KENYA'S EXPERIENCE

Planning Health Services In Developing Countries

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KENYA'S health services are based on a broad ecological approach to health. The evolution of these services and their major components were reviewed briefly in a paper given at the United Nations Conference on the Application of Science and Technology for the Benefit of Less Developed Areas, held in February 1963 (*1*). Although patterns of disease, geography, climate, and social structure may differ from country to country, Kenya's experience illustrates the difficulties and decisions to be faced in developing health services in most areas of the tropics and subtropics.

Three cardinal factors underlie the planning of health services in developing nations. These are (*a*) limited economic resources, (*b*) scarce technological manpower, and (*c*) the population growth. Failure to set policies and draft blueprints in terms of these factors courts disaster or, at the least, makes such planning sterile.

Kenya, with a land area of some 219,789 square miles, approximately the size of France, lies astride the equator from latitude 4°S. to 4°N. The climate varies from the lush humidity of the tropic coast through the hot arid plateau to the temperateness of the fertile, green highlands at an altitude of 5,000 feet or more. To the north, the land falls away abruptly to hot, dry, stark desert covering some three-fifths of the territory. The country is bisected by the Great Rift Valley running from north to south. The valley is shallow and wide in the north where it forms Lake Rudolf, but further south it is bounded by steep escarpments and is about 40 miles across.

The population, consisting of some 23 main African tribes, Asians, and Europeans, is concentrated mostly in one-fifth of the area, the Nyanza, Rift Valley, and Central Provinces. Less than 10 percent of the population is urban, and only 10 towns have populations of more than 7,000. The two largest are Nairobi, the capital, with 266,700, and Mombasa, the port, with 178,400. The total population counted in the August 1962 census was 8.67 million, in contrast to the 1948 census count of 5.4 million. The population is increasing at a rate of approximately 3 percent per year and will double in about 25 years. Urban populations are doubling at roughly twice this rate (*2*). Children under 15 account for slightly more than 50 percent of the population.

The economy rests primarily on agricultural products—tea, coffee, pyrethrum, sisal, wattle, and animal and dairy produce, with soda ash the most important mineral. There are no primary industries, but existing secondary ones produce manufactured food, beverages, tobacco, footwear, wearing apparel, wood, metal, and rubber products.

An agricultural revolution has been taking place in land consolidation and peasant settlement. Traditional shifting agriculture has given place to settled farming, fragmented holdings have been consolidated, some enclosure of common land has taken place, and village life

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initiated. Security of land tenure and consolidation of holdings has permitted the introduction of better farming methods and improvement of land usage, and crop production has improved rapidly.

The economy has a dual base (*3*), with the bulk of the population existing on a subsistence peasant economy and a modern monetary sector, based on the specialized production of cash crops, contributing more than three-fourths of the value of total production. The line between the two is rapidly becoming indistinct owing to the agricultural revolution and the entry of the African into the monetary market.

The table indicates the growth of population, per capita output, and expenditure for health between 1948 and 1961. The 1948–56 period was one of unparalleled expansion, but since 1957 there has been a definite retardation in the rate of expansion of the economy. Although the yearly value of the net cash product per capita rose from £13.6 to £30.8 over the 13 years, the depreciating value of money means that economic growth has barely kept pace with the population growth. (The value of the East Africa shilling is tied to that of the United Kingdom shilling.)

The expenditures for health listed in the table are for the public sector only; however, expenditures for the private sector, voluntary and mission hospitals and private practitioners, probably would not increase the totals by more than one-third. The growth of actual expenditure on health services between 1948 and 1956 is a reflection of the total monetary expansion, the proportion remaining constant at slightly more than 1 percent, whereas the increased expenditures on health services between 1956 and 1961 is caused by a greater proportion (2 percent) of the gross domestic product being allocated to health. This was probably due to a central government grant to local health authorities of 50 percent of their net expenditure on health, introduced in 1957. This stimulus had a one-time effect, and the grant has been frozen at the 1958 ceiling.

A policy of universal education has been adopted and at present 90 percent of the boys and 50 percent of the girls enter primary schools. Although the number of those receiving secondary education has doubled over the last 4 or 5 years, only some 13 percent of those completing primary school in 1961 entered secondary schools. In 1962, 3,274 students including 1,372 Africans were candidates for the school certificate, and in 1965 the number is expected to rise to 4,727, including 2,194 Africans. Estimates of the number of candidates for the higher school certificate follow:

Group	*1962*	*1963*	*1964*
African	166	240	250
Asian	100	160	180
European	200	200	200
Total	466	600	630

Of these, it is expected that some two-thirds will reach university entrance standard.

Although education is recognized as an essential prerequisite for economic development, unfortunately education in the early stages largely absorbs its own graduates to meet expanding services. The priority at the moment is probably expansion of secondary schools rather than primary or higher education facilities. At present education absorbs some 17 percent of the expenditure of central government (*3*) and 43 percent of the budgets of African district councils (*4*), or about 5.4 percent of the total gross domestic product (*5*).

Medical and Health Services

Medical and health services are organized through both central and local government, supplemented by voluntary and mission hospital and dispensary services. The central government through the Kenya Ministry of Health and Housing and its medical department has a small directorate which administers a state hospital service, advises on all medical and health matters, determines policy and planning, and supplies a central epidemiologic intelligence bureau, a pathological service, an insectborne diseases unit, and training, health education, and research facilities. Local government is responsible for environmental and personal health services through ambulances, dispensaries, maternity units, and a network of rural health centers.

The approximate gross expenditure on health in 1961–62 was £3.27 million by central government inclusive of development funds, and £1.5

million by local government. With a population of 8.67 million, the public expenditure on health and disease averages 11s. per person and is equivalent to some 2 percent of the gross domestic product compared with a general average of 4 percent for developed countries.

This expenditure provides for a national consultative service and hospital complex with a full range of facilities, 6 regional centers and hospitals of some 250 beds each, 32 district health services and hospitals, 23 cottage hospitals, 140 health centers, 20 health subcenters, and a network of 366 dispensaries. The total of 6,424 government hospital beds is supplemented by 3,944 voluntary and mission hospital beds, to average 1.2 beds per 1,000 population.

Some comparable statistics on another African country may be enlightening. With 7 million population, the nation budgeted £10.5 million in 1961–62 for health services, or 30 s. per capita. The expenditure provided 0.5 government hospital beds of a total of 0.77 beds per 1,000 population and 46 health centers, half functioning and half under construction (*6*).

Public Health Philosophy

Kenya is faced with a formidable range of diseases and health problems complicated by the changing patterns of many diseases from endemic to epidemic. It suffers also from a broad prevalence of poverty, ignorance, and squalor, not the least of which is chronic undernutrition and malnutrition.

A decision had to be taken on whether priority should be given to a broad ecological approach to health or to consecutive specific disease eradication programs. Emphasis has been given to the broad approach, based on the concept of medicine as a liberal humanity and the serving of the family's daily needs. The services regard the essential social unit as neither the individual nor the community but the family, either the Western biological family unit or the extended family unit or clan.

This broad approach has led to the integrated pyramidal structure of the services and the referral system. A national health service cannot exceed the efficiency of its smallest basic unit. The importance of this basic unit, the rural health center in Kenya, cannot be overstated, for it is the foundation for the whole superstructure of the health service. This view is diametrically opposed to the attitude that a health service is an infrastructure suspended from the pinnacle of the ministry. It is at the level of the basic health unit that integrated medicine that is curative, preventive, and promotive is practiced, the participation of the public is effected, and an approach of active interference rather than passive acceptance is instituted.

The faith of the people is in curative medicine, but not always is the Western view of the etiology of disease accepted. Many, while turning to Western medicine for the immediate cure, also seek the traditional healer for eradication of the cause. It is in this knowledge of faith in Western therapeutics that the integrated approach has been adopted.

The Referral System

An analysis of patients attending a regional hospital showed some 40 percent are from within a 5-mile radius, 30 percent from 5 to 10 miles, 15 percent from 10 to 15 miles, and the remaining 15 percent from beyond 15 miles. Analysis

Population, gross domestic product, per capita output, and health expenditures, Kenya, 1948, 1956, and 1961

Year	Population (millions)	Gross domestic product (millions)	Per capita output per year	Gross health expenditure (millions)	Per capita health expenditure	Percent of gross domestic product spent on health
1948	5. 4	£73	£13. 6	£0. 8	3 s.	1. 1
1956	6. 51	193	29. 7	2. 4	7 s. 4 d.	1. 2
1961	7. 29	225	30. 8	4. 77	[1] 13 s.	2. 1

[1] Population according to the 1962 census is 8.67 million so that current expenditure per capita is nearer 11 s.

of a district hospital's patients provided the following percentages.

Residence	*Inpatients*	*Outpatients*
Township	50	89
Outside town but within 25 miles	21	7
25–50 miles	18	3
More than 50 miles	11	1

Thus the basic unit in the structure should serve an area not exceeding a 10-mile radius. Economic necessity dictates that if a service is to be provided to all the people all the time the cost must be low, and therefore the standards of care must be modest. It is equally necessary to provide centers where more skilled attention and care are available. These create a system in which patients are referred from the periphery to the center at a steadily rising standard of care and cost.

A rough analysis reveals the following costs per patient per illness.

Facility	*Cost per illness (shillings)*
Dispensary	2
Health center	4
District hospital (average stay 7 days)	84
Regional hospital (average stay 10 days)	170
National hospital (average stay 22 days)	374

Because of the slow growth of the economy mentioned previously, the planning of health services cannot be tied to a marked increase in the per capita output but perhaps could be charted on the probability of allocating an increasing share of the gross domestic product to health, up to the generally accepted level of 4 percent.

For these reasons, the referral system is the only logical way to supply a service at a modest level to all the people and yet to provide, at the same time, the highest standards of care to those in urgent need.

The dispensary, which is still the smallest peripheral unit, is now outmoded, and the intention is to expand them into health subcenters. These are a more economical version of the health center with less skilled auxiliaries but still embodying the principle of integrated, comprehensive medicine. Whereas the health center practices definitive diagnosis and administers therapeutic medicine, the dispensary is staffed by a single dresser who practices symptomatic diagnosis and placebo treatment (*7a*).

Allocating Health Resources

With the development of the basic health unit throughout the country in sufficient numbers it becomes possible to contemplate, in addition to the general daily services, the mounting of special campaigns. Factors considered in attacking specific diseases have been the availability of effective preventive therapy, the cost, and administrative feasibility of achieving a measure of success. The three main tools for this task are the vaccines, the chemoprophylactic drugs, and the residual insecticides.

Although the objective of eradication is not questioned, it is considered that the approach through the basic health unit, achieving control as a first step, the circumscribing of the disease, proceeding to practical elimination, and thence to eradication is a logical orderly procedure. Such an outlook is in conformity with the World Health Organization's recently expressed views on malaria eradication by three steps: a pre-eradication campaign, an active eradication program, and a post-eradication active and passive surveillance phase (*8*). Moreover, it makes feasible an immediate start on programs for which contemplation of the economic costs of eradication would enforce delay.

Personnel. Kenya's needs for trained staff, professional, paramedical, and auxiliary, are almost unlimited. Sir John Charles in the first Rock Carling lecture (*9*) stated, "It has been estimated that for a typical under-developed country of 10 million people the provision of a doctor [to] population ratio of 1 to 5,000 inhabitants would involve an annual out-turn from the medical schools of 300 or more doctors per annum; this in turn would depend on secondary schools passing out annually some 7,000 to 8,000 more boys and girls at the standard of university entrance."

Thus, for Kenya some 270 doctors per year are required and 3 to 5 medical schools. The same number of medical schools is arrived at by calculating 1 medical school per 2.5 million population. In Africa as a whole, the proportion of medical students to other university students

is about 8 percent (*10*). Statistics on higher education cited previously underline the impossibility of achieving such an output, either now or in the near future. At present, Makerere Medical College of the University of East Africa graduates approximately 15 Kenya physicians annually.

In one African country with a population of 2.5 million and a national budget of £13 million, it is estimated that a medical school, excluding the capital cost of £5 million, would absorb 1½ times the entire cost of the medical services to that country, two-thirds of the present cost of all educational services, and 13 percent of the total budget of the country. It is evident, therefore, that limited economic and educational resources require that Kenya's health services be planned for many years to come around a cadre of medical and health auxiliary workers.

The same situation, but to a lesser degree, holds true for other personnel. Most health workers will be substitutes for rather than assistants to professional personnel. As a corollary, it seems essential to concentrate professional personnel at district, regional, and national centers and to obtain postgraduate studies for them so that they may be used in advisory and consultative roles.

Health centers. Probably the greatest health need in Africa today is for a good general practitioner service with the emphasis on social medicine, and the rural health center program is designed as a substitute for this. Such units should be designed on a modest scale if the whole population is to be served. Accordingly, plans for Kenya were laid in 1946 and began to be implemented in the early 1950's. At that time the first step envisaged was to provide 1 unit per 4,000–5,000 families, and some 250 were required. Costs were £1,500 recurrent annually and about £3,000 capital; today recurrent costs for a single unit are approximately £3,300 per year and capital outlay between £5,000 and £10,000. These targets seemed to be both economically and educationally feasible. Yet in 1963, with a population of 8.67 million and only 140 health centers and 20 subcenters constructed in the interval, some 300 more are needed.

A reappraisal of the situation led to the concept of subcenters as a simpler version of the health centers, more emphasis on mobile units, and the development of intensive areas, where full health center activities are practiced, and extensive areas, where only simple outpatient facilities and environmental sanitation is possible.

The 15–20 per year rate of development of rural health centers has led also to the necessity for a special National Reference Health Centre, where training, evaluation, and research can be strengthened. A comprehensive review of health centers in Kenya appears in the published papers of the Fourth Conference of the East African Branch, Society of Medical Officers of Health, held in January 1960 (*7*).

Dental health. Dental health services usually lag behind the development of other health services by many years because they cannot compete with the clamor of other demands, such as maternal and child health needs, and because the demand is usually accompanied by claims for the production of yet another cadre of trained workers. Filling this gap means further inroads on limited economic and manpower resources. One country of some 90 million population was extremely proud of a dental auxiliary school producing some 20 trained workers per year, at considerable cost. Yet such an effort can accomplish negligible results.

It would seem more logical to examine the priorities for developing such a service. These are relief of pain, recognition of early precancerous lesions, simple dental extractions, and oral hygiene. Such instruction could be incorporated in the training of existing medical and nursing auxiliaries without undue strain and would have an immediate practical effect throughout the country.

Mental health. Mental health services likewise tend to be dealt with cursorily by the provision of a few hospital beds. Throughout Africa it is estimated that 1 percent of the population is in need of psychiatric attention; in Kenya, more than 80,000 persons. Kenya's single mental hospital of 637 beds represents 0.07 beds per 1,000 population and 6 percent of the total hospital beds, which are usually heavily overcrowded.

Instead of attempting the impossible, a considerable increase in mental hospital bed capacity, as a first step small psychiatric units are

being added to each regional hospital for maximum turnover of acute cases using modern convulsive and drug therapy, and especially trained auxiliary nursing staff are being provided. Second, the main care for most patients will have to remain on an outpatient and home basis through the rural health centers. Such a plan demands that relatives be freed of fear of the mentally ill and that existing auxiliary personnel receive supplementary training in early recognition, simple treatment and care, and aftercare services. Such training is now being instituted at the National Reference Health Centre.

Finally, until a mental health service is achieved which can cope adequately with all patients, it would be unwise to disturb the existing structure of traditional witch doctors who are faith healers. There should be, at least, friendly recognition of their value and attempts to improve the understanding between the traditional healer and his modern counterpart.

Maternal services. The birth rate in Kenya is one of the highest in the world, an estimated 50 per 1,000 population, or a new birth group of more than 400,000 annually. With a falling infant mortality, now about 160 per 1,000 live births, a lessening of maternal and child health demands cannot be expected for many years to come.

An antenatal service based on monthly or fortnightly visits would be an impossible task for the nursing staff, and to attempt to provide a complete maternity hospital service for accouchement would require more than twice the total hospital bed capacity. The first objective is to strive to examine every expectant mother at least once before confinement. The timing of such an examination is of highest importance and between the fifth and seventh month would seem optimal, sufficiently late to recognize abnormalities and sufficiently early to apply corrective measures. Such a time fits neatly with the custom of some tribes of holding a ceremony to foretell the nature of the birth. Achievement of the objective today varies from a low of 1 percent in the more backward areas to as high as 70 percent in the more developed ones.

Hospital maternity beds must obviously be reserved for abnormal cases. These beds are supplemented by maternity wards of 4 to 6 beds at each rural health center for primipara, patients with unsatisfactory home conditions, and patients from remote areas. Adherence to the tradition of domiciliary delivery for normal pregnancies is necessary for many years; therefore the cooperation and education of the local untrained midwife is essential. Similarly, in respect to child health care the first priority must be given to those in need before enlarging services to include all children.

Choices in Combating Diseases

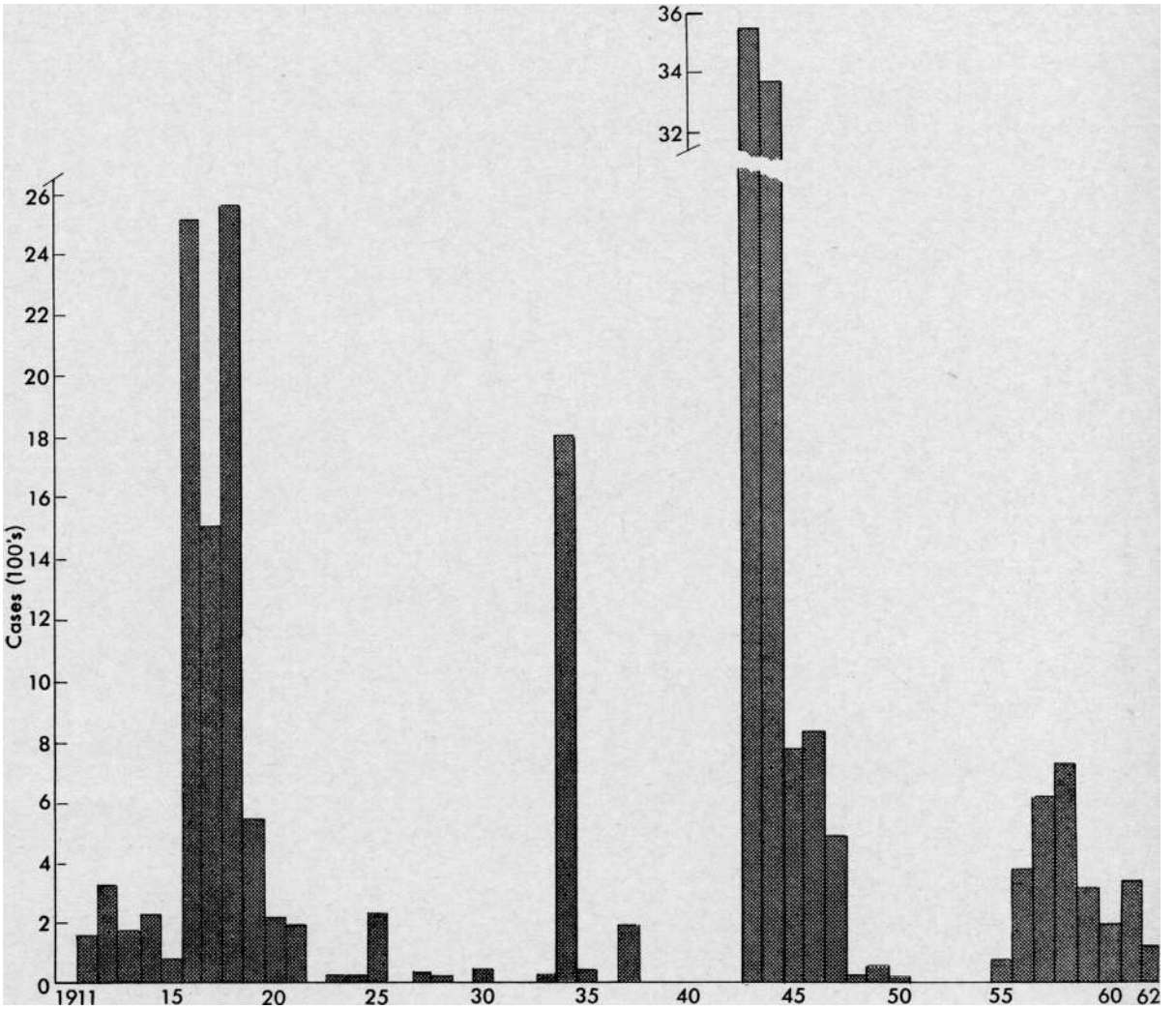
Although many achievements in health in Kenya can be attributed to modern medicine, much remains to be done. Cholera has not been seen since the turn of the century, plague has been confined to three small foci, epidemic relapsing fever and typhus eliminated, onchocerciasis eradicated. Yet other diseases, such as sleeping sickness, kala-azar, malaria, hookworm, and bilharziasis, persist.

Fortunately, many of the major endemic diseases occur mostly in zones or regions; for example, hookworm at the coast and in the Lake Victoria basin, kala-azar in the Northern Frontier District and in a belt lying in the shadow of the foothills of the highlands from northwest to southeast, trachoma in the hot, dry pastoral areas, and respiratory diseases and tuberculosis being more prevalent in Central Province. The distribution follows the pattern of tropical, subtropical, and temperate climes. Combating several diseases simultaneously is not only desirable but feasible.

The following four diseases have been selected for mention not for their relative importance but to illustrate distinct aspects of planning.

Smallpox. The history of smallpox in Kenya has been described (*11*). Apart from the change in its epidemiologic pattern from importation of cases via the coastal ports to importation from the land boundaries and from variola major to variola minor, the most interesting observation is apparent from figure 1. All major epidemics have occurred during or shortly following periods of stress; World War I, the 1934 epidemic following retrench-

Figure 1. Reported cases of smallpox, Kenya, 1911–62



ment of services during the economic depression, World War II, and the civil disturbances of the 1950's.

The paper cited drew attention to the need for a continuing effort to maintain the vaccination status of more than 80 percent of the population rather than relying on periodic mass campaigns and constant vigilance.

Smallpox may be used as an indicator of the efficiency of the health service; the case figures reveal the very thin margin between adequacy and inadequacy that prevails, with any undue strain causing a breakthrough.

The incidence of smallpox for the entire African continent today is 15 per 100,000. In Kenya's neighbors it is 10 per 100,000, but in Kenya, as the result of continuous efforts, the rate in 1962 was 1.09 per 100,000. No specific eradication program was declared in Kenya because of the impossibility of establishing an effective cordon sanitaire on the land frontiers. Under the circumstances existing in Kenya and in contiguous areas, eradication campaigns are not feasible, but the long-term objective of eradication may be approached through continuous control measures.

Yaws. Perusal of the annual reports of the Kenya Medical Department reveal that yaws was reported as early as 1902 from the coast, and in 1906 was stated to be common among the Kavirondo (Nyanza). A 1917 survey in Central Province revealed that yaws was almost

universal, and in 1920 mission physicians estimated that 90 percent of the population in the Kikuyu reserves had at one time or another been affected by yaws (*12*).

In the early 1920's anti-yaws campaigns were instigated, first with novarsenobillon; some 22,000 cases were treated in 1922. By 1923 bismuth was replacing novarsenobillon and the campaign was intensified so that between 30,000 and 70,000 cases a year were treated for the next 5 years. Following this intensive campaign cases dropped to between 10,000 and 12,000 annually during the 1930's. For the World War II period returns are not available, but in the late 1940's 9,000 to 11,000 cases annually were reported.

During the 1950's there has been a steady and continuous diminution of yaws cases reported (fig. 2). It was during this period that the growth of the rural health centers was achieved, and penicillin became liberally available to the people, but no special anti-yaws eradication measures were undertaken.

Figure 2. Number of yaws outpatients, Kenya, 1950–61

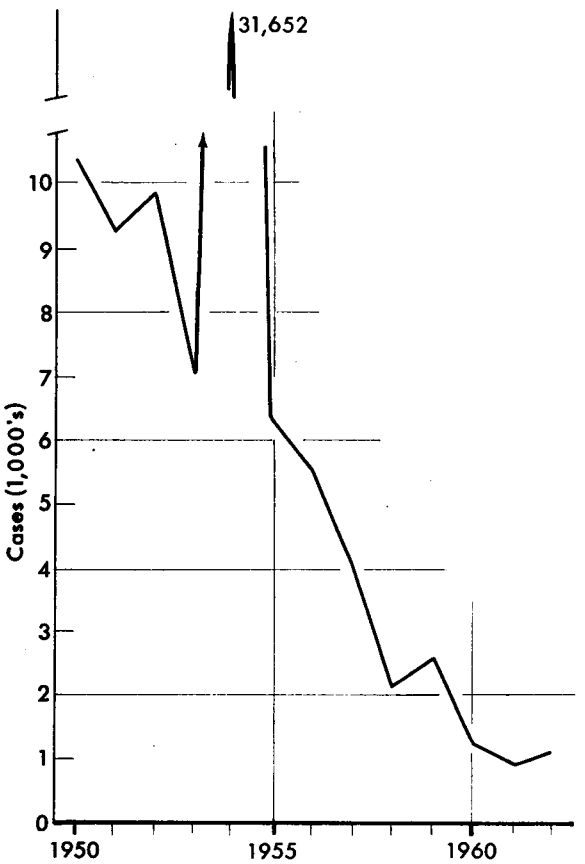
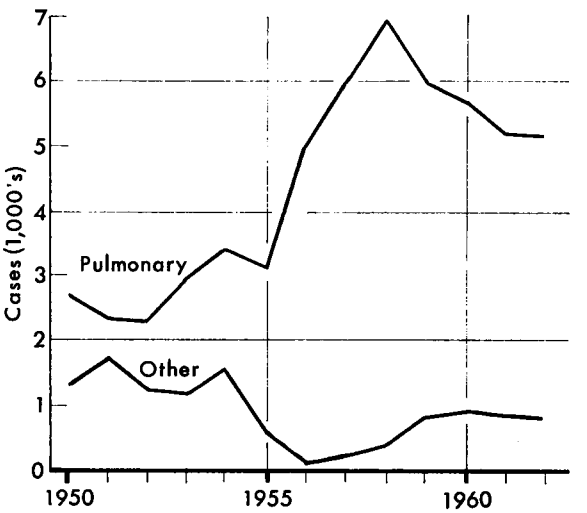


Figure 3. Reported cases of pulmonary and other types of tuberculosis, Kenya, 1950–62



Whatever reasons underlie this decline in prevalence, and it is conceded that a serologic survey might reveal a hidden residue, the drop in the number of yaws cases illustrates the law of diminishing returns, or the potential suicide of a disease once a breakpoint is reached. Among a multiplicity of problems and diseases, yaws must lose priority to others clamoring for attention, tuberculosis for example.

Tuberculosis. Tuberculosis had long been recognized as being prevalent throughout Kenya, but not until the advent of effective therapeutic agents, streptomycin and isoniazid, was there an organized attempt to cope with it. This commenced in the early 1950's with provision of some 500 tuberculosis beds in hospitals, the number later rising to 800 at national, regional, and district levels (fig. 3).

The size of the effort was limited by the relative expensiveness of the cost of treatment per patient. With the advent of paraaminosalicylic acid, this cost was more than halved, an outpatient domiciliary regimen became a practical possibility, and the effort was intensified. More recently, TB1 (thiosemicarbazone) has been proved effective in Kenya, and the cost of a dual drug regimen has dropped to a quarter of the previous regimen, permitting contemplation of a further intensification.

Research and survey programs by the Medi-

cal Research Council of East Africa and the United Kingdom and the World Health Organization accompanied this field effort. These investigations included chemotherapeutic trials and evaluations to establish the prevalence and to determine factors such as tribal and geographic prevalence, rural-urban interplay, and vulnerable sections of the population.

Increasing interest in tuberculosis stemmed from the introduction of cheap effective drugs for domiciliary treatment, and a need for further epidemiologic information was obvious. A WHO survey (*13*, *14*) was initiated in 1958 and, in an estimated population of 6 million, revealed approximately 110,000 cases and suspected cases of pulmonary tuberculosis among adults and older children. Some 40 percent of these groups are considered to be sources of infection. In addition, 3 percent of the 0–4-year age group are infected, and 13 percent of the 5–9-year age group.

Despite the intensive secondary prevention campaign of active casefinding, contact tracing, and chemotherapy and chemoprophylaxis during the last 6 years, it is doubtful if the reservoir of infection has been substantially reduced. The survey warned that the status of the disease is complicated by its high endemicity in a rural population scattered over vast areas and that it would be unwise to assume that the present high rate of dissemination of infection will not be maintained unless large-scale measures are adopted, including a BCG vaccination campaign.

It is now proposed, with the advent of freeze-dried BCG vaccine of undoubted potency and cheapness, to intensify the effort by promoting a primary prevention campaign, the BCG vaccination of children. Such a decision is not lightly made, for, working within fixed financial and manpower resources, it means a diversion of some effort from the secondary prevention campaign. In effect, it means a sacrifice of today's sick in the interests of tomorrow's children.

As Weller (*15*) states, "One needs to channel limited resources carefully into preventive activities, being ever aware that the promotion of curative services for the welfare of the few will postpone benefits that would accrue to the many."

Malaria. Malaria is ubiquitous in Kenya, ranging from endemic through hola-endemic to epidemic and undoubtedly is a major contributor to much ill health. To mount a specific malaria eradication campaign would mean an estimated direct cost of approximately £9 million, or £1 per capita; however twice this cost is a more generally accepted figure. Such a campaign is financially impossible although considered technically feasible.

In terms of the pre-eradication, eradication, and post-eradication phases, Kenya is still in the pre-eradication phase of building up a satisfactory basic health unit structure and training staff in antimalarial measures; without this it would be courting failure to mount a national eradication campaign.

In the interim, a focal or zonal approach is being followed. Areas at special risk and those of economic potential and special social importance have been selected for attention. Urban areas, large and small, are controlled. Nandi, an area of 100,000 population where epidemic malaria affected more than 50 percent of children, was tackled on classic lines—drug prophylaxis (pyrimethamine) for 2 years, residual insecticide for 3 years, active surveillance for 2 years, and presently passive surveillance. Similar specific attention is given to irrigation schemes, settlement schemes, and coast resorts.

The concept of malaria eradication put forth in past years by malariologists has led to "control" becoming a dirty word and the adoption of an all-or-nothing attitude. Eradication is undoubtedly the objective, but there is not necessarily only one method of achieving it. Perhaps an immediate approach through focal control measures is more beneficial than no action because of inability to mount a national campaign. Such an approach at least has the merit of health educating neighbors and of achieving an immediate lowering of mortality and improvement of health if only in a local area to a limited degree.

The Nandi antimalarial project has cost a total of 9s. (U.S. $1.25) per capita of protected population for the past 10 years (J. M. D. Roberts, unpublished paper) compared with the generally accepted estimate for eradication of £2 (U.S. $5.60) per person. If one accepts the £2 figure as a reasonable cost for an eradica-

tion campaign during a 5-year period, it would mean a 60 percent increase in the annual health expenditure, or a comparable recession of other health services.

Environmental factors. A recent paper on public health aspects of urbanization (*2*) illustrated how the rise and fall in the incidence of typhoid and cerebrospinal meningitis could be related to living conditions and movement of people from hastily erected emergency villages to permanent villages with hygienic housing, safe water, and safe conservancy and back again to temporary homesteads on individual farms.

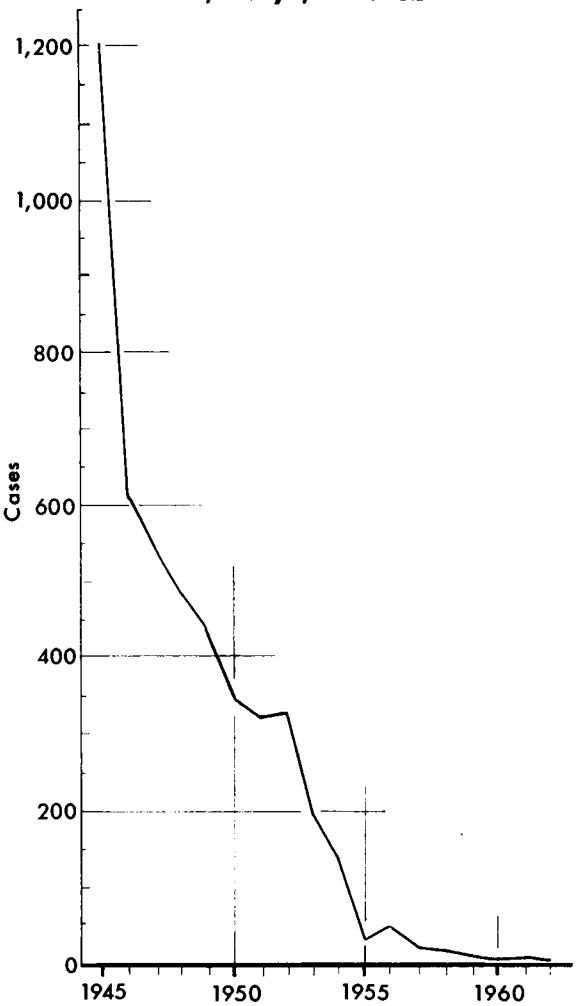
Walton (*16*) in his review of *Ornithodoros moubata* in relation to the epidemiology of human relapsing fever reveals an even more dramatic picture of the influence of home living conditions on the incidence of disease.

He points out that the incidence of relapsing fever is highest among the Bantu-speaking tribes, that the Bantu in recent times live under static conditions on a vegetarian diet, and that women as the "hewers of wood and drawers of water" have little time for the more domestic duties of normal housewives. Such conditions encouraged tick infestation. Pastoral tribes, on the other hand, restrict their womenfolk to home activities, and by constant repair to their houses keep the hut free of vermin.

Walton states "Generally the use of BHC (benzene hexachloride) convinces the African that the European means what he says. The African also knows that supplies of BHC could not be relied upon in rural areas and is interested in any simple and effective remedy. In all areas the simplest remedy is good housekeeping; in other words the adoption of the methods used by the pastoralist tribes, but in improved dwellings. Frequent repair to plastered walls and floors, the use of bedsteads, the elimination of domestic animals and fowls from the house, introduction of windows and, above all else, improved design of houses. In Kenya the process of improvement has been going on imperceptibly for a number of years. The reduction in the incidence of relapsing fever is illustrated" (fig. 4).

Improvement in housing, sanitation, and water supplies is at least as important as special

Figure 4. Reported cases of tickborne relapsing fever, Kenya, 1945–62



or specific antidisease measures. The contribution of these environmental factors to health are incalculable. In the deployment of slender resources the balance between expenditure on environmental improvements and on attacks on specific diseases must be carefully weighed.

Many other situations and diseases could have been mentioned to illustrate facets of planning. Some examples are the changing epidemiology of poliomyelitis from endemic to epidemic and the advent of oral vaccines, the emergence of kala-azar from low endemicity to high epidemicity and the need for epidemiologic research, the approach to hookworm, tapeworm, and beef cysticercosis, the common infectious diseases such as whooping cough, nutritional poverty in the midst of plenty, the general dis-

tribution of leprosy and campaigns for prevention, trachoma and the pastoral areas, and the advent of *Glossina pallidipes*-borne Rhodesian type of sleeping sickness in addition to the *G. fuscipes*-borne Gambian form and planning for eradication and settlement rather than control of sleeping sickness.

But sufficient information has been presented to delineate the stresses of planning for a limitless array of demands with strictly limited manpower and finances and to underline the advantages of an approach based on the development of the health center, the fundamental unit in the structure of a health service.

Conclusions

In planning health services in newly emerging countries cognizance must be taken of three cardinal factors: limited economic resources, a paucity of trained manpower, and the rate of population growth. Lack of long-term planning and resort to short-term idealistic demonstration projects not capable of countrywide application can only lead to frustration and lack of real progress.

The attempt to apply the practices of materially more advanced countries leads to failure; what must be applied, with knowledge of local circumstances, are the principles underlying such practices. The dilemma is not what to do but how to do it with limited resources and how to decide the priorities.

The problems of Kenya are cited to illustrate the planning of health services and the choices and methods of combating disease. By developing first the rural health center as the foundation of the public health service, an attack can be mounted on a broad front. Such a plan may be unspectacular but is certain of eventual success. Wise expenditure of limited resources demands waiting for the opportune moment and selection of priorities in attacking diseases with such tools as the vaccines, chemoprophylactic drugs, and residual insecticides.

Health services are often accused of hindering progress rather than improving health by their effect on population trends. It is incontrovertible that health will not improve until living standards improve. These, in turn, are dependent on the economic development of national resources. If public health is to provide the right conditions to produce a healthy population which can develop the economic resources of the country then, although the long-term plan must cater to the total health needs of the entire population, perhaps short-term plans should give special attention to those groups who are the intellectual and manual producers of the immediate tomorrow.

In effect, what is advocated is strict adherence to the objective of the World Health Organization's definition of health; "Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity" as the most effective means of improving health. In recent years it has been fashionable to give priority to the achievement of "absence of disease" through eradication programs; this article is an attempt to redress the balance and to call attention to the first half of the definition.

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FDA Listing of Approved Drugs

With publication in the Federal Register of August 6, 1963, of listings of new drugs approved as safe and effective under the Federal Food, Drug, and Cosmetic Act, as amended by the new Kefauver-Harris law, the Food and Drug Administration gave its first public notice of new drug approvals. The list covers applications approved during the period from enactment of this law on October 10, 1962, through May 31, 1963. Subsequent lists will be published regularly.

Previously, under the 1938 law, clearances of new drugs were based on review of safety data submitted by drug manufacturers. There was no Government approval of drugs. Under the 1962 amendments, clearance of a new drug requires a conclusion by the FDA from the submitted medical data that the drug is both safe and effective, and the Government formally approves the drug for distribution in interstate commerce.

Listings are for the information of the medical and dental professions, veterinarians, and pharmacists. They are not intended to advise the professions or the public about the use of the drugs. Manufacturers are required to place in packages of prescription drugs an insert giving full details, such as indications for use, dosage, and any side effects and hazards. Drugs sold without prescription are required to have adequate directions for use and necessary warnings on the label.

Reprints of future new drug listings will be sent to interested persons upon written request to the Division of Public Information, Food and Drug Administration, Washington, D.C.