Health and Disease in Rural Ethiopia

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Ethiopia, among the world’s poorest countries, suffers from a full spectrum of health problems. A plastic surgeon and a public health physician present their experiences in Sidamo province in the Rift Valley.

Ethiopia has come to world attention recently in the wake of widespread famine in sub-Saharan Africa, followed by a military revolution with overthrow of its Emperor, Haile Selassie.

Ethiopia is among the poorest countries of the world. Its population of approximately 27 million is largely rural (90–95% by various estimates), with great extremes of wealth and poverty. Half of the farmers are tenants on land owned by a small number of feudal landlords. Sharp class distinctions are based on both wealth and tribal identity. Amharas are the most prestigious and wealthy. Theirs is the declared national language, although many do not speak it at all. The per capita income is about $80 (U.S.) per year, and has actually followed a decreasing trend as foreign revenues from sale of agricultural products are invested in industrial development (3).

The national Ethiopian Christian Orthodox Church, an early offshoot of Christianity, has been closely identified with the ruling class and the Emperor; it has owned between 25 and 40% of the land (3), and has been a conservative force in the country’s development. The Church has been prominent as a cultural force in Ethiopia for centuries, contributing to its art, architecture, and daily life. Half of Ethiopia’s people are Christian; the rest are Moslem or subscribe to animist religions.

Much of the Ethiopian terrain is rugged and mountainous, of volcanic origin. Low-lying areas are hot and dry, rainfall increasing with altitude. The rainy season lasts from June to September, with little precipitation the rest of the year (6). Malnutrition and disease vary with the seasons but, at best, existence is marginal for the rural majority. (See Fig. 2.)

The basic food of Ethiopia is millet (teff), a grain which is made into a pancake-like bread called “injera.” Injera is eaten alone, or with various extremely spicy mixtures (wat), generally vegetable in composition, infrequently containing meat for the average family. Pastoral nomads also use dairy products. The Ethiopian Christian religion has many fast days, which further interfere with caloric intake.

The vast majority of people are illiterate. The lack of news media outside the few urban areas effectively isolates the literate and semiliterate. Numerous tribal languages increase communication difficulties.

Despite repeated government plans aimed at improving health, progress has been slow. Scattered government clinics have been established, although medical personnel and facilities are concentrated in urban areas. Various foreign Christian missions provide a substantial part of the medical care available in the country. In 1972, there
were 374 doctors for Ethiopia’s 27 million people; 250 of these were non-Ethiopian nationals (3).

In 1971, the Ethiopian population growth rate was estimated at 2.1%, with a fertility rate of about 45 live births per 1000, and crude death rate of 24 per 1000 population. The infant mortality in 1972 was over 162 per 1000 live births. The estimated life expectancy at birth for East Africa (applicable to Ethiopia) is about 42 yr.
The population age structure is typical of countries with high birth rates—a large young dependent population (56% are less than 20 yr of age), and proportionately few elderly. Vital statistics are summarized in the Syncrisis reference (3).

The present average population density of 53 persons per square mile (1) is expected to increase to about 70 per square mile by 1978 (3). The rate of natural increase has also been predicted to increase, to 2.3% per annum by 1975, and 2.8% by 1982 (3). The present population of Ethiopia will double in less than 30 yr at the present growth rates. This anticipated population increase, given the feudal nature of Ethiopian land ownership and the marginal existence of most of its people, presages increasing malnutrition and disease, as well as political and social instability, unless the new military government addresses land reform and other national problems in a prompt and concerted fashion.

THE MEDICAL SETTING

In January and February, 1974, we spent nearly 2 mo working as physicians in a mission hospital in Sidamo province, in the south-central part of the country. It is situated at about 7000 ft above sea level, on the western escarpment of the Great Rift Valley. This article presents some of our observations and commentary.

The 120-bed hospital (Fig. 1), operated by the Sudan Interior Mission (recently renamed the Society of International Missionaries), is near Soddo, a town of about 10,000 in the Wallamo tribal district, some 300 miles south of Addis Ababa. Access is by dirt track road. The hospital’s main focus is on curative medicine. It is staffed by a hardworking team of one general surgeon, one general practitioner, six to eight American nurses, and a number of dressers—Ethiopian paramedical personnel—most of whom have been trained at the hospital’s dresser school. Hospital laboratory services are minimal, but functional, providing hematocrit, white count, typespecific blood, urinalysis, stool examination for parasites, and tuberculosis and malarial blood smears.

S.I.M. Hospital at Soddo receives patients from a catchment area of some 3 to 4 million persons, including Sidamo province, as well as neighboring areas even as far as Addis Ababa. Sidamo province itself has about 2.5 million inhabitants, with the highest concentration in the Soddo region, where the population density is about 557 people per square mile (1).

The only other health facility in the area of Soddo is a small out-patient government clinic staffed by an Ethiopian health officer and several other lower personnel. The clinic carries out smallpox and BCG vaccination, and provides some direct medical care.

MEDICAL PERSONNEL

There are some 4000 dressers in Ethiopia, trained at 24 centers; training ranges from 1 to 3 yr. The dressers are the most numerous medical personnel (3). While they tend to be concentrated in urban areas, they also function as physicians in remote areas, with only minimal support and supervision, if any.

At the S.I.M. Hospital dresser school, dresser students were admitted after 6–8 yr of basic schooling into a dresser-training program which required an additional 2 yr of classwork and 1 yr of practical experience. During this time the dressers learn to set fractures, suture lacerations, change dressings, and diagnose and treat common illnesses. The few dressers out of each class who stay on to work at the hospital may also learn to be surgical assistants, to perform paracenteses (for ascites) and
thoracenteses (for tuberculosis), do eyelid surgery for trachoma, and take skin grafts.

Other sources of medical care are dressers in independent practice, and "wogeshas" (surgeon-herbalists), the traditional medical practitioners. The wogesha's skills are passed from father to son, and include setting fractures, pulling teeth, blood-letting, dispensing of folk medicines, and cautery for a variety of conditions.

Transportation difficulties further limit access to what medical care is available. Patients walk, ride donkeys, or are carried for hours or days in order to reach the more central facilities.

HEALTH CONDITIONS IN SIDAMO PROVINCE

Health conditions in the Soddo area strain the imagination. Much of the pathology is related to conditions most appropriately remedied by public health and simple sanitation measures (5). As the only comprehensive medical care facility in the area, however, the S.I.M. Hospital is attended by some 200 patients per day, with a wide spectrum of other illnesses requiring medical or surgical intervention. Perforce, the outpatient clinic, in which most patients are seen by senior dressers, functions as a triage unit for hospital admission, outpatient treatment, or refusal of treatment, if there is not a substantial chance of ameliorating the patient's disorder.

Most people have multiple intestinal parasites, which are treated on an outpatient basis except in cases of extreme dehydration. Typhoid and dysentery are common, with 80% of the households in Soddo itself having no toilets, and 65% of the households obtaining their drinking water from small streams and rivers (3), which serve simultaneous purposes of bathing, laundry, and excrement disposal (Fig. 6). Interestingly, tetracycline resistance appears to be developing in the bacterial popu-
lation around the S.I.M. Hospital, where tetracycline is freely used for a variety of conditions. Provision of clean water and sanitary sewage disposal are probably the most significant public health needs in Ethiopia (5).

Malaria, the nation's most serious disease from an economic standpoint (3), is common at lower elevations, and is more prevalent during the rainy season. In the dry season, it synergistically weakens resistance to other diseases, but was seldom seen as the presenting problem during our stay, except in persons from low-lying districts. The same was true of kala-azar.

Eye diseases are particularly severe during the dry season, when dust and tenacious flies are everywhere. Flies are concentrated around human settlements, as many of the houses are constructed of a mixture of mud and manure, and personal hygiene is poor. Domestic animals sleep in the one- and two-room houses with their owners at night. Trachoma is so prevalent that the dressers are trained to perform eyelid surgery, everting the lashes to prevent corneal scarring. Beside trachoma, other common causes of blindness are smallpox, typhoid, vitamin A deficiency, and kosso-induced optic nerve atrophy.

Kosso is a traditional medicine derived from bark and leaves of a local tree. It is taken for gastrointestinal complaints, and is thought to purge one of worms. Quite often it is also associated with small-bowel perforations and necrosis, bowel obstruction, and lethal diarrhea. Common problems of cirrhosis, nephritis, and optic nerve atrophy are also attributed to kosso by the S.I.M. personnel. A study of the pharmacology of kosso would be interesting.

Another major health problem in Ethiopia is tuberculosis. About one-third of the beds in the medical wards at the hospital were occupied by tuberculosis patients. The pulmonary form of the disease is most common, but it also is frequently seen involving the hip, kidney, and peritoneal cavity. In children, tuberculous meningitis, pericarditis, and osteomyelitis are the most common forms. Tuberculous skin lesions and lymphadenitis are found at any age (Fig. 3). No follow-up or family treatment are available; there is virtually no basic public health mechanism for control of tuberculosis.

Other frequent problems are typhus, leprosy, and schistosomiasis. Rabies is endemic in Ethiopia, and even those who have dogs (for protection from thieves) fear them. Rheumatic fever and glomerulonephritis, the serious sequelae of streptococcal infection, are unfortunately not uncommon. By various estimates on a national basis, 50–80% of the ill are suffering from infectious diseases amenable to basic public health intervention (3).

Venereal diseases are widespread. About one-third of all presenting skin complaints are syphilitic in origin (4). Most of the women on whom pelvic exams were done had evidence of chronic pelvic inflammatory disease. Gonorrhea contributes to the large amount of eye pathology.

Of maternal morbidity and mortality, one can only make indirect inferences. A small central hospital with a large catchment area receives only the worst problems. Horrendous obstetric problems presented daily—prolonged labor, bleeding, shock, incomplete macerated fetuses, and extraordinary circumstances related to cephalopelvic disproportion. The age-specific death rates for women are higher during most of the reproductive years than those for men, attesting to the impact of maternal mortality.

Chronic malnutrition accompanies and exacerbates the entire spectrum of other illness. Rickets, scurvy, xerophthalmia, kwashiorkor, and marasmus are seen even
in the highlands, where the drought conditions have been less severe than at lower altitudes.

Peptic ulcer disease is quite common in the Soddo region, and one could only speculate on possible aggravating conditions—the spicy wats, the familiar kosso, chronic anxiety.

While less tangible than all the physical ills, hostility, cruelty, and anxiety deserve equal billing in the listing of maladies we noted in Sidamo. Physical violence is common, and is the source of most of the autopsy cases done at the S.I.M. Hospital. The cause of death is usually obvious—burning, stabbing, beating. The Arussi tribe, just north of the Wallamo district, requires its young men to undergo ritual circumcision before marriage. They must then prove their manhood by bringing back as a trophy the genitals of some other male; the Wallamos are occasional victims of trophy raids (we autopsied one such victim), and then make retaliatory raids.

Thieving is allegedly common, with roving bands of thieves preying on the more wealthy, unrestrained by the small local police forces. The dressers attribute peptic disease to anxiety about robbers, and are reluctant to treat thieves for any medical condition, lest they themselves be subject to retribution for their ability to identify the thieves to others. Local vigilante groups have been known to torture and execute suspected thieves, and all their male children—"the son of a thief will grow up to be a thief."

PLASTIC AND RECONSTRUCTIVE SURGERY NEEDS

A prodigious clinical volume was seen at this hospital, including large numbers of plastic and reconstructive surgical problems. The village and church elders were the key to disseminating information regarding the current medical capabilities of the hospital in having a plastic surgeon in attendance.

Burns are common. The Wallamo people generally reside in rounded thatch
structures, entirely flammable, in which they live, cook, and keep their donkeys and cows at night, in addition to themselves. A burned-down structure is a common sight, and word has it that setting fire to another's abode at night is a favored form of revenge. Many sequelae to old burns are seen in the population at large. In particular, burn deformities of the hand are frequent. Curiously, most involve the volar side of the hand or wrist instead of the dorsum. Most are sustained by children falling into open fireplaces, and have received neither primary nor secondary care. The full range of available reconstructive techniques are required—contracture release, tendon lengthening, tenolysis, small-joint work, and surfacing by free grafts or flaps where necessary.

Acute treatment of burns differs in that constraints are imposed by the circumstances of limited manpower and resources. The burn wound is treated by open exposure, later debridement, and subsequent grafting. Fluid therapy is sharply limited, due to the high cost and short supply of intravenous fluids resulting from the considerable logistic problems of transportation and funds. Oral fluid management is carried out, quite successfully. The ability to tolerate a burn injury is impressive, testifying to the biologic ruggedness of these people. A dresser was trained during our stay to take excellent skin grafts and apply dressings expertly.

Hand surgical problems were referred to us in considerable numbers. Many paralytic hands, either from leprosy or peripheral nerve lesions, were amenable to tendon transfer work. This was feasible due to the continuity provided by the permanent nursing staff which was skilled in reference to physical therapy and rehabilitation. Quite a variety of other problems, most traumatic, were managed, involving such techniques as thumb reconstruction, arthrodesis, and nerve and tendon repair.

Cleft lip and palate patients provided interesting observations. Adults with clefts could be found in villages and rural areas often. These patients with cleft lip and

FIG. 5. Education is an important function of visiting medical staff. Techniques of cleft lip and palate repair are being shown to S.I.M.'s Dr. Adolph and his surgical assistant dresser.
palate had both repaired in one procedure. These patients postoperatively happened to be the most grateful. Again, the people with clefts do not as a general rule come to the hospital. Then senior members of the society passed on the information that a new surgeon was available who repaired clefts.

Outside of India, one of the largest populations of people with leprosy is in Ethiopia, where 1.5% of the population is afflicted (Fig. 4). It is one of the many significant public health problems. We worked for a while at a leprosarium at Shashamane, also operated by the Society for International Missionaries, where there were an incredible number of patients requiring a variety of surgical procedures.

UNUSUAL MEDICAL FEATURES

Medical diagnosis in rural Ethiopia has certain unique features. The wogesha practitioners use cautery for treatment of a variety of ills, with resultant scarring. Careful examination of the age and pattern of the round burn scars yields information as to the duration of symptoms, their episodic nature, or migration of the focus. For instance, burns over the greater trochanter are often associated with tuberculous hip; on the chest, with pulmonary tuberculosis (sometimes unilateral over the more affected lung!); the epigastrium, peptic disease; next to the eye, trachoma; the lateral parts of the abdomen, nephritis, and renal failure. This therapeutic modality, however, is also at times the source of cellulitis and abscess formation. In one instance, osteomyelitis of the frontal and parietal bones of the skull developed from the "therapeutic" burn holes.

After seeing several cases of invasive carcinoma of the cervix, one could diagnose it in a roomful of people by the fetid odor, and merely confirm its presence by pelvic examination.

Hematocrit and weight are indicators of financial status. While the dressers base economic assessments on a variety of physical and behavioral indices, we found we could usually match their estimates by assuming that anyone who can afford to be well-nourished, will be.

Rabies is diagnosed in classic fashion as hydrophobia—the strong aversion reaction of the patient to water when he is asked to drink it. The rabid are reportedly caged once they become symptomatic, to lessen chances of their infecting others.

Unusual problems such as filarial elephantiasis of the vulvae requiring reduction, nasopharyngeal bleeding requiring the removal of leeches, and snake bite dry gangrene of the hand and forearm were seen daily.

PRIORITIES

The extensive clinical volume demanded the establishment of priorities and the effective allocation of one’s time and energy (2), given that the hospital at which we worked was largely curative in orientation. Generally, the simplest procedure involving the least time and the least cost was preferred. Case and procedure selection attempted to maximize gains and results with the least expenditure of time and resources. Simple procedures were avoided, if they could be done by either the general surgeon or a dresser at another time. Young people received priority over older people, given similar surgical or medical problems. To some extent, selection was also made to maximize teaching value, so that the surgeon’s and dressers’ capabilities would be enhanced (Fig. 5).

The most significant activity in which we engaged during our short time in Ethiopia was education of dressers, in preventive medicine as well as surgical tech-
nique. Dresser training includes a minimum amount of public health and preventive medicine. For example, while able to recite a list of caveats which they always impress upon new tuberculosis patients, the dressers have little or no understanding of the communicable aspects of the disease. The dresser training is oriented toward pattern recognition, triage, and a small therapeutic repertoire. This we supplemented by discussion of public health problems with the dresser students—clean water, sewage disposal, nutrition, recognition of potential obstetrical problems, domestic safety (especially from burns), anticipation of disease by application of epidemiological observations in finding high-risk individuals, and high-risk seasons and locations for certain diseases. The discussions were structured to encourage the students to expand in a creative way upon their own observations and understanding of local conditions.

Since dressers are Ethiopia's most numerous type of health personnel, it would be desirable to enhance their effectiveness in both clinical and preventive medicine. This might be done by the establishment of networks of assistance and supervision, whereby dressers in independent practice could receive continuing education, supplies, and encouragement. Increased attention to preventive measures, not only in theory but in practice, with considerable encouragement and financial as well as moral support, has the potential for making a greater impact on Ethiopia's major medical problems.

Medical practice by wogeshas is accepted by the Ethiopian government; with these practitioners, too, continuing education and upgrading of skills might be feasible.

Like so much of the developing world, Ethiopia has an uncertain future. Proportional to the success of public health programs in lowering the mortality rate, in-
creasing rates of population growth will place added strain on the country’s resources. The challenges of education of Ethiopia’s people and self-determination of the nation’s course will be considerable.

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