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INVESTIGATING AND IMPROVING MEDICAL EDUCATION AND LIBRARY RESOURCES AT THE TAMALE TEACHING HOSPITAL IN NORTHERN GHANA: A CASE REPORT

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ABSTRACT

This article discusses a service-learning trip I took in the summer of 2011 to conduct a series of consultations and workshops for librarians, administrators, faculty, and students at Tamale Teaching Hospital (TTH) and the University of Development Studies (UDS) in Northern Ghana. The visit was organized in support of a series of programs and collaborations that have been ongoing for several years between the University of Louisville (U of L) School of Public Health and Information Science (SPHIS) and TTH and UDS. The goal of the visit was twofold: to provide a series of training workshops to improve the research, database, and digital skills of clinicians, faculty, and students; and to conduct a needs assessment and gather data to develop grant proposals to acquire financial support for education, training, and information needs of the teaching hospital and schools of nursing and medicine.

INTRODUCTION

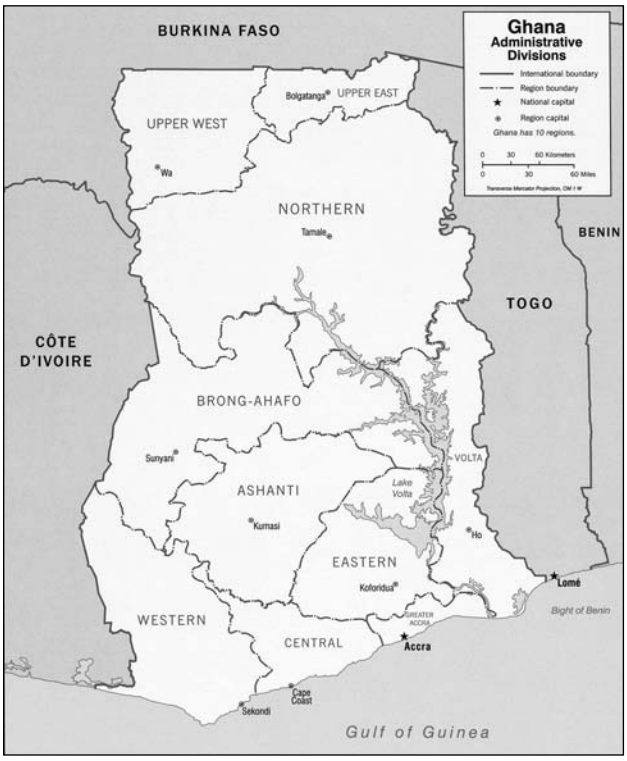
In June 2011, I received an invitation from Dr. Ken Sagoe, CEO of the Tamale Teaching Hospital, to travel to Tamale, Ghana for consultations with him and his team and to conduct a series of library training workshops for students, physicians, faculty and staff at TTH and the affiliated medical and nursing schools. The invitation came after a May 2011 visit to Tamale by faculty and graduate students from the U of L School of Public Health led by Associate Professor Dr. Muriel Harris. Dr. Harris and her team spent two weeks at TTH conducting research to develop a program to reduce maternal morbidity and mortality, a major problem in the region and throughout Ghana. In the course of gathering data and information for the research project, Dr. Harris identified a number of deficits in library resources, materials, and training, and suggested Dr. Sagoe contact me to see if I could be of assistance.

Dr. Sagoe's invitation gave my library the opportunity to participate in a unique international service project. It also opened the door for a new service component for library liaison work with the School of Public Health – and possibly other schools and departments on the medical campus – in the area of outreach services and support for international health initiatives and programs. I followed up with Dr. Sagoe via email to get additional information about his goals and objectives for the site visit and the training workshops. In planning the program for the trip, I wanted to make sure it would be appropriate to local needs. I also did not want to create false expectations as to deliverables and outcomes. There is a small but growing body of literature on how to conduct international medical trips, and how to build library capacity in Africa. I consulted both sets of literature for guidelines and best practices. In a recent article by Suchdev, et al., I found a simple model for short-term service-learning initiatives that identifies seven areas of focus: (1) having a clear mission, (2) collaborating with the local community, (3) educating the service team and the local community, (4) making a firm commitment to serve the needs of the community, (5) promoting and engaging in teamwork, (6) having a goal to build and sustain capacity, and (7) developing a method for periodic evaluation of service effectiveness and outcomes (317). The importance of cultural sensitivity and good communication also cannot be over-emphasized when traveling abroad to teach, train, and conduct research. And it is also essential to determine what other partnerships and collaborations are ongoing or forthcoming to avoid duplication of efforts and services or other redundancies in environ-

ments with limited resources. In the case of the Tamale Teaching Hospital, a major project is underway via financing arranged with the Netherlands to build a new wing and renovate the existing hospital facility. While this major initiative has no immediate impact on our plans to improve library resources, it will figure significantly in the long-term partnership and collaboration between TTH and the U of L medical school.

Taking into consideration the issues outlined above, Dr. Sagoe and I agreed that the workshops should focus on finding and using free and open source materials and resources available online for medical education and training. This also included providing PubMed training for students, faculty and physicians. The remainder of the agenda during the visit would be devoted to conducting a needs assessment to determine how to improve the resources of the hospital, nursing, and medical school libraries. The needs assessment would guide the drafting and development of grant proposals to solicit funding for additional library instructional workshops and the acquisition of library materials, resources, and equipment.

I also met with Dr. Harris to be briefed on her recent visit to Tamale and the research project she and her team were designing for TTH. Their plans called for the creation of a sustainable project that would assist care providers and public health specialists in developing interventions to reduce the morbidity and mortality of women and children in the service area of the Tamale Teaching Hospital. Maternal and child care are top priorities of the Ghana Health Service, and also constitute key goals in the United Nations Millennium Declaration adopted by Ghana and 189 other member countries in 2000 (National Development Commission). This priority and the SPHIS team's approach to it will be discussed below. As Dr. Harris gathered data and information for the project, she also perceived the need to increase library materials at TTH and its affiliate schools. Often libraries are an afterthought in such project planning, but Dr. Harris recognized the centrality of the library as a resource for disease prevention, and medical research and education. Upon her return to Louisville, she identified the Elsevier Foundation's Innovative Library Grant Program as a potential source of funding and support for the Tamale library project.
I secured approval for the trip to Ghana from Neal Nixon, the Executive Director of the Kornhauser Health Sciences Library. I also applied for financial support from the travel fund of the University Library Faculty and the U of L International Travel Program. On July 25, 2011, accompanied by my wife Gwendline Chenault, I departed for a ten-day trip that would take us first to Accra, the capital of Ghana, and then to Tamale in the Northern Region, our ultimate destination.



In the sections of this article that follow I provide general background information on Ghana and its Northern Region, and Tamale, the administrative capital of the Northern Region. Since this is a report on a service-learning trip to Northern Ghana, I think it is useful to place the project within the larger context of the nation's geography and demography. In the second part of this article, which will be published in the next issue of *Kentucky Libraries*, I describe the activities that took place during the visit, and conclude with a list of the goals and objectives that developed directly from the needs assessment and consultations, and that will form the basis for a longer-term service project and collaboration.

BACKGROUND

Ghana

The Republic of Ghana is located on the West Coast of Africa. It has a total land area of 238,537 kilometers, and is bordered by three French-speaking countries: Togo on the east, Burkina Faso on the north and northwest, and Côte d'Ivoire on the west. Ghana gained independence from Britain on March 6, 1957, and became a republic in the British Commonwealth on July 1, 1960. It was the first sub-Saharan African country to achieve independence from European colonial rule. It has a multi-party democratic presidential system of government with an Executive

Presidency elected for four years with a maximum of two terms. The parliament is elected every four years, and the nation has an independent judiciary (Central Intelligence Agency; Ministry of Health).

Ghana is divided into ten administrative regions: Western, Central, Greater Accra, Volta, Eastern, Ashanti, Brong Ahafo, Northern, Upper East, and Upper West. The Northern Region, where Tamale is located, is Ghana's largest and comprises about 30% of the nation. The regions are sub-divided into 170 districts. Accra, the administrative and political capital of the country, is located in the south on the Atlantic Coast in the Greater Accra Region. According to preliminary results from the 2010 Population and Housing Census, the Greater Accra Region has a population of 3.9 million. The 2000 and 2010 censuses list Ghana's total population as 18.9 million and 24.2 million, respectively. During the last decade the nation's population grew by 28.1% (Ghana Statistical Service). The Akan constitute Ghana's largest ethnic group (49 %) followed by the Mole-Dagbon (17%), Ewe (13%), and Ga/Dangme (8%) (Ghana Statistical Service, Ghana Health Service, & ICF Macro). English is the "official" language of Ghana. Out of the estimated 67 languages spoken in the country (which is approximately the size of Oregon) nine others have the status of government-sponsored languages: Akan, Dagaare, Dagbani, Dangme, Ewe, Ga, Gonja, Kasem, Nzema (Ethnologue: Languages of the World).

Agriculture accounts for roughly one-third of Ghana's GDP and employs more than half of the workforce, mainly on small farms and holdings. The services sector accounts for 40% of GDP. Gold and cocoa production and individual remittances from abroad are major sources of foreign exchange. Oil production at Ghana's offshore Jubilee field began in mid-December 2010 and is expected to boost economic growth. According to the *CIA World Factbook*, GDP per capita income (PPP) in Ghana in 2010 was $2,500 (Central Intelligence Agency).

Ghana has an underdeveloped and underutilized health care system, with high rates of mortality among its most vulnerable populations. Ghana also faces a double burden of infectious and chronic diseases (Aikins 154). This double burden is polarized across all regions and social classes in Ghana, and is a major concern in developing countries across the globe. Researchers have predicted "by 2020, non-communicable diseases will cause seven out of every ten deaths in developing countries" (Boutayeb 192). This trend will continue unabated until the health sectors in Ghana and other nations find ways to work cooperatively and internationally to develop and implement comprehensive interventions and solutions.

> *There is an urgent need to develop efficient preventative strategies to halt the growing trend of CDs [chronic diseases] and NCDs [non-communicable diseases] through the control of risk factors like smoking, alcohol, obesity, diet and inactivity, sexual contacts and environmental factors in general. Considering the level of poverty and the cost of prevention and management of chronic diseases, the most affected countries are unable to cope with the burden of disease. For health strategies to be successful, international solidarity and public-private partnerships are needed to tackle the problems of shortage and lack of treatments, resistance, and the need for new drugs, vaccines and diagnostic procedures* (Boutayeb 197).

Urbanization, urban and rural poverty, low literacy levels, and lack of access to medical care in rural areas are all factors contributing to morbidity and mortality rates. Wealthier communities experience higher risks of chronic diseases, but poor communities experience higher risks of infectious diseases and a double burden of infectious and chronic diseases. The problems of disease and illness also must be understood and addressed taking into account the way of life, beliefs, and taboos of people in rural communities. People living in remote areas of the country often rely on traditional medicine, herbal remedies, and folk healers for their primary care. Health care workers, whether Ghanaian or coming from abroad, need access to information about the beliefs, values, and attitudes of communities they intend to serve. This information generally is not available in medical libraries, but is found among the local chiefs, traditional medicine practitioners, and midwives (Apalayine 367). Despite these major public health issues and challenges facing the Ghanaian government, progress has been made in recent years in expanding access to health care, improving the quality of care, and providing health insurance. Recent government reports have

shown positive gains in reducing infant and maternal mortality (although the numbers of death still remain extremely high). Incremental increases over the last several decades in life expectancy for males and females also have been reported in recent studies (Ministry of Health). According to some analysis, however, government responses to this crisis have not been comprehensive, robust, or properly prioritized:

> *[…] medical, psychological, socio-cultural, economic and structural factors are all implicated in Ghana's chronic disease burden. Yet conceptual and practical responses to Ghana's chronic disease burden have been largely biomedical, with primary emphasis on epidemiological and clinical activities. Despite recognition of a growing chronic disease problem, chronic diseases are "neglected, constitute low policy priority and receive low interest from development partners." Ghana, like several African countries, is yet to develop a chronic disease plan or policy. The current research, practice and policy situation regarding chronic diseases is detrimental to Ghanaian public health* (Aikins 157).

Information communication technology (ICT) comprises an essential component in health surveillance, and health care provision, management and education. Data show the African continent lagging far behind the rest of the world in Internet availability, access, and usage. With a total population of 1 billion people, which constitutes 15% of the world's population, the Internet Penetration Rate (which corresponds to the percentage of a population in a region or nation that uses the Internet) is only 11% (118 million users) in Africa, as opposed to 33.8% for the rest of the world. Ghana was one of the first countries in Africa to achieve connection to the Internet. But with only 1.2 million Internet users currently, Ghana does not rank within the top countries on the African continent. The Internet Penetration Rate in Ghana is only 5.2%, which represents 1.1% of African users overall (Miniwatts Marketing Group).

Ghana is investing heavily in building and improving telecommunications infrastructure to make broadband technology available nationwide. Broadband/ADSL was introduced in 2003, and there are now more than 140 ISPs (Internet Service Providers) licensed to operate in Ghana (Miniwatts Marketing Group). During my trip in July-August 2011, I spent a few days in Accra and made an excursion by vehicle along Ghana's Atlantic coastline to Cape Coast and Elmina. During my sojourn in the southern districts, and later, after I arrived in the Northern region by plane, I did not encounter any significant problems accessing the Internet via various wireless networks. Connectivity generally was stable, although uploading and downloading speeds varied significantly from location to location. The recent and ongoing upgrades in the telecommunications infrastructure have been especially beneficial to the growing and robust mobile technology sector in the country. Personal Computers (PCs), however, still are not widely available. According to the United Nations, Ghana has approximately 1.07 PCs per 100 persons (United Nations Statistics Division). The lack of access to electrical power in rural areas of the country means the number cited above is skewed toward Ghana's cities and larger towns. But even in Tamale, the largest city in the Northern Region with a population of more than 1.8 million, PCs are rare.

The history of library service and training in Ghana began during the era of British colonialism in the 1950s, at a time when the literacy level of the country was estimated to be 9%. The Ghana Library Board, which is responsible for the nation's public library system, operates and maintains the Accra Central Library, 13 regional libraries, 47 branch libraries, and mobile units that bring books and services to rural areas across the country. The Balme Library at the University of Ghana (UG) in Legon is the largest research library in Ghana. Its collections include 800,000 books and approximately 8000 journals. The University of Ghana also is the site of the nation's largest medical school and medical library, and has the only library and information science school in the country. The Department for Information and Librarianship at UG offers a two-year program that culminates in the Masters of Philosophy of Information and Communication (Ghana Library Association).

Ghana has a small cadre of highly trained librarians. Included in their ranks are a few who have published seminal research on librarianship in Ghana and in Africa in general, and others who have been active internationally. However, many challenges exist in terms of governmental support for librarians and library services and programs. And the libraries themselves have not yet developed ways to network, share resources, and support

each other. The Ghana Library Association, which is headquartered in Accra and has about 400 members, summarizes the situation thusly:

> *The Ghana Libraries have no catalogue connecting system which can feed the various libraries with information on the stocks of the other libraries. There is no reciprocal agreement which would allow the libraries to fall back on electronic catalogues of the libraries at home and abroad* (Ghana Library Association).

The lack of an interlibrary loan system is also a major problem. But given the hazards of road transportation, it is doubtful the issue will be addressed anytime in the near future. Declining government financial support, a governmental failure to view libraries as high priorities in terms of national development, and the loss of trained librarians to the private sector also are factors that have contributed to the current condition and future prospects of Ghana's libraries.

Northern Region/Tamale

The Northern Region of Ghana, which has a total landmass of about 70,384 square kilometers, comprises approximately 30% of the country stretching from east to west, with the nations of Burkina Faso located to the East, and Cote D'Ivoire to the West. The Northern Region also shares borders with Upper West and Upper East regions to the far north, and with Brong Ahafo and Volta to its south. It has a population of 2,468,557 persons (Ghana Statistical Service). It is made up of twenty districts, with Tamale as the administrative capital. The population is distributed in small, scattered settlements throughout the region with more than 50% of the communities being of less than 200 people and the rest being between 200 and 500. A limited network of roads makes traveling difficult. In addition, seven of the 18 districts that make up the region (East and West Gonja, West Mamprusi, Nanumba South, Gushegu, Karaga and Tolon/Kumbunga) are accessible only by boat during the rainy season, as roads become impassible making access to health services difficult, and in some cases nearly impossible (Ghana Health Service).

Females in the northern half of the country (the Northern, Upper East, and Upper West) are seriously disadvantaged. In these three regions, more than one half to two-thirds of women have never been to school, compared to less than one-fifth in the Greater Accra and Ashanti regions. In addition, 21% of females in Greater Accra have completed secondary education or higher, compared with only 4% or less in the Northern, Upper East and Upper West regions. High illiteracy levels compromise the ability of public health officials to conduct health education campaigns to raise awareness about nutrition, disease prevention, maternal and infant care, and wellness. The birth rate in the northern region also is far higher than the national average. Data provided in the 2008 *Ghana Demographic and Health Survey Report* indicate a single woman in the northern region gives birth to at least seven children before reaching menopause compared to the average of four children per woman nationwide (Ghana Statistical Service, et al.). The low level of women's empowerment and control over their lives poses an additional factor that complicates efforts to address and meet their health needs. In many instances men make the decisions about household healthcare practices, including decisions about the reproductive choices and practices of their wives or female partners. Any interventions designed to deal with the problems of maternal and child morbidity and mortality therefore must take into account the role and authority of men.

The Northern Region, like the rest of the country, faces major problems from malaria. Additionally, anemia, pneumonia, meningitis, tuberculosis, typhoid fever, and hepatitis contribute to the double burden of chronic and communicable diseases that challenge local health care providers in a region with severely limited resources and access to health care. The Tamale Teaching Hospital is the only tertiary care facility in the entire Northern Region. The burden of dealing with these immense public health and medical needs falls solely within its purview and mandate.

Tamale Teaching Hospital

The Tamale Teaching Hospital (TTH) was built and commissioned in 1974 to serve as a regional hospital for the Northern Region of Ghana and a referral point for the Upper West and Upper East Regions, which comprise the northernmost areas of the country. According to the 2010 census, the three regions have a combined population of 4.1 million. TTH, which is now a fully accredited tertiary level health care facility, is the only hospital available in this vast area that encompasses more than 40% of Ghana's landmass (when its neighboring regions are

included). Data from 2010 show 113,960 outpatient visits and 20,814 admissions. The hospital has 341 beds for adults and 80 children's beds. The occupancy rate of the hospital in 2010 was 74%. In 2008 TTH also became the main teaching facility for the School of Medicine and Health Sciences of the University for Development Studies (UDS). In 2012 TTH will open a new wing and renovate the existing hospital building to improve the facilities. The new construction and renovation will increase the number of available beds, as well as upgrade its theatres, management information systems, and patient care facilities (Renn et al.).

TTH defines its mission as follows: "To provide quality and affordable tertiary health care delivered by well-trained, highly motivated and customer-friendly professional health staff." It identifies its core values as: professionalism, innovation, teamwork, collaboration, people centeredness, integrity and excellence. A Board of Governors oversees TTH, and the Chief Executive Officer, Dr. Ken Sagoe, ensures the day-to-day management of the hospital. The internal auditor and the directors of Pharmacy, Nursing, Administration, Medical Affairs and Finance report directly to him.

Between 2007 and 2010 there was a fourfold increase in doctors, and an almost doubling of the nursing staff. Total hospital staffing increased from 96 to 507 in the same time period, with the largest single increase occurring in 2009. The large growth in hospital personnel brings with it a need to provide both continuing education and in-service training for all levels of staff. Some of this training is provided by other teaching hospitals in Ghana such as Korle Bu and Kumasi, other educational institutions in Ghana, and via support projects and programs provided by institutions and organizations from abroad (Renn et al.).

TTH physicians, surgeons, and nurses cover five surgical specialties: Anesthesia, Neurosurgery, Urology, Orthopedics and Endoscopy. They provide dental, ophthalmic and ear, nose and throat services and care, and in internal medicine they support an intensive care unit, diabetic care, TB care, STI (sexually transmitted infections) treatment and HIV care using anti-retroviral therapy. The hospital's obstetrics and gynecology unit provides antenatal, postnatal and VVF (vagina vesico-fistula) services. A recently renovated and upgraded child health unit offers pediatric and neonatal intensive care for premature babies and newborns with anatomical or other disabilities.

TTH offers 24-hour outpatient services, and includes an Accident Emergency Center, and departments of pharmacy, social welfare and public health. The Public Health Division offers services in reproductive health, environmental health, child welfare, disease surveillance, and nutrition. The Social Welfare Department provides case management, focusing its work on patients with tuberculosis, AIDS/HIV, and sickle cell anemia. In addition, the hospital administers a range of allied health services that include laboratory, pathology, blood bank, radiology, and physiotherapy. A public health research laboratory is located on the hospital grounds.

Patient treatment and consultations are provided in consultation rooms and open wards. A few private beds in single rooms are available to patients. But many outpatient services, antenatal and postnatal care, for example, are provided in large open spaces with a few curtained off consultation rooms.

Malaria was the number one cause of OPD (Out Patient Department) attendance in 2010, and has been the number one cause of death over the previous three years. In 2010, gynecological conditions accounted for the second-highest attendance in the OPD. Second to malaria, reducing morbidity and mortality related to maternal and child health remains a major priority and concern at TTH and nationwide. (See chart on next page.)

Staff in the obstetrics and gynecology department provide a range of maternal health serv-

Top Ten Causes of OPD Attendance

Cases	2008	Cases	2009	Cases	2010
Malaria	16603	Malaria	17615	Malaria	17294
RTI	3109	Gyn. Conditions	2768	Gyn. Conditions	2102
Gyn. Conditions	2785	Pregnancy Related	2226	Other Oral Conditions	1971
Dental Conditions	2538	ARTI	1802	Acute ARI	1556
RTA	1890	Dental Conditions	1663	Hypertension	1230
Hypertension	1883	Hypertension	1598	RTA	1103
Diarrhea	1767	RTA	1448	Acute Urinary Tract	1087
Pregnancy Related	1554	Mal. in Pregnancy	1231	Acute Ear Infection	937
Vaginal Discharge	1444	Vaginal Discharge	1220	Pneumonia	716
Anemia	1100	UTI	1196	Diarrheal Diseases	685

ices that include antenatal care during pregnancy, and postnatal and well-baby follow-ups following delivery for those who are able to reach hospital. The hospital offers emergency services and maintains contact with midwives outside the hospital through cell phones. But serious challenges remain inside and outside the hospital in addressing the needs of women prenatally, during delivery, and immediately post-partum (Gumanga et al. 105).

University for Development Studies (UDS)

The University for Development Studies (UDS) was established in May 1992 to assist in the educational, economic, and social development of Northern Ghana, in particular, and Ghana as whole. UDS is made up of four campuses in the Northern Region, the largest of which is the Wa campus. The University's principal objectives are to address and find solutions to the environmental problems and socio-economic deprivations that have characterized northern Ghana and also are found in rural areas throughout the rest of the country. UDS offers a great opportunity for partnerships and collaboration in research and teaching for the Tamale Teaching Hospital. The Tamale Campus hosts the Medical School and the students in the medical and community health sciences programs. The UDS Medical School trains physicians, nurses, and nutritionists, and offers Master's programs in the social sciences, the biological and laboratory sciences, and several doctoral degree programs.

PROTOCOL VISIT AND ARRIVAL IN TAMALE

Prior to our departure from Accra to go to Tamale, we met with Alhaji Aliu Mahama, the former Vice President of Ghana (2001-2009), to discuss the purpose of our visit and solicit advice. Mr. Mahama is from the Northern Region and has been an active supporter of various service projects connecting U of L with institutions and organizations in Tamale. He informed us of key individuals we needed to meet in Tamale and of other activities and initiatives underway in the region. At his request, we met again with him upon our return to Accra to brief him on what we accomplished in Tamale, before boarding our flight back to the U.S. The opportunities we had to meet with government officials and traditional chiefs during our trip was in keeping with Ghanaian protocols and cultural traditions, but more indicative of the keen interest and commitment of the political and traditional leadership in supporting partnerships that help the nation achieve its development goals and objectives.

We arrived in Tamale on Monday, August 1, 2011 via a ninety-minute flight on Antrak Air Ghana. Air travel in Ghana is safe, efficient and well-organized. Travel by road, on the other hand, poses serious hazards and difficulties due to the poor condition of the highways. To reach Tamale by car, a distance of only 433.15 kilometers (269.15 miles), would have taken more than twelve hours given the poor state of the roadways.

After checking into our hotel, we went directly to the Tamale Teaching Hospital to meet with Dr. Ken Sagoe, the hospital CEO, and his senior staff. Dr. Sagoe had prepared an agenda for our visit that included tours of the hospital, the Nurses Training School (NTS), and the Medical School on the Tamale Campus of UDS located a short distance outside the city. The schedule also called for me to conduct instructional workshops for the hospital physicians during Grand Rounds, the administrators

and faculty of the Nursing Training School, UDS medical students, and the hospital library and IT staff. During the week that followed I provided sessions on PubMed, citation management software, open source materials for medical and health education, and web tools like Dropbox, Evernote, and LiveBinders that can improve individual efficiency and productivity. I also met with several physicians individually to discuss their research projects and information needs, and with medical and nursing school faculty and administrators about instructional resources and materials. While I was thus engaged, my wife, Gwendline Chenault, who is the personnel officer of the U of L Libraries, had a series of consultations with Samuel Akotuah Atweri, the Director of Human Resources for TTH, to discuss human resources policies, procedures, and records management. Although not originally a part of the planned agenda, she was drafted and put to work soon after Mr. Atweri was informed of her area of expertise.

In the first part of this case report I have outlined some of the challenges that must be confronted in designing and implementing a library service-learning project in a nation struggling to develop its transportation, communication, and health care infrastructures. Becoming familiar with the settings in which the service will take place – the geographic, demographic and technological contexts, and the social environment and institutional culture – is essential to service effectiveness and success. To this end I have sought to inform librarians about the opportunities that exist to provide international support to organizations and colleagues in need of resources, training, and professional development, and the issues and problems they will need to address. My hope is that others will be inspired and prepared to pursue similar endeavors. In Part 2 of this case report, which will appear in the next issue of *Kentucky Libraries*, I will discuss the results of the needs assessment and consultation with TTH staff, and the goals and objectives we developed as a team. Thus Part 2 will provide a program model that can serve as a guide for planning similar international service-learning projects and initiatives.

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