

## FOCUS: GLOBAL HEALTH AND DEVELOPMENT

# The Medical System in Ghana

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Ghana is a developing country in West Africa with a population of about 25 million. Medical illnesses in Ghana overlap with those in developed countries, but infection, trauma, and women's health problems are much more prominent. Medical practice in rural Africa faces extremely limited resources, a multiplicity of languages (hundreds in Ghana), and presentation of severe illnesses at later stages than seen elsewhere. Despite these limitations, Ghana has established a relatively successful national medical insurance system, and the quality of medical practice is high, at least where it is available. Ghana also has a well-established and sophisticated administrative structure for the supervision of medical education and accreditation, but it has proven very difficult to extend medical training to rural areas, where health care facilities are particularly short of personnel. Physicians are sorely needed in rural areas, but there are few because of the working conditions and financial limitations. Hospital wards and clinics are crowded; time per patient is limited. This article details some of the differences between medical practice in Ghana and that in wealthier countries and how it functions with very limited resources. It also introduces the medical education and training system in Ghana. The following article describes an attempt to establish and maintain a residency training program in General Medicine in a rural area of Ghana.

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†Abbreviations: CHAG, Christian Health Association of Ghana; NHIS, National Health Insurance Scheme; WACP, West African College of Physicians; WACS, West African College of Surgeons; GCPS, Ghana College of Physicians and Surgeons; GPMC, Ghana Postgraduate Medical College; HIV, human immunodeficiency virus; ICU, intensive care unit; GDP, gross domestic product; CT, computed tomography; EEG, electroencephalogram; EMG, electromyogram; MRI, magnetic resonance imaging.

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Author contributions: Dr. Drislane wrote most of the paper based on visits to the University of Ghana and the General Medicine Training Program at Techiman, with the perspective of a residency program director in the United States. Dr. Akpalu is a neurologist and MD graduate of the University of Ghana and provided much of the information about recent Ghanaian physician graduates, medical practice at Korle Bu Teaching Hospital at the University of Ghana, and the administrative structure of medical education and accreditation in Ghana. Dr. Wegdam is a Dutch trauma surgeon who worked in Ghana for more than 12 years, co-founded the residency in Techiman, and provided information about how it developed and functions.

## INTRODUCTION

Ghana is a developing country in West Africa with a population of about 25 million. Although economically poor by Western standards, it has a proud history, including as the first sub-Saharan state to regain independence from European colonial powers (in 1957), universal education through primary school, and a relatively high literacy rate for developing countries [1]. Life expectancy at birth is 60 years [2]. Well-endowed with natural resources (including gold, timber, and cocoa), Ghana has a much higher per capita economic output than most West African countries [3] but remains partially dependent on international financial and technical assistance.

Ghana's medical system is centered heavily in the two largest cities: Accra, the capital on the coast with about 2 million inhabitants, and Kumasi, with about 1 million citizens in the center of the country. Nevertheless, Ghana needs physicians and medical facilities in smaller towns where most of the population lives, but as elsewhere, it is hard to retain physicians in remote rural areas. Twenty-five years ago, most physicians at mid-sized hospitals in rural Ghana were Europeans on tours of a few years, but this is no longer common. Ghanaian and European authorities have decided to end dependence on visitors and shift resources to programs that can be sustained over a longer period by Ghanaians.

The article following this one describes an attempt to address the scarcity of physicians in rural Ghana by development of a General Medicine residency program in Techiman, a small city in central Ghana. Here, we detail three aspects of practicing medicine in Ghana pertinent to a young physician in training: the different range of illnesses found in West Africa, especially outside the cities; the substantial financial limitations on the practice of medicine in Ghana and attempts to ameliorate them; and the very well-developed organization and administration of medical education and training in Ghana.

## THE ILLNESSES

While the practice of General Medicine is similar in principle to that in wealthier countries and the total range of illnesses is similar, some illnesses are seen in far greater measure than in developed countries. They include infections, particularly those common to tropical countries, trauma, and women's health problems such as complications of pregnancy (specific examples of all these problems are detailed in the following article on the development of a particular General Medicine residency program in rural Ghana).

### *Infections*

Infections are a primary reason for hospital visits and admissions. Malaria is rampant, and its burden is tremendous [4]. Most malaria is treated easily with 3 days of pills distributed by the government [5,6], but many people acquire malaria repeatedly, and if untreated, it can be fatal. Typhus infection is common and is a major cause of intestinal perforation and urgent surgery. There are frequent, fulminant cases of tuberculosis, as well as filariasis and schistosomiasis. Tuberculosis and HIV infection are common (the latter infecting 1.8 percent of the population [7] — much less than in Southern Africa), and about half of the patients in Ghana who die with HIV do so from consequences of tuberculosis [8].

### *Trauma*

Trauma comes from the same sources as in other countries, including home and work-related accidents, and violence, domestic and other. Much more trauma, however, comes from motor vehicle accidents, which are far more common in most developing countries than in the developed world [9]. Ghana is no exception. The cause is a combination of poor road conditions, vehicle malfunction, and, mostly, less well-trained drivers with dangerous habits. Rules of the road are not well adhered to or enforced. Motor vehicle accidents generate the large majority of severe trauma cases in Ghana.

## Women's Health

A disturbingly large percentage of emergency and critically ill patients are young women who are pregnant — and many from complications of botched abortions. Safe abortions cost approximately \$25 in some private clinics, but this is prohibitive for many young women and their families. Various herbal concoctions may or may not produce miscarriages, but they also cause fulminant infections or even sepsis and subsequent scarring, obstructions, and child-bearing trauma. Early life mutilation produces similar anatomic barriers to healthy deliveries. Toxemia and eclampsia are common. Maternal mortality is high in West Africa, approximately 560/100,000 births in Ghana [10], but Ghana's is one of the best rates in West Africa. Infant mortality is 61/1000 live births [11], but reliable statistics are difficult to determine and just beginning to be gathered, in part because most births occur at home.

## Other Illnesses

Diabetes may be less common than it is in the overweight population of the United States, but it is almost certainly under-diagnosed in Ghana. It also takes a terrible toll when not attended to appropriately, leading to the spread of devastating infections (including perinatal) and gangrene of the limbs after minor cuts. A patient may wait for a few weeks at home before going to a hospital with a nearly necrotic limb. Often, it is too late, and many septic patients die.

Heart disease and cancer, so prominent in the developed world, certainly exist in West Africa, but they are not the major focus of the medical system. The acute presentation of coronary disease is relatively rare in rural hospitals, but the disease appears to be increasing rapidly and is being recognized much more nationwide. Asthma exists but is much less common than infectious illnesses of the lung, especially tuberculosis. Cancers tend to present late, often with gigantic masses, leaving little to offer.

Sickle cell disease causes some cases of severe anemia, including in very young children. In rural Ghanaian medical facilities, a

hemoglobin of 5 to 6 (hematocrit 15 to 18) is considered a non-urgent, outpatient evaluation. Osteomyelitis is a very frequent complication of sickle cell disease, often requiring surgery to remove infected bone (a "sequestrectomy"), with long courses of antibiotics, or leading to crippling bone deformities to the point where it is common to see hobbled, indigent people on the streets of towns of any size.

## Medical Technology

While equipment and other facilities are generally modern in the university hospitals, this is not the case in most small towns. Nationwide, there are relatively few ventilators, except in operating rooms and in the thoracic surgery ICU at the university in Accra, with smaller units at large teaching and military hospitals. Cardiopulmonary resuscitation is seldom attempted outside major urban centers. Neither patients with coma from severe head injury nor those with severe respiratory diseases are intubated. There are hemodialysis units at only the two primary teaching hospitals in the large cities. It can be difficult to get a cardiogram done, sometimes even in the teaching hospital in Kumasi. With the development of a small but growing middle class, especially in the cities, some private clinics are springing up, and some have sophisticated equipment.

## Specialization

Specialist physicians are relatively few in Ghana as most acquire their formal specialty training abroad, and most stay there. A few years ago, three of Ghana's five urologists were killed in a single car crash after a medical meeting.

Neurology, the field of one of the authors (AA), for example, does not have its own section in the universities. There are only a couple of neurologists in the country, and none in the Ashanti or Brong-Ahafo regions. There is one clinically active neurologist in Ghana, at the Korle Bu Teaching Hospital in Accra, who runs the only EEG and EMG laboratory. The two main teaching hospitals have CT scanners, as do a few medium-sized cities and private clinics.

There are just four or five neurosurgeons in the country, so most intracranial hemorrhages take their courses without assisted ventilation or surgical drainage. The first MRI scanner was installed at Korle Bu in 2006. Still, throughout Ghana, lumbar radiculopathies from disks, peripheral neuropathies, seizures, and strokes are common problems. Spinal cord trauma is common, and some neurologic function improves with immobilization and traction; decompression surgery is generally not available. Spastic paraparesis and Guillain-Barré syndrome are not rare, and cerebral malaria is commonplace.

## FINANCES

The Ghana Health Service consists of government (including university) hospitals and clinics, hospitals and clinics within the Christian Health Association of Ghana (CHAG), and private facilities. The Ghana government pays most of the salaries of the staff physicians, house officers, nurses, and some others in the government and CHAG hospitals. For other funding, the CHAG hospitals must be self-sufficient, and much of the operating expenses depend on income from patient charges. For special projects, expansion, and development of new projects, most CHAG hospitals are largely dependent on foreign assistance and non-governmental organizations.

The Ghana Ministry of Health has introduced a national universal medical insurance system, the National Health Insurance Scheme (NHIS), which pays for hospitalizations and outpatient doctor visits, as well as basic laboratory testing and certain medications [14]. All hospitals bill the NHIS monthly for the patients who have joined the program.

The NHIS, however, does not cover HIV medications, thoracic, neuro- or plastic surgery (except after trauma), other elective surgery, infertility evaluations, transplant medication or surgery, and many other expensive items, such as hemodialysis. Among cancer treatments, only those for cervical and breast cancer are included. Neverthe-

less, payment for physician visits and long-established medications is of tremendous benefit.

Medications are a major expense, as elsewhere [12]. In Ghana, a patient or patient's family typically buys medications individually for the patient, including for hospitalized patients. A week's outpatient amoxicillin might cost just \$1, but for a hospitalized patient, intravenous ceftriaxone (often necessary because of antibiotic resistance) is about \$6 a day. For perspective, GDP/person in Ghana is \$1,605 per year (2012), compared to approximately \$51,700 in the United States [13]. Families without insurance may decide that they cannot afford certain antibiotics, and sometimes they are stopped in mid-course for lack of funds.

The NHIS has a premium of about \$10 a year, but ironically, the poorest and sickest people may be least likely to sign up [15]. The plan will take years to implement fully, in part because of its complexity and the lack of patient education (not completely unlike some U.S. Medicare benefits and some stipulations of the Affordable Care Act), but by 2010, over half the population of Ghana was enrolled.

## MEDICAL EDUCATION

Even more than physicians and medical facilities in general, Ghana's medical education is heavily concentrated in the cities, where the two university medical centers employ about 100 physicians each. Korle Bu is a 1,500 bed teaching hospital connected to the University of Ghana in Accra. That university and a second in Kumasi produce about 200 graduate physicians each year, while a third, new university at Tamale in the North graduates a few dozen more. Still, the number of physicians in Ghana has held steady at about 1,400 for many years because most physicians emigrate [16,17]. Ghana is working hard to educate and retain locally trained physicians, but it is difficult to get them to work in rural settings, where the need is greatest.

As part of the trend toward local, i.e., Ghanaian, training, and self-sufficiency,

physician training programs have been organized under the aegis of the West African College of Physicians (WACP) and the West African College of Surgeons (WACS), founded in 1976, and the Ghana College of Physicians and Surgeons (GCPS), founded by an act of the Ghanaian parliament in 2002. The Ghana Postgraduate Medical College (GPMC), founded in 2003, promotes the development of residency training programs. In coordination with the Ghana Medical and Dental Council, the GPMC also promotes (more junior) house officer training, including, more recently, outside of the cities.

The GCPS was founded “to promote specialist education in Medicine, Surgery, and related disciplines.” It accredits training centers and supervises the medical education of about 300 residents currently in training [18]. The WACS accredits surgery training programs, runs postgraduate courses, and determines eligibility for and sponsors a board examination. Fellowships for these specialties are sponsored by the WACP or GCPS, but it is at that point that many trainees choose to leave Ghana, most never to return [16,17].

A recent graduate (author AA) estimates that at least 70 percent of his classmates have left Ghana for the United Kingdom, United States, Canada, Australia, and the Gulf states, almost all to remain abroad permanently. Often, their parents have spent substantial portions of their income on earlier school fees and consider this an investment. Beyond the loss of trained personnel to the country, some of the emigrants send money home to their families, and some do not. Better income and the chance for more specialty training are the major motivations [19].

## CONCLUSION

Despite facing many limitations, Ghana has made tremendous strides in promoting medical care in a moderately large and very complicated country. It is a leader in West Africa and beyond. The practice of medicine and the illnesses faced are similar in many

ways to those in developed countries, but with infections particularly common in the tropics, more trauma, and more extensive problems in women’s health as the most prominent burdens. As with other developing countries, however, Ghana has great difficulty extending modern medical care to smaller towns and rural areas. Its universities and medical training programs are heavily concentrated in the larger urban centers, where most of the physicians stay — unless they, as most, emigrate for better jobs and for other reasons. Still, Ghana has many government-sponsored health programs and even a reasonably successful national health insurance system, as well as a well-developed and sophisticated administration of medical education, now focusing more on rural areas. It has begun to bring General Medicine, and even specialty training, to smaller communities, in part with the hope that physicians will stay in rural areas, where there are many sick patients to treat and learn from. The following article describes in detail the establishment and functioning of a General Medicine training program in rural Ghana.

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