Annual report of the Medical Department / Uganda Protectorate.

UGANDA PROTECTORATE

ANNUAL REPORT

OF THE

MEDICAL DEPARTMENT

For the year ended 31st December, 1951

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CORRIGENDA

Page 3, last line but three, *read* "insect" *for* "inspect."

Page 17, line 16, *insert* "the" *before* "premolars."

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MEDICAL DEPARTMENT

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I.—GENERAL REVIEW

The past year was characterised by a steady strengthening of the Department's activities in most branches. It is satisfactory to be able to record that one of the most important of these activities, health education, has made good progress. Although demands for more curative services show no sign of abating, the fact that requests for additional health workers have been received from some African communities reflects a new perception of the importance of preventive work.

The major infectious diseases remained at a low level, and there were no serious outbreaks of epidemic diseases. Progress was made in the control of endemic diseases, especially leprosy, yaws and bilharziasis. African local authorities showed an increasing interest in measures to control these affections.

The total number of patients treated at Government medical units has risen, this being accounted for by increases in numbers of dispensaries and aid posts, and patients attending these centres; the number of patients admitted to or treated at hospitals has fallen. Mulago Hospital alone has shown a marked increase in in-patient admissions, combined with a fall in out-patient attendances. The maintenance of an adequate supply of trained African staff—in particular, Assistant Medical Officers, nurses, midwives, Medical Assistants and Assistant Health Inspectors—presents a serious problem, as training facilities now in existence are insufficient to replace wastage and enable an orderly expansion to take place. While it will clearly be necessary to expand these facilities, it has to be admitted that the lack of vocational outlook on the part of candidates for training is a serious factor in the situation.

One of the difficult tasks confronting the Medical Department is that of promoting a public understanding of the economic and other factors which limit the rate of expansion of curative services. Some of these factors are discussed below.

It has to be appreciated that territories whose production of wealth greatly exceeds that of Uganda are unable to provide those comprehensive services which the general public desires. This state of affairs exists even in the United States of America, where in some areas as much as £25 per head of the population is spent annually on medical care alone. In the United Kingdom, where over £8 per head of population is available to meet the cost of the National Health Service in 1952, adequate curative services cannot be provided for all who fall sick. In contrast with these

wealthy countries, the amount which is at present available in Uganda for all medical and health services is only about Shs. 3 per head, while vast leeways of building and training have to be made up and much more extensive problems of ill-health overcome. In the United Kingdom there is approximately one doctor for every 1,100 persons, while in Uganda the number of qualified medical practitioners, if distributed uniformly, would provide one doctor for every 25,000 persons. Distribution of doctors in Uganda is far from uniform, and in the Northern and Western Provinces some 25 doctors serve 1,200,000 people.

The accumulation of large surplus funds from the sale of cotton and coffee in exceptionally favourable markets during recent years has led many people to think that this is an appropriate time for the establishment of new units and the undertaking of additional responsibilities. It is seldom remembered that expansion of services implies an ability to meet additional recurrent charges for staff, equipment, dressings, drugs and other materials. Accumulations of capital cannot safely be used for such purposes. If any social service is to be expanded, there must be a real increase in the production of wealth to cover the increased cost. Again, additional services require additional trained staff. Departmental training institutions are full to capacity, while the high rate of wastage among both students and trained staff means that much expenditure on training is virtually thrown away. In particular, the lack of any social sanction on casual liaisons leading to pregnancy makes it difficult to maintain the nursing and midwifery services at even their present level.

These limiting factors should not be forgotten. The balanced expansion of rural preventive and curative work is a matter of high priority, but cannot be achieved without a steady rise in production of wealth, and equally important, without a better understanding of the meaning of service by those who present themselves for training in the various branches of medical and health work. While more money is needed to pay for new services, these services cannot run efficiently without an adequate supply of men and women who are prepared to place duty before self-interest.

In contrast with local staff difficulties, the recruitment of overseas staff has become definitely easier. At the end of 1951 the vacancies for nursing sisters and health inspectors were only one-half of those which existed at the beginning of the year, while candidates were in view for most of the medical officer vacancies which existed and for which housing was available. Heavy losses due to retirement and resignation since the war have led to a relative lack of experienced officers, a lack which is to some extent offset by the keenness and energy of the staff recently recruited.

It is natural that plans and aspirations in a relatively undeveloped country such as Uganda should be affected by conditions in more advanced countries, particularly in the United Kingdom. This is very noticeable where medical services are concerned. There is a widespread tendency to regard free dispensation of drugs and free hospital treatment as the

proper objectives of medical policy. Thus, African local authorities who wish to devote money for additional medical services are prone to think in terms of increased provision of penicillin and other powerful drugs; little regard is paid to the conditions which must exist if these drugs are to be used effectively, while the social background in which disease flourishes is generally ignored.

The truth is that treatment of many complaints can only be palliative, with heavy recurrent costs and with little effect upon the patients' disabilities or upon the loss of manpower. For a comparable expenditure, some of the more disabling diseases could be reduced to minimal proportions. Tropical territories have provided striking instances of this fact. The control of sleeping sickness, smallpox, plague, yellow fever and malaria has been achieved in many areas by preventive measures. The very success of these measures has removed the evidence on which the value of the policy can be demonstrated, and the lessons are likely to be neglected by the coming generation. It is, of course, necessary to consider each disease on its merits, as it would clearly be uneconomic to devote large sums of money to the prevention of a disease which only occurs sporadically, with a negligible effect upon the prosperity and welfare of the population as a whole. But in Uganda it is comparatively easy to find examples of widespread community diseases which can readily be avoided by simple measures costing a fraction of the amount required to provide effective treatment for the sufferers. Here again, the waste of resources in attempting to cure persons who are likely to contract a fresh infection shortly afterwards is only too apparent.

The majority of diseases which give rise to the heavy demand for increased curative facilities are due to defective nutrition, defective housing and sanitation, inadequate water supplies and dangerous personal habits. All these factors are largely associated with poverty and ignorance, which in turn result from a low production of wealth. The problem of raising the standard of living is primarily an economic one, while the Medical Department must concentrate upon the standard of health. There is no possibility of achieving any significant improvement in the level of health by treatment of established diseases in an unfavourable social and sanitary environment. If this fact was more widely comprehended, there would be a more favourable atmosphere in which the Medical Department could fulfil a most important function, namely, the teaching of safer ways of living. As it is, about three-quarters of the money available for medical purposes is spent on curative services; the conservation of the remaining quarter for preventive services is far from easy when there is general public unwillingness to face the realities of the situation.

Among the local inspect pests which are likely to be controllable by new techniques is the "mbwa" fly (*Simulium* species), whose widespread occurrence in the Protectorate is only now becoming realised, and whose role in causing blindness, restricting cultivation and leading to stunted

growth and sterility still awaits precise assessment. Diseases spread by personal contact, such as leprosy and the venereal diseases, are obviously controllable, but the practical difficulties in changing faulty human behaviour are great. The problem of leprosy is more amenable to preventive measures partly because of popular aversion to the disease and partly because of its low infectivity. The precipitating causes of one of the commonest killing diseases, pneumonia, are still obscure, and effective prevention will probably be found to depend upon the ability of the ordinary peasant to obtain better housing and clothing.

The ultimate results of reduction of disease should not be overlooked. Twenty-five years ago there was serious concern about the decreasing population of East Africa. Today, the increase in numbers is a source of anxiety, and measures are needed to increase food supplies and to bring home to the public the disastrous effects of uncontrolled reproduction. Efforts to increase food production without attempts to restrict population growth are unlikely to provide a solution to the problem, for shortage of food does not appear to restrain the exuberance of human increase until a state of virtual starvation has been reached. There is no need to dwell upon the condition of a population subsisting upon a land area which is insufficient for the production of an adequate food supply, where malnutrition becomes both the direct and indirect cause of high rates of morbidity and mortality.

Europe has passed through the stage in which East Africa finds itself today, the phenomenal population growth of European countries during the 19th century exceeding anything yet witnessed in Africa. Most of these countries have now reached a fairly stationary condition, births roughly balancing deaths. The achievement of this stability was simplified by the capacity of sparsely-populated countries overseas to absorb emigrants. This relief will not be available for East Africa, and a rational limitation of births is therefore the more necessary.

One major consideration has to be borne in mind in planning expansions of medical facilities. Any expansion should favour an increase in effective manpower, and not merely an increase in consumption of medical materials. While it should exercise a steady influence upon the standard of health, improving economic output, it should not encourage profligacy and unrestricted procreation. Schemes of venereal disease treatment having the avowed object of making it easy for the sufferer to get rapid relief, with no concomitant attempts to discourage promiscuity or to encourage a higher standard of living for the growing family, are of little value to the community as a whole. The medical aspect is only one part of a complex social and economic problem, involving defective ways of life and usage of land.

A second consideration, important in view of the poverty of tropical countries, is the pattern which curative services should take. The hospital is undoubtedly the most popular form of unit, but is also the most expen-

sive and complex method of providing medical care. Hospitals are certainly needed for specialised treatment, but the immediate need in Africa is for simple and effective methods of dealing with common diseases, coupled with intensive education on how these conditions may be avoided.

Domiciliary visiting has been proposed, especially in connection with pregnancy and childbirth. In view of the time required to reach the homes of patients scattered over wide areas, domiciliary visiting with the present meagre resources of trained staff could not cope with more than a small part of the problem. Patients must be seen and treated at medical centres.

A recent extension of this policy has occurred in connection with leprosy control. Existing settlements can accommodate and support a relatively small fraction of the patients needing treatment, and cannot be expanded to any great extent. Organisation of treatment at temporary settlements where patients can reside and support themselves for perhaps a year or more may well be the best practical means of extending the use of new drugs to people who are dispersed widely over rural areas.

Distinguished Medical Visitors

The names of some official visitors are given below, but many other persons from outside Uganda visited departmental units during the year.

NUFFIELD PANEL OF CONSULTANTS

Professor T. H. Davey, O.B.E., of the Liverpool School of Tropical Medicine.

Professor Alan Moncrieff, of the Institute of Child Health, London.

Dr. G. L. M. McElligott, Director of the Venereal Disease Department, St. Mary's Hospital, London.

COLONIAL OFFICE

Dr. A. M. Wilson Rae, C.M.G., Deputy Chief Medical Officer.

GOVERNMENT OF NIGERIA

Dr. W. E. Stanley Merrett, O.B.E.

COLONIAL MEDICAL RESEARCH COMMITTEE

Sir Neil Hamilton Fairley, K.B.E.

Sir Harold Himsworth, K.C.B.

COLONIAL INSECTICIDES, FUNGICIDES AND HERBICIDES COMMITTEE

Mr. C. B. Symes, O.B.E.

WORLD HEALTH ORGANISATION

General F. Daubenton, C.B.E., Director of the Regional Office for Africa.

VISITORS APPOINTED BY THE GENERAL MEDICAL COUNCIL OF THE UNITED KINGDOM

Dr. E. R. Boland, C.B.E.
Dr. A. J. McNair.
Mr. J. M. Graham.

EDINBURGH UNIVERSITY

Mr. D. J. Guthrie, Lecturer in the History of Medicine.

II.—VITAL STATISTICS

In recent years the scope of the term "Vital Statistics" has been broadened. Originally dealing almost entirely with the enumeration of births and deaths, vital statistics now concern morbidity as much as mortality—the extent and causes of illness, absences from work, or calls for medical attention. Among highly organised communities, the standard methods of acquiring information entail compulsory registration of births and deaths and notification of infectious disease by doctors. As these methods seldom yield reliable data in undeveloped territories, hospital data have been the chief source of information about the relative importance of local diseases. Attempts have been made to increase the reliability and usefulness of these data. It is now possible to give separate figures for the three main races, while data for individual age-groups are being collected from certain units.

Registrations of births and deaths, even of non-natives, cannot be considered satisfactory. It is difficult to accept the infant mortality rate of 23 per 1,000 births for Asians, while an abnormally large difference between births and deaths for Europeans as well as for Asians indicates that no reliance should be placed on crude rates calculated from these returns. Complicating factors, such as changes in age-composition of the population and departure of older people from the country, must be taken into account. There are grounds for considering that about one-third of all African births are not notified, and similar failures may also occur in the notification of deaths.

Defective notification of infectious diseases is a frequent source of difficulty. It is not unusual to find that notifications are received more consistently from chiefs than from hospitals and medical practitioners. This may to some extent be due to striving after certainty in diagnosis. Whatever the reason, information obtained from hospitals often fails to tally with that obtained from other sources. The reported diseases should be regarded as a rough indication and not as the whole story.

One problem in interpretation is due to the rapid expansion of the non-native population, and the difficulty of estimating the current population even within 4 years of the last census. Detailed immigration data are available, but no counts of persons emigrating are collected centrally.

A rough guide to the number of persons who may leave the country, although not necessarily permanently, is provided by the issue and renewal of passports and certificates of similar purpose.

TABLE I

Year	Reported Immigration			Issue and Renewal of Passports, etc.		
	In transit and visitors	Permanent	Total	Total	Normal duration	Short term
1949	3,889	1,781	6,843	3,657	3,176	481
1950	5,965	2,386	9,456	5,493	5,174	319
1951	2,987	3,448	7,889	8,047	7,594	453

A. African Population

Summaries of the chiefs' returns of births and deaths reported to them are not available since 1949, but from other sources of information it is possible to make estimates of the salient demographical phenomena. These inspired guesses are probably no more inacccurate and possibly less misleading than data which have been presented in the past.

The African population in August, 1948, was 4,918,000. Applying an annual rate of increase of 1.5% (derived from chiefs' notifications, with an arbitrary correction) the mid-year population for succeeding years is estimated as:—

1949	4,990,000
1950	5,060,000
1951	5,140,000

The estimate for 1951 may be in error by as much as 100,000.

The balance of migration has shown an increasing retention of immigrants since 1948, but too great an accuracy should not be attached to this figure as the collection of data is necessarily incomplete.

TABLE II

Migration into Uganda of Africans

	1948	1949	1950	1951
		thousands		
Immigrants recorded	93	123	72	91
Emigrants recorded	105	115	59	62
Net Retention ...	—12	8	13	29

BIRTHS

The number of births occurring in institutions (hospitals and maternity centres under the control of Government and Missions) showed a slight increase. Other evidence suggests that the increase was due mainly to patients coming from further afield and more patients in need of assistance being brought in by ambulance. There is nothing to suggest any marked increase in the number of births. Efforts are being made in some districts to improve the reporting of births, so that the figures, when available, may show some local increase. The annual number of births is estimated to be about 150,000.

DEATHS

The number of deaths occurring in Government hospitals increased by 7%, but consideration of the individual causes which account for this increase gives no grounds for suspecting any enhanced mortality in the general population. The causes showing the largest increases were childbearing (46), newborn infants (72), cerebro-spinal meningitis (73), pneumonia (50) and the group of diarrhoeas and dysenteries (63).

TABLE III

Health of African Officers of Local Civil Service

	1949	1950	1951
Number of officers in Estimates	1,626	...	...
Number of officers in L.C.S. Staff List	...	...	1,510
Estimated average number of officers	...	...	1,750
Deaths recorded	—	2	1
Number invalided out of service	1	—	—
Number of illnesses recorded causing absence from duty	125	190	214
Number of days on sick list	690	1,088	932
Number granted sick leave	—	1	1
RATES—			
Average length of each illness (days)	5·5	5·8	4·4
Average length of sick leave granted (days)... ...	...	7	6

The data recorded above are not sufficiently complete to enable sickness or death rates to be calculated. One important advance during the year has been the publication of a Local Civil Service Staff List, which may provide a means of acquiring fuller information in the future. At the moment, sickness and deaths are not being recorded systematically. In one of the largest towns, the African hospital recorded one L.C.S. officer off duty during the whole year, and he was a member of the hospital staff. The data in Table III are therefore published more as a base-line for future improvements in recording, than as a contribution to knowledge of the state of health of the staff employed.

B. European Population

Owing to the absence of emigration data it is difficult to estimate the growth of the European population since the census in 1948. The

population in February, 1948, was 3,545 (with 4,000 Poles in the refugee camps) and at the end of 1951 was estimated to be about 5,600. The recorded permanent immigration is:—

1948 (last 5 months)	253
1949	774
1950	1,054
1951	1,348

The registered births and deaths from 1946–1950, compared with the 1948 census population, gave a birth-rate of 27 and a standardised death-rate of 7.8 per 1,000 for Europeans (other than Poles).

	Year					
	1946	1947	1948	1949	1950	1951
Births—						
Poles	54	26	21	13	6	—
All other Europeans ...	48	72	88	127	140	175
Deaths	37	30	39	38	23	21

An analysis was made of all deaths for the five years 1946–50 compared with the census population in 1948. The following age-specific death-rates were obtained:—

	Age					
	0–	5–	15–	25–	45–	65–
Death rate—per thousand ...	5	2	6	5	10	35

The crude death rate of 5.6 per thousand must be judged in conjunction with the unusual age composition of the population. The majority of Europeans, whether Government officials or not, leave the country before the age of 55 when the period of heaviest mortality begins. This discrepancy between the populations in Uganda and in the United Kingdom makes comparison difficult. The European population in Uganda is select in two senses, compared with the United Kingdom population; it is recruited from the upper social strata with an attendant lower natural mortality, and a preliminary medical examination of a large proportion of immigrants weeds out the obviously unfit. In addition, some persons who would otherwise die while in the country are invalided out early in the course of their last fatal illness. Bearing these considerations in mind, the recorded standardised rate of 70% of the rate in the United Kingdom is understandable.

During 1951, 175 births and 21 deaths were registered. The infant mortality rate between 1946/50 was 20 per 1,000 births (based on a limited number of births), 60% of the deaths occurring under the age of one month.

TABLE IV

European Patients at Government Hospitals

	Year	OFFICIAL		NON-OFFICIAL		TOTAL
		Male	Female	Male	Female	
Total patients	1950...	2,053	1,551	1,773	1,354	6,731
	1951...	2,187	1,814	2,036	2,158	8,195
Admissions to hospital ...	1950...	294	376	328	227	1,223
	1951...	305	365	363	312	1,345
Deaths in hospital	1950...	1	—	3	—	4
	1951...	4	—	2	2	8

The European Hospital, Kampala, treated 4,733 patients during 1951 (3,708 in 1950 and 4,345 in 1949) of whom 1,046 were admitted to the wards. The number of outpatients treated at Jinja rose from 539 in 1950 to 1,439 in 1951.

The causes of death notified to the Registrar of Births and Deaths were as follows:—

	Male	Female
Septicaemia	—	1
Infective hepatitis	1	—
Vincent's infection	—	1
Cancer, unspecified	2	—
Diabetes mellitus	1	—
Degenerative heart disease	2	—
Other disease of heart	1	—
Hypertensive heart disease	2	2
Intestinal obstruction	—	1
Birth injuries	1	—
Ill-defined and unknown causes ...	1	1
Motor vehicle accident	1	1
Accident by blasting	1	—
Accidental drowning	1	—
TOTAL DEATHS ...	14	7

TABLE V

Health of European Officers

	1949	1950	1951	
			Males	Females
Mid-year number on Staff List	810	895	848	135
Average number resident	707	709	712	115
Number of deaths	2	1	2	—
Number invalided	2	2	5	1
Number of illnesses during year causing absence from duty	391	380	334	70
Number of days on sick list	3,155	2,783	2,275	476
Number granted sick leave*	79	75	26	9
RATES—				
Percentage of daily sick to average number resident	1·22	1·08	0·88	1·13
Average days sick each illness	8·1	7·3	6·8	6·8
Average days sick leave per patient	16·5	12·6	13·3	10·5

* Transport concessions, formerly allowed only when on sick leave, were extended to cover local leave towards the end of 1950.

The causes of death of officers recorded in the above table were—

Male (51)—Chronic bronchitis, asthma and emphysema;
Male (22)—Acute poliomyelitis.

Two other officials died during the year, but are not included in the above table—

Male (Tanganyika Government Service)—Coronary thrombosis;
Male (temporary staff)—Motor accident with head injuries.

The causes of invaliding of officers from the service included in the above table were as follows—

Male (23)—Severe anxiety state;
Male (32)—Alcoholism and personality changes;
Female (52)—Carcinoma of breast;
Male (55)—Nasal cararrh.
Male (56)—Severe anxiety state.

One other officer was sent to the United Kingdom for treatment.

Female (40)—Carcinoma of breast.

In addition, one official of a High Commission department was invalided out—

Male—Hypertension and arteriosclerosis with mental impairment.

52 officials of High Commission departments were put off duty for a total of 442 days.

C. Asians

The Asian population (including Indians, Goans and Arabs) was 36,800 in 1948 and is estimated to be about 48,000 at the end of 1951. The following data for permanent immigration have been recorded—

1948 (last 5 months)	427
1949	1,004
1950	1,210
1951	2,084

The only section of the population whose number is known with any exactitude is the Goan population, which numbered 1,448 at the time of the census. In 1950, 976 Goans over the age of 16 were registered as aliens, and 1,008 in 1951.

The births and deaths registered during the past few years are given below:

Year	1946	1947	1948	1949	1950	1951
Births ...	1,722	1,890	2,049	2,424	2,634	2,634
Deaths ...	223	194	190	186	199	248

The annual increase is estimated to be 6.5%, natural increase accounting for more than half and immigration for the balance.

An analysis of the Asian deaths during the five years 1946-50, compared with the census population of 1948, gave the following age-specific death-rates—

Death-rates per Thousand—Asians

Age	0–	5–	15–	25–	45–	65–
Males ...	10	2	2	3	11	50
Females ...	10	2	4	5	10	40

The crude death rate for all Asians was 5.5 per thousand for this period, but owing to the youthfulness of the population and the return of many older persons to Asia this rate appears acceptable on the whole. Even as it is, the standardised death-rate is 20% higher than the death-rate in the United Kingdom. The infantile mortality rate based on registered data was 17 per 1,000 births for these five years, only 12% of the deaths being of infants under the age of one month. In the United Kingdom 59% of infant deaths are of infants under one month of age.

TABLE VI

Asian Patients at Government Hospitals

	Year	*Official*		*Non-Official*		TOTAL
		Male	Female	Male	Female	
Total patients	1950 ...	2,948	166	5,010	4,500	12,624
	1951 ...	4,233	2,168	2,915	2,237	11,553
Admissions to hospital ...	1950 ...	219	178	937	1,229	2,563
	1951 ...	248	238	770	1,092	2,348
Deaths in hospital	1950 ...	2	2	31	14	49
	1951 ...	2	1	30	12	45

The number of patients treated at the Asian Hospital, Kampala, was precisely the same in 1951 as in 1950 (4,983), of whom 1,524 were admitted as in-patients. Greater consistency was secured by counting all those entitled to free medical attendance as official patients, that is to say, not only Government and High Commission officers, but also their wives and families. This accounts for the different partition of the patients compared with the previous year.

The deaths of Asians notified to the Registrar of Births and Deaths amounted to 248 as compared with 199 in 1950, deaths of infants under 1 year of age being 61 (47)*, giving an infant mortality rate of 23 per thousand. Maternal deaths amounted to 14 (12), a rate of 5 per thousand births. Accidents caused 17 (18) of the deaths, 6 being the result of motor accidents and 4 being from burns and scalds. Malaria accounted for 52 (33), including 14 (8) from blackwater fever. Of the blackwater fever deaths, 11 occurred in the Eastern Province, although only 37% of deaths from all causes occurred in that Province. No deaths were reported from typhoid, and only 2 (3) from tuberculosis. Pneumonia claimed 33 (21) victims, the majority being infants under the age of one year.

NOTE.—*Number in previous year given in brackets.

TABLE VII

Health of Asian Officers

	1949	1950	1951
Number in Estimates	589	...	...
Mid-year number in L.C.S. Staff List	...	...	398
Estimated average number resident (including temporary staff)	552	...	600
Number of deaths	1	2	1
Number invalided out of service	3	—	—
Number of recorded illnesses causing absence from duty	500	562	572
Number of days on sick list	2,273	2,573	2,504
Number granted sick leave	13	18	10
RATES—			
Percentage of daily sick to number resident ...	1·13	...	1·1
Average length of each illness (days)	4·6	4·6	4·4
Average length of sick leave granted (days)... ...	21·5	19·8	18·8

The death included in the table above was—

Male—S.T. malaria and coronary occlusion.

In addition to the Government officers shown above, the death occurred from blackwater fever of a temporary employee in the East African Railways and Harbours. One other employee was invalided out on medical grounds. 541 High Commission staff were put off duty for a total of 2,990 days.

III.—PUBLIC HEALTH

A. General

In the past this annual report contained a section labelled "Meteorology", and although that section has disappeared from the report the influence of climate, season and weather on the incidence of disease and on the health of the population still remains. Early hopes of finding straightforward relationships have not been fulfilled, and many puzzling ætiological phenomena remain unexplained.

Malaria is dependent on mosquitoes whose numbers vary with the amount of suitable collections of water lying around; and although graphical relationships between rainfall and malaria and blackwater fever in Uganda have occasionally been demonstrated, these occasions are probably no more frequent than might arise by chance alone. It is suspected that the rise of "clinical malaria" following the rains is connected with the rise in upper respiratory infections, and the psychological tendency to diagnose malaria in any case of indefinite illness.

Plague transmission is limited by well-defined conditions of temperature and humidity which determine the survival time of the infected rat-flea, and the factors which were shown by Rogers to be applicable in India can also be shown to apply in the Lango District of Uganda (Barrett, R. E., 1933, *E. Afr. Med. J.*, Vol. X, p. 160). The gradual diminution and apparent disappearance of plague from Uganda during recent years has not been satisfactorily explained. Climatic and environmental conditions are still favourable to the dissemination of plague, and the reason for the absence of noticeable infection in the rodent population is unknown.

Cerebro-spinal meningitis has a characteristic seasonal distribution, but whereas in temperate climates it is commonest in cold weather which favours indoor life, in the tropics it flares up at the onset of the dry season and is worst where the dry season is dustiest. Epidemics are associated with outbreaks of coughs and colds in the children's clinics, although respiratory infections in general do not have any seasonal preponderance at this time of year. Many meteorological changes have been postulated to explain the phenomena, including interception of ultra-violet light by the clouds and consequent interference with vitamin intake from plants.

Some diseases and events show fluctuations from year to year, or over a period of years. Meningitis, smallpox, sleeping sickness, influenza and the recession and extension of tsetse flies show fluctuations resembling cycles. Even famines were formerly said to be associated with years ending in an "8". While scarcities of food or abundant harvests are attributed to secular variations in rainfall, less apparent manifestations, such as vitamin A deficiency, recur seasonally in the same areas. The recognition of such relationships would appear to be of little practical importance apart from two considerations. One is the prospect of being able to forecast epidemics, by noting the occurrence of conditions which are likely to favour the spread of disease; the second is the possibility that the climate of Uganda, in small areas at any rate, may be modified in future by man's own efforts, such as mechanical cultivation, swamp drainage, irrigation, or raising of lake levels for hydro-electric purposes. The present need is for the accurate recording of all relevant data, meteorological, entomological, medical and epidemiological, so that their interactions may be studied and disentangled.

Deaths from accidents form a greater proportion of all deaths among both Africans and other races than they do in temperate climates, and accidents account for many minor injuries which can be both prolonged and disabling. It is disturbing to note an increase of 16% in traffic accidents, in which 237 persons were killed (194 in 1950). The numbers of deaths and persons injured were doubled in 4 years. In the period 1946-50 injuries caused one-tenth of all deaths in non-natives, and motor accidents were responsible for one-sixth of all deaths from injury; this proportion seems only too likely to increase in future, and measures to minimise road risks are of great importance.

B. Nutrition and Food Supplies

The year 1951 provided surprises both in its weather and in the occurrence of nutritional defects. The first six months were dry, leading to local food shortages in the Northern Province; the second six months were unusually turbulent, with hurricanes during September in the western part of the Protectorate and unparalleled rainfall figures for the year, generally favouring crops and producing record yields of sorghum in Kigezi.

Vitamin deficiencies are noted most frequently in residential institutions such as boarding schools and prisons. They were recorded at widely separated parts of the country during the year, from the West Nile and Karamoja in the north to Kampala on the shores of Lake Victoria. The deficiencies appeared to be precipitated by the failure to obtain some normal component which was an essential accessory to the main diet. It has proved extremely difficult to maintain an adequate institutional diet. Although vitamin A deficiency was well recognised in Luzira Prison a quarter of a century ago, and although an adequate dietary scale was laid down when new Prisons legislation was introduced in 1944, cases again occurred in the prison during 1951. It is estimated that 10% of prisoners have some degree of vitamin deficiency on admission, and residence in prison may precipitate the onset of clinical symptoms. In Moroto, five cases of scurvy and night-blindness with one death were noted among remand prisoners who do not work out of doors and who do not have the opportunity afforded to other prisoners of supplementing their diet with antiscorbutic fruits and vegetables. These occurrences have led to a review of prison diets, aimed at reducing the risk of vitamin deficiencies.

There is no lack of rich sources of both vitamins A and C in Uganda. Sweet potatoes, certain native vegetables and the large sweet pepper (*Capsicum annuum* variety *grossum*) are available to provide the former, while citrus fruits and green vegetables in general provide the latter. Evidence of vitamin B complex deficiency is rare; examples are seen occasionally, although an obvious dietary defect is not always demonstrable. An interesting outbreak of suspected pellagra was noted at a leprosy settlement, the skin lesions appearing at the site of intra-dermal injections given to patients on a maize diet. Another small outbreak of 38 cases occurred in the mental hospital after maize had been substituted for plantains for less than six weeks.

Further progress has been made in the study of protein requirements, particularly of young children. The clinical condition resulting from a relative lack of protein after weaning is now commonly known as "kwashiorkor". It has been shown by workers at Mulago Hospital, where staff from Makerere College and the Medical Research Council have been collaborating with Government specialists, that the deficiency causes physiological changes which accentuate the mal-absorption of food. The

pancreas seems to be particularly affected, with reduced production of the enzymes needed to break down fat and starch in the bowel. Signs of liver damage are also commonly noted.

Uganda was visited by Professor Brock, and the report on "Kwashiorkor in Africa" by Brock and Autret, published by W. H. O. (*Bull. World Hlth. Org.*, 1952, Vol. 5, p. 1), contains the results of the visits of these two authors to parts of Africa where the disease is known or is suspected to occur.

The clinical features now recognised to be typical of the syndrome include retarded growth, the weight being subnormal; hair scanty, soft, lighter in colour and unusually straight; œdema, with low serum albumin; enlarged liver, showing fatty or fibrotic changes; and a high mortality unless treated. The syndrome generally occurs at the time of weaning. Diarrhoea, hyperpigmentation of the napkin area and other dermatoses are associated with these changes. Anaemia is probably not an integral part of the syndrome.

The distribution of kwashiorkor has not yet been fully determined, but there is evidence of its occurrence in most parts of the Protectorate. It is frequently seen in Kampala and Mbale District and it is reported to be more commonly encountered in the West Nile District. In some districts, such as Toro and Kigezi, it appears to be less common. Little is known of the basic factors influencing its distribution, although the presence or absence of tsetse fly, the consumption of milk, the growing of beans, and reliance upon plaintains or millet for the staple diet may prove to be relevant.

In view of the limited supplies of animal protein in Uganda, attention has been directed to other sources of protein. Dried milk powder has hitherto been considered necessary for the treatment of established cases, but success has been reported with the use of processed soya-bean flour. This flour is an ingredient of a well-known beverage which has a large vogue in other parts of Africa. Sunflower seed also has potentialities which need to be explored. To assist African mothers in providing the most suitable foods for infants after weaning, a book of recipes for native foodstuffs was cyclostyled and is likely to prove valuable in the Child Welfare clinics in Mengo District.

The adequacy of total calories in the diet of the average African is still uncertain. From the results of family budgets investigated around Kampala, the low work output of plantation labour, and the resemblance between clinical conditions seen in Uganda and those noted among calorie-deficient patients in Western Germany, it seems premature to conclude from agricultural data that adequate supplies of calories are being obtained from the crops which are planted.

The concept of an adequate diet has several aspects. Not only should the food intake satisfy the pangs of hunger and enable a full day's work

to be done, but it should contain the quantities of vitamins and other special components needed for health during growth and in adult life. There is evidence that an adequate diet is of primary importance in enabling the body successfully to resist diseases such as malaria, schistosomiasis, ankylostomiasis and tuberculosis.

The rocks upon which the Tororo Cement Industry are based occur at several places around the Mount Elgon massif and contain large amounts of fluorine in the form of fluor-apatite. It was thought possible that human fluorosis might occur in persons residing in these areas, either through use of water obtained from boreholes in these mineral formations or from crops grown locally. A dental examination of 193 schoolchildren at Nakupa, Mbale District, disclosed some mottling of the teeth, but the mottling was not considered to be due to fluorosis. Fluorine mottling is often yellow, brown or black, and is most marked on the upper incisors; the mottling observed was chalky-white and was confined to the deciduous teeth, and to those teeth erupting after premolars. Combined with the presence of hypoplasia of the enamel, this pointed to a nutritional defect occurring about the time of weaning, possibly related to kwashiorkor. Similar but more universal mottling was seen away from the fluorine area, at Nagongera in West Budama, the scene of an anaemia survey in 1950.

C. Communicable Diseases

(1) Arthropod Borne.

Malaria.—Rainfall during the main rainy season was below normal for most of the country with the exception of the zone around Lake Victoria, and the general incidence of malaria was low. Unusually protracted and continuous rain in the latter half of the year produced record annual totals, and some towns which are normally free from anopheline mosquitoes and malaria experienced sharp outbreaks of malaria at the end of the year. Antimalarial drains and culverts were damaged, and the routine work of antimalarial gangs was disorganised by the need for emergency clearance operations.

The microscopic diagnosis of malaria species shows curious fluctuations, and in 1951 relatively few (only 1%) of all microscopic diagnoses were of species other than *Plasmodium falciparum*, the proportion in 1950 being 9%. The proportion varies with race, being highest in Europeans. The proportion of all patients diagnosed as malaria whose blood contained malaria parasites rose from the average of 20% for recent years to 26% in 1951.

The incidence of malaria and its toll of life among the three main races seem very similar. Asians show a higher rate for all diagnoses of malaria, but a larger proportion are unsubstantiated by a positive blood slide. Six per cent. of all deaths in hospital (all races) were ascribed to malaria

confirmed by positive blood slides. The death rate in non-natives may be slightly higher; from the registrations of non-native deaths it appears that deaths from malaria formed 24 per cent. of deaths from all causes in children up to the age of 10, thereafter falling to a much lower proportion (based on the years 1946–51).

The effect of malaria in hyperendemic areas is still open to speculation, and plans are being made for an investigation by the East Africa Inter-territorial Malaria Unit to assess the effect of the interruption of malarial transmission over a period of years.

Surveys included larval investigations, adult catching and clinical surveys. Attention was focused largely on the Northern Province townships, but surveys were also made of swamp land to the north of Kampala which may be of importance in future development. In Fort Portal, at an altitude of 5,000′, *A. funestus* was found but not *A. gambiæ*. While catches of female anophelines in catching posts in towns are usually low, catches at Lira ranged from 2–8 to 36–60. In the Nile valley, with spleen rates of about 75%, malaria may not be hyperendemic, as has been supposed in the past, but may undergo an annual interruption of transmission. Such interruption is known to occur in dry parts of the Northern Province.

The extension of the runway at Entebbe airport provided a text-book example of "man-made" malaria. The vast impermeable apron, discharging water after heavy rains on to inadequately levelled and undrained surrounds of clay from which the top-soil had been removed, produced ideal conditions for the breeding of both *A. gambiæ* and *A. funestus*. Only the sparcity of African population in the surrounding region prevented a serious outbreak, and the incident should serve as a salutory reminder of the need for close liaison between engineers and health workers.

Progress has been made in laying permanent drains in some of the Northern Province townships. On the advice of the Interterritorial Malariologist, "high-spread" oil is being used experimentally. Although savings would be effected on rail freight and on the load to be carried by the oiling-gang, there are counter-disadvantages. Special trigger releases are needed for the sprays, oilers need to be trained to use smaller quantities of the more expensive oil, visual evidence of the application of oil is more transitory, and special methods—such as oil-soaked dry sawdust—are needed for small collections of water.

An interesting experiment in anopheline control was carried out at Nsambya Mission, on the outskirts of Kampala. Spraying with D.T.T. emulsion containing dimethyl-phthalate and para-dichlorbenzene as repellents was found to be effective, but the method was judged to be less economical than mosquito-screening.

During the year three Assistant Health Inspectors undertook a course of training at the East African Malaria Unit, Amani, Tanganyika.

Plague

Plague was not reported in the Protectorate during 1951, but cases occurred in adjacent territories (Tanganyika, Ruanda-Urundi and the Belgian Congo). In the past, plague in Uganda has been closely associated with the cotton industry. Information collected during typhus investigations has shown an increasing preponderance around Kampala of the rat and flea which are the most efficient carriers of the disease—*Rattus rattus kijabius* and *Xenopsylla cheopis*. The replacement of grass thatch by tiles or metal-roofing is laudable in denying the rat a resting place in the middle of the household; but avoidance of conditions which attract rats and favour their breeding, such as piles of cotton in huts, accumulations of household rubbish, and untidy compounds, still remains a primary duty of householders of all races.

Relapsing Fever

TABLE VIII.

Cases of Relapsing Fever

	1949	1950	1951
Western Province—			
Ankole	327	393	192
Kigezi	18	40	23
Toro	24	43	41
Bunyoro	2	5	2
Buganda Province—			
Masaka	105	170	156
Mengo	50	70	33
Mubende	2	3	7
Eastern Province—			
Busoga	33	1	1
Other Districts ...	5	2	—
TOTAL CASES ...	566	727	455
Admitted to hospital ...	346	301	229
Deaths in hospital	11	12	4

The fall in the total number of cases reported is probably due principally to administrative changes adopted in Ankole. One change was a more stringent standard of diagnosis. Another was the withdrawal of arsenicals from dispensaries, which removed an inducement to seek injections. Analysis of the age distribution of the cases in relation to the age distribution of the total population shows that the incidence is uniform at all ages, except possibly in old persons, who are known not to be proportionately represented in hospital statistics.

A sum of £100 was made available from the local Community Development Fund in December for the treatment of huts with benzene hexachloride (P. 520) in the areas from which most patients have come, that is,

around Mbarara and Lwasamaire. Just under 10% of all huts examined were found infested with *Ornithodorus moubata*. The degree of infestation was high in some cases—one hut had 37 ticks in a single square foot of floor surface. The resulting destruction of other kinds of insect life is appreciated by the inhabitants, who are being encouraged to search critically the belongings of visitors to their huts and to renew the application of B.H.C.

While penicillin is commonly used for the treatment of relapsing fever, aureomycin has also been shown to produce good results. Terramycin is under trial.

Trypanosomiasis

Notifications during 1951 were the lowest on record, but the disease is still widely spread throughout the Protectorate. An analysis of notifications during the past decade shows that the fatality rate is 10% for *T. rhodesiense* infections but only 1% for *T. gambiense* infections, the variations from year to year in the total recorded death-rate being due to varying proportions of the two types. There is no evidence of any fall in the fatality rate during the past decade.

Taking *T. gambiense* areas, only 2 cases were recorded from the West Nile District, where twenty years ago four medical officers were largely engaged in the control of sleeping sickness. Two cases only were reported from Toro district, both in the early part of the year; but in view of economic developments in this district and the widespread distribution of tsetse fly, precautions still need to be taken. A survey carried out at the southern end of Lake Albert during the year demonstrated the presence of large populations of *G. palpalis* and *G. pallidipes*.

In the Northern Province, the most resistant focus lies on the River Aswa along the boundary between Lango and Acholi districts. Since the epidemic outbreak in 1945, coincident with the movement of population from Aweri, this focus has persisted and has become relatively more important.

In the *T. rhodesiense* areas, the disease appears to be under control. Voluntary evacuation was recommended to combat the 1950 epidemic on Buvuma Island, but only 10% of the population took advantage of the scheme. Blood examinations of the whole population have been carried out at intervals of about six weeks, and concentration of the population has been encouraged. Improved agricultural methods have been introduced, while better protection against the depredations of wild game is being organised. Most of the new infections during 1951 could be traced to contact with the infected *G. pallidipes* area in the northern part of the island. Six cases were reported in 1951 as against 25 in 1950, the fall being attributed largely to the recession of fly from the inhabited areas.

Fewer cases have been reported from Busoga and Mbale districts. It was possible to open up part of the South Busoga Restricted Area by

planned resettlement, with extension of mechanical farming and clearings by the Sugar Estate, and to abolish the Kami–Nsolo Restricted Area, which is being opened up for the benefit of new industries at Sukulu.

The cases reported from districts in recent years are set out below. The decrease in the number of cases has naturally reduced interest in the disease. Many annual reports from districts no longer mention it, but competent observers stress the possibility of cyclic variations in fly activity, such as that causing the epidemic in Buvuma in 1950, which may lead to recrudescence of the disease.

TABLE IX.

Cases of Trypanosomiasis

	1948	1949	1950	1951
Mengo	2	5	27	7
Masaka	2	—	—	—
Busoga	7	35	19	3
Mbale	5	23	14	7
Lango	3	2	4	9
Acholi	5	13	2	8
West Nile ...	9	12	8	2
Bunyoro	3	10	2	...
Toro	18	4	2	2
TOTAL CASES ...	54	104	78	38
TOTAL DEATHS...	2	6	6	2

The enforcement of sleeping sickness legislation, interfering as it must with unrestricted fishing, hunting and wood-cutting, is not popular either with the Africans or with employers of labour, and does not always obtain the full support of chiefs. The number of registered alien labourers working in dangerous areas in Mengo District fell from 6,455 in 1950 to only 2,415 in 1951, when the European Sleeping Sickness Inspector was absent on leave, and this is indicative of the need for firm and efficient supervision and control rather than of any decrease in the number of labourers actually employed.

Typhus

The majority of typhus cases among Africans are recorded at Mulago Hospital, while sporadic cases are diagnosed at Entebbe and Bombo. The infection is of murine type, transmitted by the rat flea. Investigations into the rat and flea population were continued in the early part of the year, and it was found that a threefold increase in the flea index (to an average of 5·6 fleas per rat) occurred at the height of the rains.

Fourteen cases occurred amongst Europeans, all except two being reported from the Eastern Province (Jinja 7, Mbale 3, Tororo 2). This is in contrast with 1950, when the majority of the cases were treated in

Kampala and only 3 at Jinja. It is presumed, but not known with certainty, that these were examples of tick typhus.

TABLE X.

Cases of Typhus Treated at Hospitals

	1947	1948	1949	1950	1951
Africans	29	63	73	129	114
Asians	—	—	—	8	1
Europeans	3	6	8	14	12

The accurate notification of murine typhus has an importance quite apart from its value in affording information on the prevalence of typhus, as it throws light on the intimacy of contact between men and rats. This has a useful bearing upon the subject of plague, a disease which also depends upon the proximity of the rat to habitations and working places of man.

The mortality from this disease is low, only three patients dying. It was noted that relapse was apt to occur after chloramphenicol treatment if too short a course of treatment was given. A report from one district suggests that some private practitioners are in the habit of treating every febrile illness with quinine, penicillin, chloramphenicol and possibly streptomycin; if this is correct it affords an explanation of the difficulty of getting reliable information about the incidence of typhus and other diseases among certain sections of the community.

Yellow Fever

No cases were recorded during 1951, but the work of the Virus Research Institute in Karamoja has extended the known areas in which infection may occur.

Although immunity to the virus of yellow fever occurs on a considerable scale among monkeys in the western and central parts of Uganda* (the proportion exceeding 50% in Toro and Mengo districts), the reasons why human beings escape infection in these areas have not yet been worked out. It has been found that *Aedes simpsoni,* the mosquito responsible for transmission from monkey to man, is far more anthropophilic in Bwamba than in other parts of the Protectorate. In the drier part of the Protectorate, as in Kenya, it is possible that animals other than monkeys

* Buxton, A. P., & Lumsden, W. H. R. (1951) "A study of the epidemiology of yellow fever in West Nile District, Uganda." *Trans. Roy. Soc. trop. Med. Hyg.* Vol. 45, p. 53.

Haddow, A. J., Dick, G. W. A., Lumsden, W. H. R., Smithburn, K. C. (1951) "Monkeys in relation to the epidemiology of yellow fever in Uganda." *Trans. Roy. Soc. trop. Med. Hyg.,* Vol. 45 p. 189.

may keep the infection alive; bush-babies from Karamoja have been found to possess antibodies to the virus, while hedgehogs have also come under suspicion.

Experiments with combined vaccination against smallpox and yellow fever showed that the immunising response against yellow fever was less than that resulting from separate vaccination against the two diseases. It was possible in Toro to follow up the result of the mass vaccination campaign of 1941. It was found that 77% of the population over 9 years of age were still immune; the difference from the expected 100% immune is probably explicable by cross movements of population, 18% of persons tested having come from outside the area.

(2) Helminthic Diseases.

Dracontiasis.

The areas in the Northern Province from which cases are reported vary from year to year. In 1951, reports from the Karamoja and West Nile Districts make special mention of the disease (compare 1949 Annual Report). The factors influencing the occurrence of guinea-worm are by no means clear. In some places its transmission is facilitated by the seasonal drying up of water supplies and consequent resort to easily contaminated holes dug in swamps. The recent rise in incidence in Karamoja was popularly believed to be due to exceptional rains providing temporary pools and more numerous sources of infection. The vector *Cyclops coronatus* was reported to be more widespread this year. Some unusual manifestations have been reported. A lipoma on the back of a young girl was removed and found to contain a guinea-worm. Tenosynovitis of the wrist in small children has been ascribed to this disease. In some areas it is still of serious and widespread economic importance; deformities of the knees and ankles occur in childhood and persist into adult life. The numbers of cases reported from the West Nile District are given below, the majority of which are from the Nile Valley.

1947	1948	1949	1950	1951
356	368	394	422	430

Onchocerciasis

Further surveys have provided additional information on the distribution of the insect vector and the incidence of the disease.

The presence of *Simulium neavei* has been demonstrated on the western and northern sides of Mount Elgon, in contiguity with the known focus to the south which extends south-eastwards into Kenya. The fly is not common below the 6,000′ level in heavily cultivated areas, and it is only in the forest zone that contact with man is frequent. Although infection is not common in man, a high rate of infection is found in fly in virtually uninhabited areas; this suggests that there is an animal carrier of the disease, or that flies make long journeys to their "feeding grounds".

The occurrence of onchocerciasis and of at least eight species of *Simulium* has now been demonstrated in the West Nile District, especially along the escarpment forming the western margin of the Rift Valley. *S. neavei* has been proved to be a carrier of the human disease, and *S. damnosum* is suspected to play some part; the former occurs at 5,000′, the larvæ and pupæ in association with the crab *Potamonautus niloticus,* the latter below 4,000′, the larvæ and pupæ being attached to aquatic grass. It is fairly safe to assume that if broken water (due to falls, rapids or projecting stones) occurs in conjunction with dense fringing vegetation, *Simulium* flies will also be found. One-sixth of all adult flies along the Nile below Jinja have been found to be infected.

Exposure to the bites of infected flies leads to infection of the majority of the population. The filarial worm *Onchocerca volvulus* has been found in the following proportions of persons living in infested neighbourhoods—

Kigezi (Kayonza)—	67%.
West Nile (Bondo)—	5% under the age of 10 years.
	64% over the age of 10 years.
Busoga (Buluba leprosy settlement)—	6% in skin snips taken for leprosy examination.
Prisoners (Jinja)—	66% with subcutaneous nodules.
S. Bugishu (Bumbo)—	6/26 selected on account of defective vision.

It has been noted that some of the entomological staff have not been found infected even after six months' intensive exposure.

The most characteristic clinical feature is the subcutaneous nodule, occurring around the hip bones in scantily-dressed races. Roughness of the skin may result from itching, but infection may be found without clinical signs.

The extent to which onchocerciasis causes blindness is of obvious interest. It can only be satisfactorily determined by the use of the slit-lamp, so that microfilaria in the eye may be illuminated and magnified. Subsidiary information suggests that onchocerciasis is rarely the cause of blindness in Uganda. At Bumbo, only one man out of a population of 1,500 had been exempted from poll-tax on account of blindness; in districts where blindness is prevalent, clinicians have concluded that other causes of blindness were more important. Trachoma in particular has been incriminated in the West Nile District.

A form of endemic dwarfism has been studied in the Mabira Forest, to the west of the Nile and not far from Jinja. The affection begins in childhood, and the patient is weak and listless, with slender limbs and stunted growth. Sexual development is poor, epilepsy seems unduly common, and a lowered excretion of 17-ketosteroids suggests reduced function of the anterior pituitary gland. The condition is ascribed by the

local people to the bite of *Simulium*, and all the patients seen—even young children—were infected with onchocerciasis. The local inhabitants of the West Nile District seem aware of the baneful effects of waterfalls and rapids, which are alleged to possess malevolent spirits capable of causing barrenness in women who stub their toes on the rocks.

The therapeutic effect of Hetrazan on this condition is a matter of importance. The drug was discovered in 1947 and has been investigated at Jinja by Hawking* of the National Institute for Medical Research. Dosage was increased up to $\frac{1}{4}$g. daily. Persons with onchocerciasis show violent allergic symptoms due to reaction around microfilaria in the skin. The drug has no effect upon the adult worms, and the effect upon persons with eye changes is likely to be deleterious.

Preliminary investigations have been made in connection with a project to eradicate this scourge from the River Nile between Lakes Victoria and Kyoga. Special attention was paid to potential breeding places in neighbouring streams, from which re-infestation might occur. Fly catches have thrown light upon the longevity of the flies; 75% of those caught at Jinja are immature, and few females survive to lay a third batch of eggs.

An experimental aerial spraying of a 5-mile stretch of the Nile near Jinja produced a temporary recession of infestation in the neighbourhood of the town. This was to be expected, as breeding extends over some 35 miles of river. The *modus operandi* was to spray a D.D.T. solution on the riverine vegetation upon which newly emerged flies settle. Owing to the difficulties and hazards of aerial navigation and the lack of suitable aircraft, alternative methods of attack have had to be considered. Control of an experiment of this nature is a matter of special difficulty, paths having to be cut through dense vegetation in order to obtain access to the river for the necessary entomological observations.

Schistosomiasis

Isolated reports of cases from Mbale and Teso indicate that *S. mansoni* may exist without attracting attention.

As a result of stool surveys, a clearer picture of the distribution of *S. mansoni* infection in the West Nile District is coming to light. The highest infection rates are found where Lake Albert narrows to form the River Nile (Panyamur, 88% of children, Pakwach 53%, Panyigoro 35%). Otherwise, the average incidence (9%) along the Nile is less than at many inland places. The suggestion of a steadily decreasing rate of infection down the Nile from Lake Albert has not been corroborated.

Infection rates at boarding schools and training centres (10–20%) depend upon incidence in the pupils' home areas. Important foci have been brought to light by examination of pupils; one such focus was found at

*Hawking, F. (1950), *Trans. Roy Soc. trop. Med. Hyg. 44*, p. 153.
Hawking, F. (1952), "A histological study of onchocerciasis treated with Hetrazan", *Brit. Med. J.*, i, p. 992.

Ajumani, where 23% of those examined were positive. An interesting observation was that nearly 10% of Banyoro porters imported to work at Rhino Camp for the ginning season acquired this infection during their stay.

The infection rate increases with age, and is higher in males than in females at comparable ages:

Age	Up to 2	3–5	6–10	11–15	Children		Adults	
					M	*F*	*M*	*F*
Percentage infected with *S. mansoni*	0	21	40	48	46	24	45	32
Total examined	39	111	284	90	132	38	296	158

(Data collected by District Medical Officer, West Nile).

By comparing infected children with non-infected children in the same age group, it was found that schistosomal infection had apparently little effect on the spleen size or haemoglobin level. This has been noted elsewhere in Uganda and in other countries.

History repeats itself. In 1923 a medical officer visiting Buvuma Island for sleeping sickness inspections examined the 17 canoemen who had just paddled him 30 miles across Lake Victoria. 16 of them had *S. mansoni* in their stools. In 1951, the 12 ferrymen on the new ferry at Pakwach were examined; 11 had *S. mansoni* in their stools, the twelfth man having just completed a course of treatment.

Vesical Schistosomiasis

A survey of the *S. hæmatobium* areas in Lango has been in progress during the year, starting with the known foci of high incidence. The incidence of infection was at first gauged by the use of the miracidioscope, but this was subsequently considered to offer no significant advantage over the usual microscopic examination. In the worst areas, schoolchildren aged 10-14 showed the highest infection rates (judged either by microscopic examination of the urine, or by the presence of blood in the urine). At this age over 50% of children are infected, as are more than 25% of children under the age of five.

The infection appears to be limited to the south-west part of Lango District, infected persons elsewhere nearly always being found to have visited known foci of infection. Marginal areas, where the total incidence is low (5% or under) do not show the same frequency at school-ages, but tend to have an incidence increasing with age; this would be expected if infection depended upon ability to travel and come into contact with infected areas at a distance.

The vector of the disease is the snail *Physopsis nasuta,* and the danger-spots are casual excavations holding water, vegetation and snails, in which small boys bathe and fish. Treatment of pools with copper sulphate has been started, and it has been found that one application will render them free from snails for at least two months. Nilodin has been used in the treatment of a small series of cases; it seems capable of curing about two-thirds of those infected.

Anthiomaline has been used in north Busoga for treating vesical schistosomiasis, but many relapses have been recorded.

(3) Direct Infections

Anthrax.—No reports of anthrax were received from Ankole, where it was formerly most prevalent. The focus on the shore of Lake Albert, in the north-west corner of Bunyoro District, provided 31 cases with two deaths. Details of cases occurring in Masaka are not known, but one case was reported from Busunju (Mengo) where an outbreak occurred in 1950. One of the two cases reported from Teso was from the place affected in Usuku in 1950.

Jonam and East Madi, two areas of the West Nile District which provided outbreaks in 1950, again provided cases this year. In March a young hippopotamus was speared near Liri and cut up by three men, who transported the meat in their canoes. They ate some of the raw liver themselves, giving the rest to three children. The next day two of the men were seriously ill with internal symptoms, and subsequently died. Prompt quarantine measures and destruction of the meat by burning were carried out by the people themselves.

Seven men from Pakwach found a dead hippopotamus on the east bank of the Nile. They ate some of the meat raw, brought back the remainder in their canoes, and dried it prior to distribution to their friends. One man sickened and died 16 days later, and a second died the next day. The remainder sought treatment at the nearest dispensary and when seen later were found to have typical malignant pustules. No person eating the dried meat was affected.

These events recall a letter written in 1877 by Emin Pasha describing the people living on the south bank of the Somerset Nile, close to its entry into Lake Albert: "The Magungo are very clean, and particularly in eating and drinking . . . Meat is little eaten, the flesh of elephant and hippopotamus never, for it causes eruptions of the skin, as also does crocodile flesh".

Chickenpox.—Outbreaks were reported from Arua Prison and Madi District, from Kampala and from Budadiri (A.L.G.) Prison.

Leprosy.—Surveys have been continued by Government medical officers and doctors attached to the Mission leprosy settlements. The need for taking stringent precautions in making these surveys is becoming realised. Some of the earlier estimates of incidence have had to be amended, as it was found that they were based on heavily biased samples.

Recent results can be summarised by districts—

	Rate per 1,000 population
Mbale District, Bugishu (3 centres)	10
Mbale District, Bukedi (1 centre)	20
Teso District, Kumi (1 centre)	47
Acholi District (2 centres)	17
Madi, East Madi (2 centres)	18
West Nile (13 centres)	9

The incidence rate among adult prisoners, mainly male, in Luzira Prison is approximately 20 per thousand. These prisoners come from all parts of the Protectorate. Infected prisoners are segregated.

The results of treatment with the sulphone drugs have been published by two of the settlement doctors*. The earliest tuberculoid cases, with only faint skin lesions, are not particularly infectious, do not react well to these drugs, and benefit most from good food and general care. Patients with major tuberculoid lesions or nerve involvement respond more quickly if sulphone treatment is combined with injections of hydnocarpus oil. Lepromatous cases show the most gratifying response, but are best treated in a settlement. Burnt-out cases, with trophic ulcers, bone changes and deformities, receive no benefit from specific drug treatment.

The burnt-out cases tend to accumulate in the settlements, which could be more usefully employed dealing with earlier stages of the disease. There is an obvious need—as in other diseases—for social care for these patients in their own district, by their own people. Active steps are being taken to extend out-patient treatment, but the factor of distance has to be remembered in this connection. At the Mission settlements, it has been found that 40% of outpatients reside too far away to attend regularly, and the average number of annual attendances per patient is only 14. Patients residing at settlements each receive on an average 42 injections a year and 320 tablets of D.D.S.

The most promising line of advance is the construction of settlements by local authorities, where patients can reside while obtaining out-patient treatment at adjacent dispensaries. Such settlements are under construction in three districts of the Northern Province; the settlement in the West Nile District is closely associated with the African Inland Mission leprosy centre and hospital. In the absence of such provision there is a tendency for outpatients and discharged inpatients to become squatters around settlements. These persons generally live in insanitary conditions, forming a pool of cheap labour which is not entirely unwelcome to African landowners in the vicinity.

The establishment of a new leprosy centre in the Western Province has had to be deferred. It seems likely that settlements run under the auspices of African local authorities will play an increasingly important part in control schemes. Local authorities have recently shown more interest in the disease; in some districts, they have enacted domestic segregation laws based on old tribal customs which have been neglected in recent years.

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*Connolly, E. M. (1951) Some notes on sulphetrone treatment of leprosy. *E. Afr. Med. J.*, Vol. 28, p. 277.

Wheate, H. W. (1951) Preliminary report on sulphetrone treatment in lepromatous children. *E. Afr. Med. J.*, Vol. 28, p. 277.

A timely warning has recently been given by Muir (1952) *Trans. Roy. Soc. trop. Med. Hyg. 46,* p. 124, that while the sulphone drugs produce marked subjective and clinical improvement in the patient, the bacteria in the lesions are affected to a much less extent. The use of these drugs alone, with no corresponding public health measures, might actually favour the spread of leprosy, by masking active infections.

TABLE XI

Patients in Leprosy Settlements

	Bunyonyi		Nyenga		Buluba		Kumi and Ongino		Kuluva	Total	
	1950	1951	1950	1951	1950	1951	1950	1951	1951	1950	1951
Resident at start of year ...	816	916	233	267	351	447	548	821	30	1,948	2,481
Admitted ...	120	68	122	115	254	234	591	366	13	1,087	796
Births	35	22	2	2	7	6	8	6	...	52	36
Left settlement ...	29	207	86	86	158	180	297	386	5	570	864
Deaths	26	22	4	18	7	3	29	20	2	66	65
Resident at end of year	916	777	267	280	447	504	821	787	36	2,451	2,384

TABLE XII

Financial Summary for Leprosy Settlements

	Bunyonyi	Nyenga	Buluba	Kumi–Ongino	Kuluva	Total
	£	£	£	£	£	£
GRANTS TO SETTLEMENTS—						
From Government—						
Maintenance	1,163	867	779	1,661	...	4,470
Buildings	247	204	200	349	1,335	2,335
Doctor's salary	300	...	300	300	...	900
Value of free drugs ...	216	291	268	251	...	1,026
Water supply	...	...	...	250	...	250
From African Local Governments	166	500	1,800	2,030	...	4,496
EXPENDITURE BY SETTLEMENTS—						
Staff	1,100	122	546	2,540	...	4,308
Maintenance—						
Food and housekeeping ...	751	1,441	2,217	4,044	...	8,453
Stores and furniture ...	118	346	297	218	...	979
Drugs and dressings ...	155	225	134	678	...	1,192
Buildings	520	961	326	2,820	...	4,627
Transport and repairs to vehicles	...	162	410	1,052	...	1,624
Other (Schools Administration, etc.)	217	266	220	495	...	1,198
TOTAL EXPENDITURE £	2,861	3,523	4,150	11,847*	...	22,381

* Nine months only.

Cerebro-Spinal Meningitis.—The numbers of cases and deaths reported is about the same as in 1950, but in the majority of cases no bacteriological identification of the causative organism has been attempted.

In one district, which reported the second highest total number of cases, none of the patients admitted to hospital as "C.S.M." had meningococcal infection. This discrepancy between notifications and hospital records makes the numerical data of uncertain value.

Notifications of Cerebro-spinal Meningitis

	1949	1950	1951
Cases	550	185	218
Deaths	94	50	63

Pneumococcal Infection.—Little attention has so far been paid to the epidemiological aspects of this infection, although pneumococcal meningitis is at the moment probably more widespread and deadly than meningococcal meningitis, while pneumococcal infection of the lung kills more people than tubercular infection. The incidence of the disease seems to fall fairly evenly upon the three races, but the disease is much more lethal in Africans.

Pneumonia, 1951

	Europeans	Asians	Africans
Total patients (all causes) ...	8,195	11,553	843,809
Cases of pneumonia	32	103	5,438
Deaths	—	1	420
Proportion of pneumonia cases per 1,000 patients	4·0	8·8	6·4
Fatality rate per cent.	—	1·0	7·7

It is difficult to assess to what extent the greater mortality among Africans is due to delay in seeking treatment or to a higher proportion of serious cases among hospital admissions. More facts are needed before postulating any differences in incidence or resistance to the disease.

A useful hint for preventive measures was given when a leaking draughty grass hut in Mengo jail was demolished. The pneumonia rate fell, in spite of the resultant overcrowding in other cells, and it was found that the majority of cases which had occurred earlier had been occupants of the decrepit building. Returns from employers of labour show that agricultural labour, exposed to the rigours of the weather, suffer far more severely from pneumonia than others in more protected places of work.

Rabies.—The brains of 25 dogs from the West Nile District were examined and 7 were found to contain Negri bodies. The infected region stretches northwards from Arua to Koboko; one possible human case was heard of but not seen.

Roseola Infantum.—Five cases of this disease were diagnosed in European children at Entebbe, all under the age of eight.

Smallpox.—Scattered cases of alastrim occurred during 1951, a total of 45 being notified with no deaths (5 cases in 1950, 47 in 1949).

Appearing first in Ankole in April, the disease was seen soon afterwards in Kigezi, Mengo and Kampala. Cases again occurred in Kampala and Masaka in September and in Tororo in October. The disease was still active in Ankole and Kigezi at the close of the year. Immigrants from Ruanda were incriminated in two outbreaks. Vaccination of immediate contacts successfully prevented the occurrence of any secondary cases in Mengo, but the same success was not achieved in all other places. Compulsory vaccination of immigrant labourers ceased in 1950.

Trachoma.—In the 1948 international classification of diseases, trachoma was elevated to the status of a specific infectious disease. Surveys among schoolchildren in the West Nile District showed that on an average more than 50% of children living in the Nile Valley were affected, lower infection rates being found in children living on higher ground away from the Nile. Although the disease is commonest among Africans, Asians and Europeans are by no means exempt.

The value of the new antibiotics in the treatment of trachoma has been investigated at Mulago Hospital, and the ophthalmologist has published the results of these studies.

Tuberculosis.—Pulmonary tuberculosis accounts for 5% of all deaths in hospital. If this were taken as an indication of the proportion of all deaths in the general population, it would indicate an absolute death rate from this disease exceeding that found at the present day in Great Britain. However, only some 1.6% of all deaths in hospital in the Eastern and Northern Provinces are due to pulmonary tuberculosis. The high rate (11% of all deaths) recorded at Mulago Hospital is probably influenced by the availability of suitable facilities for treatment.

All notified deaths were of Africans, but the disease itself occurs among all races. An analysis of non-native deaths from pulmonary tuberculosis during 1946-50 gives a death-rate of 17 per 1,000, considerably less than the mortality in the United Kingdom at that time. Changes with age and sex are similar to those shown in temperate climates. It was found that the mortality among non-natives was highest in the Western Province; if Mulago Hospital is excluded, the highest proportion of African deaths in hospital due to this disease is found in the Western Province, where the highest rates of tuberculin reactors also occur. Among the patients in Mulago, tuberculous infection is noted most commonly in members of immigrant tribes from the south-west, but the tuberculin survey (1950 report) did not suggest that it was race rather than place which was responsible for the differences in incidence.

The presence in Ankole District of cattle susceptible to and suffering from tuberculosis is related to the human disease in this area. It is reported that of 423 cattle slaughtered in Mbarara for food, six were condemned for generalised tuberculosis and 143 for localised lesions.

TABLE XIII

Hospital Patients with Pulmonary Tuberculosis

	1949	1950	1951
DEATHS—			
Protectorate Total	110	109	142
Mulago Hospital ...	57	48	92
Western Province ...	8	5	11
ADMISSIONS—			
Protectorate Total	426	362	518
Mulago Hospital ...	156	83	229
Western Province ...	47	47	58

The accommodation for patients with pulmonary tuberculosis consists of 60 beds in Mulago Hospital and small ward reservations at some district hospitals. The average stay in hospital of these patients is considerably longer than the average for other diseases, being 38 days in Mulago Hospital. (The average stay for all patients is 14 days at Mulago, and under 10 days for the whole Protectorate).

It was formerly considered that pulmonary tuberculosis in Africans was invariably progressive, but the findings in the tuberculin survey by Santon Gilmour (1950 Report) of high rates of reactors with low incidence of obvious disease called for a reconsideration of the position. A careful search of bodies coming to autopsy at Mulago Hospital, discarding only those with signs of active tuberculosis, showed that calcified tuberculous bronchial glands existed in 50% of those examined.

A trial was made of B.C.G. under African conditions. Lyophilized vaccine was used, as it has better keeping qualities than the preparations used in temperate countries. Female nursing staff at Mulago were first tested for their reaction to 1/10,000 Old Tuberculin by the Mantoux method, non-reactors being tested with 1/100 dilution. 30% of girls in the Preliminary Training School and 76% of those already in training showed some reaction, indicating the effect of exposure during training. Some of the older nurses objected to scarification and only a proportion of the susceptible students could be vaccinated. Some of the Mantoux readings after the procedure were equivocal, but it seems that one-third of the susceptible nurses were converted to positive reactors, one-third remained negative and one-third were doubtful.

An increased number of deaths from pulmonary tuberculosis were reported from the prisons and the mental hospital. In the latter case, the overcrowded conditions may be partly responsible for the increase. Plans for a new mental hospital are in preparation.

Typhoid Fever.—Scattered outbreaks of typhoid occurred in many districts during the year. Deaths were fewer than in 1950 and the total cases about the same. The size of any individual outbreak is largely fortuitous, and tends to increase with density of population. Cases are being reported more frequently from rural communities, where facilities for laboratory diagnosis have been improved.

Typhoid Fever

	1949	1950	1951
Admissions to hospital ...	469	336	366
Deaths	77	60	38

In Gulu township an outbreak was traced to a butcher's son, who was a healthy carrier. Infection occurred among the police in Mbale.

The foci reported in 1950 in Mengo and Masaka District seem to have diminished, although cases occurred at a dairy near Kampala. Infections were still being reported from rural areas in Kigezi. A small outbreak of three cases at Bukinda in October was attributed to a defective water-supply, and a similar focus of eight cases occurred south of Hoima in March. A more puzzling epidemic broke out at Dufile (Madi sub-district), the first cases which occurred in August being thought to be cerebro-spinal meningitis; the diagnosis was clarified when cases were admitted to hospital. Fifteen cases occurred (positive Widals being obtained from 7), with one death.

The 38 deaths in hospital were all among Africans. The incidence of the disease is roughly the same among Europeans, Asians and Africans, but it is likely that a considerable number of African patients do not come to hospital for treatment.

It is not known to what extent the fall in the number of deaths is due to chloramphenicol; the use of this antibiotic is limited by its cost.

Venereal Diseases.—No reliable evidence is yet available about the incidence of venereal disease throughout the country. In Buganda, 50% of all Kahn tests performed on patients and women attending antenatal clinics have been reported as positive or doubtful, but it is not known to what extent those examined were representative of the general population. In other places where the prevalence of syphilis is thought to be as great, the proportion of positive Kahn tests in women attending antenatal clinics is much lower (e.g. Mbale 2%). Nearly 10,000 cases of early syphilis were reported from dispensaries in Mengo District, but the reliability of the diagnosis is somewhat doubtful in view of the fact that considerably fewer cases of gonorrhoea were reported.

Most of the treatment given for syphilis is largely a waste of drugs. In spite of the demands for more medicine for venereal disease treatment, it was found that less than 1% of the patients who received treatment in Mengo completed the minimum course of injections; 50% failed to return after three injections. It is doubtful whether the use of penicillin will solve this problem, for preliminary reports indicate that drying up of lesions after the first injection leads to defaulting.

One Assistant Medical Officer writes: "Many people think that every sick child in this country is emaciated, pale and very irritable because of syphilis, and there is discontent on the part of parents when a doctor

informs them that the child suffers from kwashiorkor". This department must plead guilty to over-facile diagnosis of "syphilis" and erroneous interpretation of hospital data in the past. In a pamphlet published in 1922 it was claimed that two-thirds of all pregnant women in Buganda suffered from syphilis and it is evident that many other diseases of childhood were in those days confused with syphilis. Enthusiastic concentration on a single disease is liable to override discrimination.

Yaws.—After the 1949/50 yaws campaign in Lango, treatment was continued at dispensaries, relying upon the use of bismuth injections alone. Plans are now being made for a follow-up campaign using penicillin. Five cases of bismuth poisoning were treated at Lira Hospital.

Surveys in the West Nile District indicate a low incidence of secondary yaws. Both at Laropi and Aringa, counts during routine sleeping sickness inspections gave an incidence of the order of two per thousand population.

Whooping Cough.—The disease was reported from various places in the Eastern Province. An outbreak occurred among Asian children in Jinja and two deaths were registered. In Mbale District, the use of penicillin is thought to have reduced the number of deaths from complications of the disease.

Virus Diseases.—Knowledge of virus diseases occurring in Uganda has increased through the work of the Virus Research Institute. In addition to such well-known infections as poliomyelitis and yellow fever, the list now includes Bwamba fever, West Nile encephalitis, Mengo encephalitis and infection with the Semliki Forest, Uganda S, Bunyamwera, Zika and Ntaya viruses.

Clinical cases suggesting an unusual type of nervous diseases were unduly common towards the end of the year, the milder cases having severe headache and the fatal cases dying with ascending paralysis. Clinical diagnoses included "poliomyelitis" and "virus encephalitis". A few of these cases were investigated with the aid of the Virus Research Institute, and all were found to be due to infection with the poliomyelitis virus.

TABLE XIV

Notifications of Poliomyelitis

	1949	1950	1951
Mengo	2	6	23
Masaka	2	3	1
Mubende	1	—	—
Busoga	1	7	6
Mbale	2	—	11
Teso	1	—	—

	1949	1950	1951	
Karamoja	—	1	—	
Lango	4	—	—	
Acholi	—	—	—	
West Nile	—	—	—	
Bunyoro	—	1	2	
Toro	—	—	—	
Ankole	—	—	—	
Kigezi	—	—	1	
Total cases	13	18	44	
Deaths	1	1	3	
Europeans	...	2	6	(2 deaths)
Asians	...	4	4	

Among Africans and Asians, the disease generally attacks children between the ages of 18 months and 4 years. In Europeans, adults are more commonly attacked.

Monkeys kept in cages in the open at Entebbe have been found to die suddenly, and several strains of Mengo encephalitis have been recovered from them. Evidence suggests that rats (*R. rattus kijabius* and *R. couchae ugandae*) are associated with the disease; virus can be found in their urine and faeces two weeks after infection, while one-third of the rats caught had neutralizing antibodies in their blood.

D. Health Education

In some districts the African local authorities have shown a growing appreciation of the need to devote money to the promotion of health education as well as to curative purposes. The Buganda Government set aside £2,500 for community development, a leaders' course was held, and a shield of mvule wood was presented as the trophy for an inter-gombolola* competition known as the South Kyadondo Health Competition. In Busoga, a Health Week was held in Bugweri, and an instructional course for 70 persons was organised at Busese. Professor T. H. Davey, a Nuffield Visitor, was able to attend one of the Health Days at Budaka (Mbale District). During these Health Weeks and Health Days, simple information on disease prevention is supplied by means of demonstrations, photographs, diagrams, cartoons, cinematograph films and group discussions. Toro is the latest district to have its own county show, a popular event in which the Agricultural, Veterinary and Medical Departments combine to demonstrate methods of improving living conditions in rural areas.

A new edition of the explanatory booklet on the Public Health Ordinance has been printed by the Buganda Government, and a nutrition pamphlet has been prepared at Masaka. In Acholi, the publication of a booklet to illustrate new health bye-laws is being subsidized by the African Local Government. The initiative for and the routine work involved in health education devolves largely on departmental officers. It must be

* A gombolola is an administrative unit of about 130 square miles with an average population of 10,000 persons.

admitted that the training of a doctor does little to prepare him for giving instruction of this kind, which calls for an unaccustomed outlook upon the problems of medicine. Removal of the fear of epidemic disease has made it more difficult to interest people in preventive medicine; a special approach is needed when the dangers are insidious rather than dramatic.

Health education is at present directed towards two main objectives. One of these is centred around the women, aiming at the encouragement of domestic hygiene, clean food, good dietary balance and the mother's pride in and love for her child. Most of this teaching has to be given at rural welfare centres, as health visiting is made difficult by the extent to which the population is scattered. A qualified Health Visitor is at work in a rural area in Buganda, and this important branch of the work will increase with the development of more concentrated communities. Health visiting is also undertaken in Kampala Municipality. The second objective is the promotion of a sense of responsibility for environmental hygiene among the men—in particular, aiming at the construction of latrines, better houses, and safe water supplies. Instruction in these matters is mainly through the African Health Inspectors and the Local Government Councils.

The cure of disease is largely the responsibility of the medical profession; the prevention of disease calls for a wider gamut of skills and more varied types of effort by laymen. Organised health weeks should co-ordinate instruction in hygiene, agriculture and animal husbandry, backed up by mass literacy campaigns and the work of the co-operative societies. Such mass efforts are only the first steps, and any improvements effected would soon regress in the absence of a systematic follow-up with inspection and exhortation, in which the enthusiasm and drive of health inspectors and chiefs are of the utmost importance.

The Health Weeks started in Mengo have become more ambitious. Now known as Community Development Weeks, several departments co-operate under the supervision of the Welfare Officer. Clinicians from Mulago Hospital and Makerere College assist by giving talks; good and bad houses are prominent features of the demonstrations.

The vernacular press is being increasingly used; most of the African Assistant Health Inspectors in Mengo District have had at least one article accepted, and one has had three.

E. Maternity and Child Welfare

No new centres were opened. The change in the bed accommodation was slight, but the total amount of work has increased. New antenatal patients increased by 15%, but with no corresponding change in the number of reattendances; deliveries in institutions increased by 7½%. The outstanding figure in the returns is the greater number of infant deaths and maternal deaths. Stillbirths have also increased slightly. It seems that these changes are largely due to a few districts which have been able to bring into hospital more women with complications of pregnancy who would otherwise have remained in their homes.

TABLE XV

Antenatal Attendances

	1949	1950	1951
New patients, Government units—			
At hospitals	34,906	34,388	34,742
At rural centres	34,758	32,865	38,972
All Government units	69,664	67,253	73,714
New patients, Mission units	28,835	31,219	40,617
TOTAL NEW PATIENTS ...	98,499	98,472	114,331
Reattendances—			
At Government units	218,444	208,585	207,598
At Mission units	91,367	82,392	106,849
TOTAL ATTENDANCES ...	408,310	389,449	428,778
Ratio of reattendances to new patients—			
Government units	3·1	3·1	2·8
Mission units	3·2	2·6	2·6

In some districts, maternity clinics have suffered through shortage of midwives and the tendency of nursing sisters to be tied down by hospital duties. In other districts, notably Masaka, the clinics have concentrated on the maintenance of child health, with demonstrations of bathing and feeding the infant, methods of weaning, what to do if the child is underweight, and other simple but important matters. Although the idea of having clinics for healthy people is new to Africans, some promising results have been obtained.

TABLE XVI

Institutional Deliveries

	1949	1950	1951		
			Government Units	Mission Units	All Units
Abortions (complete) ...	1,523	1,158	846	376	1,222
Full-term deliveries—					
Live births	18,101	20,422	12,874	9,076	21,950
Stillbirths	1,098	1,209	978	409	1,387
Deaths—					
Infant	486	496	366	205	571
Maternal	214	215	254	46	300

The greatest increase in the number of institutional live births has been in the following districts:—

Ankole District, increased by 36%. Toro District, increased by 35%.

The increased number of maternal deaths merits close attention to their causation, and a summary of the causes is set out below:—

Cause of Maternal Death	1949	1950	1951	
			African	Asian
Sepsis	27	25	29	—
Toxaemia (i.e. Eclampsia)	3	5	7	1
Haemorrhage	33	37	39	3
Abortion	12	11	6	—
Ruptured uterus	39	40	43	—
Other and unspecified complications of childbearing	82	74	133	—
Total deaths from childbearing	196	192	257	4
Associated disease not directly due to childbearing	18	23	39	—
TOTAL DEATHS ...	214	215	296	4

The information given for "Other complications" is not as full as could be wished. Obstruction, unspecified, accounted for 71 deaths (61 in 1949 and 34 in 1950); shock or exhaustion for 35 (6 in 1949, 13 in 1950).

Ruptured uterus was the cause of 44 deaths (one in conjunction with toxaemia). Other conditions mentioned in cases of ruptured uterus are: Transverse presentation 1, hydramnios 1, internal version 1, prolonged labour 2, obstruction 3. Much desirable information is missing in these cases. The average parity of the women is believed to be high, but better histories and records are needed to determine whether rupture was due to weakness of the uterine wall, possibly connected with nutritional defects in early childhood or in more recent years; to degenerative changes, myomatous or otherwise; or to obstruction by a large child or following malpresentation.

It is possible to compare the incidence of rupture in various districts, and in Table XVII this has been expressed as a rate per thousand of all live births.

TABLE XVII

Deaths from Rupture of Uterus

District	Number of cases			Total live births 1949–51	Rate per thousand live births
	1949	1950	1951		
Mengo	10	14	21	21,612	2·1
Masaka	15	5	12	7,601	4·2
Mubende	...	1	1	1,846	1·1
Busoga	9	3	3	8,668	1·7
Mbale	...	7	5	5,482	2·2
Kigezi	4	...	2	1,595	3·8
Other Districts	1	4	...	13,669	0·4
ALL UGANDA ...	39	34	44	60,473	1·9

The differences may reflect the proportions of different tribes, or may be due in part to different degrees of accuracy in diagnosis. The diagnosis is often in doubt, and in some cases is only made post-mortem.

The increased number of deaths from associated diseases, not directly due to pregnancy, is of interest. The chief causes of higher mortality were meningitis (9 deaths), pneumonia (8 deaths) and malaria (6 deaths). This increase probably arises from more women being admitted to antenatal wards than to general wards. If the rather dubious assumption is made that these deaths are related to the last three months of pregnancy, the data for the past three years give the following rough death-rates for women in the childbearing period:—

Pneumonia	1.1	per thousand annually.
Meningitis	0.6	" " "
Malaria	0.5	" " "
Relapsing fever	0.2	" " "
Pulmonary tuberculosis	0.1	" " "

Table XVIII

Deaths in Relation to Deliveries in Institutions—1951

				(Africans only)			
	European	Asian	African	Buganda Province	Eastern Province	Northern Province	Western Province
Live births	132	777	21,041	10,460	6,378	1,091	3,112
Stillbirths	9	13	1,365	615	489	65	196
Total Births...	141	790	22,406	11,075	6,867	1,156	3,308
Maternal deaths		4	296	151	92	18	35
Infant deaths in hospital		22	549	341	118	17	73
Rates per Thousand							
Stillbirths	64	16	61	56	71	56	69
Infant deaths in hospital	...	28	26	33	18	16	23
Maternal deaths ...	...	5	13	14	13	16	11

Table XIX

	Cause of Infant Deaths	1949	1950	1951	
				African	Asian
A 127	Spina bifida and meningocoele	—	1	2	—
A 128	Congenital malformation of the circulatory system	—	2	1	—
A 129	Other congenital malformations	18	10	8	1
A 130	Birth injuries	64	55	71	4
A 131	Post-natal asphyxia and atelectasis ...	13	21	23	1
A 132	Infections of the newborn	5	9	13	—
A 133	Haemolytic disease	4	5	1	—
A 134	Other defined disease of early infancy ...	9	11	12	—
A 135	Ill-defined disease	307	334	357	16
	Other illnesses—				
	Syphilis	58	42	57	—
	Malaria	8	6	4	—
	Total Deaths	486	496	549	22

The biggest item in the group of ill-defined diseases is prematurity, to which 249 deaths were attributed in 1951. The proportion of 50% of deaths from this cause is preserved for Africans and Asians, Government and

Mission units, hospitals and rural centres; the only difference is a geographical one, prematurity being favoured as a cause of death nearly twice as often in Buganda as in the other Provinces.

The stillbirth rate for Europeans is based on comparatively few births (141). Two stillbirths were ascribed to toxaemia, one to accidental haemorrhage and three to placental degeneration. Combining the two non-native races, the stillbirth rate is 24 per thousand, the maternal mortality rate 4 per thousand, and the infant mortality while in hospital (approximately the first ten days) 24 per thousand. This last rate is valuable; the "official" infant mortality rate for the whole of the first year of life is only 23 per thousand for Asian births.

For African births, the apparent maternal mortality rate is 13 per thousand births. It should be borne in mind that some deaths (about 7%) occurred in women whose babies were born before arrival at hospital, while many women had been in labour for some days and were only brought to hospital as a last resort. In the case of Buganda, the Province with the largest proportion of births in hospital, comparison of deaths in hospital with the total estimated births in the Province gives a maternal death rate of 5 per thousand.

There is surprisingly little difference between the Provinces in the rates of loss from stillbirths and infant deaths in hospital, indicating that straightforward "booked" cases and difficult emergency cases occur in about the same proportion in all Provinces. The combined loss in these two groups is over 80 per thousand; the ratios between the groups are apt to vary considerably in different places, possibly through different interpretations of the terms.

The deaths of mothers and infants in hospital may be related to three possible denominators:—

(i) births in hospital,

(ii) births in respect of women who had attended antenatal centres, and

(iii) total estimated births in the Protectorate.

These three estimates are given for Buganda and the whole Protectorate.

TABLE XX

Rates per thousand births	Buganda			Whole Protectorate		
	Still-birth rate	Hospital Neonatal mortality rate	Maternal mortality rate	Still-birth rate	Hospital Neonatal mortality rate	Maternal mortality rate
Based on—						
(i) women admitted for delivery ...	54	30	14	60	25	13
(ii) women who had attended Ante-natal Centres ...	15	8	4	19	8	4
(iii) estimated total births	20	11	5	9	4	2

A "middle of the road" estimate for the real rates in the population generally would therefore be:—

(1) Stillbirth rate about 40 per thousand.

(2) Neonatal mortality rate (while in hospital) about 20 per thousand.

(3) Maternal mortality rate about 6 per thousand.

F. School Health

Medical inspection of schoolchildren is not only of value in the detection of defects in the individual child which need to be remedied; information is gained about the local incidence of disease, as a result of which measures which will benefit the community as a whole can be planned. In the West Nile District, light has been thrown on geographical differences in the incidence of schistosomiasis, trachoma, anaemia, leprosy and other diseases. In Busoga, a comparative study is being made of the health of children of different races.

Special attention has been given to the condition of the teeth. Caries in children is far less common in Uganda than in the United Kingdom, but disease of the gums is more prevalent and severe. Differences between districts were noted during the dental survey carried out in 1946*, and a more detailed study of these differences is needed.

Schools provide valuable opportunities for instruction in the fundamentals of personal hygiene, as well as in the general principles of disease transmission. Officers frequently give talks on health matters during their tours of districts. Closer attention is being paid to the problem of nutrition in schools, and the Gulu Local Education Authority voted £35 for school-meals equipment. Minor vitamin deficiencies have been remedied when discovered.

G. Environmental Hygiene

(1) Housing and Town Planning

The Town and Country Planning Ordinance was redrafted during the year, provision being made for the administration of minor planning schemes by existing local authorities. The Planning Scheme for Kampala was published during the year, but alterations had to be made in the light of the decision to extend the railway westwards. A planning scheme for the peri-urban region through which the railway will pass is under consideration.

Progress has been made in the solution of health problems connected with land tenure in Buganda. The Buganda Government Shop Law will give control over the siting and design of shops. Legislation affecting townships and trading centres should encourage the erection of better buildings by non-native traders.

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* Annual Medical Report, 1946.

Planning in Jinja has gone ahead, and provision is being made for further industrial development in the area on the west bank of the Nile now to be known as Njeru. The erection of new buildings has continued but cannot keep pace with the demand for housing.

New Government buildings (114 for Europeans and 110 for Asians) provided housing for 319 families, the majority being situated in Kampala and Jinja.

Attention was directed to possible pollution of water supplies and the atmosphere as the result of new industrial and mining processes and increasing densities of population. A committee investigated the dangers and had the advice of Dr. Southgate of the United Kingdom Water Pollution Research Laboratory, who visited Uganda for this purpose.

Two African Assistant Medical Officers holding the Diploma in Public Health have been posted for health duties, one to an area immediately outside Kampala, the other to a fertile rural area in Busoga.

Sewage disposal is becoming a matter of increasing importance with the growth of the towns. The Kampala system, which was inaugurated shortly before the second World War, dealt with 460,000 gallons daily at the time of the census in 1948, and was disposing of 700,000 gallons daily by the end of 1951. The increase was to some extent due to conversions from other methods of conservancy; even in the centre of Kampala, water-borne sanitation is not yet universal. The difficulty of recruiting night soil porters has hastened the construction of small water-borne installations in some areas.

(2) Water supplies

Water examinations.—Bacteriological examinations were carried out on 263 samples during the year (213 in 1950), but owing to the absence on leave of the Government Chemist only 19 chemical examinations were made (54 in 1950).

The Kampala supply was extended and new systems were installed at Mbarara and Kabale. Work on the new system for Jinja had reached an advanced stage. Improvement of springs and wells is an important departmental activity, in which voluntary help is often forthcoming from rural communities. From Lango comes the report of a village buying cement for works designed to improve the water supply. Mengo District maintains seven artisans engaged solely on spring protection, in addition to the work of the Assistant Health Inspectors.

(3) Food Supplies

93 samples of milk were analysed by the Government Chemist (as against 50 in 1950) and 67 were found to be watered (11 in 1950). The milk-can washing stations in Kampala have proved most useful and have been increased in number. Pasteurized milk is now being imported from

Kenya, and the distribution system is working satisfactorily. The initial consignments to Kampala were arranged through the initiative of the Municipal Council.

Imported dried milk is being increasingly used by many sections of the community. It has for long been an essential commodity in areas where local supplies of fresh milk are restricted by tsetse infestation. In other places it has become a necessity during the dry season. Dried milk is now available at special prices to pregnant women, nursing mothers and young children at Maternity and Child Welfare Centres, particularly in Mengo and Mbale Districts. In Masaka it has been found cheaper to use dried milk than to accept local tenders for fresh milk.

Skimmed dried milk is preferable to full-cream dried milk for many purposes. It is cheaper and keeps better, and has definite advantages in the treatment of infants with Kwashiorkor.

The rapid development of Jinja in recent years has favoured modern and progressive undertakings; these include an electric bakery, a milk pasteurizing plant, and a soda-water factory which is said to equal the best in East Africa.

The Busoga Fisheries scheme encountered financial difficulties and had to suspend operations. The Uganda Fish Marketing Corporation was able to extend its services, and fish from Lake George is now supplied to Kampala packed in ice.

Markets, slaughter-houses and eating houses in some minor townships are in a deplorable state, and should be replaced as soon as funds become available.

(4) Hotels

The Hotel Board, of which the secretary is the Chief Health Inspector, granted licences to two new hotels in Kampala but refused a licence to a third. Of the 15 hotels licensed in Uganda at the beginning of 1951, eight changed their management and two their ownership during the year.

Improvements and additions were carried out to hotels in Kampala, Jinja, Tororo and Kichwamba. The need for better hotel accommodation in Jinja has long been felt, and suitable sites are to be included in the Planning Scheme.

(5) Urban Sanitation

New Building Rules under the Public Health Ordinance came into force during the year. In addition to recasting the Rules to facilitate easy reference, the following additions and important changes were made:

(*a*) fuller details of requirements for reinforced concrete work and structural steelwork,

(*b*) requirements for places of public assembly with special reference to fire precautions,

(*c*) requirement for lifts,

(*d*) details of rat-proofing precautions,

(*e*) requirement for ventilation to be based on room volume, not on floor-area.

In an endeavour to enforce the disposal of waste water within the plot boundaries, legal action was taken in some of the Eastern Province townships; the matter was *sub judice* at the end of the year. Good results in the control of fly breeding were reported from Jinja by the application to tipping heaps of B.H.C. (Gammexane) mixed with diatomite.

(6) Rural Sanitation

Considerable progress has been reported from many districts in the construction of latrines. It is still necessary to encourage people to use latrines after they have been completed; the desire to have a spotless prize-winning latrine has sometimes led to neglect of its real function. Many African Local Governments are producing concrete stances for sale to the public at about 5/- apiece, and this laudable enterprise has spread as far afield as Kitgum. A method of supporting the stance on solid ground on three sides, obviating the need for supporting poles across the top of the pit, has been evolved in Mengo. The stance is situated close to one end wall of the pit, and a chase or rebate is dug where the stance is placed. Provided that the chase is properly constructed, fouling of the sides should not occur.

House construction on approved lines is being encouraged in all districts. In Gulu, schoolboys built four model houses with local materials under skilled guidance; in Kitgum, nails are purchased by the African Local Government for those building houses. In Buganda particularly, the landscape is being changed by the cropping up of red tiled roofs, which have obvious advantages in removing the risk of arson and in reducing domestic rat infestation. Things do not always turn out as anticipated when building a house, and the report from one district of a house built by an enthusiastic demonstration team which exceeded estimates both in dimensions and cost is not the first occurrence of its kind.

The training of Hygiene Orderlies, 111 of whom are employed by the department, is in abeyance. These men, who received one year's systematic instruction in hygiene, are now being used in teams, an arrangement which gives better results than the former practice of leaving them to work as individuals. It is intended to resume this form of training when financial circumstances allow more posts to be created.

H. Health and Welfare of Employed Persons

Administrative Machinery

In addition to the provisions of the Public Health Ordinance, which are applicable to all buildings in non-native occupation, special provision is made for the welfare of employees by the Uganda Employment Ordin-

ance, and for compensation in cases of injury or occupational disease by the Workmen's Compensation Ordinance. A Factories Ordinance has been under consideration for some time; the first bill was drafted in 1950, and the Ordinance will come into operation in 1953.

Whereas formerly it was possible for administrative and health staff to deal with health matters arising out of employment, the expansion of industry has led to this work becoming a major responsibility of the Labour Department. This latter Department is able to undertake more systematic inspection and control than was possible with health staff engaged on a variety of other duties. Close liaison between the Labour and Medical Departments is maintained at all levels, and a Senior Medical Officer of the Medical Department is seconded to the Labour Department.

The similarity of labour problems affecting all territories in East Africa, and the existence of important sources of labour in Belgian territory, has led to the holding of regular conferences attended by officers of the East African territories and their colleagues in Ruanda-Urundi. These meetings have been most valuable.

The long trek of immigrant labour from Ruanda-Urundi across Uganda to estates in Mengo and Busoga formerly resulted in gross deterioration of their physical condition. Immigrants were exposed to risks of sleeping sickness, malaria and relapsing fever, and not infrequently carried these and other serious diseases along their travel routes. With an increased use of motor and lake transport, these hazards are no longer so formidable. There are still important health considerations affecting the movement of labour; infections such as sleeping sickness may be brought from or carried back to the district from which the labour was recruited, while persons who come from areas where malaria is uncommon are likely to contract severe infections in places where they are frequently exposed to the disease.

Welfare

The African parent is still apt to look upon his children as a source of cheap labour for herding domestic stock or other duties, and even the desire for education has not abolished this outlook. Restrictions which have been placed upon the employment of children under 12 years of age require, *inter alia,* that they should not work for more than three hours a day, and should stop work at noon; they must not be employed on task work, but should work together in their own gangs. Some employers have erected schools for the children of their employees, with good effects upon the contentment and stability of the labour forces concerned.

The housing of labour has shown important improvements during the year. Permanent materials are being increasingly used, while there is a satisfactory trend towards married quarters with individual houses instead of stereotyped bachelors' quarters in long characterless lines. One black spot is the insanitary collections of huts which spring up around labour camps, many of which are brothels and beershops; removal of these blots often conflicts with African vested interests.

Details of construction, particularly of lighting and ventilation, are important both in living quarters and in workrooms. It is found that standards suitable for the former purpose are often inadequate for the latter. Uncleaned windows, windows that cannot be opened or are inaccessible, dust and grime from the processes going on, the presence of machinery—all these reduce the availability of air and light. One great advantage which temperate climates possess is a temperature between the limits of 59° and 68° Fahrenheit, between which human output is probably maximal for most activities. Conditions in Uganda are on the average above the upper limit, but maintenance of the wet bulb temperature in a factory at 80° F. through faulty ventilation when the outside reading is ten degrees lower is a poor business proposition.

One common criticism of factory conditions in Uganda is poor "housekeeping"—lack of cleanliness and inattention to waste. This is perhaps worst in oil-mills; stairs are found coated with grease and grime, presenting a constant hazard to users. Besides increasing the liability to accidents, such conditions betray the manufacturer's disregard of waste of the materials he is processing, and inspire doubts as to the cleanliness of the product he is marketing. Efforts are being made to reduce dust in various processes such as cotton ginning and sisal brushing, while exhaust ventilation has been installed in tyre-retreading factories.

Although employers have a statutory duty to supply good drinking water and to protect it from pollution, the standard of purity maintained in many labour camps and factories is still very low. Better reports are given of the diet of labourers, mainly through the increased availability of dried fish distributed by TUFMAC. All European firms employing recruited labour have supplied dried fish for the greater part of the year, and fresh meat is provided for sale to their employees when available. Some Hindu employers have found that religious scruples forbid them to supply animal protein to their employees, even through a contractor.

Health

Sanitary conveniences play a more important part in the transmission of disease in the tropics than in temperate climates, and it is regrettable that dangerous conditions are still permitted to exist in some places of employment. Waterborne systems can become as objectionable as pit-latrines or buckets. It is not only necessary for employers to provide adequate facilities, sited so as to be accessible at night and in inclement weather; labourers have to be given some idea of how these facilities, which may be strange to them, should be used. The aquaprivy, a design which has proved successful in West Africa, did not come up to expectation under local conditions, possibly through failure to provide attendants trained in its maintenance.

Returns of sickness are submitted by 21 of the largest employers of labour, covering rather more than 30,000 labourers, i.e. 15% of the gainfully employed population. The statistic of greatest economic importance

is perhaps the average number off duty on account of sickness, which is found to vary considerably in different types of employment. This depends on two factors—the number of illnesses, and the average duration of each. Factory workers (Table XXI) show the highest number of new illnesses, probably because it is easy for them to seek attention for injuries or incipient illness; whilst the lengthy duration of illness in miners may be due to delay in putting a man back on duty until he is completely fit to undertake strenuous underground tasks.

The largest group of illness is that labelled Respiratory Infections, of which pneumonia is the most lethal; this group results from a variety of infecting agents. The most effective preventive methods include adequate ventilation in work places and living quarters, rainproof clothing and facilities for changing and drying wet clothes. The importance to be attached to diagnoses of malaria is uncertain.

TABLE XXI

Morbidity Rates—Employed Labour

	All workers	Mines	Factories	Con-struction	Agri-culture
New illnesses—					
(Daily rate %) 1951 ...	1·02	0·9	1·7	0·6	1·0
Daily sick—					
(Rate %)—					
1950	3·04	8·3	3·5	...	2·7
1951	3·07	13·3	3·6	2·9	2·4
Average duration—					
(Days) 1951	3·02	14·9	2·1	4·8	2·4

TABLE XXII

Causes of Illness and Death

	Total cases	Daily sick rate	Total deaths
Clinical Malaria	26,649	2·19	32
Pneumonia	809	2·49	76
Other respiratory infections	19,231		3
Chronic ulcer of leg	11,641	1·03	—
Scabies	3,020	...	—
Diarrhoea and Dysentery	2,329	0·21	14
Venereal disease	1,746	0·15	—
Yaws	1,123	0·09	—
Injuries	17,768	1·57	·9

A relationship between the incidences of ulcers and injuries can be traced in the records of some firms. Efforts are being made to reduce the complications which retard the quick healing of a simple wound, by providing suitable first-aid facilities.

Workmen's Compensation for Injuries and Industrial Diseases.— This is a matter of some complexity, and the machinery for sorting out these cases is not yet working properly. The number of cases dealt with is still rising at a rate which is unlikely to be associated with a proportionate real increase of injuries.

1951		
Cases reported	...	1,402
Cases closed	...	1,372
Compensation paid	...	£10,833

The "cases closed" naturally include some reported before the beginning of the year. Based on data for the last six months alone, it appears that in 38% of closed cases no claim was allowed, and that 4.5% of the closed cases were of fatal accidents. Slightly more than half the compensation paid was in respect of fatal accidents.

Special attention is being paid to industrial hazards, and some possible dangers are being brought to light. Arsenical poisoning may occur from the tanning of hides, lead poisoning from the repair of storage batteries or in the printing trade, and hazards from benzene occasionally arise. Handling broken fluorescent lights may result in beryllium poisoning. The existence of beryllium deposits in parts of the Protectorate may lead to an increase in this hazard in years to come. Injuries are commonest in factory workers, but fatal accidents occur more often among workers engaged in building and construction.

The medical facilities needed for dealing with illness are laid down in the Employment Ordinance. Seven of the largest employers have hospitals, varying in size from six to fifty beds, while eleven others have their own dispensaries. Three of the hospitals have resident doctors and two have visiting doctors. Five of the dispensaries have visiting doctors. In other concerns, partly trained dressers are employed, supervision being carried out by Government medical officers; serious injuries and illnesses are treated in Government hospitals.

I. Port Health

Airports

During the year, Entebbe airport became one of the key airports in Africa. The airstrip was lengthened, an undertaking which produced considerable breeding of *Anopheles gambiæ,* and major additions were made to the buildings, including the reception and customs block, restaurant, sanitary block and police lines. Flights within East Africa are not regarded as international, presentation of certificates of vaccination and spraying of aircraft not being required. Disinsectization was carried out on 1,800 aircraft.

The Aedes Index for Entebbe for the whole year was 0.29% (as against 0.03 in 1950), based on 31,217 inspections of premises during the year. Control measures included 6,343 tree holes filled, 9,405 tins and bottles destroyed, and 3,500 plants uprooted.

The coming into force of the new International Sanitary Regulations during 1952 will impose new restrictions and duties on the sanitary supervisers of the airport. The condition that mosquito breeding must be abolished within 400 metres of the perimeter of the airfield will present a task of some difficulty, as a portion of lacustrine swamp within this range is a fertile source of *Tæniorhynchus*.

LAKE SERVICES

In view of the occurrence of plague in Tanganyika, arrangements were made for regular de-ratting of the lake steamers, tugs and barges at Port Bell.

J. Health of Prisoners

The average number of persons in prison was 2,832 (as against 2,685 in 1950), with 40 boys at the Reformatory School. This number was the highest on record, slightly exceeding the peak which followed the Buganda riots in 1949. The deaths of 35 prisoners were recorded (27 in 1950).

TABLE XXIII

Health Rates for Prisoners

	1946	1947	1948	1949	1950	1951
Death-rate annually per thousand	15·7	14·7	14·3	7·1	10·1	12·3
Percentage of daily sick to average number of prisoners ...	1·57	1·47	1·28	1·24	1·30	1·63
Admissions to hospital annually per thousand prisoners ...	509	583	563	502	507	498

Bearing in mind that the deaths refer to a population of males whose average age is about 30, and that prisoners whose deaths seem imminent, or who are unlikely to be fit enough to revert to crime, are discharged and so omitted from the deaths recorded for the prison population, the mortality appears to be at least thrice as heavy as a comparable body of men in temperate climates. The association of social misbehaviour with hygienic irresponsibility is probably an important factor here.

A summary of the commonest causes of death in recent years is given in Table XXIV. It will be noted that infections of the lung (including tuberculosis) account for over one quarter of all deaths. The growing incidence of pulmonary tuberculosis is noteworthy.

Outbreaks of vitamin deficiency occurred in Luzira and Moroto Prisons, as a result of which the adequacy of prison diets has been reviewed. At Luzira, the occurrence of blindness in one prisoner directed attention to the prevalence of vitamin A deficiency, a deficiency which was corrected by the administration of red palm oil and vitamin A concentrate. At Moroto, a mixed deficiency of vitamin A and scurvy was noted, one prisoner dying. Several district prisons recorded the presence of vitamin A

deficiency in prisoners recently transferred from Luzira. Luzira Prison has hospital accommodation for 30 patients; prisoners requiring special treatment are transferred to Mulago Hospital.

TABLE XXIV

Causes of Deaths in Prisoners during 1951

International Classification Item No.	Disease	Deaths	Remarks
A 1	Respiratory tuberculosis	8	(2 Kitalya).
10	Neurosyphilis	2	
43	Toxaemia, septic wound	1	(Fort Portal).
57	Carcinoma, unspecified	2	
58	Aleukaemic leukaemia	1	(Mbarara).
65	Anæmia	1	(Moroto).
66	Abscess of spleen	1	
67	Psychosis	2	(Mbale, Soroti).
78	Transverse myelitis	1	
89	Lobar pneumonia	3	(Masindi 1, Moroto 1).
90	Bronchopneumonia	2	(Kitalya 1).
95	Empyema	1	
100	Ulcer of duodenum	1	(Arua).
107	Abdominal abscess	1	(Moroto).
	Acute peritonitis	1	
	Liver disease	1	(Moroto).
109	Chronic nephritis	3	(Kitalya 1).
110	Pyelonephritis	1	
137	Heart failure	1	
AE 149	Justifiable homicide	1	
	TOTAL DEATHS	35	

All deaths not otherwise accounted for occurred in Luzira Central Prison.

Summary of deaths for recent years

	1946	1947	1948	1949	1950	1951
Average number of prisoners	2,168	2,174	2,234	2,814	2,685	2,832
Deaths	34	32	32	20	27	35
Tuberculosis	—	4	5	3	4	8
Venereal disease and sequelae	1	1	3	5	3	2
Malaria	2	1	2	2	1	—
Intestinal infections	5	3	1	—	2	—
Pneumonia	4	2	4	1	3	5
Other pulmonary infections	2	2	—	—	2	1

An approved school in temporary buildings was opened at Kampiringisa (Mengo) for young offenders, and is visited regularly by medical staff. A dispensary built by prisoners at the Kitalya prison farm for first offenders was opened early in 1951, providing eight beds for in-patients.

African Local Government Prisons

Information concerning African Local Government prisons is fragmentary, and the amount of interest taken in them varies widely from district to district. The buildings are often dark and badly ventilated. Diet and space are on the whole better than in the Protectorate prisons, although insect infestation probably occurs more commonly and sanitary defects are not so quickly remedied.

Outbreaks of chickenpox were recorded from prisons at Arua and Budadiri.

One African Local Government prison, which has for long been a source of anxiety to medical officers who visit and advise, was described in the district annual report as an "overcrowded, insanitary doss-house". The huts provided for warders were said to be disgraceful, while latrine accommodation was not provided until many representations had been made. Despite the insanitary conditions, the prisoners were considered to be living more comfortably than they would have done outside the prison, while venereal disease had become endemic.

IV.—CURATIVE SERVICES

A. Hospitals

Staff

The increased availability of medical officers removed the necessity for Provincial Medical Officers to take a personal share in the curative and health work of the districts in which their headquarters were situated. This enabled them to devote more time to the supervision and co-ordination of services in their provinces. A medical officer was available for posting to Tororo, but three stations were still without a medical officer —Hoima, Moroto and Mubende. Kamuge, for some years a rural hospital in the charge of an assistant medical officer, has had to revert to the status of a dispensary, as the prospects of finding a qualified officer to take charge of it are remote at the moment. Serere rural hospital was also without a doctor for part of the year.

Buildings

Expenditure on medical buildings in recent years has been—

	1949 £	1950 £	1951 £
New works and major improvements	30,416	47,227	59,278
Minor works and maintenance	4,176	4,178	5,302
Maintenance of temporary buildings (estimate only)	570	698	850

Although expenditure exceeding £150,000 was sanctioned in the estimates for 1951, less than one-half of the programme could be executed, the balance being carried forward as re-votes for 1952. No new units were established and no major reconstruction attempted; the work consisted mainly of extensions and improvements, to cope with new and increased demands on the hospitals.

At Mulago Hospital, work was started on the new radiological unit, which will take over the functions of the unit housed for many years in the medical laboratory; preparations were in hand for the construction of new kitchens, a laundry, and a hostel and training school for nurses. Additional quarters for assistant medical officers at Mulago were completed, and extensions to the Asian Hospital, Kampala, were brought into use. Masaka Hospital was wired for electricity supply, and its septic tank system was improved. The installation of septic tanks was begun at Mubende. The new hospital buildings at Bombo were completed and occupied during the year.

Projects under construction in the Northern Province included a new theatre at Arua, new roofing at Moyo, a new maternity unit at Lira, and a new hospital at Moroto.

B. Dispensaries

In Mengo District, a new ward was completed at Nakasongola and a maternity ward opened at Ntenjeru. An aid-post was constructed at Lugombe. Elsewhere in Buganda, new buildings were erected at Kakuto dispensary in Masaka District.

Expansion and improvement of the network of rural units in Mbale District has been aided by the new road round the north of Mount Elgon and the high price of coffee. A new antenatal clinic was built at Bubulu rural hospital, staff quarters were provided at Buluchekе dispensary, and new sub-dispensaries were completed at Nakupa (Butiru) and Kapchorwa (Sebei).

In Acholi District (Northern Province), improvements were made in the in-patient accommodation at many of the rural units. Two aid-posts were established in Madi.

In-patient accommodation was also provided at Kiryandongo in Bunyoro District of the Western Province. In Toro District the new dispensary at Kyegegwa was completed, replacing Kakabara (which becomes an aid-post). Permanent buildings were erected at Rubaya and Bugangali in Kigezi District, and a small maternity ward was completed at Rukungiri.

Mission Activities

The hospital of the Seventh Day Adventist Mission at Bushenyi (Ankole District) was nearing completion, and a dispensary was started by the same mission at Mitandi in Toro District. The Africa Inland Mission has extended its hospital accommodation near Arua (West Nile District), and provision has been made for leprosy patients. Replacements have been carried out at the Catholic Mission Hospital near Fort Portal (Toro District).

A new maternity wing was opened at the C.M.S. Hospital at Mengo, Kampala. Missions have experienced some difficulty in keeping all their

units staffed, and the assistant medical officer seconded to Kabarole hospital was temporarily posted to the mission hospital at Ngora (Teso District) in the absence of a mission doctor.

African Local Governments

The provision and maintenance of rural units is the responsibility of African Local Governments (formerly Native Administrations), whose contributions towards curative and health services have progressively increased in recent years. It is difficult to obtain accurate information about actual expenditure, for some votes such as travelling or maintenance of buildings may cover activities of other Government departments. Estimates are not always reliable, and it has been known for an allocation to go unused through ignorance of its existence. An attempt has been made to collect information from all districts for 1951, and the result is summarised below:

Expenditure by African Local Government

	Buganda Province	Eastern Province	Northern Province	Western Province	Total
	£	£	£	£	£
Staff	2,900	2,250	1,468	795	7,413
Travelling	1,734	7,835	2,543	95	12,207
Maintenance	3,800	6,258	935	2,116	13,109
Public Health	.	295	267	—	562
Specific diseases	3,753	2,952	60	—	6,765
Contributions	1,888	3,215	1,515	166	6,784
Capital expenditure ...	(20,000)	2,161	2,630	3,403	28,194
Total ... £	34,075	24,966	9,418	6,575	75,034

Mulago Hospital

Full-time Professors of Medicine, Surgery and Gynæcology and Obstetrics, appointed by Makerere College, assumed duties as heads of their respective divisions at Mulago Hospital. This system has worked smoothly. There has been close collaboration between Government officers, members of the Makerere College staff, and research workers attached to the Medical School. The Medical School library has been of particular value to Government workers.

Maintenance of buildings by P.W.D. units attached to the hospital has continued to be successful. Some trouble was experienced through the electrical transmission system being unequal to the demands made upon it, but water-supplies and the new internal telephone system have earned praise. The hospital ambulance service has been relieved of many local calls through the provision of an ambulance by the Municipality of Kampala. A panel of hospital visitors met twice during the year, and frequent visits were paid by the Katikiro and Ministers of the Buganda Government.

In spite of the greater number of doctors at Mulago, it is becoming increasingly difficult to deal with routine clinical work. A retired assistant medical officer was appointed on a sessional basis for out-patient duties, but this arrangement proved unsatisfactory.

The surgical division has been organised on the "firm" system, the three surgeons (two Government and one Makerere) assuming responsibility for arranging duty days and bed allocations. A valuable innovation has been visits by surgical teams from Mulago Hospital to district and rural hospitals, enabling techniques in the outlying units to be improved and resulting in better choice of cases for transfer to Mulago. Investigations have been made of the effect of aureomycin in Kaposi's disease and lymphogranulomatous proctitis, using preparations supplied by the makers. Observations have also been made on the association of raised portal venous pressure and œsophageal varices with hepatic cirrhosis; experiments to relieve the condition have yielded encouraging results. So far, it has not been possible to incriminate filariasis as a cause of the elephantiasis of scrotum and lower limb which is fairly common in Uganda. Satisfactory progress has been made with the local construction and fitting of artificial limbs, a service which is carried out in co-operation with the Department of Social Welfare.

Good results have been reported from welfare work among the nurses. Embroidery and machine-sewing are their chief leisure occupations, but dancing and netball are also popular. The library is a success, although the stock of books is still small. Ranger Guides have made good progress.

Losses of materials from hospitals, mainly bedding, but occasionally drugs such as penicillin and sulphonomides, are a constant problem. A comparison between losses at Mulago and at Masaka (the next largest hospital) is given below—

	Mulago	*Masaka*
	£	£
Value of equipment per bed	... 44	23
Annual loss (as % of value of equipment) ...	... 3.2%	1.8%

The difference is likely to be connected with the numbers and varieties of staff and other persons who have access to the hospital premises.

TABLE XXV

Summary of Units and Beds

(A) Government and African Local Government Institutions

	Kampala	Rest of Buganda Province	Eastern Province	Northern Province	Western Province	TOTAL
UNITS—						
Hospitals:						
European	1	1	2	—	—	4
Asian	1	2	4	1	2	10
African—						
District hospitals ...	1	3	4	5	5	18
Rural hospitals ...	—	2	5	1	—	8
Mental hospitals ...	1	—	—	—	—	1
Prison hospitals ...	—	1	—	—	—	1
Dispensaries:						
With beds	—	23	19	23	31	96
Without beds	—	11	13	21	7	52
Aid-posts	—	41	12	10	37	100
Maternity Centres:						
At dispensaries ...	—	12	10	1	10	33
Solitary	—	—	1	—	1	2

	Kampala	Rest of Buganda Province	Eastern Province	Northern Province	Western Province	Total
Beds—						
For Europeans	38	3	11	—	1	53
For Asians	55	12	33	3	7	110
For Africans—						
In district hospitals ...	653	455	595	315	348	2,366
In rural hospitals ...	—	110	211	28	—	349
In other units	—	348	546	150	414	1,458
For mental patients ...	322	—	—	—	—	322
For prisoners	—	30	—	—	—	30
Total Beds ...	1,068	958	1,396	496	770	4,688
General beds	674	681	1,144	463	626	3,588
Maternity beds ...	72	247	252	33	144	748

(B) *Units and Beds in Mission Institutions*

Units	2	24	15	6	6	53
Beds—						
In hospitals	394	—	110	24	149	677
In other units	—	537	318	28	4	887
Total Beds ...	394	537	428	52	153	1,564
General beds	292	253	289	52	132	1,018
Maternity beds ...	102	284	139	—	21	546

(C) *Beds Maintained by Employers of Labour*

In hospitals	—	50	56	—	—	106
In dispensaries	—	24	6	—	31	61

Table XXVI

Comparative Summary of Patients

	Government Hospitals			Dispensaries and Aid-Posts	All Units
	Admitted	Died	Out-Patients*	Total Patients	Total Patients
New Patients:					
1949	89,558	2,747	829,821	1,452,046	2,281,867
1950	89,912	2,842	887,115	1,504,495	2,391,610
1951	88,025	3,037	775,532	1,553,483	2,417,040
	Number			Number	Number
Re-attendances:					
1951			771,234	1,650,751	2,421,985
Total attendances:					
1949			1,725,661	3,198,376	4,924,037
1950			1,834,829	3,160,527	4,995,356
1951			1,634,791	3,204,234	4,839,025

Note.—*"Out-patients" included admissions during 1949 and the first five months of 1950

TABLE XXVII

Analysis of Patients—1951

	Buganda Province	Eastern Province	Northern Province	Western Province	TOTAL
IN-PATIENTS—					
Hospital admissions:					
European	1,157	186	—	2	1,345
Asian	1,745	433	—	170	2,348
African	35,742	27,943	9,173	11,474	84,332
ALL HOSPITAL ADMISSIONS ...	38,644	28,562	9,173	11,646	88,025
Dispensary admissions: (Estimated from incomplete data)	11,000	13,000	2,000	8,000	34,000
OUT-PATIENTS— NEW PATIENTS—					
At hospitals:					
European	4,564	1,994	108	184	6,850
Asian	4,546	3,885	163	611	9,205
African	275,604	247,801	112,406	123,666	759,477
ALL OUT-PATIENTS AT HOSPITALS	284,714	253,680	112,677	124,461	775,532
New patients at dispensaries and aid-posts	378,177	487,514	333,485	354,307	1,553,483
TOTAL OUT-PATIENTS ...	662,891	741,194	446,162	478,768	2,329,015
RE-ATTENDANCES ...	798,603	570,038	467,940	585,404	2,421,985
TOTAL ATTENDANCES ...	1,461,494	1,311,232	914,102	1,064,172	4,751,000

From the accompanying tabular summaries it will be seen that there has been an increase in bed accommodation without an increase in the recorded number of in-patients. This is because complete returns of in-patients are received from hospitals only, while the number of hospital beds shows a slight decrease. Although no province is yet able to provide complete data for all its dispensaries, sufficient information is available to enable estimates to be made of the number of in-patients treated, and these are shown for the first time in the summaries.

The reduction in the number of hospital beds is due in the main to two features, one being the demolition of a temporary ward at Jinja Hospital, and the other being the relegation of Kamuge from the status of rural hospital to that of dispensary. Both these units are in the Eastern Province.

In conjunction with the other East African territories, new forms of hospital returns were agreed upon during the year, based upon the 1948 International Classification of Causes of Disease and Injury. The in-patient return is the intermediate short list A of 150 causes, suitably expanded to cope with the commoner tropical conditions met with, while the out-patient return is considerably shorter and simpler. Both were brought into operation on 1st January, 1952.

C. Patients and Diseases Treated

During 1950 two important changes were made in the method of preparing hospital returns—

(*a*) Europeans and Asians were recorded separately, and not merged in with the African records,

(*b*) Out-patients who were subsequently admitted to hospital were excluded from the "Out-patient" numbers.

As the changes did not come into operation until June, 1950, it was not until 1951 that the new system was in force for the whole year. The change-over necessarily affects comparison of data collected over the past three years.

Use has been made of additional information provided for the various races. Examples of the different incidence of diseases are given in the following table. The diseases are recorded as rates per thousand patients, omitting items 66-71 in Appendix VI.

Rates per thousand patients	*European*	*Asian*	*African*
Yaws	–	–	25.9
Leprosy	–	0.1	0.12
Abortion	2.3	8.2	1.7
Diabetes	0.2	4.5	0.5
Appendicitis	10.4	7.6	0.03

Before drawing any conclusions from differences such as these, it is necessary first to consider other factors which, apart from differences in incidence, might affect the frequency with which disease-diagnoses appear in the hospital records. These would include age differences in the populations attending hospital as well as factors which induce patients with certain diseases or of certain races to attend for treatment.

A census of African patients in hospital was taken in July, 1951, 2,909 patients being listed. Of these, 468 were in the Mental Hospital, and 28 (mostly in the Mental Hospital) were of unknown tribe. Of the patients in general and maternity wards, over 95% belonged to tribes indigenous to or firmly established in Uganda.

The hospital population (excluding the Mental Hospital) amounted to 49 per 100,000 of the general population. The racial distribution is shown below—

	Hospital population per 100,000 tribal population
Baganda	81
Mbale District tribes:—	
"Badama" 102	
Basamia, Bagweri and Banyuli ... 57	
Bagishu 45	
All Mbale tribes	58
Immigrant tribes:—	
Banyaruanda	79
Balundi	103
All other tribes	34
AVERAGE FOR UGANDA ...	49

The term "Badama", including tribes speaking Bantu, Nilotic and Hamitic languages, is ill-defined, and it is not certain that patients and general population have been classified in the same way; the high rates for the Balundi both in the general and mental hospital population may be due to increases in this immigrant population since the 1948 census.

In practice, the hospitals serve a very restricted population; for example, the number of deaths in Mulago Hospital is about the same as the number of deaths reported from the nearest gombolola. Taking the tribal composition of this gombolola as a basis, the hospital population in Mulago Hospital would be—

Tribes	% of total hospital population	% of total gombolola population
	%	%
Baganda	49	66
Batoro	4	8
Banyaruanda	12	4
Banyoro	4	4

There are two hospitals in the neighbourhood, at which fees are charged, so that the differences may reflect the tendency of the poorer immigrants to seek free treatment.

D. Mental Hospital Services and Mental Health

The number of patients accommodated in the Mental Hospital at Mulago has continued to increase. As will be seen from the summary below, the increase has mainly affected non-criminal patients of both sexes, and has caused serious overcrowding.

TABLE XXVIII

Number of Patients in Mental Hospital

End of	Total patients	Non-criminal cases		Criminal cases		Planned accom-modation
		Male	Female	Male	Female	
1949	390	226	106	43	15	322
1950	477	288	125	50	14	322
1951	505	302	141	50	12	322

This overcrowding has been accompanied by an increase in deaths, the death-rate based on the average population rising from 142 per thousand in 1949 to 228 in 1951. This same rise in the death-rate of inmates was observed in the years 1946-48 prior to the opening of extensions to the existing hospital. Deaths due to tuberculosis have increased, being 4 in 1949, 5 in 1950 and 10 in 1951. Rather less than two-thirds of the deaths were attributable primarily to mental disease; of 72 such deaths, 43 were due to syphilis (G.P.I. 38). There is a marked difference in the ages at which

death occurs in various conditions, G.P.I. and cerebro-vascular accidents being at a maximum around 40 years of age, epilepsy and schizophrenia having maxima nearer 25. Diseases of the respiratory system accounted for 21 deaths, among which were pulmonary tuberculosis (11), pneumonia (5), and abscess or gangrene of the lung (4). The death-rate from all causes was equivalent to 250 per thousand annually for males and 160 for females.

Both deaths and discharges during 1951 were the highest on record, but the high rate of discharge cannot be attributed entirely to better therapeutic results; it was probably due in part to efforts to keep down the numbers in hospital by all possible means. It is of interest to note that the percentage of patients who died or were discharged in one year rose from 36% to 63% during the period from 1946 to 1948 when overcrowding increased steadily; after the new accommodation had been opened, the percentage rose again from 35% to 62% in the years 1949 to 1951.

The annual discharge rate is of importance in estimating the number of beds which are needed. If adequate accommodation were available, both the death-rate and the discharge rate would probably fall—a decrease of the annual combined rate to 30% may be taken as likely. This 30% of the accommodation would be available for new patients and re-admissions; at the present rate of over 300 such admissions a year, accommodation for 1,000 patients would be necessary if the patients were to have adequate treatment and avoid premature discharge or death. The annual number of admissions has doubled since 1946; with the increasing use of mental hospital facilities by the outlying tribes, the growing and probably ageing population, and the disturbances created by new social conditions, the admission rate may be expected to rise steadily. Plans have been prepared for the new mental hospital near Port Bell, to accommodate some 160 patients in the first phase.

A tribal census of patients in the Mental Hospital indicated the extent to which various tribes were represented in the hospital population. The rates given below are based on the 1948 census analysis—

	Percentage of all patients	Mental hospital patients per 100,000 tribal population
Tribes living in Mengo District:—	%	
Baganda	30	16
Banyaruanda	11	18
Balundi	3	25
Tribes from West Nile District ...	8	10
Rest of Uganda Tribes ...	48	7
AVERAGE FOR ALL UGANDA		9·5

The tendency for tribes who provide immigrant labour to have a rather higher admission rate is apparent, but may be due to the difficulties of arranging for care at home. Proximity to the mental hospital also seems to encourage admission.

It is worth recalling that Scotland, with a population of the same order as Uganda (5 million), has a mental hospital population of over 20,000. Accommodation for a mental hospital population of such dimensions is not likely to be required in Uganda on account of several factors. The average age of the population is much lower in Uganda; persons over 60 years of age whose condition is unlikely to improve number more than one-third of all admissions in Scotland, whereas in Uganda the proportion is less than 5%; in countries similar to Uganda a considerable number of the more amenable insane are looked after at home*. There are well-founded reasons for believing that the incidence of insanity in Africans living in their natural environment is low. Higher rates of insanity are found in Africans living away from their former tribal areas, and this section of the community is likely to increase in the future.

Much is being done in temperate climates to treat and cure mental disease. Treatment is time-consuming, and depends largely on verbal skill and understanding of the patients' background and mentality. It is most effective when given in the early stages of a complaint. In Uganda, elucidation of the causes of psychosis has barely begun, and in consequence the forms of treatment which are available are strictly limited. The Mental Hospital is largely used for the accommodation of patients suffering from the more serious and advanced forms of mental disease. Apart from the treatment of organic disease, shock and occupational therapy are the chief remedial measures. When it is recalled that 30% of illnesses causing absence from work in the United Kingdom have been attributed to psychological causes, it will be realised that there is a vast field for investigation in the Protectorate.

It is likely that much of the ordinary somatic illness now being treated by injections and medicines at dispensaries and hospitals has a psychological background. Reactions against the environment are a common cause of bodily dysfunction. Medicines in such circumstances are of secondary importance, except in so far as they alleviate symptoms by their psychological effect.

TABLE XXIX

Admissions, Deaths and Discharges—Mental Hospital.

	Lunacy cases heard by District Courts	Admissions		Deaths	Discharges
		New	Re-admissions		
1949 ...	266	199	19	49	74
1950 ...	326	268	27	77	131
1951 ...	...	297	34	112	191
1951 ... *Criminal:*					
Males ...		9	—	8	1
Females ...		—	—	2	—
Civil:					
Males ...		215	23	80	144
Females ...		73	11	22	46

*Carothers, J. C. D. (1948), *E. Afr. Med. J.*, Vol. 25, page 142.

E. Dental Services

It was possible to maintain three dental units in operation throughout the year, at the Kampala European Hospital, Mulago African Hospital and Jinja. The senior Dental Surgeon and Dental Mechanic were transferred to Nigeria, and Kampala was without a dental mechanic at the end of the year.

The variety of work done at Mulago Hospital is, as might be expected, considerably greater than among non-native patients. A number of cases of malignant disease, detected at an early stage, were referred to general surgeons. Conservative work has increased considerably.

A summary of the work carried out at the non-native clinics is shown below—

	1949	1950	1951	
			Kampala	Jinja
Extractions	705	685	680	801
Scalings, gum treatments	472	280	248	298
Fillings	954	741	802	519
Temporary fillings and dressings ...	272	244	374	51
Crowns, inlays, etc.	10	17	11	17
Prosthetics:—				
New dentures	64	51	39	106
Repairs and alterations	31	40	33	83
TOTAL APPOINTMENTS ...	2,373	2,412	2,140	2,428

At Jinja, it was recorded that 11% of all appointments were broken, constituting a loss of 21 working days. A large number of extractions, often full clearances, were required in Asians and Africans on account of pyorrhoea. An attempt was made to educate the public in personal dental hygiene by the distribution of cyclostyled sheets to all patients.

F. Ancillary Services

(1) RADIOLOGICAL

Plans were well advanced for the new radiological building at Mulago African Hospital which should be completed in 1952. Equipment will include two 400 milliampere sets and one camera set taking 5″ × 4″ films.

The dental surgeons have their own X-ray apparatus. Apart from its normal work, the set at Jinja has provided radiographs of skeletons of fish for the Fisheries Research Station.

(2) PHARMACEUTICAL

This division perhaps more than any other has suffered from shortage of staff, both of European pharmacists and of Asian and African clerical staff. In spite of this, the increasingly heavy burden of work has been borne without complaint, and the new system of allocations to stations on a price basis was put into operation as planned. Amendments to the Pharmacy and Poisons Ordinance came into force during the year, but

inspection of pharmacies by the Registrar (the Government Chief Pharmacist) could not be carried out as regularly as was hoped.

Storage space was centralised, the old godowns near Entebbe pier being replaced by aluminium sheds at the main depot.

There has been further reduction in the amount of galenicals prepared in the Medical Stores, especially of ointments. This is largely due to the trend towards specific remedies. One process which entails a good deal of supervision is the filtration of hydnocarpus oil for injection, experience having shown that care in this operation is of the utmost importance in rendering the injection painless and well tolerated by patients.

Following upon the decision in 1950 to stop importation of heroin (acetylmorphine), all existing stocks of this drug were returned to the United Kingdom.

Summary of some preparations manufactured

		1949	1950	1951
Injections:				
Bismuth oxide	*litres*	1,661	979	1,262
Emetine hydrochloride	*litres*	23	36	10
Hydnocarpus oil	*litres*	1,470	2,708	1,119
Glucose	*litres*	305	257	501
Quinine dihydrochloride	*litres*	88	109	211
Procaine	*litres*	21	17	264
Galenicals:				
Infusions	*pints*	248	408	465
Liquors	*pints*	2,238	863	1,093
Mixtures	*pints*	668	1,019	586
Syrups	*pints*	532	945	335
Tinctures	*pints*	3,176	3,642	3,270
Ointments	*lb.*	12,484	24,827	7,555
Insecticides:				
Bug spray	*pints*	1,454	1,843	—
D.D.T. spray	*pints*	2,827	2,975	5,664
D.D.T. powder	*lb.*	1,251	—	—
B.H.C. spray	*pints*	—	160	—
B.H.C. powder	*lb.*	—	416	—
Pyrethrum spray	*pints*	2,394	1,516	1,944

Prices continued to increase during the year, and the cost of many textile materials rose by 100% or more. Of the older established drugs, emetine and ergot increased most in price; the former now stands at 353/- per ounce, and is therefore almost worth its weight in gold. The most embarrassing change in recent years has been the introduction of new and powerful drugs whose cost far exceeds the average for most pharmaceutical preparations. Examples of the cost of some of these drugs in the dosage required for adequate effect are shown below—

Cost of new drugs

Drug	Used for	Approximate cost of course of treatment
		Shs.
Penicillin	Syphilis	20
Streptomycin	Tuberculosis	700
Chloramphenicol	Typhoid fever	200
Aureomycin	Relapsing fever	25

If these drugs were widely used, their high cost would entail a great reduction in the availability of less costly preparations required for the treatment of a much larger group of sick people. An attack of malaria can now be treated by drugs which cost a fraction of a shilling. With a fixed allocation of money for drugs, treatment of one patient with an expensive antibiotic may mean that hundreds of others will be neglected.

A large amount of useful background reorganisation was carried out. The draft of the Uganda Formulary was completed, and was being prepared for printing at the end of the year. Standard lists of hospital and laboratory equipment were under consideration.

(3) Rehabilitation and Physiotherapy

One Physiotherapist is employed at the European Hospital, Kampala, and one at Mulago African Hospital. A blind African Medical Officer returned to Uganda after having completed a course in physiotherapy under the auspices of the National Institute for the Blind in London.

The accommodation available at Mulago does not permit full use to be made of all the apparatus. 834 patients were treated, 80% being in-patients having daily treatment. The premises are closely associated with the artificial limb making and fitting section, while the Social Welfare Department also undertake occupational therapy for the benefit of patients in the same building. Cotton spinning is one of the popular pastimes.

At the European and Asian Hospitals, Kampala, 545 new patients were treated for the first time, a substantial increase over 1950.

(4) Ambulances and Transport

The repair depot at headquarters was considerably developed during the year. An inspection pit was installed, and the covered area extended to enable work on more vehicles to proceed simultaneously. Shortage of spare parts made it extremely difficult to keep vehicles on the road.

The state of the fleet of vehicles is shown in the accompanying comparative table. At one time, half the ambulances in the department were in the repair depot.

	1948	1949	1950	1951	Average Age
Medical Department Vehicles in working order:					
Ambulances	...	...	15	12	6·8 years.
Vans	...	...	10	18	2·7 years.
Not in working order:					
Ambulances	...	...	7	9	5·5 years.
Vans	...	...	2	1	7 years.
No longer serviceable	...	7	9	6	8 years.
Total Vehicles on Charge ...	37	40	43	46	
New vehicles received	3	3	4	7	
Vehicles written off	—	—	—	4	

G. Registration of Medical Practitioners and Dentists

Changes in the register and lists of licensed practitioners are set out in the table below.

	Number at 31–12–50	Names added	Names removed	Number at 31–12–51
Registered doctors ...	140	13	2	151
Licensed doctors	77	9	5	81
Registered dentists ...	8	2	—	10
Licensed dentists ...	1	—	—	1

Medical practitioners are classified by race and nature of employment in Table XXX, giving the position at the end of 1951

TABLE XXX

	Registered Doctors				Licensed Doctors			
	European	Asian	African	All	European	Asian	African	All
Government ...	47	3	1	51	1	8	57	66
Other Public service	12	—	—	12	—	—	—	—
Mission	15	—	—	15	—	—	—	—
Private	4	33	1	38	1	9	3	13
	78	36	2	116	2	17	60	79
No longer in Protectorate ...	...	...	...	35	...	...	...	2
	Total on Register ...			151	Total Licensed ...			81

Table XXXI illustrates the extent to which medical personnel are concentrated in the two main towns of Jinja and Kampala.

TABLE XXXI

Distribution of Registered Practitioners

	Government	Other Public Service	Mission	Private	Total
Kampala	25	8	6	23	62
Rest of Buganda	9	4	—	2	15
Jinja	5	—	—	5	10
Rest of Eastern Province ...	3	—	4	7	14
Northern Province ...	4	—	2	—	6
Western Province	5	—	3	1	9
Total in Uganda ...	51	12	15	38	116

V.—LABORATORY SERVICES

A. General

The work of the laboratories division has suffered from shortage of European staff, vacancies caused by transfer not being filled. As a result, no visits to district laboratories could be undertaken during the year. Structural changes to the central laboratory included complete electrical rewiring and repairs to the Mansfield gas generator.

A tabular summary of the work done is given below. Items of interest include the following:

C. diphtheriæ gravis was isolated five times from African patients.

Salmonella typhimurium was isolated from five patients, and was suspected of having caused an attack of food poisoning through the medium of meat pies.

S. stanleyville was isolated from the blood and *S. bovis morbificans* from an abscess of the spleen.

Helminths included *Oesophagostomum* forming abscesses in relation to the colon, *Coenurus* cysts in the neck, and *Sparganum* in a conjunctival nodule.

Two members of an Indian family showed hæmolytic anæmia which could not be related to any of the recognised forms. Erythroblastalis fœtalis was diagnosed in an Indian infant. 84 Rh blood tests were carried out and 10 Coombs tests.

The work carried out reflects to some extent the changing interests of clinical workers. 65 examinations for cold agglutinins were carried out (as against 3 in 1950) in suspected cases of virus pneumonia, while 863 serum protein estimations (361 in 1950) were made (largely in connection with research into kwashiorkor).

Among the blood films examined (thick and thin together), the following positive results were obtained—

	African	European	Asian
	%	%	%
P. falciparum	29·2	9·4	10·5
P. vivax	0·1	0·9	0·3
P. malariae	0·6	...	...
TOTAL EXAMINED ...	22,926	593	1,042

TABLE XXXII

Summary of work done in Laboratories in Kampala

	1950	1951			
	TOTAL	TOTAL	Africans	Europeans	Asians
Bacteriological	4,848	3,066	1,720	276	178
Serological	2,378	1,643	...	...	..
Venereal diseases:—					
Kahn tests	28,817	31,280	31,003	40	237
Other tests	12,230	11,850	11,796	15	39
Haematological	17,827	16,346	(13,038)	(1,017)	(1,559)
Biochemical	4,002	3,543	3,459	77	107
Blood films for parasites ...	28,829	27,142	24,485	893	1,784
Urine examinations ...	4,500	4,062	2,867	950	245
Faeces, microscopical ...	8,140	7,862	7,249	329	284
Sputum	2,532	2,780	2,731	27	22
TOTALS	114,103	109,574	(98,348)	(3,624)	(4,455)
OTHERS	8,935	3,610			
TOTAL EXAMINATIONS	123,038	113,184			

N.B.—Brackets (. .) indicate that data are incomplete.
Autopsies and histological examinations are not included.

Summary of Positive Findings

		Number Positive	Total Specimens
Blood culture	*S. typhi*	57	340
Faeces culture for dysentery organisms ...	*Sh. sonnei* ...	1	...
	Sh. schmitzi ...	1	...
	Sh. flexneri ...	5	...
Cerebrospinal fluid	*H. influenzae* ...	4	115
Serology—Kahn tests	... ...	53·8% negative	
Agglutinins against *Brucella*	... ...	11	

HISTOLOGICAL EXAMINATIONS AND AUTOPSIES

The number of blocks prepared for section rose to 1,310 from tissues removed at autopsy and 1,346 from 902 biopsy specimens received. The biopsy specimens included 3 cases of rhinoscleroma, one of which had been treated with terramycin and which was found to be quiescent. Neoplasms accounted for nearly a quarter of the specimens. Out of 234 specimens of malignant neoplasm, 62 were of the skin or subcutaneous tissues, and 30 of the penis.

Mulago hospital mortuary received 944 bodies, autopsies being performed on 637. Including 235 autopsies performed elsewhere, the number performed at the request of the police amounted to 298. These latter have risen sharply in recent years, being only 99 in 1946. The commonest form of kidney disease found is chronic pyelonephritis, apparently the result of complications of gonococcal infection; a common form of heart disease is endomyocardial fibrosis, possibly of nutritional origin. Of the malignant tumours found at autopsy, one-third were primary tumours of the liver.

B. Government Chemist

The examinations of water supplies and foodstuffs have been dealt with in earlier sections. Owing to the absence on leave of the Government Chemist, the work was undertaken by other laboratory staff. Thanks are due to the Government Chemist of Kenya for undertaking the more urgent forensic chemical examinations. The work done is summarised in the table below.

TABLE XXXIII

Examinations by Government Chemist

	1950	1951
Water	54	19
Food:—		
Milk	50	93
Oil	12	9
Ghee	4	4
Medical	41	17
Forensic	105	150
Miscellaneous:—		
Collector of Customs ...	12	7
Others	43	22

The forensic examinations were mainly for the identification of poisons. Poisonous substances found included arsenic, bismuth, sulphuric acid, a barbiturate derivative and a native medicinal plant (? *Dioscorea,* or wild yam). Miscellaneous examinations included analyses of sulphuric acid, soap, pigments and chemicals used for water treatment.

C. Entomologist

Losses of staff, both European and African, hampered the work of this division, but the appointment of a second entomologist towards the end of the year eased the situation. A variety of surveys was carried out in connection with malaria and other insect-borne disease.

Two special investigations may be mentioned. A tsetse survey was made at the southern end of Lake Albert, where a new port to serve Toro District was under consideration before the decision was made to extend the railway westwards from Kampala. The other investigation, upon which most of the attention of the division was focused, was related to the proposed *Simulium* eradication scheme on the River Nile.

An experimental spraying of the vegetation fringing the banks of the Nile in the five-mile stretch below Jinja was carried out during the dry season (February). The entomological division made observations in the forests along the river, entailing the cutting of paths of access for fly-rounds. Catching stations were maintained at various distances from the Nile in Busoga District and in the Mabira Forest. The success of an eradication scheme depends upon the detection of all sites of *Simulium* breeding in the vicinity. This was an arduous task. Other investigations included the examination of captured flies, to ascertain their age and state of sexual maturity. This made it possible to estimate the length of time between successive reproductive cycles in the female. With this knowledge, it was possible to determine the period for which the spraying would have to be continued in order to be effective. In addition, data were accumulated on the flow of various rivers likely to need treatment, and on the viscosity and rate of flow of D.D.T. preparations through different types of nozzles.

Other work on *Simulium* was carried out on Mount Elgon in association with Kenya workers. The results obtained there and in the West Nile District are described in the section dealing with onchocerciasis.

VI.—TRAINING OF STAFF

Assistant Medical Officers

The curriculum at Makerere College Medical School now extends over seven years. Newly qualified doctors normally do a year's internship at Mulago Hospital before being posted for duties elsewhere.

Three qualified students entered Government service in 1951, and two who passed their final examinations at the end of the year (one a student from Nyasaland) were ready to begin their internships in 1952.

Four A.M.Os. were studying overseas during the year; two returned to Uganda, one having obtained the Diploma in Public Health and the other the certificate of the London School of Physiotherapy for the Blind.

Medical Assistants

The training of Medical Assistants is now carried out entirely at Masaka. A medical officer and sister-tutor are in charge of the School, and some of the hospital wards are staffed by the students.

The first students in the three years' course, i.e. those who had no previous medical experience either in the army or in Government service, completed their training at the end of 1951. At the terminal examinations held early in 1952, eleven of the thirteen students passed successfully, 12 second-year students and seventeen first-year students remaining in training.

Nurses

It is sometimes suggested that female nurses are taught too much theory and given too little practice. A brief review of the situation may therefore be useful. Less than half the girls entering the Nurses' Training School at Mulago Hospital in 1951 had any secondary education, and special classes in English were held three times a week for those needing help in this subject. At the end of the three months' preliminary training, nearly one-third of the students were found to be unsuitable for further instruction. For the remainder of the three years' course an average of 88 per cent. of working time is spent on ward duties. Theoretical instruction includes lectures in the classroom and wards. Instruction outside the wards included visits to a "Health Week" and demonstrations in the Medical School. The chief difficulty is the low level of basic education. It has been claimed that some "nurses" who have had no formal training can give better service than those whose heads are stuffed with theory. It may be that such a person, if employed on routine duties, may perform these tasks to the satisfaction of a doctor who knows her limitations. But it is clear that a woman of this type could not be expected to assume any serious responsibility, particularly in connection with the training of others. There is no reason to doubt the ability of local women to achieve satisfactory standards in the field of nursing; the chief factor determining progress is the ability of African parents to see that secondary school education is as important for girls as it is for boys.

During 1951, fourteen students qualified as nurses. There were 86 new entrants and 49 students abandoned the course. At the end of the year, 101 students were in training.

The Mission training schools also train nurses, and are solely responsible for the training of midwives. During 1951, twelve trained nurses and nine midwives entered Government service from Mengo Hospital C.M.S. Training School, and six nurses and eight midwives from Nsambya Training School.

Nursing Orderlies

At the end of 1951, the first batch of sixteen students undertaking the two years' course of instruction at the Lira Training School were approaching the end of their studies; fourteen first-year students were in training. Four first-year students abandoned the course during the year.

It was not possible to post a second medical officer to Lira to assist in the work of the school until late in the year.

Dispensers

The training is carried out at Mulago Hospital, lasting three years. Two students completed the course, and three others who were referred in 1950 passed the final examinations at their second attempt. Five first-year and one second-year student remained in training, while four students abandoned the course.

Laboratory Assistants

This course, also covering three years, is given at the Central Laboratories, Kampala. One student passed the final examination, one first-year and two second-year students remained in training, and one student abandoned the course during the year.

Assistant Health Inspectors

Three students completed the three-year course of training at the Mbale School of Hygiene, but failed to pass the examination set under the auspices of the Royal Sanitary Institute, London. Five students abandoned the course during the year. Of eleven first-year students and four second-year students still in training, three are from Ethiopia. Three Assistant Health Inspectors attended a six weeks' course at the East African Malaria Unit, Amani.

No course for hygiene orderlies was held during the year.

Wastage of Staff

Continuity of service is a desirable asset, for the value of an officer increases steadily as he grows more familiar with local conditions and departmental methods. As he becomes better acquainted with the people among whom he works, and gains an understanding of their customs, language and outlook, so his influence for good is enhanced.

European male officers are recruited by Government with a view to service lasting 25 years or so. About one-fifth are lost by death or invaliding before the time for retirement arrives, while others are transferred, or find themselves incompatible with local conditions. It is estimated that over half complete the normal span of service. The wastage rate of female European staff through marriage is high, although many are able to return and assist in temporary capacities when occasion arises.

Wastage of staff is particularly serious if lengthy training is required before duties can be undertaken. In this connection losses of staff who can only be replaced from the local training schools constitute a major

problem. Weeding out of unsuitable students during training is unavoidable; but the high rate of wastage among certain classes of trained staff points to lack of a real interest in the work, except as a source of income.

The losses of various categories of female staff are given in the table below.

TABLE XXXIV

Wastage of Female African Staff, Medical Department, 1951

	Preliminary Training School	Nurses in Training		Trained Nursing Staff
		1st Year	2nd–3rd	
Average number in training or trained ...	86*	33	56	270
Wastage	20†	16	13	29
Rate for the year	...	48%	23%	11%
Reasons:—				
Retirement	—	—	—	—
Death	—	—	1	—
Illness	2	1	—	—
Resigned:—				
Marriage	—	2	6	10
Pregnant	1	1	3	10
Care of relatives	—	2	—	7
Other reasons	1	—	—	—
Discharged	16	10	3	2

* For 3 months. † In 3 months.

TABLE XXXV

Wastage of Male African Staff, Medical Department, 1951

	Medical Assistants and Nursing Orderlies	Clerical Staff
	(*Mulago Hospital*)	(*Medical Department*)
Number employed	115	115
Wastage	5	25
Rate for the year	4%	22%
Reasons:—		
Retirement	1	—
Death	—	1
Illness	—	—
Resigned	2	21
Discharged	1	3

TABLE XXXVI

Wastage of European Staff, Medical Department, 1951

	Qualified medical staff (male and female)	Nursing staff (female)
Number employed	48	56
Wastage	2	6
Rate for the year	4%	11%
Reasons:—		
Retirement	—	—
Resigned:—		
Marriage	—	4
Other reasons	2	—
Transfer	—	2

Appendix I

LEGISLATION

Approved Schools Ordinance, 1951

Legal Notice 258 makes the dietary of pupils subject to approval by the Director of Medical Services.

Dangerous Drugs Ordinance, 1935

Legal Notice 220 adds other drugs to the list laid down in Legal Notice 247 of 1950.

District Council Bye-laws

Legal Notices 5 and 271 govern the construction of houses and latrines and the sanitary maintenance of compounds in Acholi District and Lango District respectively.

Legal Notice 6 controls the segregation of contagious leprosy cases in Acholi District.

Legal Notice 233 enforces in the Bukedi sub-district of Mbale the registration of births and deaths within 14 days of occurrence and the payment of a fee of one shilling for the issue of a birth certificate.

Legal Notice 305 enforces the digging and maintenance of latrines in Bugishu sub-district of Mbale District.

Interpretation and General Clauses Ordinance (No. 7 of 1951)

Defines, *inter alia*, a medical practitioner.

Local Government (Municipalities) Ordinance, 1947

General Notice 946 published the Draft Bakehouse Bye-laws.

Midwives (Amendment) Ordinance (No. 27 of 1951)

The Ordinance provides for appeals to the High Court and amends the period of office of non-official members of the Board.

Legal Notice 203 replaces the previous Midwives Rules.

Pharmacy and Poisons Ordinance, 1946

Legal Notice 224 amends the Poison Rules and adds a new Schedule of drugs which can only be sold on prescription.

General Notices 559 and 560 notify changes in the Register of Pharmacists.

Legal Notice 214 adds to Part I of the Poisons List (poisons which may only be sold by an authorised seller), some recently introduced drugs, including pethidine, curare, antibiotics, semithiocarbazone and P.A.S., and removes glandular extracts of the pituitary, thyroid and suprarenal; and adds to Part II of the Poisons List (preparations which may be sold by licensed sellers who are not authorised to sell poisons in Part I), many preparations in which the amount of poison is below a certain limit.

Police Ordinance, 1939

Legal Notice 138 varies the appointment of Inspector and Constable under the Mulago Hospital Special Constable Regulations, 1947.

Public Health Ordinance

Legal Notice 127 replaces the Public Health (Building) Rules of 1939.

Legal Notices 83 and 165 apply Rule 6 of the Public Health (Sale of Milk and Milk Products) Rules, 1939, to Kabale Township, and the first schedule to Port Bell Township.

Legal Notice 166 applies the Public Health (Bakehouse) Rules, 1939, to all townships in the Eastern Province.

Legal Notice 167 applies the Public Health (Eating House) Rules, 1939, to all townships in Busoga and Mbale Districts.

Legal Notices 84 and 137 appoint cemeteries in Mbale and Masindi Townships.

Legal Notice 280 publishes the Public Health (Gas) Rules.

Sleeping Sickness Ordinance

General Notices 553 and 554 relax prohibitions on entry into the Victoria Nyanza and River Nile Sleeping Sickness Area and the Sesse Islands.

Legal Notice 162 amends the definition of the Mjanji Area.

Legal Notice 148 applies the Sleeping Sickness (Fishing) Rules to parts of Busoga District.

Legal Notice 226 amends the definition of the East Madi Restricted Area.

Legal Notice 269 abolishes the Kami-Nsolo Restricted Area.

Town and Country Planning Ordinance (No. 25 of 1951)

This Ordinance replaces the 1948 Ordinance.

General Notice 267 sets out the Kampala Outline Scheme.

General Notice 809 appoints members of the Planning Board.

Townships Ordinance, 1938

General Notice 1058 appoints members of Township Authorities for 1952.

Legal Notice 192 amends the limits of Gulu Township.

Legal Notice 74 controls the keeping of cattle in Jinja Township.

Legal Notice 190 controls quarrying within Entebbe Township.

Waterworks (Amendment) Ordinance (No. 6 of 1951)

Amends the definition of some terms used, and makes other changes in the Ordinance.

Legal Notice 123 extends the Kampala Water Supply Area.

Legal Notice 87 replaces the Waterworks Rules, 1935, and provides specifications for sanitary fittings.

Legal Notices 44-7 establish a water supply and authority for the Mbarara Water Supply and Authority.

Legal Notices 34 and 39-40 establish the Masaka Water Supply and Authority.

Workmen's Compensation Ordinance, 1950

Legal Notice 246 appoints officers on behalf of dependents of workmen.

Appendix II

SCIENTIFIC PUBLICATIONS

Baird, R. B. and Tonkin, I. M. (1951)—"Endemic typhus in Mengo District, Uganda". *East African Medical Journal*, Vol. 28, page 157.

Barnley, G. R. (1951)—"Medical Entomology". *Uganda Review.*

Boase, A. J. (1951)—"Concomitant squint in childhood". *East African Medical Journal*, Vol. 28, page 247.

Boase, A. J. (1951)—"Blueprint for corneal trephine". *British Journal of Ophthalmology*, Vol. 35, page 248.

Boase, A. J. (1951)—"Amblyopia: recovery at forty years of age". *British Journal of Ophthalmology*, Vol. 35, page 440.

BURKITT, D. P. (1951)—"Primary hydrocele and its treatment". *Lancet*, i, 1341.

KAFERO, E. D. (1951)—"A case of rhinoscleroma". *East African Medical Journal*, Vol. 28, page 315.

LADKIN, R. G. (1951)—"The Banakalanga of Kyaggwe". *Uganda Journal*, Vol. 15, page 144.

RAPER, A. B. (1951)—"Splenosis: a sequel of rupture of the spleen". *East African Medical Journal*, Vol. 28, page 265.

RAPER, A. B. (1951)—"*Schistosoma bovis* infection in man". *East African Medical Journal*, Vol. 28, page 50.

RAPER, A. B. and LEHMANN, H.—"Distribution of the sickle-cell trait in Uganda, and its entomological significance". *Uganda Journal*, Vol. 15, page 41.

TROWELL, H. C. (1951)—"Kwashiorkor"—Contribution to *Encyclopædia of Medical Practice*.

TROWELL, H. C. (1951)—"The treatment of tick-borne relapsing fever in East Africa with special reference to aureomycin". *East African Medical Journal*, Vol. 28, page 402.

TROWELL, H. C. (1951)—"Two cases of onyalai in Uganda". *East African Medical Journal*, Vol. 28, page 449.

WELBOURN, H. F. (1951)—"The growth of Baganda children in the vicinity of Kampala". *East African Medical Journal*, Vol. 28, page 428.

Appendix III

REVENUE AND EXPENDITURE

1950 Actual	Revenue	1951 Estimated	1951 Actual
£		£	£
	CHARGES FOR SERVICES RENDERED—		
4,965	Hospital charges, European		5,253
3,272	Hospital charges, Asian		3,304
351	Sale of drugs	11,000	408
233	Pathological examinations		209
276	Ambulance and other charges		70
855	Sale of surplus stores		17
	SERVICES SUBJECT TO 50% REPAYMENT TO SPECIALIST OR OTHER OFFICERS—		
7	Radiological examinations	...	1,127
497	Dental treatment	1,000	1,683
...	Medical and surgical treatment	7,000	1,159
15	Workmen's compensation patients	2,000	1,710
£12,838	TOTAL (including revenue which has not been allocated.) £	21,000	15,763
	CAPITATION FEES—		
3,182	East African Railways and Harbours	3,000	3,493
1,393	Other High Commission Departments, other agencies and Makerere College	2,500	2,401
	CONTRIBUTIONS FROM AFRICAN LOCAL GOVERNMENTS—		
2,200	Buganda—medical stores	2,200	2,700
1,325	Busoga drugs	...	...
589	Lango—Yaws campaign	...	...
375	Toro—salary of A.M.O. seconded to Kabarole Hospital	390	390
	COLONIAL DEVELOPMENT AND WELFARE SCHEMES—		
(15,000)	D.1351 Medical Department Development ...	23,000	...
(7,466)	Overseas scholarships—Reimbursement of salaries ...	600	...

Revenue and Expenditure—*continued*

1950 Actual	Expenditure	1951 Estimated	1951 Actual
£		£	£
	STAFF—		
334,478	Personal emoluments	388,382	405,684
31,706	Transport of staff and patients	37,500	37,973
...	Private fees of Government practitioners	2,000	1,043
...	Payments to private practitioners and nurses ...	300	298
...	Courses of instruction	1,600	1,414
...	Rations for probationer nurses	1,764	1,720
	MATERIALS—		
(111,081)	Stores, drugs and equipment	128,926	190,091
...	Transport of stores	1,989	1,479
...	Incidentals	244	135
...	Publications	450	390
	UPKEEP—		
41,342	Maintenance of hospitals and laboratories	44,539	47,307
(4,710)	Water	4,660	5,900
(7,400)	Electricity	10,245	11,446
2,655	Postal services	3,500	2,967
...	Non-native mental patients	250	250
	HYGIENE—		
5,761	Control of epidemic and endemic diseases	7,425	5,493
174	Public health propaganda	250	228
	CONTRIBUTIONS—		
6,675	Mission training schools	7,875	6,777
5,583	Mission leprosy settlements	5,650	5,532
500	Kabarole Hospital, C.M.S.	500	500
70	Others	110	70
	SPECIAL EXPENDITURE—		
238	New equipment—Mulago, radiological	11,700	5,973
5,505	Hospitals and dispensaries	1,875	810
2,419	Motor vehicles	3,850	5,659
...	Adding machine	48	41
64	*Simulium* eradication	5,000	723
1,000	Building grants to leprosy settlements	1,000	2,335
£561,361	TOTAL—MEDICAL DEPARTMENT £	671,632	742,244
	PUBLIC WORKS DEPARTMENT—		
47,277	New buildings and extensions	128,530	59,278
4,178	Minor works and maintenance	...	5,302
698	Maintenance of temporary buildings	1,103	850
	Servicing of motor vehicles	250	290
	TOWNSHIPS AND LOCAL GOVERNMENT—		
...	Anti-malarial measures	10,661	...
...	Public health, Kampala	9,335	...
	MISCELLANEOUS—		
...	Passages	18,700	...
...	Travelling on leave	250	...
	SUBVENTIONS—		
...	E.A. High Commission	5,222	...
...	Makerere College, Medical School	8,000	...
...	Other contributions	484	...
...	British Red Cross Society (Blood Transfusion Van) ...	100	...
16,722	African Local Governments	...	...

Appendix IV

STAFF

Honours

Dr. A. J. Boase, Specialist (Ophthalmologist) to be an Officer of the Most Excellent Order of the British Empire (Civil Division).

Dr. R. G. Ladkin to be a Member of the Most Excellent Order of the British Empire (Civil Division).

Mr. J. Hetherington, Chief Pharmacist, to be a Member of the Most Excellent Order of the British Empire (Civil Division).

Mr. Joseph Kiwanuka Salongo, Medical Assistant, awarded the Certificate of Honour.

Mr. Joseph Kawesa, Health Orderly, awarded the Certificate of Honour.

Mr. Israel Ogwal, Medical Assistant, awarded the Certificate of Honour.

Post Graduate Degrees and Diplomas Awarded

Dr. N. N. Kanyarutoke ...	Pt.I, D.P.H. (Liverpool) ...	December, 1951
Dr. L. W. Lwanga	Cert. Chartered Soc. of Physiotherapy	May, 1951
Dr. J. A. McDonald	D.T.M.&H. (England) ...	April, 1951
Dr. G. de B. Mitford-Barberton	D.T.M.&H. (England) ...	April, 1951
Dr. F. G. Sembeguya ...	D.P.H. (London)	September, 1951
Dr. J. Fairfull Smith ...	D.T.M.&H. (England) ...	April, 1951

Senior Staff

Director: R. S. F. Hennessey, B.A., M.D., F.R.C.P.I., Dip.Bact. D.T.M.&H.

Deputy Director: D. D. McCarthy, M.D., D.T.M.&H.

Assistant Director: J. K. Hunter, M.B., D.T.M.&H., D.P.H.

Medical Superintendent, Mulago Hospital: A. A. Alderdice, M.B., M.R.C.P.

Specialists

Physicians: H. C. Trowell, M.D., F.R.C.P.
P. W. Hutton, M.D., M.R.C.P.

Surgeons: A. H. Mowat, M.B., F.R.C.S., D.T.M.&H.
I. W. J. McAdam, M.B., F.R.C.S.

Gynæcologist: G. Holmes, M.B., M.R.C.O.G.

Ophthalmologist: A. J. Boase, O.B.E., M.R.C.S., D.O.M.S.

Radiologist: J. Scott Brown, M.D., D.T.M.&H., D.M.R.E.

Alienist: G. Campbell Young, M.R.C.S., D.P.M.

Anæsthetist: H. R. Hudd, B.SC., M.B., M.R.C.S., D.A.

Leprologist: J. A. K. Brown, B.SC., M.D., M.R.C.S., D.T.M.&H.

Senior Medical Officers:
J. J. Black, M.B.
W. A. Wilson, M.D., M.R.C.S., D.P.H., D.T.M.&H.
D. G. Snell, M.B., M.R.C.S., D.P.H., D.T.M.&H.
I. W. MacKichan, B.A., M.B., M.R.C.S., D.P.H., D.T.M.&H.
W. Barnetson, M.B., D.T.M.&H.
J. M. Caldwell, B.A., M.B., D.P.H., D.T.M.&H.

Senior Pathologist: A. B. Raper, B.SC., M.D., M.R.C.P., D.T.M.&H.

Senior Entomologist: G. R. Barnley, M.SC.

Chief Matron: Miss M. O. C. Bonthron, S.R.N., S.C.M., R.F.N., Diploma in Nursing.

Chief Pharmacist: J. C. Baird, M.P.S.

Chief Health Inspector: E. J. Hines, CERT.R.SAN.I., A.M.I.SAN.E.

Appointments and Promotions

Alhuwalia, Dr. Pritam Singh...	Medical Officer (L.C.S.) ...	... 22– 8–51
Allan, Miss A. M.	Nursing Sister	... 1–11–50
Allen, Miss B.	Nursing Sister	... 24–10–51
Asplet, Mr. P. R.	Dental Surgeon	... 25– 4–51
Baird, Mr. J. C.	Acting Chief Pharmacist ...	... 19– 5–51
	Chief Pharmacist ...	... 6–11–51
Bhasin, Dr. S. P.	Sub-assistant Surgeon ...	... 5– 3–51
Brown, Dr. J. A. K.	Specialist Leprologist ...	... 2–11–51
Bunge, Mr. V. A.	Senior Health Inspector ...	... 1– 9–51
Burkitt, Mr. D. P.	Acting Specialist Surgeon ...	... 18–12–51
Cashmore, Miss R. M. ...	Nursing Sister	... 1–12–51
Chugh, Dr. Ram Lal	Sub-assistant Surgeon ...	... 3–10–51
Cockburn, Miss E. M. ...	Nursing Sister	... 1–11–50
Cruickshank, Miss J. M. ...	Acting Matron, Grade I ...	... 13– 6–51
Davies, Mr. K. C.	Health Inspector ...	... 5–10–51
Dentith, Miss A. J. M. ...	Nursing Sister	... 7– 4–51
Dutton, Mr. R. D. W. ...	Health Inspector ...	... 14–12–51
Graham, Mr. G. D.	Male Mental Nurse ...	... 4–10–51
Handsley, Mr. W.	Laboratory Technician ...	... 29–12–51
Hainsworth, Capt. I.	Temporary Sanitary Overseer	... 1– 9–51
Howells, Mr. E. M.	Health Inspector ...	... 5–10–51
Hoyle, Mr. J.	Acting Hospital Superintendent	... 21– 9–50 to 12–8–51
Hunter, Dr. J. K.	Acting Deputy Director ...	... 9–12–51
Hutton, Dr. P. W.	Acting Medical Superintendent, Mental Hospital	... 23–12–51
Jamieson, Miss I. H.	Matron, Grade II ...	... 29–12–50
Johnson, Mr. W.	Temporary Senior Health Inspector	15– 2–51
Kagwa, Dr. A.	Medical Officer (L.C.S.) ...	... 25– 4–51
McCarthy, Dr. D. D.	Acting Director of Medical Services	9–12–51
McDonald, Dr. J. A. ...	Medical Officer	... 15– 4–51
McKnight, Miss B.	Nursing Sister	... 4– 5–51
Megens, Mr. M. J. C. ...	Male Mental Nurse ...	... 6– 6–51
Mitford-Barberton, Dr. G. de B.	Medical Officer	... 13– 5–51
McWilliam, Miss M. L. ...	Nursing Sister	... 20– 2–51
Murdoch, Miss M. S. ...	Nursing Sister on transfer	... 11– 8–51
Murphy, Dr. G. C.	Medical Officer	... 3– 8–51
Monger, Mr. N. D. ...	Acting Health Inspector ...	... 25– 5–50
Packham, Miss F. M. ...	Nursing Sister	... 30–10–51
Passmore, Miss J. M. ...	Sister Tutor	... 9– 8–51
Prentice, Mr. M. A.	Entomologist	... 7– 9–51
Pandit, Dr. B. B.	Sub-assistant Surgeon ...	... 23–11–51
Rush, Dr. S. V.	Acting Provincial Medical Officer ...	2– 6–51
Salter, Miss L. E.	Matron, Grade II ...	... 5– 3–51
Stalker, Miss M. W.	Nursing Sister	... 4– 1–51
Shore, Dr. H.	Medical Officer	... 11– 8–51
Short, Dr. G. M.	Medical Officer	... 28–12–51
Smith, Miss I. T.	Nursing Sister	... 20– 2–51
Stafford, Dr. J. I.	Medical Officer	... 30–11–51
Thomson, Miss T.	Acting Matron in Chief ...	... 13– 6–51
Tucker, Dr. W. A. L. ...	Acting Specialist Surgeon	to 7–10–51
Walpole, Miss S. R.	Acting Matron, Grade I ...	... 7– 9–51
	Matron, Grade I	... 29–12–51
Webb, Mr. F. J.	Acting Hospital Superintendent	... 13– 8–51 to 20–9–51
White, Mr. J. A. G.	Health Inspector ...	... 5–10–51
Wilson, Dr. W. A.	Acting Assistant Director ...	... 9–12–51
Wyatt, Mr. A. J.	Assistant Hospital Superintendent ...	5– 8–51

Departures

Baird, Dr. R. B.	Pathologist, on transfer ...	... 2– 2–51
Barker, Commdr. D.	Dental Surgeon, agreement terminated	... 28–10–51
Bhasin, Dr. S. P.	Sub-assistant Surgeon ...	... 1–11–51
Carter, Mr. M. R.	Pharmacist, left service ...	... 15– 9–51

Physicians: H. C. Trowell, M.D., F.R.C.P.

Departures—*continued*

Cotton, Dr. D. Powell	Temporary Medical Officer, *resigned*	14– 7–51
Dick, Dr. G. W. A.	Pathologist, seconded to Virus Research Institute, *resigned*	1– 9–51
Gillett, Mr. J. D.	Entomologist, seconded to Virus Research Institute	21– 9–49
Hallsworth, Miss S.	Nursing Sister, *resigned*	10– 6–51
Hetherington, Mr. J., M.B.E.	Chief Pharmacist, *retired*	5–11–51
Hopwood, Dr. B. E. C.	Medical Officer, seconded to Kampala Municipality	16– 1–51
Jones, Dr. D. M. Norman	Medical Officer, *resigned*	1– 6–51
Keep, Major R. W.	Assistant Hospital Superintendent	3– 7–51
Kelshiker, Dr. Y. B.	Sub-assistant surgeon, agreement terminated	1–11–51
King, Miss E. E. S.	Matron, on transfer	2– 2–51
Knott, Mr. E. G.	Laboratory Technician, on transfer	3– 8–51
Kafero, Dr. E. D.	Assistant Medical Officer, *resigned*	1– 7–51
Kyewalyanga, Dr. E. B. S.	Assistant Medical Officer, *resigned*	30– 4–51
Lubulwa, Dr. E. S.	Assistant Medical Officer, *dismissed*	2– 3–51
Mills, Mr. A. V.	Dental Mechanic, on transfer	8–11–51
Philip, Miss A. C.	Nursing Sister, *resigned*	1– 9–51
Reynolds, Miss A. J.	Nursing Sister, *resigned*	1– 3–51
Smith, Mr. F.	Senior Health Inspector, *resigned*	1– 4–51
Stretton, Miss D.	Nursing Sister, on transfer	27–10–51
Welbourn, Dr. H. F.	Part-time Medical Officer, *resigned*	16– 9–51
Waddicar, Mr. H.	Health Inspector, *resigned*	1– 8–51
Skaife, Miss E. M.	Sister Tutor, *resigned*	15– 3–51
Wiggins, Miss B. C.	Physiotherapist, *resigned*	18–11–51

Appendix V

SANCTIONED ESTABLISHMENT, 1951

Administration

1 Director of Medical Services
1 Deputy Director
1 Assistant Director
7 Senior Medical Officers
1 Administrative Assistant
2 Accountants
4 Stenographers

LOCAL CIVIL SERVICE POSTS

2 Chief Clerks

General

2 Specialists (Physicians)
2 Specialists (Surgeons)
1 Specialist (Ophthalmologist)
1 Specialist (Gynaecologist)
1 Specialist (Leprologist)
40 Medical Officers (11 *vacancies*)
1 Hospital Superintendent
6 Assistant Hospital Superintendents (1 *vacancy*)
1 Welfare Worker
1 Domestic Assistant

4 Medical Officers (L.C.S.)
1 Senior Sub-Assistant Surgeon
8 Sub-Assistant Surgeons
62 Assistant Medical Officers (7 *vacancies*)

14 Clerks (Executive Class)
63 Clerks (Clerical Class)
3 Hospital cooks
77 Clerical Assistants and Clinical writers
5 Artisans

Nursing

1 Chief Matron
2 Matrons, Grade I
5 Matrons, Grade II
52 Nursing Sisters (4 *vacancies*)
2 Physiotherapists

Local Civil Service Posts

15 Asian Nurses
34 Nurse Midwives } (5 *vacancies*)
139 Midwives }
118 Nurses (15 *vacancies*)
284 Medical Assistants (32 *vacancies*)
803 Nursing Orderlies
211 Ward maids
147 Nurses in training

Laboratory and Entomological

1 Senior Pathologist
3 Pathologists (2 *vacancies*)
1 Government Chemist
3 Senior Entomologist and Entomologists (1 *vacancy*)
4 Laboratory Technicians (3 *vacancies*)
1 Assistant Bacteriologist

1 Laboratory Technician
58 Laboratory Assistants (9 *vacancies*)
3 Entomological Orderlies
31 Laboratory Orderlies
7 Entomological Observers

Pharmaceutical

1 Chief Pharmacist
6 Pharmacists (3 *vacancies*)

1 Assistant Storekeeper
48 Dispensers

Radiological

1 Specialist (Radiologist)
4 Radiographers (2 *vacancies*)

Hygiene

1 Chief Health Inspector
1 Instructor of Hygiene
21 Senior Health Inspectors and Health Inspectors (5 *vacancies*)
4 Sanitary Overseers (1 *vacancy*)

99 Assistant Health Inspectors (14 *vacancies*)
113 Hygiene Orderlies
61 Health Orderlies

Dental

4 Dental Surgeons (1 *vacancy*)
2 Dental Mechanics (1 *vacancy*)

3 Dental Orderlies

Mental Hospital

1 Specialist (Alienist)
1 Superintendent
2 Male Nurses
1 Sister-in-Charge
1 Female nurse

19 Male attendants
14 Female attendants
78 Male Mental Orderlies
44 Female Mental Orderlies

Transport

1 Mechanic.
1 Driver (L.C.S. General).
42 Drivers (L.C.S. Employees).

N.B.—All vacancies for European staff are counted at end of year.

Other grades are in some cases counted at the time estimates for next year are submitted.

Appendix VI A

Patients attending Government Hospitals, 1951

	Total patients	Males	Females	Europeans	Asians	Africans	In-patients	Out-patients
1. (*a*) Typhoid fever ...	372	254	118	7	10	355	366	6
(*b*) Paratyphoid fever ...	8	4	4	1	1	6	8	...
2. Typhus fever	127	92	35	12	1	114	122	5
3. Relapsing fever	304	221	83	1	3	300	229	75
4. Undulant fever	7	6	1	...	2	5	7	...
5. Smallpox	23	14	9	...	...	23	22	1
6. Measles	915	559	356	25	18	872	334	581
7. Scarlet fever	1	1	...	1	...	...	...	1
8. Whooping cough ...	2,545	1,180	1,365	43	40	2,462	804	1,741
9. Diphtheria	3	2	1	1	2	...	1	2
10. Influenza—								
(*a*) With respiratory complications ...	298	202	96	26	72	200	88	210
(*b*) Without	3,484	2,393	1,091	90	319	3,075	284	3,200
11. Cholera	...	...	...	...	...	...	...	...
12. Dysentery—								
(*a*) Amoebic	874	537	337	25	11	838	311	563
(*b*) Bacillary	1,354	917	437	48	25	1,281	665	689
(*c*) Unclassified ...	1,771	1,154	617	8	19	1,744	113	1,658
13. Plague	...	...	...	...	...	...	...	...
14. Acute poliomyelitis ...	40	20	20	9	6	25	35	5
15. Encephalitis lethargica ...	7	4	3	...	...	7	7	...
16. Cerebrospinal fever ...	222	127	95	1	1	220	202	20
17. Rabies	...	...	...	...	...	...	...	...
18. Tetanus	94	60	34	2	6	86	79	15
19. Tuberculosis, respiratory ...	707	535	172	6	5	696	518	189
20. Tuberculosis, other forms	147	114	33	2	2	143	111	36
21. Leprosy	89	75	14	...	1	88	53	36
22. Venereal diseases—								
(*a*) Syphilis	36,857	21,023	15,834	...	6	36,851	2,042	34,815
(*b*) Gonorrhoea ...	32,271	20,592	11,679	7	24	32,240	5,385	26,886
(*c*) Other forms ...	6,312	4,439	1,873	2	1	6,309	825	5,487
23. Yellow fever	...	...	...	...	...	...	...	...
24. Malaria—								
(*a*) Benign tertian ...	120	85	35	17	17	86	25	95
(*b*) Subtertian	25,373	15,136	10,237	252	963	24,158	4,863	20,510
(*c*) Quartan	263	160	103	8	...	255	96	167
(*d*) Unclassified ...	71,543	45,412	26,131	95	1,567	69,881	4,727	66,816
25. Blackwater fever... ...	15	11	4	2	3	10	8	7
26. Kala-azar	2	2	...	...	...	2	2	...
27. Trypanosomiasis ...	27	21	6	...	...	27	22	5
28. Yaws	18,413	10,898	7,515	...	...	18,413	626	17,787
29. Other protozoal disease ...	255	173	82	25	16	214	30	225
30. Ankylostomiasis ...	6,664	3,704	2,960	1	17	6,646	2,083	4,581
31. Schistosomiasis	756	486	270	5	3	748	248	508
32. Other helminthic disease ...	9,238	5,781	3,457	23	10	9,205	1,375	7,863
33. Other infectious or parasitic disease	2,903	1,985	918	88	48	2,767	563	2,340
34. Cancer and other tumours—								
(*a*) Malignant	258	121	137	4	6	248	175	83
(*b*) Non-malignant ...	549	165	384	23	9	517	302	247
(*c*) Unspecified ...	48	23	25	1	3	44	26	22
35. Rheumatic conditions ...	30,295	18,965	11,330	65	252	29,978	552	29,743
36. Diabetes	81	52	29	1	43	37	58	23
37. Scurvy...	10	8	2	4	5	1	7	3
38. Beri-beri	1	1	...	...	1	...	...	1
39. Pellagra	...	...	...	...	...	...	...	...
40. Other general disease—								
(*a*) Nutritional ...	1,363	817	546	27	16	1,320	523	840
(*b*) Endocrine and general	280	141	139	19	17	244	180	100
41. Diseases of the blood and blood-forming organs ...	2,049	1,121	928	29	163	1,857	538	1,511
42. Poisoning	53	35	18	11	1	41	44	9
43. Cerebral haemorrhage ...	10	9	1	...	3	7	10	...
44. Other diseases of the nervous system	2,960	2,054	906	106	172	2,682	508	2,452
45. Trachoma	5,855	2,966	2,889	2	13	5,840	1,154	4,701
46. Other diseases of the eye ...	25,267	15,621	9,646	114	221	24,932	1,449	23,818
47. Diseases of the ear and mastoid	14,823	8,567	6,256	215	198	14,410	601	14,222
48. (*a*) Heart disease ...	568	345	223	34	57	477	345	223
(*b*) Circulatory disease ...	437	284	153	87	63	287	133	304
49. Bronchitis	4,516	2,809	1,707	67	289	4,160	1,079	3,437
50. (*a*) Bronchopneumonia ...	1,600	876	724	19	54	1,527	1,343	257
(*b*) Lobar pneumonia ...	3,236	2,219	1,017	12	30	3,194	2,938	298
(*c*) Other pneumonia ...	737	522	215	1	19	717	498	239
51. Other respiratory disease ...	84,797	54,952	29,845	802	943	83,052	2,188	82,609
52. Diarrhoea and enteritis—								
(*a*) Under 2 years of age ...	7,718	4,428	3,290	27	76	7,615	428	7,290
(*b*) Over 2 years of age ...	10,222	6,576	3,646	263	126	9,833	577	9,645
53. Appendicitis	154	112	42	59	73	22	112	42

Patients attending Government Hospitals, 1951—*continued*

	Total patients	Males	Females	Europeans	Asians	Africans	In-patients	Out-patients
54. Hernia and intestinal obstruction	3,853	3,300	553	15	32	3,806	1,837	2,016
55. Cirrhosis of liver ...	201	130	71	2	6	193	131	70
56. Other diseases of the liver and biliary passages ...	366	248	118	41	39	286	181	185
57. Other digestive diseases ...	51,091	30,309	20,782	407	1,051	49,633	2,210	48,881
58. Nephritis—								
(*a*) Acute	52	34	18	1	7	44	39	13
(*b*) Chronic	162	96	66	14	17	131	135	27
59. Non-venereal disease of the genito-urinary system ...	7,899	1,882	6,017	138	330	7,431	3,116	4,783
60. (*a*) Abortion	1,294	...	1,294	13	79	1,202	1,207	87
(*b*) Ectopic gestation ...	10	...	10	...	1	9	10	...
(*c*) Toxaemia of pregnancy	20	...	20	1	12	7	15	5
(*d*) Other conditions of pregnancy, child birth and the puerperal state ...	1,834	...	1,834	69	69	1,696	1,793	41
61. Diseases of the skin, cellular tissues, bones and organs of locomotion ...	101,476	71,497	29,979	1,071	1,145	99,260	8,672	92,804
62. Congenital malformations and diseases of early infancy—								
(*a*) Congenital debility ...	136	56	80	4	3	129	134	2
(*b*) Premature birth ...	251	110	141	5	13	233	250	1
(*c*) Injury at birth ...	124	47	77	...	1	123	124	...
63. Senility	57	31	26	...	4	53	21	36
64. (*a*) Suicide	1	1	...	...	1	...	1	...
(*b*) Other forms of violence	84,472	63,705	20,767	602	583	83,287	6,459	78,013
65. Ill-defined causes ...	40,313	28,985	11,328	445	141	39,727	2,959	37,354
66. Malingering	364	248	116	4	1	359	47	317
67. Antenatal supervision ...	34,742	...	34,742	185	159	34,398	2,340	32,402
68. Normal living babies ...	6,840	3,444	3,396	139	617	6,084	6,722	118
69. Post-puerperal care ...	396	...	396	55	4	337	43	353
Child welfare clinics ...	9,659	4,643	5,016	...	...	9,659	...	9,659
70. Normal labour	5,930	...	5,930	103	498	5,329	5,910	20
71. Examinations	80,866	51,253	29,613	2,056	668	78,142	622	80,244
TOTALS ...	863,557	522,187	341,370	8,195	11,553	843,809	88,025	775,532

Appendix VI B

Deaths in Government Hospitals, 1951

	Total deaths	Males	Females	Europeans	Asians	Africans
1. (*a*) Typhoid fever ...	38	28	10	...	...	38
(*b*) Paratyphoid fever ...	1	. .	1	...	...	1
2. Typhus fever	3	2	1	...	...	3
3. Relapsing fever	4	2	2	...	...	4
4. Undulant fever	...	...	. .	...	...	...
5. Smallpox	...	...	...	...	...	...
6. Measles	3	2	1	...	...	3
7. Scarlet fever	...	...	. .	...	...	...
8. Whooping cough ...	24	15	9	...	...	24
9. Diphtheria	...	. .	. .	...	...	...
10. Influenza—						
(*a*) Respiratory complications	1	1	...	...	...	1
(*b*) Otherwise	...	...	...	...	...	...
11. Cholera	...	...	...	...	...	...
12. Dysentery—						
(*a*) Amoebic	4	3	1	...	...	4
(*b*) Bacillary	27	15	12	...	1	26
(*c*) Unclassified ...	7	6	1	...	...	7
13. Plague	...	...	...	...	...	...
14. Acute poliomyelitis ...	...	...	...	...	...	...

Deaths in Government Hospitals, 1951—continued

	Total deaths	Males	Females	Europeans	Asians	Africans
15. Encephalitis lethargica ...	...	...	...	...	...	...
16. Cerebrospinal fever ...	96	58	38	...	1	95
17. Rabies	...	...	...	...	...	...
18. Tetanus	...	...	...	...	...	...
19. Tuberculosis, respiratory ...	142	113	29	...	...	142
20. Tuberculosis, other forms...	16	15	1	...	...	16
21. Leprosy	...	...	...	...	...	...
22. Venereal Diseases—						
(*a*) Syphilis	52	36	16	...	...	52
(*b*) Gonorrhoea ...	74	68	6	...	...	74
(*c*) Other forms ...	6	5	1	...	...	6
23. Yellow fever	...	...	...	...	...	...
24. Malaria—						
(*a*) Benign tertian ...	2	2	...	...	...	2
(*b*) Subtertian	174	102	72	...	4	170
(*c*) Quartan	4	2	2	...	...	4
(*d*) Unclassified ...	105	68	37	...	1	104
25. Blackwater fever... ...	3	2	1	1	...	2
26. Kala-azar	...	...	...	...	...	...
27. Trypanosomiasis ...	2	1	1	...	...	2
28. Yaws	1	1	...	...	...	1
29. Other protozoal disease ...	1	1	...	...	...	1
30. Ankylostomiasis ...	61	42	19	...	...	61
31. Schistosomiasis	3	2	1	...	...	3
32. Other helminthic disease ...	11	5	6	...	...	11
33. Other infectious or parasitic disease	7	4	3	...	1	6
34. Cancer and other tumours—						
(*a*) Malignant	19	9	10	...	1	18
(*b*) Non-malignant ...	6	...	6	...	...	6
(*c*) Unspecified ...	4	2	2	...	...	4
35. Rheumatic conditions ...	...	...	...	...	...	...
36. Diabetes	2	...	2	...	1	1
37. Scurvy...	...	...	...	...	...	...
38. Beri-beri	...	...	...	...	...	...
39. Pellagra	...	...	...	...	...	...
40. Other general disease—						
(*a*) Nutritional ...	80	47	33	1	...	79
(*b*) Endocrine and general	2	2	...	...	...	2
41. Diseases of the blood and blood-forming organs ...	68	38	30	...	3	65
42. Poisoning	4	4	...	...	...	4
43. Cerebral haemorrhage ...	3	3	...	...	2	1
44. Other diseases of nervous system	31	20	11	...	1	30
45. Trachoma	...	...	...	...	...	...
46. Other diseases of the eye ...	1	1	...	...	1	...
47. Diseases of the ear and mastoid	11	9	2	...	...	11
48. (*a*) Heart disease ...	76	46	30	2	2	72
(*b*) Circulatory disease ...	10	7	3	1	1	8
49. Bronchitis	29	15	14	...	...	29
50. (*a*) Bronchopneumonia ...	150	75	75	...	...	150
(*b*) Lobar pneumonia ...	249	165	84	...	...	249
(*c*) Other pneumonia ...	22	16	6	...	1	21
51. Other respiratory disease ...	52	32	20	...	...	52
52. Diarrhoea and enteritis—						
(*a*) Under 2 years of age ...	48	27	21	...	1	47
(*b*) Over 2 years of age ...	65	36	29	...	1	64
53. Appendicitis	2	2	...	...	...	2
54. Hernia and intestinal obstruction	135	117	18	...	...	135

Deaths in Government Hospitals, 1951—*continued*

	Total deaths	Male	Females	Europeans	Asians	Africans
55. Cirrhosis of liver ...	26	21	5	...	...	26
56. Other disease of the liver and biliary passages ...	29	26	3	...	...	29
57. Other digestive diseases ...	79	58	21	...	...	79
58. Nephritis—						
(*a*) Acute	5	4	1	1	2	2
(*b*) Chronic	28	23	5	...	...	28
59. Non-venereal disease of the genito-urinary system	4	1	3	...	...	4
60. (*a*) Abortion	9	...	9	...	...	9
(*b*) Ectopic gestation ...	2	...	2	...	...	2
(*c*) Toxaemia of pregnancy	1	...	1	...	...	1
(*d*) Other conditions of pregnancy, child birth and the puerperal state ...	190	...	190	...	1	189
61. Diseases of the skin, cellular tissues, bones and organs of locomotion ...	177	118	59	...	1	176
62. Congenital malformations and diseases of early infancy—						
(*a*) Congenital debility ...	54	29	25	...	...	54
(*b*) Premature birth ...	187	97	90	...	10	177
(*c*) Injury at birth ...	47	22	25	...	1	46
63. Senility	2	2	...	..	...	2
64. (*a*) Suicide	1	1	..	...	1	...
(*b*) Other forms of violence	161	129	32	2	3	156
65. Ill-defined causes ...	64	37	27	...	2	62
66. Malingering	...	...	...	...	...	...
67. Antenatal supervision ...	4	..	4	...	1	3
68. Healthy babies born in hospital	18	9	9	...	...	18
69. Post-puerperal care ...	1	..	1	...	...	1
Child welfare clinics ...	...	...	...	...	...	...
70. Normal labour	4	...	4	...	...	4
71. Examinations	3	1	2	...	...	3
TOTAL DEATHS ...	3,037	1,852	1,185	8	45	2,984

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