

Training Health Workers in Gondar, Ethiopia

FRANZ W. ROSA, M.D., M.P.H.

DEATH is wasteful, and it occurs early too frequently in Africa. Suffering and crippling also come too often to the farmers, the craftsmen, and the school children in the villages. Upon these villagers rests the strength of the land. Most of the sickness which burdens them is preventable.

Ethiopia is an uncrowded country in Africa's highlands, with an estimated 19 million persons living in an area of 350,000 square miles. Only 800,000 of these live in towns with more than 10,000 population. The other 95 percent dwell in widely scattered small agricultural communities. These people are decimated by typhus, intestinal parasites, dysentery, malaria, relapsing fever, and other communicable diseases.

Most of the 200 physicians in Ethiopia have their practices in the towns, the majority in Addis Ababa, the capital. Prior to the establishment of the first rural health centers in 1960, rural dwellers had to find their way to the larger towns for treatment or be content with care by informally trained dressers or untrained healers scattered around the countryside. Sanitation workers were practically unknown outside the capital. Nurse training had only recently been developed and was geared to caring for patients in hospitals.

The Haile Selassie I Public Health College and Training Center was established by the Imperial Ethiopian Government in October

Dr. Rosa is director of the Haile Selassie I Public Health College and Training Center, Gondar, Ethiopia.

1954, with help from the Agency for International Development, U.S. State Department (then ICA), the World Health Organization, and the International Children's Emergency Fund of the United Nations.

Its purpose is to train health workers who are adapted to meet the needs of rural Ethiopia. The three principal types of workers are community health officers, community nurses, and community sanitarians. They are trained to staff health centers which are being established throughout the country by the Imperial Ethiopian Ministry of Public Health. Each center is to provide general services to 10,000 to 30,000 people.

This college is not a second-rate medical school, but a first-rate institution for training health workers who will in many ways be better adapted than medical graduates for the rural health services of this newly developing region in Africa. Elaborate clinical methods have been eliminated from the health officers' curriculum. Such methods can be a handicap rather than a help, since they divert limited resources from the primary task of preventing widespread communicable and nutritional diseases.

The college is located at Gondar, the capital of Beghemider Province in northwestern Ethiopia. Gondar, a town of 25,000, has a three-century heritage of castles, churches, and art. It lies at 6,800 feet near the Semien Mountains, 40 miles north of Lake Tana, and has a year-round climate similar to that of southern California. The city has three schools (one of

them of secondary level), regular postal service, an office of the State Bank of Ethiopia, an airport, electricity, and a piped water system. The rural environs provide a suitable setting for practical training, with problems and conditions similar to those which the graduates will face.

Facilities and Faculty

The training project encompasses five institutions and facilities. The academic and residential buildings of the college are adequate for 160 students and 30 members of the faculty and staff. Facilities include lecture rooms, an auditorium, library, dining hall, recreational rooms, athletic courts and fields, and furnished staff accommodations.

A 180-bed hospital with surgical, medical, maternity, and pediatric services is located on the college campus. The hospital gives students a chance to observe intimately the diseases they are studying; they are not taught the skills needed by members of a hospital staff.

Also in the training center complex is one of the largest laboratories in Ethiopia. It has departments of parasitology, bacteriology, serology, chemistries, and other studies, as well as a science teaching room.

The Beghemider Provincial Demonstration Health Service consists of 4 training health centers (Amba Gbiorghis, Dabat, Dembia, and Gorgora), an epidemiologic field team, 18 dresser stations, and demonstration school health services in 8 schools. The service conducts mobile campaigns against smallpox, malaria, tuberculosis, trachoma, and other communicable diseases. The students get their practical training working in teams in the health centers and as members of the field team.

The Gondar municipal health service includes a clinic and two substations where both general and maternal and child health clinics are held and integrated with home visiting, school health, sanitation, and home midwifery programs. This service is used to give students practical orientation early in their academic training.

The Gondar faculty has been a small "United Nations" with members from Ethiopia, China, Denmark, England, Germany, India, Iran,

Netherlands, New Zealand, Pakistan, Peru, Scotland, Sweden, Turkey, Belgium, and the United States, who stay for periods of 2 to 8 years.

The international character of the group provides a diversified panorama of practical experience. However, the background of many of the faculty has been in clinical medicine in technically advanced areas, and they require orientation by other faculty members with more experience in newly developing countries.

The keynote of staff planning has been to adapt rather than adopt. This readiness and ability to adapt has been the greatest contribution of the experienced staff. It is difficult for the newcomer, faced with a multitude of demands, to understand that work cannot be pursued in all directions at once. Experience develops the ability to choose the priorities for applying limited resources most effectively as well as ability to work within the cultural setting.

The development of national health workers who have a lifelong familiarity with the culture has broadened the ability of the staff at Gondar to adapt the training project to the country's needs. At present 15 foreign and 26 Ethiopian members constitute the faculty. The professional competence of the Ethiopian staff is constantly being furthered by training abroad and by working with the experienced foreign staff whom they will eventually replace.

The staff is recruited and paid by the Imperial Ethiopian Ministry of Public Health, U.S. Agency for International Development, and the World Health Organization. The faculty consists of five public health and six clinical physicians, four sanitarians, three laboratory instructors, six public health and two clinical nurses, six community health officers, a nurse-midwife with five community nurse-midwife supervisors, a health educator, a science teacher, and a social worker. Five other faculty members are currently receiving training outside the project.

Student Life

The college has a set of detailed rules and regulations to govern the conduct of the students. These regulations are aimed at motivat-



Distributing chloroquine tablets during a malaria investigation in the Dembia Plains. Epidemiologic fieldwork is part of the students' training.

ing the students to be honorable, socially conscious, and responsible workers.

Students receive free board, lodging, school supplies, roundtrip tickets to their hometowns for vacations, and, except during the long holidays in August and September, monthly pocket money of Ethiopian \$10. They are also given two suits of work clothes every year and, for their entire academic career, one pair of shoes and one dress uniform.

Every student is a member of a student association. Its function is to foster the growth of honor and self-discipline. The members of the associations elect officers who are in charge of sports teams, debating societies, a college publication, dramas, parties, and festival celebrations. Each student is assigned to a faculty counselor with whom he is encouraged to discuss his problems.

The college has a sportsmaster who coaches games and arranges competitions between classes and with other sports groups in the Gondar area. Recreational facilities are available for basketball, volleyball, football, Ping-

pong, and tennis. Occasionally, transportation is provided for student picnics and visits to surrounding points of interest.

Types of Trainees

The community health officer is the central member of the rural health team. He is trained in preventive medicine, basic clinical medicine, health administration, health aspects of community development, and methods for educating and informing the public. The entrance requirement is completion of 12 years of schooling. He receives 3 years of academic training and 1 year of internship.

Why are physicians not selected for this responsibility? Besides a shortage of candidates and the expenses of a medical education, certain other factors were considered in making this decision. After the usual medical education, the physician is a clinician oriented toward the medical conditions of individual patients. Treatment of individual illnesses will have little impact on the formidable health care needs of Ethiopia. The health officer, with a practical education emphasizing the community approach, preventive methods directed at masses of people, and supervision of auxiliaries, will have more impact and is more suited than the physician to work in rural Ethiopia.

The clinical skills of the health officer are fairly broad, although limited to the ordinary conditions needing treatment. (See curriculum summaries.) Surgically, he can manage simple fractures, correct the entropion complication of trachoma, drain abscesses, and repair lacerations. He uses standard therapy for communicable and nutritional diseases. He integrates medical treatment with contact investigation, health education, and other appropriate control measures. Soap and water have been found to be a most useful prescription. An iron-rich local cereal known as teff and UNICEF-supplied milk powder are other effective adjuncts.

The common medical emergencies and diseases are not lacking in severity. Although conservative management is stressed in his training, the health officer must be prepared to do what he can with any condition, since the nearest physician may be a day or more away

by mule. He is taught to refer patients when possible. Economy is emphasized since the funds and supplies must stretch a long way. He is likely to supervise a dresser who handles routine minor treatment, allowing himself more freedom for public health tasks.

His understanding of the function of the other members of the team is crucial. His knowledge of sanitation is equal to that of the sanitarian, but his training has emphasized supervision and more extensive contact with the community. Similarly, he is aware of the importance of coordination with the community nurse because of her contacts with the family.

The community nurse's special task is giving preventive and clinical services to the family. She spends much of her time improving unhealthful conditions in the homes. She works with mothers, teaching them the healthful rearing of children. She tries to improve the care of mothers during pregnancy and delivery, and guide them in the supplementary feeding of infants. The entrance requirement is an 8th-grade education, and she receives in the college 2 years of academic training and 1 year of internship.

The community sanitarian is a specialist in remedying the environmental defects which

Summary of Curriculums

Course	Lecture (hours)	Practice (hours)	Course	Lecture (hours)	Practice (hours)
Health Officers			Community Nurses—Continued		
<i>First year:</i>			Medical nursing.....	48	300
Principles of public health.....	24	-----	Surgical nursing.....	48	60
General sciences.....	144	-----	Drugs and solutions.....	36	-----
Nursing arts and first aid.....	36	90	Microbiology.....	36	108
Environmental sanitation.....	132	135	<i>Second year:</i>		
Personal hygiene.....	12	-----	Communicable diseases.....	60	-----
Anatomy and physiology.....	228	-----	Maternal and child health, midwifery.....	156	432
Laboratory technology and microbiology.....	156	170	First aid.....	12	-----
Pathology.....	24	-----	Health education.....	36	108
Pharmacology.....	48	90	Nutrition.....	24	12
<i>Second year:</i>			Sanitation.....	24	-----
Physical diagnosis.....	24	-----	Sociology.....	24	-----
Pediatrics and maternal and child health.....	96	450	Village field experience.....	-----	228
Internal medicine.....	168	200	<i>Third year: Training health center.....</i>		
Communicable diseases.....	156	200	Sanitarians		
Surgery.....	72	200	<i>First year:</i>		
Sociology and health education.....	60	90	Mathematics, physics, chemistry.....	72	-----
<i>Third year:</i>			Construction.....	12	36
Nutrition.....	24	-----	Surveying.....	24	36
Obstetrics.....	60	90	Hygiene.....	36	-----
Epidemiology and statistics.....	36	90	Public health organization.....	48	-----
Psychology.....	24	-----	Statistics.....	12	-----
Public health administration.....	36	45	Microbiology.....	24	24
Medical ethics.....	12	-----	Water supplies.....	48	72
<i>Fourth year:</i>			Waste disposal.....	60	72
Training health center.....	-----	1 9	Food sanitation.....	24	36
Field team.....	-----	1 3	Communicable diseases.....	24	-----
Community Nurses			Vector control.....	24	36
<i>First year:</i>			Building sanitation.....	24	36
Personal hygiene.....	24	-----	Health education.....	12	36
Nursing arts.....	108	-----	First aid.....	12	-----
Anatomy and physiology.....	72	-----	Village field experience.....	-----	182
Principles of public health.....	60	-----	Drawing.....	-----	80
<i>Second year:</i>			<i>Second year:</i>		
Training health center.....			Training health center.....		
Field team.....			Field team.....		

¹ Months.



Playing badminton on the athletic courts at Gondar. Sports and other nonacademic activities are conducted by student associations at the college.

cause or contribute to ill health. He learns how to survey the community's needs and how to work with the people to improve water supplies, dispose of wastes safely, and control harmful insects. He must use simple approaches and limited, easily maintained equipment. He must be expert in motivating people to want to improve their environment and in getting them to help themselves. The entrance requirement is an 8th-grade education and college training consists of 1 year of academic studies and a 1-year internship.

These three work together as a team, each helping with a special skill and a particular approach to meet the community health demands. Each specializes in one area of public health education. Teamwork is developed especially during the final internship year when all three types of trainees are assigned as teams in the training health centers.

The centers are in villages of 1,000–2,000 population. They have general functions similar to the programs in which the students will work after graduation. These functions

include general and maternal and child health clinics, home visiting, sanitary work with the communities emphasizing water supply improvements and latrine construction, teamwork with small peripheral villages, and communicable disease control measures as indicated. Young Ethiopians adapt well to such training and are deeply interested and eager to learn all aspects of health work.

Through 1961, 84 health officers, 58 community nurses, and 76 community sanitarians have been graduated from Gondar. These health workers have been employed since graduation by the Ministry of Public Health which requires employment for 5 years of health officers, for 4 years of community nurses, and for 3 years of community sanitarians. By March 1962, 42 rural service centers in all parts of the country had been opened and staffed by these workers. Although the impact of these graduates on the health status of the community they serve is a consideration important to the training project, it is too early to give a comprehensive report on this aspect.

Life in the small rural communities is far from easy for the graduates. For example, getting along with indigenous practitioners called "wageshas" requires a careful balance of cooperation and control of their more dangerous measures. The villagers at first have little appreciation of preventive measures. Health workers must maintain an example by following good sanitation practices in generally very unsanitary settings. There are few recreational opportunities. Shortages of supplies and technical skills limit the accommodations to a primitive level.

Problems

Three general considerations have been of fundamental importance to the success of the project. First, and most important, has been how to motivate the graduates to satisfactory achievements in public health. The fee for service incentive is eliminated, and the problems of living and working in rural communities are considerable. Both the training and employment after graduation must be oriented toward strengthening motivation. It is necessary to select well-motivated students with backgrounds as similar as possible to the environment in which they will ultimately be working. Essential during training is the development of an esprit de corps and a sense of discipline, careful but not too hesitant assignment of responsibilities, and the setting of a good example by the faculty.

After graduation, satisfactory administrative support of the health workers with balanced discipline and consideration for their problems, careful assignment, opportunity for recognition, promotion, and selected further training are needed. Technical supervision and stimulation are important. The abundance of responsibilities put on the shoulders of these workers when they are assigned to a rural community is in itself a powerful incentive to perform.

A second and related consideration has been the satisfactory incorporation of the graduates into the country's services. Obviously, training cannot be separated from future employment. In this project there was some lack of coordination between the training and the jobs. Positions must exist, with satisfactory adminis-

trative budgeting, supply, provision of working facilities, and adequate technical supervision.

The financial basis for employing these health workers was strengthened significantly during 1960 and 1961 by the collection of a special local tax for health services. Furthermore, a limited administration under considerable strain has striven heroically and effectively to support the health centers.

A team of WHO supervisors is currently being recruited to undertake technical supervision. Another team of AID technicians is undergoing orientation for the task of evaluating effectiveness of the health center's services. Modifications in the training program may be indicated as a result of the team's findings.

The third consideration has been phasing the project over to national responsibility. Slow but steady progress has been made. It has been difficult to get the few national professionals to work in this setting, and those that have joined the project, like the international professionals, have required considerable orientation. However, some are now the most effective members of the staff. Some gaps in the faculty ranks can be filled by the best of the graduates after they mature with experience in the field. Certainly they will require far less adaptation to the setting.

The total annual expenditure for the project is equivalent to about US\$550,000. Sources of support are the Government of Ethiopia, 35 percent; U.S. Agency for International Development, 35 percent; collection of service fees, 10 percent; WHO, 10 percent; and UNICEF and other sources, 10 percent. The Government of Ethiopia is progressively assuming total support.

Conclusion

In developing areas such as Ethiopia, where there is only 1 physician per 100,000 population, and maldistribution of these, it is impossible to make an impact on the prevalent diseases by conventional clinical means. The training and employment of health workers must be closely adapted to the character of the needs as well as the economy and the resources in personnel, facilities, supplies, and communications.

At the Haile Selassie I Public Health College

and Training Center in Gondar, Ethiopia, teams composed of a health officer, a community nurse, and a sanitarian are being prepared to staff rural health centers. Their training emphasizes simple management of prevalent

diseases and common medical emergencies, the approaches and techniques of preventive medicine, mass methods, control of environmental hazards, skills necessary to obtain community cooperation, and health education of the public.

Occupational Health Notes

Coin-Operated Drycleaning

All operations in several coin-operated drycleaning establishments in Washington State were tested for perchloroethylene vapors, particularly to determine the potential exposure of employees. Certain operations, such as cleaning of filters and lint traps, addition of "sweetening" agents, and backwash operations, caused vapors to reach the maximum allowable concentration of 100 ppm in the immediate work area for a few minutes each day. The cleaning of filter units was the only operation for which stringent controls were considered necessary. Either permanent exhaust ventilation or use of an approved organic vapor respirator was recommended, depending on degree of potential exposure. Warning labels will be put on the machines to alert employees and others about the hazards of perchloroethylene vapors.

Atmospheric Lead Levels

High atmospheric lead levels were found in a plant manufacturing leaded stainless steel in Indiana. In the furnace and pouring areas, where atmospheric lead levels were as high as 400 times the maximum allowable concentration, urinary lead and copro-

porphyrin studies showed that respirators were effective in protecting workers. High atmospheric lead levels were also found, however, in adjoining departments where respirators were not used. Although the steel alloy contains only 0.25 percent lead, burning of the leaded billets with oxyacetylene produces high atmospheric levels of both lead and chromium oxides, which may be controlled by local exhaust ventilation. In collecting air samples from crane cabs, a portable, battery-operated electrostatic precipitator was used.

Beryllium Alloy

An apparent case of chronic beryllium disease was found in a Pennsylvania worker who machined products from beryllium-copper alloy without local exhaust ventilation. Pennsylvania's division of occupational health has suggested a revision in the section of the American Industrial Hygiene Association's guide on beryllium which states that the machining of beryllium-copper alloy has never produced illness.

In Michigan, breathing zone air samples from a tool and die shop, where molds made of 2 percent beryllium-copper alloy were ground and hand polished, showed excessive concentrations of beryllium, ranging from 0.013 to 0.15 milligrams per cubic meter. Three tool and die shops were requested to discontinue work on beryllium-copper alloy until local exhaust ventilation and air-cleaning equipment were installed. Worker education and special handling of tools, materials, and work clothing were also recommended.