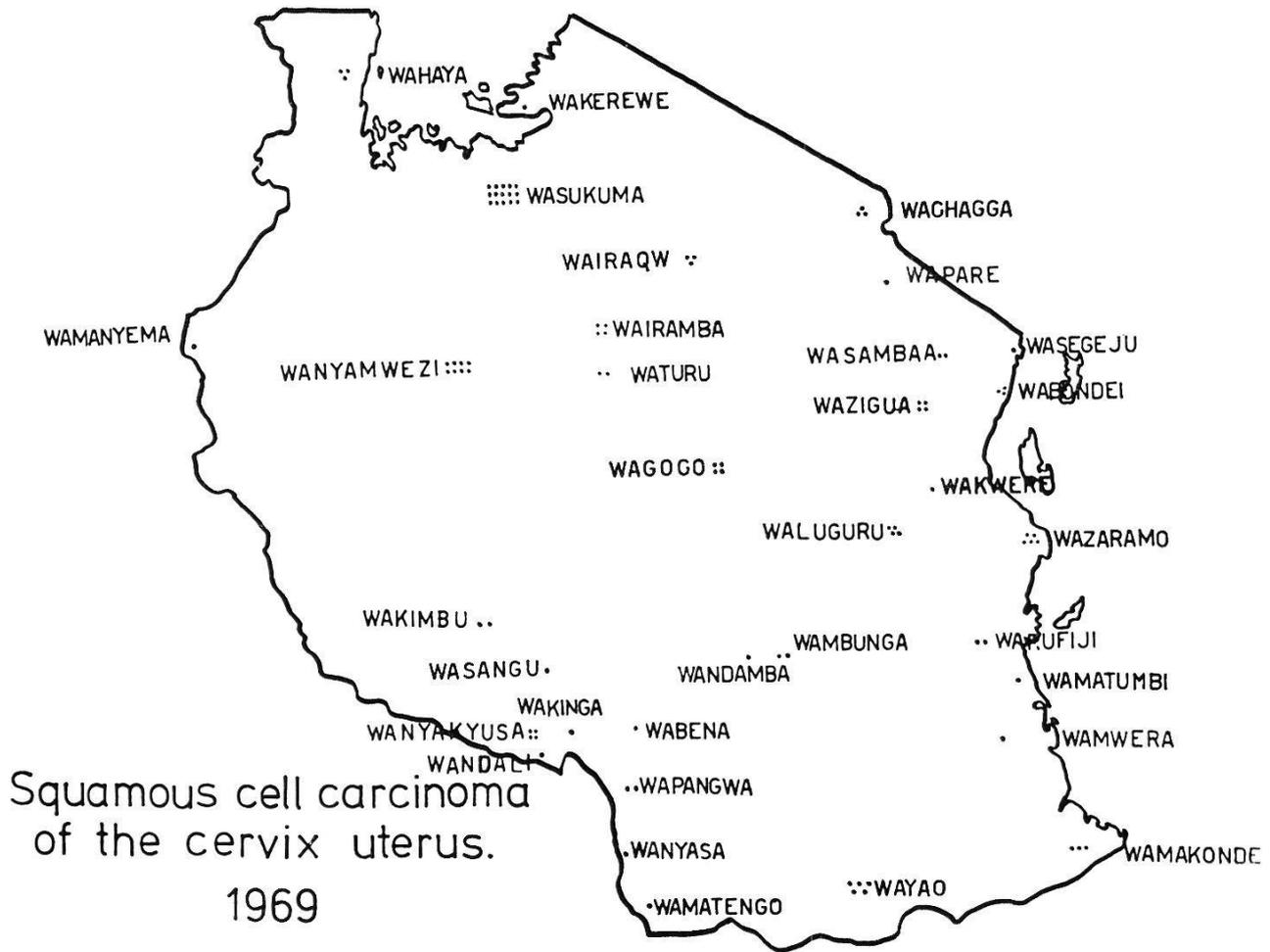


Fig. 3. The demographic distribution of the tumours.

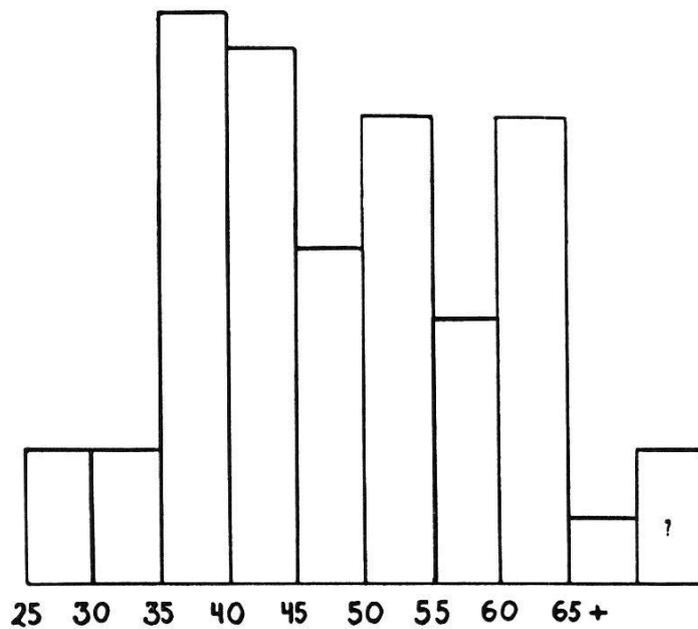


Fig. 4. Squamous cell carcinoma of cervix uterus age distribution: 96 cases.

Table 2. Squamous cell carcinoma of cervix

Ethnic Group	Female Population (Estimated 1969)	Tumours per 100,000 Female
Wasukuma	743,127	2.00
Wanyamwezi	254,848	2.12
Wamakonde	232,008	1.30
Wahaya	231,375	1.30
Wachagga	220,230	1.31
Wagogo	207,370	2.00
Waha	207,940	0.00
Wahehe	171,454	0.00
Wanyakyusa	158,763	2.66
Waluguru	145,033	2.85
Wabena	133,697	0.76
Waturu	130,530	1.53
Wasambaa	127,250	1.66
Wazaramo	121,308	4.15
Wairamba	132,322	3.33
Wayao	96,141	7.77
Wamwera	88,898	1.25
Wairaqw	89,272	3.75
Total average per 100,000 females 2.48 S.D. \pm 1.65		

Table 3. Squamous cell carcinoma of skin

W.H.O. I. C. D. No.	Site	Male	Female
191.0	Lip	2.3 %	1.28%
191.1	Eyelid	0.79%	2.56%
191.2	External ear	0.79%	0.00%
191.3	Face, unspecified	6.34%	7.56%
191.4	Scalp and neck	11.11%	5.12%
191.5	Trunk	6.34%	8.84%
191.6	Upper limb	3.96%	5.12%
191.7	Lower limb	65.87%	66.66%
191.9	Skin, unspecified	0.79%	0.00%
191.8	Multiple sites	1.68%	2.56%

geographic origin of the tumours (i.e. the medical centre remitting these for histological diagnosis) was plotted out and may be seen in Figures 2 and 5 (Atlas of Tanzania, 1967). The demographic incidence of the tumours was also plotted out and may be seen in Figures 3 and 6.

The assessment of the age of an individual under the present circumstances in this country is very difficult. This is mainly due to the

Table 4. The demographic incidence of squamous cell carcinomas of skin

Ethnic Group	Population (estimated 1969)	Tumours per 100,000 Population
Wasukuma	1,454,699	1.50
Wanyamwezi	483,133	1.45
Wamakonde	452,185	1.11
Wahaya	431,746	0.47
Wachagga	423,162	0.71
Wagogo	398,224	2.14
Waha	385,316	1.31
Wahehe	334,659	1.81
Wanyakyusa	292,171	1.03
Waluguru	279,055	1.11
Wabena	250,416	2.40
Waturu	250,292	0.80
Wasambaa	247,756	1.66
Wazaramo	243,645	0.00
Wairamba	234,816	0.00
Wayao	191,783	0.52
Wamwera	183,819	1.11
Wairaqw	179,738	0.52
Total average per 100,000 population 1.20 S.D. \pm 0.59		

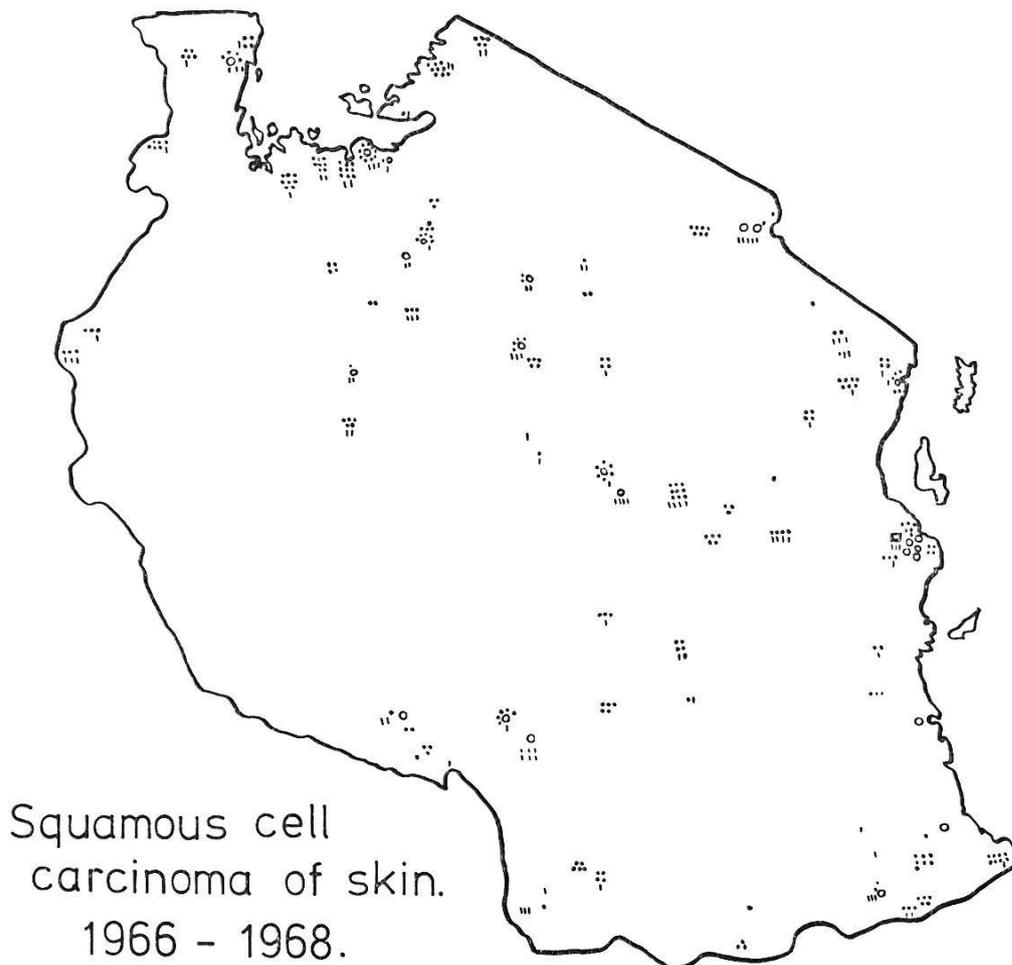


Fig. 5. The geographic distribution of tumours according to different medical centres remitting biopsies to the C.P.L. Circles and squares = 20 cases.

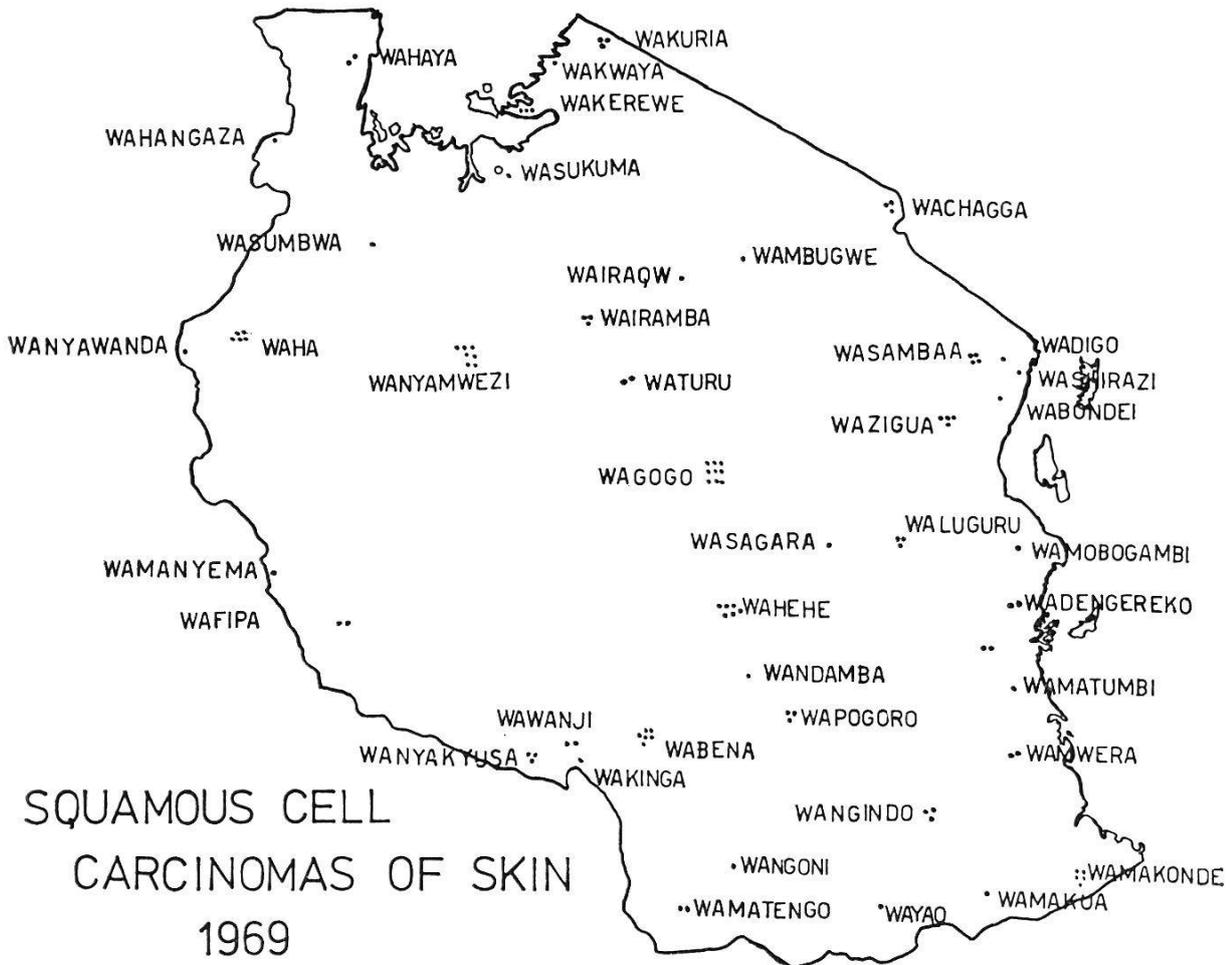


Fig. 6. The demographic distribution of the tumours. Circles = 20 cases.

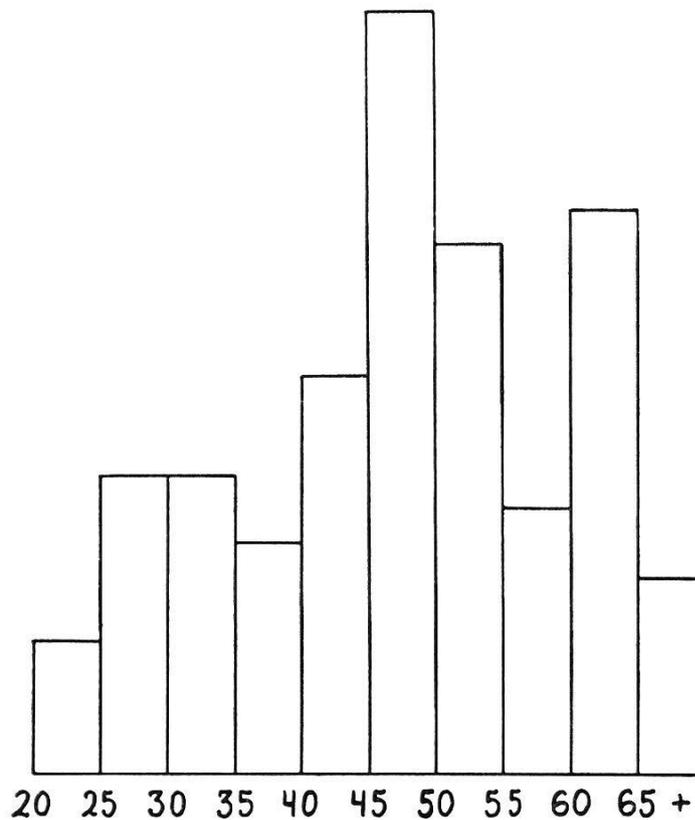


Fig. 7. Squamous cell carcinoma of the skin age distribution: 115 cases.

fact that birth and death registers have only recently been introduced. The ages quoted in this study represent "honest assessments" made by physicians with years of experience in rural practice and are taken as probable with a plus-minus five-year error. This error has been taken into account when working out the age incidences of the tumours under discussion.

The age distribution of these two groups of tumours at time of biopsy may be seen in Figures 4 and 7. The demographic incidence of squamous cell carcinomas of cervix uterus per 100,000 females may be seen in Table 2. While the incidence of squamous cell carcinomas of the skin has been broken down as to site of origin in the body in accordance with the World Health Organisation International Classification of Diseases and may be seen in table 3, the number of tumours per 100,000 head of population of the different ethnic groups may be seen in Table 4.

Discussion

BURKITT & SLAVIN (1968) have stated that the study of malignancies in Tanzania demanded a full re-appraisal and that only the surface of the problem had been scratched. They have called for a closer co-operation between the clinical and pathological services in an attempt to try to obtain a figure which may adequately reflect the real incidence of malignancies in this country. Granted that this study is based on histological diagnosis alone, the fact is also recognised that the figures presented and discussed herein correspond to tumours which are relatively common, of easy access to surgical biopsy, and the nature of which demand absolute confirmation before further therapy is carried out on the patient.

Squamous cell carcinomas of the cervix uterus account for 21.62% of all female malignancies, and 13.44% of all malignancies seen in the Tanzania Cancer Registry from September 1968 to December 1969. LINSELL (1968) abstracting the Records of the Central Pathology Laboratory from 1957 to 1962 found an incidence of 8.2% of all malignancies. Even if one excludes from Linsell's figures the Asians and Europeans the incidence in the present series is significantly higher. The average age incidence of squamous cell carcinomas of cervix uterus at time of diagnosis is 46.68 years of age, the youngest patient being 25 years of age and the oldest patient being over 64 years of age. The peak in the age-distribution-curve lies between 35 and 45 years of age. The average age incidence of this series is surprisingly close to that stated by WILLIS (1967): 47 years of age. With the exception of the Waha and the Wahehe, which show no cases during the past 16 months and in which this tumour appears to be rare, the demographical in-

idence of squamous cell carcinoma of the cervix uterus appears to be fairly uniform showing an average per 100,000 females of 2.48 ± 1.65 . Figures for the Wazaramo are artificially high, possibly due to the fact that this ethnic group dwells in the vicinity of Dar es Salaam and hence has a higher doctor/patient ratio than the rest of the country. On the other hand, the figures shown for the Wayao are high and out of proportion to the incidence of this tumour in the remainder of the ethnic groups. This is in spite of the fact that medical facilities in their area are not any better than they are in other areas of the interior of the country. It is difficult to account for this disproportionate increased incidence of this tumour in the Wayao female and these figures may be of real significance.

BRAS (1967) dwells on the various factors which have been implicated as contributing towards the development of squamous cell carcinoma of the cervix, some of which stem from observations in western countries: socio-economic status, marital status and sexual exposure, male circumcision and penile hygiene, venereal disease, hormones, heredity, etc. It would certainly be interesting to carry out a survey in the Wayao area and in a control area showing an average incidence of this tumour regarding these above-mentioned so-called contributing factors, as also to determine the possible contribution of other factors hitherto unmentioned in western countries, such as primitive beliefs and native medical practices which are supposed to predispose to uncomplicated childbirth. At the present moment, though the population of inland Tanzania is rapidly striving towards modernisation, it is probable that ethnic practices and folklore may persist in the different regions for quite a time. This should enable us to apply modern research techniques to the social and environmental factors such as genital flora which may bear an influence on this tumour in a relatively stable population in its natural habitat.

Squamous cell carcinomas of the skin account for 13.98% of all malignancies recorded in the Tanzania Cancer Registry during the last 16 months. LINSELL (1968) and WOOD (1968) both refer to a rather similar though higher incidence of 15.2%. BURKITT & SLAVIN (1968) stated that it was as yet not possible to state whether there was any demographic difference in incidence in regard to this tumour. Comparing the anatomical site and sex analysis of the cases of the present series with that of WOOD (1968), there are some minor variations which may lack significance. The only observation I would make regarding the present series is that only about 70% of those squamous cell carcinomas arising in the lower limb were taken from patients who gave a history of having previously had a long-standing ulceration of the skin. Only three of the patients of the present series gave any history of having previously been burned at the site of the tumour. The average age

incidence of squamous cell carcinomas of the skin at time of biopsy is 45.41 years of age. The youngest patient being 20 years of age and the oldest over 64.

The peak of the age-distribution-curve lies in the 45–50-year age group.

When one regards the geographical distribution of squamous cell carcinomas of the skin according to the hospital which remitted the biopsy to the C.P.L. and compares this with the map of population distribution of the Atlas of Tanzania, one cannot but feel that the geographical distribution of these tumours follows the population density of the country. On the other hand, when one takes into consideration the incidence of squamous cell carcinomas per 100,000 head of population per ethnic group, Table 4, one confirms the impression hitherto held by BURKITT & SLAVIN (1968) that there really is no significant difference in the demographic incidence of this tumour which might have been otherwise attributed to social customs or environment.

Acknowledgement

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Zusammenfassung

Total 1527 Pflasterzellcarcinome, die von 1966 bis 1969 histologisch diagnostiziert worden sind am Zentralen Pathologielaboratorium Dar es Salaam (Tanzania), werden nach geographischer und demographischer Verbreitung sowie in Altersgruppen statistisch erfaßt. Eine signifikant höhere Zahl von Pflasterzellcarcinomen der cervix uteri wurde im Wayao-Stamm gefunden, verglichen mit den übrigen siebzehn bedeutendsten Stämmen in Tanzania. Die mögliche Bedeutung dieser Feststellung wird speziell diskutiert. Die Pflasterzellcarcinome der Haut zeigen keine signifikante Verteilung in geographischer und demographischer Hinsicht.

Résumé

Un total de 1527 cas de carcinome spinocellulaire qui ont été diagnostiqués histologiquement de 1966 à 1969 au Laboratoire Centrale de Pathologie à Dar es Salaam (Tanzanie) sont suivis statistiquement selon leur distribution géographique et démographique d'une part, leur groupes d'âge d'autre part. Il en résulte un nombre significativement plus élevé pour les carcinomes spinocellulaires du cervix uteri dans la tribues Wayao comparé aux autres 17 tribues Tanzaniennes importantes. L'importance de cette constatation est discutée. Les carcinomes spinocellulaires de la peau d'autre part ne montre aucune distribution significative quant à leur distribution géographique ou démographique.