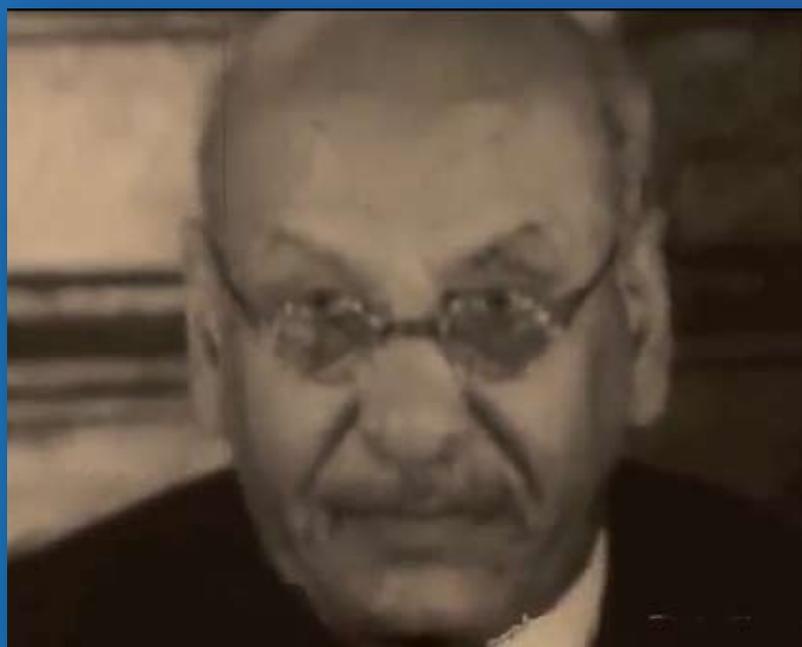


THE MANUAL OF

ETHIOPIAN

MEDICAL HISTORY



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Acknowledgment

People to People extends its gratitude to the authors and their families, who gave precious time to research, review and write on the various topics in this manual so that students of medical history will be stimulated to continue the learning process. This manual is not intended to serve as a comprehensive textbook on the medical history of Ethiopia, but as a starting point, serving as a window for appreciation and learning from the past so that we can build and connect to the future.

Though there are not many, we are fortunate to have a few books that have documented the medical history of Ethiopia, one of them being *An introduction to the Medical History of Ethiopia*, by Richard Pankhurst, with a postscript by Asrat Woldeyes, which is a gem that students of medical history of Ethiopia should consider reading and learning from. We would like to extend our sincere appreciation to Professor Pankhurst – not only for his advice but also for his participation in developing this manual.

We – health professionals and the Ethiopian public in general – are indebted to so many of the pioneers who have left visible traces of their remarkable work to serve humanity. History will never forget the two Ethiopian patriots, Dr. Workneh Eshete (Hakim Workneh) and Dr. Melaku Beyan, who not only served their people during trying times but bravely stood with defenders of their country's freedom against aggressors.

People to People would also like to take the opportunity to thank the hundreds of expatriates who provided much needed medical care in the past when there were no Ethiopian health professionals. In the present era, we extend our gratitude to the numerous expatriate colleagues in various universities and medical establishments who travel with us, advise us and share their resources for the good cause of serving and sharing knowledge and technology.

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—Enawgaw Mehari, MD
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Development of the Manual on Ethiopian Medical History

Welcome to Ethiopian Medical History

By Enawgaw Mehari, MD

The story of medicine is also the story of disease and the story of people affected by the disease. The first Ethiopian hospital was established in 1897, the Ministry of Health in 1948 and the first medical school in the country opened in 1964. Any medical history of Ethiopia must give voice not only to the medical doctors but also to traditional healers who have combated disease and injury, to nurses and attendants who have nurtured and comforted, and to the sufferers who have endured the illnesses. It is tempting to think that the diseases and accidents that trouble humankind have always been there, are always the same, and only our abilities to deal with them have changed. Over the years, our people have suffered from disease and epidemics: Cholera, Smallpox, Malaria and the like. We also share micro-organisms with dogs, cattle, sheep, pigs and poultry. For our ancestors, disease was a mystery, often approached with the aid of magic, superstition, and religion.

In Ethiopia, the quest for modern medicine beyond traditional practice started during Emperor Lebnedingil's reign in the 15th century, when the emperor appealed to the Portuguese king for physicians and surgeons to cure illnesses. It was only during Emperor Menelik's time (1889-1913) that the first foreign-trained Ethiopian medical doctor, Hakim Workneh Eshete, began practicing medicine in Addis Ababa. Not surprisingly, organized and sustainable modern medical practice was nonexistent until the Battle of Adwa in 1886. Given the shortage of modern medicine, traditional medical practice that has prevailed over many centuries was still accepted and for many it was a culturally preferred mode of treatment.

The genesis of modern medicine in Ethiopia was formulated by the thoughts and ideas brought by medical practitioners from Ethiopia, Africa, America, the British Commonwealth, Belgium, China, Czechoslovakia, Egypt, France, Germany, Greece, Holland, Hungary, India, Israel, Italy, Pakistan, the Philippines, Poland, Portugal, Russia, Spain, Scandinavia, Switzerland, Yugoslavia, and other parts of the world. Each country has made immense contributions to the Ethiopian medical service. The ever-expanding number of medical schools and medical students is yet another indicator of the expansion of modern medicine in Ethiopia. As we train these young professionals, it is imperative that they understand the accomplishments of their predecessors and develop an appreciation of the virtues of traditional medicine.

Numerous medical schools in Europe and the United States provide their students with an opportunity to explore the history of medicine. Today, history of medicine courses are offered in the majority of medical schools worldwide. The hallways of famous universities are adored by pictures and paintings chronicling the historical contributions of great minds associated with them. The Institute of Ethiopian Studies is a national treasure, where some of the most comprehensive work in indigenous medical practices is archived.

The history of medicine and diseases illuminates our understanding of the bodies we inhabit, developing models for how we work and how diseases affect us. It encompasses the development of medicine, surgery, and genetics. Globally, over the years, much has been achieved, but the story of medicine is far from over. In some ways, we are no closer than the ancient Greeks in knowing at what point after conception life begins or what, in fact, creates consciousness. We may be able to identify the cause of inherited deformity and disease, but we have not yet been able to fix genes to prevent its expression. There are many diseases we have not been able to cure and injuries we do not know how to heal.

In principle, the raw material of medicine is the human body and the work of medicine is to maintain the body in perfect condition or restore it if it goes awry. Humankind's concept of the body and how it works has changed radically. Our present knowledge of the physical and chemical workings of the body has come about through a process of observation and experimentation that has been particularly intense throughout the last 500 years. Our understanding is by no means complete. The path has been tortuous, but the journey of discovery has been a fascinating one.

Ancient books still herald past victories over diseases – trials and errors, remedies and surgical challenges. It is a short retrospective view of medicine centuries ago and how traditional healers and physicians met the staggering medical crisis. Understanding this provides a unique opportunity to medical students to equip and arm themselves with the necessary tools to shape their views and expand their horizon and to practice high ethical standards of noncommercial medicine. Medicine in the 21st century should become primarily patient-oriented. Governments and health institutions need to change course and provide honest and transparent information to ensure that we develop better medical students and doctors, better patients and better health care. Efficient health care requires informed doctors and patients.

This manual attempts to highlight some of the milestones in Ethiopian medical history. While it aims to arouse the curiosity of the young mind and stimulate further reading, it is by no means intended to be a comprehensive account of such a rich and complex subject.

Goals and Objectives

The overall goal of the Ethiopian medical history lesson is to help health care students gain an understanding of the genesis and evolution of Ethiopian health care. The lecture will build on the student's knowledge of the role traditional medicine has played over the years, the quest for modern medicine in Ethiopia and the heroic contributions by Ethiopians and friends of Ethiopians. Students are expected to participate actively in classroom discussions and to take initiatives in searching both electronic media and current literature to supplement their lecture notes. During the semester, students are expected to accomplish the following:

- Become proficient with a basic understanding of the contribution of traditional medicine in the Ethiopian health care system.
- Learn the important milestones in the health care evolution in Ethiopia.
- Gain a basic level of proficiency identifying Ethiopians who have played a pivotal role in the evolution of Ethiopian medical history.
- Gain an understanding of how hospitals, medical schools, public health, nursing, pharmacy and post-graduate training evolved.

Implementing the Goals and Objectives

- **Assignments:** Students will be assigned to write a term paper.
- **Responsibilities:** To gain facility with Ethiopian medical history and traditional medicine, students will independently write up the papers in one term assigned to them. These papers will be discussed in the class.
- **Teaching materials:**
 1. **Core Curriculum Booklet** – Summaries of challenges, events, manifestations, approaches to traditional therapy. These summaries will serve as back-ground material for class discussions to be conducted by each student in a session allocated by the teacher.
 2. **Case Studies Booklet** – Illustrate common challenges and management problems to be reviewed with the teacher.
 3. **Electronic Media** - An annotated list of websites and other electronic media containing historical documents, images, illustrations.
 4. **Annotated Bibliography** – Selected textbooks and critical articles from the original literature.

Enawgaw Mehari, MD, is the founder and president of People to People, as well as the chair of medical staff and a consulting neurologist at St. Claire Regional Medical Center in Morehead, Kentucky.

Introduction to the Medical History of Ethiopia

By Richard Pankhurst, Ph.D.

In this manual, medical history re-asserts its rightful – and traditional – role in Ethiopian social and cultural life. In the following pages, you will read about Ethiopia's medical history dating from the 16th century to the present.

Melding Old and New

The Ethiopians, since time immemorial, have been familiar with a wide range of diseases and medical complaints for which they had long-established names, both in their ancient classical language, Ge'ez, and in other indigenous tongues of the country. Scrutiny of Ethiopian ecclesiastical texts, the majority of which are unfortunately still mainly accessible only in foreign collections, indicates that traditional Ethiopian healers also possessed a wide variety of cures. Many of these, like those in long-established civilizations in other parts of the world, came from the Vegetable Kingdom. These included leaves, roots, flowers, and seeds or fruit of locally grown plants, which, in Ethiopia, varied greatly with altitude and hence climate. The Animal Kingdom was at the same time represented by certain insects used in medicine and the Chemical Kingdom by various salts.

Other traditional treatments utilized a variety of medical practices. These included purging, bleeding and cupping, steam baths and immersion in hot, often thermal, water, and counter-irritation. Many such cures were recorded in Ethiopian Ge'ez texts, and were passed down by practicing families from generation to generation, often with considerable secrecy. Information on such treatments is also preserved in traditional medical books produced by Ethiopian church scholars, as well as in the detailed accounts of foreign travellers, some of whom were themselves medical practitioners.

The wealth of medical knowledge available to Ethiopians in the past is apparent from the detailed memoirs of the early 16th century Portuguese traveller, Francesco Alvares, and in the subsequent records of Spanish and Portuguese Jesuits. Extensive accounts of traditional medical cures were later found in early 19th and 20th century European scientific, botanical, and other literature.

Such information was much expanded in the early 20th century through the study of traditional Ethiopian medical manuscripts. This work was largely initiated by Marcel Cohen, the French founder of Ethiopian Studies in Europe, as well as more recently by the Polish éthiopianist Stefan Strelcyn, who published several important Ge'ez medical texts and extended his studies from linguistics far into botany.

Research on traditional Ethiopian medicine is now well underway in such scientific studies as *Medicinal Plants and Enigmatic Health Practices of Northern Ethiopia*, 1993, by Dawit Abebe and Ahadu Ayehu, and *Ethiopian Traditional Medicine: Common Medicinal Plants in Perspective*, 2001, by Fekadu Fullas.

An understanding of traditional Ethiopian medicine is important not only for the light it throws on the extent and antiquity of medical knowledge in the past but also to help present-day practitioners through an awareness of these traditions. The following articles in this manual – by some of Ethiopia's foremost medical professionals – shed new light on a medical history that is rich with knowledge, conflict, drama, discovery, and progress – leading, ultimately, to the saving of many lives.

Richard Pankhurst, Ph.D. has co-authored 22 books and has either edited or compiled 17 books on Ethiopia. In addition, he has written more than 400 scholarly articles about Ethiopian history, culture, and tradition that appeared in numerous academic journals, magazines and newspapers throughout the world.

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We asked a few of our colleagues if a curriculum in the history of medicine would benefit tomorrow's doctors. Here's what they had to say:

I warmly welcome your important initiative. I have always felt that the study of medical history is a notable aspect of Ethiopian Studies and of major significance for the Ethiopian medical profession. My belief in this thesis informs all of my writings on Ethiopia and, in particular, my An Introduction to the Medical History of Ethiopia and my more general volumes, An Introduction to the Economic History of Ethiopia, Economic History of Ethiopia and A Social History of Ethiopia. I strongly believe that the medical history of Ethiopia should be included in the curriculum of all medical students. I feel also that the time has come to launch a periodical, or a series of monographs, devoted to Ethiopian medical history, a journal or series that would publish new materials on traditional Ethiopian curative practices.

— Richard Pankhurst, Ph.D.

When I was in medical school in Gondar, Ethiopia, a while ago, there was no formal education or lecture that covered the history of medicine in our country. Even though over the years I have tried to teach myself some of the historic milestones, my knowledge in that area remains incomplete to this date.

Although the quest for modern health care was started in the 16th century, Ethiopia, being one of the oldest nations in the world, always had its own way of dealing with medical conditions and epidemics. Unfortunately, those experiences and wisdoms have not been taught in our schools and medical institutions. The role of traditional medicine over the centuries, as well as the history of how modern health care was introduced and reached the current status, should be part of the educational core curriculum. Any successful attempt to know and conquer the world starts by knowing yourself and your own history. As they say, those who don't know history are destined to repeat it.

My own specialty of Endocrinology, Diabetes and Metabolism is a relatively young one in the Ethiopian setting. Despite that, it is quite humbling to learn the historical contribution of both Professor Jemal Abdulkadir at Black Lion Hospital (since the 1960s) and Dr. Frances T. Lester at Yekatit 12 Hospital (since 1971) in the development of these specialties in our country. Important also is the contribution of Dr. W.H. Peters, a German biochemist who helped introduce for the first time specialized diabetes care and research at Gondar College of Medical Sciences (in the early to mid-1980s).

Finally, I salute the longstanding contribution of Professor Richard Pankhurst, an international scholar, who recorded our history of medicine. I also support the efforts of Dr. Enawgaw Mehari, president and founder of P2P, who has been working hard the last 10 years to raise the awareness of the medical community and leaders in Ethiopia about the significance of knowing our own history and the need to include it in medical school curriculum.

In summary, I think it is time that our own history of medicine is incorporated into our own medical school curriculums throughout the country and I support all efforts to make it a reality.

— Elias S. Siraj, MD, FACP, FACE, associate professor of Medicine Temple University School of Medicine and Hospital

Ethiopian Medical Students' Association is a legally registered nonprofit association, which was formed by the volunteer medical students of Ethiopia. This association strives to make a difference in the quality of medical education all over Ethiopia. It has voiced students' concern on the current medical education through different ways designed to upgrade medical education, especially at the 46th annual conference of the Ethiopian Medical Association on Medical Education in 2010.

To this end, the association strongly believes that the current medical education needs improvement so that students become well-rounded and responsible physicians. The association endorses incorporation of Ethiopian medical history into the current curriculum as one way of achieving this. It is very important that today's medical students know about their legacies, so that they feel a sense of belonging to the medical problems that Ethiopia faces. By doing so, students will be inspired by the brilliant achievements and sacrifices paid to reach the point we are at now. Students will be able to know the unsung heroes of the medical profession in our country and this will enable them to follow in their footsteps. Moreover, this can be one means of giving recognition and acknowledgment to our past phenomenal medical personnel.

The young doctors of the current generation will become motivated to involve themselves in activities that are beneficial to the Ethiopian people; and thus build on what has already been done. Indeed, we will "Stand on the shoulder of giants", as was said by Sir Isaac Newton. In addition, had there been properly documented histories, it would have been a good source of reference for research activities.

In a country like Ethiopia where educated doctors abroad outnumber practitioners working in the country, it is imperative that medical students be taught their past legacies so that they become physicians determined to improve the current medical perils.

— Ermias Abebaw, vice president External Affairs and Public Relations Ethiopian Medical Students' Association

In the early history of mankind, illness was attributed to evil spirits, witchcraft, adverse astral influence or the will of super naturals. These ideas still retain some power in several cultures, with faith, shrines, rituals, holy water, etc, being used. As of the 19th century, however, advances in science and laboratory technology have replaced mysticism and revolutionized medicine. In the long process of discovering which plants are edible, humans in the early stages also identified medicinal plants to cure or alleviate ailments. The use of plants for healing purposes (herbal medicine) therefore predates human history and forms the major part of traditional medicine and the origin of much of modern medicine; and remains an important part of medicine to this day. According to WHO, "[Traditional medicine] is the sum total of knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures that are used to maintain health, as well as to prevent, diagnose, improve or treat physical and mental illnesses". Today, TM is used by about 60% of the world population; and WHO estimates 80% of the population in developing countries rely on TM for their primary health care. History forms a major component of human cultural and scientific knowledge, including the evolution of modern health care. Documented evidence indicates that modern medicine in Ethiopia was initiated at the early 16th century, during the time of Emperor Lebna Dengel with the arrival of Joao Bermudes, a member of the first Portuguese mission to Ethiopia. Medical anthropology is a growing field that studies the development of systems of medical knowledge and medical care, whether modern or traditional; the integration of alternative medical systems in culturally diverse settings and the interaction of social, environmental and biological factors, which influence health and illness both in the individual and the community. To train well-rounded health care professionals, a medical curriculum should include an interdisciplinary course that can provide a framework in which students can comprehend the development of medicine – alongside science and technology – in relationship to our society. Only such an approach would enable our students to examine a wide range of issues in the past and their relevance to the present. Such a course would broaden students' perspectives, enabling them to better meet the demands they will face as practitioners in the diversified cultural settings of Ethiopia. To know the present better and shape the future, we need to learn from the past! A course on Ethiopian medical history and anthropology should be an essential component of medical education and part of the compulsory core curriculum.

— Professor Tsige Gebre-Mariam, Humboldt Ambassador scientist School of Pharmacy, Addis Ababa University

Ethiopian chronicles and foreign travelers have left many historical accounts of outbreaks of epidemics and famine as well as the role of traditional medicine within the Ethiopian society. The development of modern health care in Ethiopia is very much intertwined with the deep-rooted cultural and religious beliefs in traditional medicine. Holy water is often used as the first line of therapy for all kinds of ailments. Ethnobotanical remedies are also widespread and very popular, irrespective of one's ethnic and religious backgrounds. Even to this day, it is quite common for patients to present to a modern clinic only after they have exhausted consultations with traditional healers. What is more, consultations with traditional healers, who deal with both mental and physical illnesses, are invariably kept secret from the modern practitioner.

I believe it is essential for a physician practicing in Ethiopia or looking after Ethiopian immigrants abroad to have a thorough knowledge of the intricacies of traditional medicine. Extracting a reliable medical history and planning an effective therapeutic strategy is very much dependent on this factor. For instance, it has been reported that Israeli psychiatrists treating Ethiopian Jewish immigrants at a medical center had to refer 15% of their patients to traditional healers because conventional medical knowledge alone could not penetrate the strong beliefs in traditional medicine. It is, therefore, very important for Ethiopian physicians to be systematically exposed to the developmental history of modern health care in the country with an emphasis on ethno-medical practices. This is best achieved when such training is incorporated into the curriculum of Ethiopian medical schools. From my own experience as an educator in the Medical School of Addis Ababa University, I have often found medical students to be keen and inquisitive to learn more about traditional medicine. I strongly believe that this enthusiasm should be exploited through a formal course of health care evolution within the medical curriculum.

— Redda Tekle Haimanot, MD, professor of Neurology Addis Ababa University

When I think of modern medicine, what comes to mind is the dedication and high standards of the first pioneers. Haile Selassie University (HSIU), subsequently named Addis Ababa University, was well known for its exceptionally high standards and quality. The eloquence and intellectual sophistication of graduates of HSIU or former students of HSIU are still well and alive. HSIU Medical School and the Gondar Public Health School have had a leading role in laying down the solid foundation for medical education in Ethiopia. The pioneers of modern medicine have served our country exceptionally well through thick and thin. For example, during the time of the “Derg”, there was an attempt to copy the Chinese model. The plan was to train physicians in three years rather than seven years. The majority of the medical school faculty was against it. One dictum of the day was: “The bare foot doctor is neither bare footed nor a doctor”. This was attributed to Professor Nebiat Taffari, who was well known for his wit and scientific knowledge. Ethiopian medical history should be included in the core medical education curriculum, which will add value to the quality of training, education and research.

— Yonas E. Geda, MD, associate professor Psychiatry & Neurology College of Medicine, Mayo Clinic

How Understanding the Medical History of Ethiopia Will Make Us Better Doctors

By Kinfu Gebeyehu, MD

In an article for the University of Birmingham in England, R. Arnott addresses why its medical school introduced the teaching of the history of medicine and summarizes its justification for the curriculum as follows:

- The history of medicine broadens students’ educational horizon.
- It helps them develop critical analytical approaches to medical knowledge and practice beyond the rigidly biomedical and statistical preoccupation of modern medicine.
- It helps them avoid developing a tunnel vision in studying and applying the practice of the art and science of medicine.

Many medical schools in Europe – such as Greece, Russia, Croatia and England to mention a few – integrated the history of medicine into their medical school programs much earlier than schools in the U.S. Records show that Russia was teaching medical history to its medical undergraduates starting as early as the 1800s. Some of the European programs linked their curricula in the history of medicine to bioethics, humanities, medicinal plant science, and aging and health. Even though only a few of the 150 or so medical schools in the U.S. that have a well-established curriculum in the history of medicine, those that ran stronger programs either as electives or obligatory courses believe that students gained not only by adding to their understanding of the historical origin of medicine but also by developing humanistic and behavioral aspects of medicine in their learning and practice.

Tomorrow’s doctors in Ethiopia can benefit even more from a curriculum in the history of medicine. They need to understand how medicine developed globally, but, maybe more importantly, how it developed in their own country.

Finding published references on the history of medicine in Ethiopia for this venture has been a challenge. A valuable book many of the writers of this manual referenced is Professor Pankhurst’s book *An Introduction to the Medical History of Ethiopia*. The book gives brief but useful historical accounts of traditional medical practice in the past, including the common use of herbal remedies. Emperor Libnedingil is credited as taking the first mighty step at introducing Western healing practices during his reign and subsequent monarchs also made a contribution to a European style of medical practice, especially Menelik, but it was more recently, in Emperor Haile Selassie’s time, that the practice of contemporary medicine and public health was broadly introduced.

This takes us to the era of the opening of nursing schools to serve hospitals that were slowly growing in number, including mission hospitals in the more rural settings. The opening of the Public Health College and Training Centre in Gondar in 1954 was partly a response to the then-overwhelming epidemics of Malaria. But soon the Centre became an important cornerstone of public and community health practice making its way to rural regions of the country.

Graduates of the Public Health College and Training Centre went out to remote rural towns in teams as HOs, community nurses and sanitarians to give medical, community health and maternal and child health care, environmental health and preventive health care, including immunizations. It was then that pit latrines were introduced to remote villages, and educational efforts toward child rearing, the importance of breast feeding, safe mothering and methods of transmission of parasitic diseases and infections were made known to millions of rural inhabitants all over the country. Health education – demonstrations on the proper ways to feed children, how to boost nutrition for pregnant mothers, how to safely dispose of human excrement – was given to many for the first time at the health centers, in designated day market areas, in the homes and anywhere else the teams saw a need that would benefit the public.

In the early 60s, teaching and practicing public health in Gondar and later on in the early 70s practicing pediatrics medicine, our fight against harmful traditional practice was intense. The cutting of uvulas of children for many unrelated illnesses by traditional healers, the scrapping of the tonsils that posed potential serious complications, applying cow dung to freshly cut umbilical cords, thus making the newborn an easy target for Tetanus infection, were some of the traditional practices we were armed to fight against as practitioners of health. Of course, hundreds of the graduates spread all over the nation must have experienced numerous other harmful practices that they were trained to handle or prevent – some of which they must have faced for the first time. Female circumcisions and labia suturing, which have gained more recent national and international attention and were being practiced in various regions of the country, have now been added to the list of harmful traditional practices that public health and medical professionals continue to stamp out.

On equal terms, for certainly not all traditional medicine is harmful, the study of the history of medicine will enable teaching institutions to keep records to modify or endorse the beneficial practices, especially in the use of herbal medicines and alternative approaches in assessing and managing various illnesses. Our goal should be to create a healthy marriage between the beneficial traditional medicine and contemporary modern medicine while ridding the countryside of the more harmful practices. We can do this by understanding the history of medicine in Ethiopia; a curriculum focused on this can serve as a reference resource for all practitioners and for a more holistic approach to learning the practice of medicine for tomorrow's doctors.

Kinfe Gebeyehu, MD, MPH, FAAP-Pediatrics & Public Health, is the emeritus attending pediatrician at Stroger Hospital of Cook County in Chicago.

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Hakim Workneh Eshete and Melaku Beyan: Pioneers in Medicine

By Zergabachew Asfaw, MD, and Efre Alemayehu, MD

Western medicine was introduced to Ethiopia by two pioneers in medicine: Hakim Workneh and Melaku Beyan. Although they practiced in different eras, they were both innovators and independent thinkers who fought for freedom from foreign invaders. By understanding Ethiopia's past, we can better analyze the present and prepare for the future. Much can be learned from examining the lives of two great Ethiopian doctors.

Hakim Workneh Eshete

Hakim was born in 1865 and was a small boy when his parents – along with other prominent citizens of Gondar – were seized by Emperor Tewodros and taken to his fortress at Maqdala. In an effort to modernize his armies, Emperor Tewodros sought support from the British. Tewodros wanted to unify Ethiopia, but the British ignored his request for help, so he became angry and took British hostages. This created so much friction that Tewodros had to fight the British in a battle. The Emperor's army was dramatically defeated by the British and Tewodros took his own life with his pistol. In the aftermath of this battle, a very young Workneh was found wandering around. The British assumed the little child was lost, so Colonel Charles Chamberlain took the boy under his wing and brought him back to India with him.

After the death of the Colonel in 1871, Hakim was sent to a mission school at Amritsar. A Colonel Martin paid for the young boy's education, so the missionaries decided to christen Hakim Charles after Colonel Chamberlain (who had brought him to India) and Martin (after the Colonel who paid for his education). Thus Hakim Workneh was renamed Charles Martin.

He eventually was sent to a boarding school and then joined Lahore Medical College. He obtained his medical degree in 1882 after graduating third in his class. He was then appointed as an assistant surgeon in the British medical service in India. After traveling to Scotland for additional training, he returned to India, where he was appointed district medical officer and surgeon in Burma.

In 1886, hearing that the Italians had invaded his native land, he obtained a three-month leave and traveled to Eden and then to Zeila in British Somaliland. He was stopped by a British district officer and was prevented from proceeding to Abyssinia because the situation was so dangerous. His effort, however, was not wasted. The British Officer, J.L. Harrington, who prevented him from going to Abyssinia, remembered the young doctor and when he was subsequently appointed a British agent in Addis Ababa, he informed Emperor Menelik about the young Ethiopian doctor he had met earlier. The Emperor asked Harrington to arrange a visit by the young doctor to Ethiopia.

Dr. Charles Martin traveled to Ethiopia and met with the Emperor. The Emperor arranged with the British government for him to take a leave of absence for a year. During his stay, he rediscovered his family and met some relatives after setting up a tent hospital to treat patients. Most notably, he met his grandmother, who identified him by his scar on his leg and arm. He discovered that his original name was Workneh. This had a profound effect on him. He learned Amharic and urged the Emperor to open schools. Menelik agreed, but so much opposition was encountered from the church that no progress was made initially.

In the meantime, he got married to the daughter of a nobleman. He continued treating patients and was also the private physician for Emperor Menelik. When the Emperor became seriously ill, Hakim sought the help from the British and French doctors who came from Harar. He remained in Addis Ababa till February 1902 before setting forth for Burma.

On his journey back to Burma, he met Ras Makonnen, the governor of Harar, who extended his stay for another year and asked him to join a British expedition as a medical officer for the campaign the British were waging against the "Mad Mullah" in British Somaliland. Workneh eventually severed his ties with the British, but at the end of the campaign, he went to Harar, where he treated Ras Makonnen. Workneh stayed and worked for him for six months and as a show of appreciation, Ras Makonnen gave the doctor 70 acres of land.

In February 1902, Dr. Martin returned to Burma taking with him his children, his wife and a few other Ethiopian boys to secure their education. In 1908, he was appointed medical officer in the British legation in Addis Ababa. He subsequently decided to stay permanently in Ethiopia and worked very closely with Regent Ras Tafari Makonnen (later becoming Emperor Haile Selassie). He assisted him closely and was a personal adviser to the Regent, who was directly involved in administration during Empress Zewditu's reign. He served as an administrator to a new hospital that was built by Tafari Makonnen. He helped the Regent to build a new school named Tafari Makonnen School in Addis Ababa.

Azaj Hakim Workneh Eshete, as he was popularly known, was deeply involved in numerous development projects, serving in different capacities. Despite frequent opposition to his ideas, he served as an administrator, adviser to the government, researcher, teacher, author, human rights advocate, entrepreneur and businessman. He was even appointed ambassador to London. He served his nation with great distinction in negotiations and diplomatic endeavors to avert the Second Italo-Ethiopian War. He helped the international Red Cross to go to Ethiopia during the war. When the Emperor went to England in exile, he worked with Haile Selassie very closely in diplomatic negotiations to free the nation during the occupation by Italy.

Hakim Workneh Eshete was the first Ethiopian doctor to obtain a modern medical education at the turn of the 19th century. His unique contributions to Ethiopia as it was becoming a nation are undeniable. For more information about this remarkable man, read the detailed account of his life history written by Tadele Kibret in Amharic.

Melaku Emanuel Beyan: The First Ethiopian to Earn an American Degree

Melaku Beyan was born in Wollo province, Ethiopia, on April 27, 1900. His father was transferred to Harar when he was a little boy to serve Ras Makonnen, then governor of the province. He spent his childhood as Haile Selassie's page and personal assistant in the palace and attended the palace priest school that later prepared him for modern education.

Along with two other young Ethiopians, he was sent to attend an English school in India. India was a British Colony at that time, but the Ethiopian students did not find the situation in India tolerable and thus they persuaded their model father, Ras Tafari, in Addis Ababa, for permission to continue their education in the United States, where imperial ambition regarding Africa was minimal. When Melaku and his two companions left India for the United States, they carried with them a sealed envelope containing a personal letter of recommendation to President Warren G. Harding from Ras Tafari, heir apparent to the Ethiopian throne. The Ethiopian Regent had asked the U.S. president to kindly assist the young Ethiopians in their pursuit of higher education. The Ethiopian students were received by the President, who then counseled them to attend his alma mater, Marietta College in Ohio.

Melaku and his colleagues joined a preparatory school at Marietta College as first-year students. Melaku received his high school diploma and then joined the college in Ohio. After four years of college, he earned a degree in 1928. He joined the graduate school for advanced work in chemistry at Ohio State University. A year later, he transferred to Howard University in Washington, D.C., where he became a medical student. While at Howard, he met a beautiful African-American, Dorothy Hadley, and married her in 1931. He graduated from Howard with a degree of Doctor of Medicine cum laude in 1935.

While still a student in the United States – even before graduating from Howard – Melaku served his country as an unofficial Ethiopian representative to the United States, dealing with relationships between the people of Ethiopia and African-Americans. He sought scholarships and other educational opportunities for Ethiopians in the Western Hemisphere. During the Italian- Ethiopian War in the 1930s, he seized every opportunity to explain the real issues to Americans and Caribbean audiences. On November 2, 1930, Melaku attended the coronation of Emperor Haile Selassie in Addis Ababa.

Dr. Melaku began his work as an intern in the United States in 1935, but he was recalled home because of the imminent Italian attack on Ethiopia. After only about a month in Addis, he was sent to the Ogaden with the Ethiopian Red Cross to tend to the wounded soldiers. In late November 1935, Emperor Haile Selassie was about to leave Addis Ababa for the northern front, and Dr. Melaku was called back from the Ogaden to serve as an attending physician to the Emperor and take charge of the first aid unit in the war zone – serving more than 120,000 active combatants. The fighting did not go well for the Ethiopians and the Emperor ordered their return to the capital.

Members of the Imperial Council met in Addis Ababa and it was proposed that the Emperor depart immediately to appeal to the League of Nations for justice. There were oppositions to the Emperor's departure. The Emperor left Ethiopia for Europe and Dr. Melaku accompanied him as his physician, secretary and interpreter. The King appeared before the assembly of the League of Nations and delivered an emotional and historical speech on June 30, 1936. But those who had the power to act in favor of Ethiopia's legitimate causes turned a deaf ear to his appeal.

In retrospect, Dr. Melaku agreed with those who opposed the departure of the Emperor. He said, "I came to a definite conclusion that our hope lay in what we Ethiopians at home could do and what our people, the black people of the world, would do to help us save our independence".

In September 1936, Dr. Melaku returned to the United States as Ethiopia's representative and coordinator of fund-raising activities. The Emperor instructed Dr. Melaku Beyan to open diplomatic offices in countries that continued to recognize the Ethiopian government, to carry out the diplomatic struggle at the League of Nations, and to solicit funds. To carry out his mandate, representative Melaku introduced a weekly paper *The Voice of Ethiopia*, and created the Ethiopian World Federation by merging with all Pro-Ethiopian organizations, including the Universal Negro Improvement Association that was established by Marcus Garvey.

The move to create a united African-American, African and Ethiopian front to defend the cause of his country was his greatest contribution. He worked closely with Marcus Garvey, even though they often had their differences.

Dr. Melaku worked tirelessly until the day he died of pneumonia in New York on May 4, 1940. He died one year before Ethiopia and its allies expelled the invading Italian army from his mother land. He was a great leader who dedicated himself to his nation. He worked as a doctor, social activist, journalist, freedom fighter, and ambassador for peace and equality. He created a link between Ethiopia and other people of color, especially black Americans, in the Western Hemisphere. Dr Melaku has set an excellent example for generations to come.

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Indigenous Healing Practices in Ethiopia

By Solomon A. Getahun, Ph. D. and Assefa Balcha, Ph. D

Indigenous healing – and the challenges it faced during the 20th century – has its roots in a wide variety of indigenous therapeutic methods and practitioners and occupied the country’s medical landscape for centuries.

Indigenous Views on Causation of Diseases

Ethiopian indigenous cosmology regarding the causes and prevention of diseases has been the result of mixed beliefs of Christian, Islamic, and indigenous beliefs and practices. The cultural affinities that existed for centuries with different peoples precluded Ethiopia from developing neither fully indigenous nor wholly exotic therapeutic methods.

Most African indigenous religions encompassed the belief that all natural objects were pervaded by spirits that were also personified and worshipped. The wraths of these spiritual entities were often considered as causative agents of a whole range of human misfortune: illness, deaths, drought and famine. Every kind of assistance was also sought from almost all the endowments of nature. In short, spirits were held responsible for the mishaps and/or the well-being of the society. This suggests that the indigenous beliefs together with imported religious and cultural ideas enabled Ethiopia to cultivate its own medical-cultural beliefs upon which both Christianity and Islam founded and developed their medical beliefs and practices.

A pantheon of devils and demons, presumably taken from later Judaism, pervaded Ethiopian Christianity. Most personal and social misfortunes were attributed to the malevolence of these supernatural beings. As a result, a variety of magic-religious techniques flourished to fight against evil spirits. A great deal of these activities confirmed the persistence and syncretism of both pre- and post- Christian beliefs and practices. As evil spirits were mostly incriminated in most misfortunes, the supposedly efficacious spiritual counter-measures were given precedence over all kinds of rational efforts. The Orthodox Church, in particular, considered all rational therapeutic efforts as Satanic. As a process of syncretism, many indigenous elements had been incorporated into Islam. Realizing the remoteness of Allah, the faithful were determined to consider the existence of a range of subsidiary – benevolent and noxious – spiritual beings between ordinary Muslims and the Creator. While some of these spiritual entities were accused of personal failures, illnesses and other misfortunes, others were praised for successes, good health and happiness.

Veneration of local Muslim saints can be taken as a good example of the legacies and transmuted cults of pre-Islamic periods. The introduction of the mystic orders since the end of the 18th century was accompanied by the establishment of “various centers of learning and local pilgrimage”. Shrines were dedicated to several Muslim saints whose intercessory role was thought to be a powerful spiritual force to alleviate the problems of individuals and the larger society. For example, in times of disease – such as drought, famine and communicable diseases – people would simply gather around the wujib (or the tombs of local Muslim saints) and pray for mercy. Whenever social misfortunes – such as shortage of rain, prolonged drought, communicable disease, cattle disease, heavy rain or locust invasion – occurred or were imminent, people prepared rituals to make petitions and supplication. For example, Wadaja, a ritual of group or communal prayer, was an act of confident expectation and forlorn hope.

Types of Indigenous Healers and Therapeutic Methods

Herbalist-healers were the largest group of specialists who occupied the pre-biomedical medical landscape. The art of herbal therapy was the oldest medical tradition in Ethiopia, and, in all likelihood, it pre-dated other forms of indigenous healing. Although all indigenous practitioners employed botanical medicine, it would be a mistake to designate all groups of healers as herbalists. Here, the term herbalist refers strictly to medical specialists who prepared and administered herbal drugs only. Though largely illiterate and dependent on memory to learn and preserve their medical information, the majority of herbalist-healers commanded an extensive knowledge of the plant kingdom. Acquiring herbal knowledge was a lengthy process, requiring prospective healers to undergo a long period of apprenticeship under the mentorship of experienced herbalists. The quality of medical training was crucial to produce proficient, God-fearing, ethical and moral herbalist-healers.

The balazar were the single most important group of spiritually inspired practitioners. The belief in the Zar spirit had an ancient origin predating even the introduction of Christianity and Islam to Ethiopia. After Christianity assumed spiritual predominance, however, the Zar, the former sky-god of the Cushitic Agaw, was relegated to becoming a possessing spirit. Scores of human maladies and tribulations were attributed to this spirit, in Ethiopia as well as in neighboring countries and areas of the Arabian Peninsula.

When an intrusion of disease-causing spirit was suspected, a person with a history of Zar possession was found right away to serve as a spirit medium and communicate with the spirit causing the sickness. During these ritual healing sessions, the Zar-spirit (through its human medium) would identify the troubling spirit, including Jinn and evil-eye spirits, diagnose the illness, and recommend a therapeutic solution. Spiritually inspired healers, using their clairvoyant powers, recommended various kinds of therapeutic modalities to the physically ill, the psychologically disturbed, and to those with scores of personal and social problems.

Another group of secular practitioners was the waggasha (literally the one who “gives relief” or “effects cure”). The term waggasha or “surgeon-herbologist-empiricist” stood for indigenous healers, who in large part cured through the physical manipulation of the human body. Like the majority of herbalist-healers, the waggasha were mostly nonliterate and professed to no esoteric or mystic knowledge. They acquired their craft through a long period of apprenticeship. Written records on the waggasha’s empiric-therapeutic vocations date from the 16th century; they served as bone-setters (or orthopedists) and performed other surgical operations – such as cauterization, bleeding, cupping, circumcision, cutting the uvula, scarification, opening abscesses, removing tumors and bullets, and extracting carious tooth. In addition to these specialized skills, the waggasha also possessed a limited amount of herbal knowledge, an essentially pragmatic and experiential wisdom.

Among the wide array of practitioners of indigenous medicine, church-based healers (dabtara) were paramount. Possessing the widest array of medical knowledge, they began their education as ecclesiastical students in church schools and were viewed as particularly skilled in treating a broad range of medical and socio-cultural problems. Church-based healing, associated with the Orthodox Ethiopian Church, can be traced back to the 16th century. It involved a rich complex of practices based on the use of esoteric medical texts and the manipulation of letters and numbers, as well as an invocation of spirits and the use of herbal remedies.

Church-based healers had to undergo the most rigorous training – involving years of education from a range of teachers located over wide areas of the country. It was only after this long period of textually based and practical training that medical students could command the religious, linguistic and medical/magical subjects needed to practice their craft. Though the history of church-based medical education can be traced back to the early days of the Orthodox Church, the earliest medical/magical manuscripts identified so far belonged to the 17th century. Religious institutions played a decisive role in providing the instructional resources for church-based medicine and healing for several centuries, even though the church viewed the acquisition of medical knowledge with some trepidation. The training of cleric healers constituted the acquisition of the “much admired wisdom” to invoke and exorcize evil spirits; cast and break magic spells; make divinations; provide herbal treatments; and produce written amulets and talismans.

The availability of indigenous practitioners of differing educational background and training – as well as their competition for the medical market – was a major feature of the medical landscape of the 20th century. It is worth noting that the success of any group of healers within this market was determined not simply by its ability to attract patients but also by the extent to which any given medical tradition was sanctioned by the political elites and religious establishments. This was a dominant feature of the history of therapeutics during the course of the 20th century.

Disputes Between Indigenous and Biomedicine in Ethiopia

What is often missed by those seeking to develop cooperation between indigenous and biomedicine is that in many parts of the world current integration efforts are part of a much longer history of state-led efforts to manage the activities of indigenous healers. These efforts have ranged from early attempts at cooperation to all-out attacks on the existence of healers. Together these actions have shaped indigenous health practices and affected the perspectives that indigenous health practitioners have toward contemporary integration efforts. While a number of studies have described aspects of these earlier approaches, none have systematically traced their history over an extended period of time. Lack of a detailed study on the history of indigenous medicine in Ethiopia, and its relationship to government efforts to manage indigenous health-care practices during the 20th century, has been an observable lacuna that should have been narrowed down or bridged.

It is therefore vital to have an understanding on the changing role of indigenous medicine in Ethiopia during the 20th century. Healers had to contend with a rapidly changing social and political environment shaped by successive state-led efforts to transform Ethiopian society. These transformations, including attempts to transform medical care, began with the westernizing initiatives of Menelik II, and continued through successive Ethiopian administrations of the Imperial regime, the brief Italian rule, the restored Ethiopian monarchy, and the Marxist military regime that assumed power in the 1970s. Menelik sought a suitable compromise between the indigenous and western allopathic therapeutic systems. And as part of this scheme, the emperor provided experienced healers full-time employment at Arada Clinic, a branch of the Menelik Hospital, which was staffed almost entirely by salaried church-educated healers. The official encouragement provided to indigenous healers, however, was entirely confined to the Imperial capital and had no impact on the majority of healers working in the rest of the country.

Although appreciative of the virtues of foreign medicine, Menelik seemed to encourage allopathic medicine only so long as it maintained a compromising stance toward indigenous therapeutics. To create a “curious compromise between traditional and western medicine”, the Russian Medical Mission that came to Ethiopia following the Battle of Adwa was asked by Emperor Menelik to produce the “first Western Amharic [bio]medical textbook [or manual]”. Consequently, when we talk of integration, we need to have in-depth knowledge on how church- and non-church-based healers struggled to maintain their medical traditions in the face of repeated attempts to control their activities and how these struggles shaped their attitudes toward integration efforts.

In the last century, indigenous healers constituted a sizable number of health practitioners in the country. They provided their services to a cross-section of the Ethiopian population. But the expansion of western biomedicine and education posed a formidable chal-

lenge to their near monopolistic position. They had to devise strategies to ensure their survival in the changing society where the state was bent on structuring the country's health care system along the biomedical lines. Healers had to find ways to work in a pluralistic medical environment. Taken as a whole, since the Italian era (1935-1941), state policies have undermined the practice of indigenous therapeutic systems that had once dominated the medical marketplace of the country by preventing the preservation of the indigenous medical wisdom from waning.

As western biomedicine made only limited inroads, indigenous healers were able to maintain their dominance until the mid-1930s. Under the Italians, however, attacks on indigenous healers for their alleged involvement in political resistance, combined with an expansion of biomedical services, began to undermine this dominance. With the restoration of the Imperial regime in 1941, the position of healers was further eroded. Though the 1948 proclamation accorded legal recognition to the indigenous therapeutic system, the place of indigenous practitioners was not clearly delineated. And the expansion of modern biomedical institutions further undermined indigenous healers. Though the provision of biomedical services was principally handicapped by an inefficient bureaucracy, the emergence of new forms of healing – including hybrid healers and “injectionists” – expanded therapeutic options available to the public.

Under the military government that took control of the state power in 1974, indigenous healers faced new challenges. The Derg's efforts to eliminate religion, including forms of healing that were based on religious/traditional beliefs, put indigenous medicine in a state of confusion and disrupted the emergence of new healers. The deterioration of the public health system and the adoption of the WHO's 1978 Primary Healthcare Strategy, however, persuaded the military government to soften its hostile attitude toward a section of indigenous healers. But in acknowledging the value of indigenous medical knowledge, the Derg emphasized what it saw as practical elements, focusing primarily on herbal remedies. At the same time, it largely rejected the value of other forms of healing, focusing mostly on the training of traditional birth attendants and excluding other indigenous healers from taking part in the primary health care training programs. While it created a Coordinating Office for Traditional Medicine, and organized a limited number of seminars and workshops on indigenous medicine, these activities did little to overcome the suspicion that healers had of a government that had earlier attempted to eliminate their practices.

The government that succeeded the military regime in 1991 incorporated indigenous medicine into its health policy. The 1993 Health Policy and the 2009 Health Care Proclamation speak to the need to develop indigenous medicine, including the adoption of regulations and registration of healers, and its eventual integration into the biomedical system. But little has been accomplished so far.

In a word, the efforts of successive Ethiopian governments to deal with indigenous healers have failed to achieve an effective integration of indigenous healing practices and western biomedicine. Repeated attacks on healers combined with misguided efforts to define and regulate indigenous medical practices have weakened the hold of indigenous medicine and discouraged healers from participating in efforts to integrate them into the country's health system. As a result of healers' marginalization, the valuable medical knowledge imbedded in indigenous medical texts and the ability to properly deploy this knowledge is in danger of disappearing.

What Should Be Done?

To save indigenous medicine from vanishing, there must be a strong positive attitude, sense of direction and purpose as well as absolute trust and sincerity – on the part of both indigenous health practitioners and state/public health officials – to finding ways to preserve, value, and utilize the rich body of indigenous medical knowledge that is rapidly disappearing. It requires the creation of new institution/s, which will take this goal seriously and seize opportunities to explore potentialities for integrating indigenous therapies into the country's health system. It is therefore vital to create an environment on which a cooperative spirit is cultivated. Unlike the committee created in the 1950s for this purpose, the new institution/s must purposely engage with indigenous healers.

At present, indigenous healers complain about the absence of individuals or organizations with a commitment to learning, evaluating and preserving the indigenous medical lore. They are extremely passionate about transmitting and preserving their indigenous medical knowledge and reiterate their readiness to collaborate with those who would want to carry out action-oriented researches and explore opportunities for cooperation with conventional medicine. For this to happen, healers have stressed that it is essential to establish genuine healers' associations, organized by healers, which can endorse or certify qualified practitioners, promote members' interests, and create harmonious working relationships with the Ministry of Health and other governmental bodies. While healers' associations were created in the past, they were largely ineffectual and generated little enthusiasm. Creating a favorable working environment is an extremely important precondition for healers to come forward and participate in the struggle for the establishment of an integrated health care system.

Many healers recognize that they need to provide evidence on the hypothetical association and pragmatic worth of the material and non-material (or the “natural” and “mystical”) elements of their therapies. They also acknowledge that any effort to develop an integrated system of medical care will require healers to work together to systematize the indigenous medical knowledge and help them fulfill their unfulfilled promises. The evolution of multiple forms of medical care during the 20th century has created a complex situation of which ideas and practices should be integrated into the health care system. Among the work that needs to be done in this regard is the adoption of linguistic standards for local medical texts and resolving the issues of unessential/unintelligible words/phrases and the mysterious writing techniques contained in these texts.

This grueling undertaking, which should aim to produce new standardized medical texts, requires the collaborative effort of several literate healers. This means, caring for the literate healing tradition is the same as caring for the health care needs of the majority of the population. It is only with healers' wholehearted participation and scrupulous examination/interrogation of medical texts that the alleged medical value or the healing power of inscribed prayers and words can be ascertained. In addition, the flaws and deficiencies of the written knowledge of the 20th century can be redressed. By the same token, such an endeavor would help us to appreciate the peculiarity of the Ethiopian indigenous therapeutic modalities vis-à-vis the various schools of healing traditions that had been utilized and documented in different parts of the world.

At the moment, however, such a collaborative effort is far from becoming a reality. Many healers remain resistant to departing from a tradition in which medical knowledge and its transmission have been closeted in secrecy. Moreover, many of those who possess knowledge of indigenous medicine are growing old and there may not be enough time to develop the type of long-term collaborative project. The issue is more complicated than it seems. If we do not have the luxury of planning for a distant future, we must take some tangible steps now. Even the first step of creating healers' associations – which would begin the necessary cooperative work – may not be a trouble-free undertaking.

All previous attempts at setting up healers' associations have been partially obstructed by practitioners' deep-rooted suspicion of one another, their lack of faith in the intentions of the state, and above all, their lack of freedom to organize autonomous healers' associations with legitimate and trusted leadership. During the Imperial era, most cleric healers were selfish and more interested in outsmarting their competitors than doing something to promote their collective rights and interests.

The unpleasant experience of the Derg period deprived healers of their sense of community and alienated them from any government involvement or initiative in matters relating to indigenous medicine and healing. For instance, the military government persecuted and stigmatized cleric healers and prevented them from taking part in its Primary Health Care Program. At the same time, many healers viewed the Derg as contributing to the burgeoning of "self-styled" healers. For the majority of healers, the absence of legitimate healers' associations meant that there was no mechanism for sorting out or regulating practitioners in accordance with their qualifications. The state-organized associations established under the Derg were incompetent to regulate the field. They were seen instead as assisting scores of inept healers to acquire identification/registration papers and work permits and flood the urban medical marketplace. This course of action corrupted the practice of indigenous medicine and posed a serious challenge to the position of some competent healers.

It is therefore imperative to establish the necessary institutional and financial support to promote the potential role of herbal medicine in primary health care delivery. The following measures can be of vital importance:

- Inventory and document the various plants and herbs of therapeutic value.
- Establish local botanical gardens for the preservation of essential medicinal herbal plants in different parts of the country in order to ensure a sustainable supply of safe, effective and affordable medicinal herbs.
- Set up testing laboratories with adequate facilities for the assessment of the efficacy of medicinal herbs.
- Establish dosage norms for the most efficacious use of herbal extracts, whether in tablet, capsule, powder, syrup, liquid or other forms.

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The Evolution of Modern Medicine in Ethiopia

By Yifru Berhan, MD

Since the early 16th century, Western doctors from different countries were coming to Ethiopia as missionaries, sportsmen, scholars or diplomats and were treating patients with different medical conditions in unorganized and uncoordinated situations during their temporary stay. The British Diplomatic Mission of 1841-1842 was the most noteworthy effort, whereby 717 patients with various ailments were treated in different parts of Ethiopia.

The first organized and hospital-based modern medical practice for the public was started immediately after the Battle of Adwa by a team of Russian physicians and nurses. This effort lasted 10 years and initiated the advent of modern medicine in Ethiopia.

Modern medical services for the public can be classified into four major phases:

- The first phase is between the Battle of Adwa (1896) and 1901.
- The second phase is between 1901 and the establishment of the Ministry of Health (1948).
- The third phase is between the establishment of the Ministry of Health and the 1974 Revolution.
- The fourth phase begins in 1974 and continues till the present.

Menelik II, a leader with an open mind for science and technology, reigned as king of Shoa from 1865 to 1889 and as emperor from 1889 until 1913. His commitment made Western medicine go one step further in Ethiopia and ushered in a new phase of cottage health service to institution-based care.

In Ethiopian modern medical history, the first health service institution was established in Addis Ababa following the Battle of Adwa (Table 1). Emperor Menelik II requested help from the Russian Red Cross to treat about 3,000 wounded soldiers during the Battle of Adwa. A team of three physicians (later to become five), four nurses and several orderlies arrived at Addis Ababa after they had treated wounded soldiers in Harar. They established a hospital in the same year (1896) in Addis Ababa. Since the institution was owned by Russian health professionals, it was named Russian Hospital. It had 20 beds, which grew to 50 beds. (The Russian Hospital should not be confused with the currently functioning Balcha Hospital.) One author noted that the hospital was built near the area that is presently known as “Russian Street”. That hospital provided service for 10 years and was closed in 1906 when the Russian health professionals left the country.

On the same site where the Russian hospital was constructed and the same year the Russian professionals left, construction of the Menelik II Hospital began. Its inauguration was in 1909. Initially the hospital was staffed only by nurses. Ras Mekonnen Hospital in Harar and Dire Dawa Railway Hospital were built in 1903 and 1911, respectively, by the order of Ras Tafari Makonnen (later known as Emperor Haile Selassie). Harar Ras Makonnen Hospital was a stone structure, with six wards on the ground floor and three double wards on the first floor. This hospital was soon purchased by the French government and renamed, but it continued to serve as a hospital. In short, the establishment of the Russian Hospital was a turning point in Ethiopian modern medical history – and treating wounded soldiers in the war in Adwa should be considered the hallmark of its establishment.

In 1906-07, Emperor Menelik II established 12 ministries for the first time in Ethiopian history; however, establishment of the Ministry of Health (MOH) was still not a priority. It was not until 1908 that an office for health services (Bureau de L’Hygiene Publique) was opened within the Ministry of Interior. This bureau would have a direct impact on health services in Ethiopia. The directorate was mainly engaged on curative services in the capital. In 1947, the first Ethiopian health legislation, known as “Public Health Proclamation of 1947”, was formulated and stated that the government was in charge of the health of the people.

This proclamation laid a cornerstone in the establishment of the Ministry of Health (MOH) in 1948. The first minister for MOH was Blata Zewde Belayineh. He was a cotton engineer by profession (prior to this appointment, he was a minister at the Ministry of Labor). Although MOH was established, there was no formulated national health policy and strategy till 1963, at which time the Second Five-Year Development Plan of the Ethiopian government (1963-1967) incorporated health sector policy and strategy. That health policy and strategy was designed to decentralize and integrate the curative and preventive health services by providing a primary health service. It planned to construct one health center for 50,000 and one health station for 5,000 people, respectively. It was also during this time, that the Malaria Eradication Program was launched at the national level.

In 1922, an American missionary named Dr. Thomas Lambie and his colleagues established Gulele Hospital with 70 beds in Addis Ababa, which was operational until the Italian Invasion in 1935. After liberation from Italian occupation this hospital failed to resume clinical service and in 1942 became the “Medical Research Institute”; with its name changed to the “Institute Pasteur” in 1950 and then changed again to “the Central Laboratory and Research Institute” (1964). It was finally renamed the Ethiopian Health and Nutrition Research Institute (EHNRI). Following the end of the war with Italy, Princess Tsahai Memorial Hospital – named after the first Ethiopian nurse and also the daughter of the emperor – was established in Addis Ababa.

Table 1: Hospitals established between Battle of Adwa to the second Italian invasion

Name of Hospital	Year	Status
Russian Hospital	1896	Closed 1906 when physicians left
Harer Ras Makonnen Hospital	1903	Sold to France and renamed
Menelik II Hospital	1906	Still operating as such
Diredawa Railway Hospital	1911	No data after establishment
Gulele Hospital	1922	Later, Pasteur Institute, now EHNRI Ethiopian Health & Nutrition Research Institute
Bete Saida Hospital	1923	Currently Yekatit 12 Hospital
Zenebework Hospital	1930	Now Alert Hospital
Ras Desta Damtew	1932	Still operating as such
Zewuditu Hospital	1933	Still operating as such

Records show that prior to the second Italian invasion (1935-1941), there were 13 government-owned hospitals at the national level (six in Addis Ababa, three in Harar, one each in Jijiga, Nekemt, Dessie and Debremarkos). In addition, there were 35 clinics throughout the country. During the five-year Italian invasion, 19 hospitals were built. But in the next 30 years – between 1966 and 1996 – much attention was given to hospital expansion rather than construction. The number of hospital beds increased from 3,415 (1972) to 11,368 (1982). Still the increase in the number of hospitals between 1995 and 2011 was remarkable (see the following for the update). Interestingly, nearly 40% of the current counts of public hospitals were built in the first half of the last century, predating the establishment of the MOH.

As mentioned earlier, the taste for modern (Western style) medical practice in Ethiopia (at least by the royal family) dates back to the late 16th century. The first medical practitioner on record to come to Ethiopia was a Portuguese “barber-surgeon” (Joao Bermudez), who came for a diplomatic mission and later on was known to be welcomed at the court of King Libne Dengel (1520-1535). Later, in the 17th century, Peter Heiling (1632-1667), a German missionary, was at the court of Emperor Fasilidas, serving as a court physician. Up to the time of Emperor Menelik II, physicians came from different countries and gave service mainly to the ruling class.

The first Ethiopian physician, who graduated with a medical doctorate degree from Lahore University in India (1865), was Dr. Workneh Martin (1866-1952), also known by the name Hakim Workneh. Dr. Workneh had also studied in Scotland and worked in Burma, India, as well as Ethiopia. He was taken to India after the Mekdela Battle (1868) by the British-Indian forces. Until he met his grandmother in Addis Ababa upon his return to Ethiopia, his name was Dr. Charles Martin, having been christened and renamed after the two British colonels who sponsored him.

In 1898, Menelik II heard that there was an Ethiopian medical doctor abroad, Dr. Charles Martin, and invited him to Ethiopia. Although Dr. Charles Martin welcomed the invitation, he was unable to enter the country. On his arrival to Addis Ababa, he installed a tent at the center of the city and started to treat patients free of charge. Later on, he became Emperor Menelik’s personal physician, director and clinician at Menelik II Hospital. He was also a diplomat. Dr. Melaku Beyan was the second Ethiopian medical doctor, who graduated from Howard University in the U.S. During the Italian invasion, he was the chief medical officer of the Ethiopian army (see the “Hakim Workneh and Melaku Beyan: Pioneers in Medicine” article).

By the time the MOH was established, 110 Ethiopian and expatriate medical doctors were working in 46 hospitals, mainly in the capital. Growth in the number of medical professionals was slow until 1980; at which time the number of physicians began to double every five-years up to 1989. In the history of the public sector serving medical doctors (MOH), the highest number of new physicians recorded was in 1989 and 1990 (1,658 and 1,596 medical doctors, respectively).

Contrary to a sharp increase in the number of physicians of all types in the public sector from 1980-1990, there was a sharp decline between 1990 and 2006. (It should be noted that the period of 1989 to 1995 is the exception due to the large number of medical doctors coming to the MOH from medical schools in the country/abroad or as expatriates). Otherwise, the annual physician attrition rate from the public sector was not that much different from other periods.

The contributing factors for the scarcity of physicians in the public sector are myriad: low production of medical doctors in the country or abroad, a high migration of medical doctors to institutions abroad, fast population growth, increased post-graduate entry and rapid expansion as well as extremely high remuneration in private and NGO health institutions.

In particular, the production of new doctors in the Ethiopian medical schools was low, in spite of the fact that the schools were already functioning for 42 years. Addis Ababa University Faculty of Medicine started undergraduate medical training in 1964 at Princess Tsahai Memorial Hospital (now Army Hospital) by training six Ethiopian clinical medical students, who came from American University of Beirut (Lebanon) after they had completed their basic science courses. Eventually two more batches of medical students came from Beirut and joined the medical faculty. Then the faculty started to give preclinical courses at the Sidist Kilo campus until 1972. Preclinical and clinical classes were transferred soon after to the premises of Tikur Anbessa Hospital, which was designed for a capacity of up to 200 medical students per year. In the first 12-year period (1968-1980), the medical faculty was able to graduate only 148 medical doctors, which was far less than the expected annual intake. Until 2011, about 2,500 medical students graduated from Addis Ababa University, which was only about 29% of the initial plan. Multiple factors, including a shortage of staff and limitation of the facility, played a role in the school’s inability to achieve the initial plan.

In addition, it should be noted that graduation from Addis Ababa University students was interrupted for three years because of the 1974 Revolution and the 1976 and 1977 development of “Co-operation Campaign” that enforced the academic staff and students of every higher institution to go to a rural area to perform some kind of social work for two years.

In total, since the establishment of the medical schools until 2006, about 3,728 medical doctors were graduated from three medical schools. Addis Ababa medical faculty alone graduated 1,890 general practitioners (1964-2006) and 862 clinical specialists (1979-2006). In 1978, 14 years after the A.A.U. Medical Faculty was established, Gondar Public Health College underwent a major transformation.

Health officers and public health nurses training was closed and the facility converted to a new medical school with clinical nurse training in 1978. In the 23-year period since then (1983-2006), 1,014 medical doctors graduated; on average 44 per year. The third medical school that opened in Jimma in 1983 was able to graduate 824 medical doctors (1983-2006). In 2003, two more medical schools opened at Hawassa and Mekele Universities (see the following for an update).

As shown in Table 2, in this 23-year period (1984-2006), the highest as well as the lowest physician-to-population ratios in the public sector were found to be in 1989 (1:28,000) and 2006 (1:118,000), respectively. In 2006, the physician-to-population ratio in Amhara, Oromia and SNNP regional states was computed to be 1:280,000, 1:220,000, and 1:230,000, respectively. Since 1994, the highest number of medical doctors recorded in Tigray regional state was in 2003 (1:27,000), in Amhara in 1995 (1:56,000), in Oromia in 1996 (1:55,000), and in SNNPR in 2004 (1:36,000).

In other words, compared to the physician population recommendation of the WHO standard for developing countries (1:10,000), there were extreme shortages of medical doctors both at the national and regional level. Average physician-to-hospital ratio in five regional states in December 2006 was 3.6 (Tigray), 4.3 (Amhara), 6.1 (Oromia), and 5.3 (SNNP). A December 2006 direct interview with 76 public hospitals outside Addis Ababa showed that there were no specialists in 36 hospitals and no doctor at all in three hospitals. In short, in December 2006, 80.3% of regional hospitals were equipped with 0-2 specialists of one kind or another, and in 48.7% there were 0-3 general practitioners.

For comparison, according to a 2003 WHO report, the first five countries with the highest physician-to-population ratio were Cuba (1:167), Georgia (1:208), Belarus (1:217), Russian Federation (1:233), and Lithuania (1:250). Among developing countries, in 2004 in Sudan, there were 5.5 physicians for a 10,000 population (1:2,000). To put this in perspective, when the number of specialists was computed against population size in 2006, the ratio in the regional states, Addis Ababa and the national was found to be 1:550,000, 1:34,000 and 1:342,000 respectively. In the regional states, the specialist-to-population ratio ranged from 1:1.6 million to 1:10.3 million.

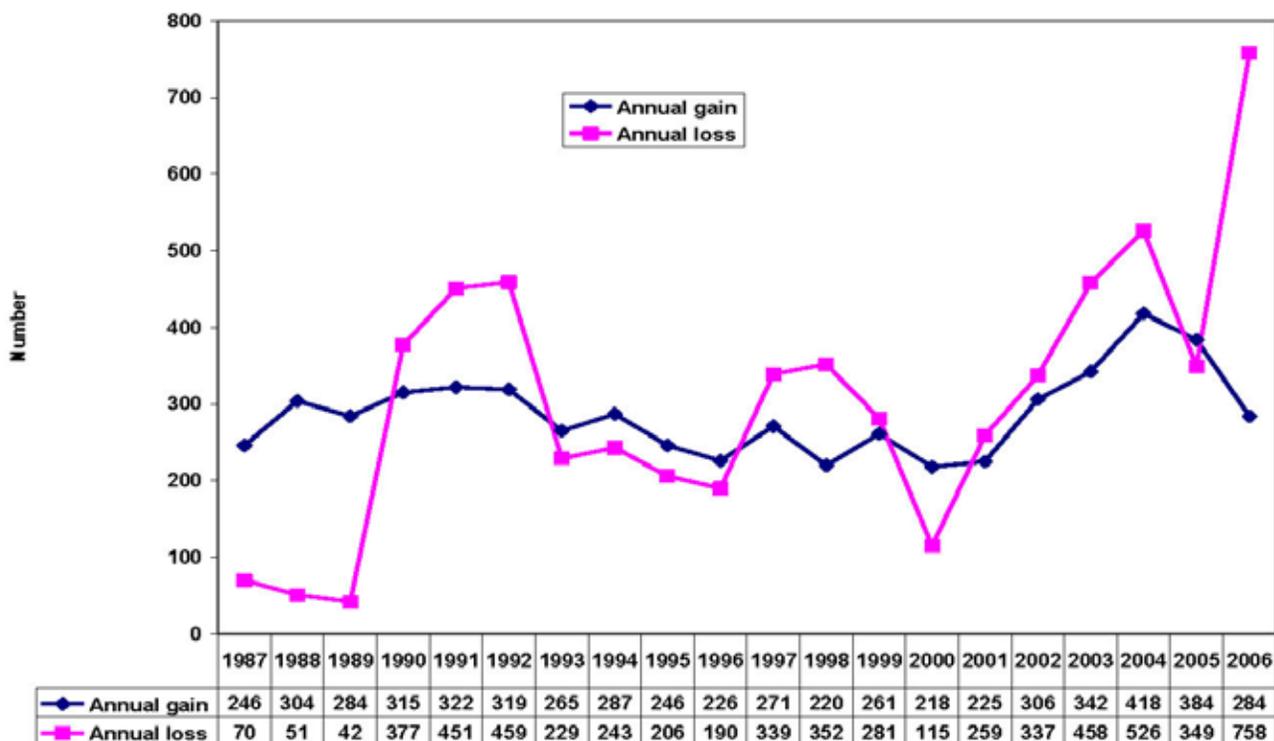
Table 2: Serial national and select regional physician-to-population ratios in public health facilities

Year	National	Tigray	Amhara	Oromia	SNNP
1984	1:84,000				
1985	1:56,000				
1986	1:44,000				
1987	1:38,000				
1988	1:32,000				
1989	1:28,000	Not applicable*	Not applicable*	Not applicable*	Not applicable*
1990	1:30,000				
1991	1:33,000				
1992	1:38,000				
1993	1:37,000				
1994	1:38,000	1:40,000	1:57,000	1:56,000	1:42,000
1995	1:37,000	1:39,000	1:56,000	1:56,000	1:47,000
1996	1:38,000	1:39,000	1:59,000	1:55,000	1:43,000
1997	1:41,000	1:42,000	1:67,000	1:73,000	1:44,000
1998	1:46,000	1:33,000	1:70,000	1:70,000	1:45,000
1999	1:48,000	1:50,000	1:93,000	1:80,000	1:67,000
2000	1:46,000	1:53,000	1:76,000	1:86,000	1:77,000
2001	1:49,000	1:30,000	1:61,000	1:57,000	1:54,000
2002	1:52,000	1:28,000	1:60,000	1:60,000	1:44,000
2003	1:58,000	1:27,000	1:67,000	1:68,000	1:52,000
2004	1:66,000	1:54,000	1:142,000	1:138,000	1:136,000
2005	1:66,000	1:108,000	1:140,000	1:140,000	1:130,000
2006	1:118,000	1:100,000	1:280,000	1:220,000	1:230,000

*Not applicable implies that the new administrative regional states were established in 1991 and population census of each regional state was done in 1994.

As shown in Figure 1, the annual attrition rate of medical doctors from the public sector appeared to look like a wave with variable amplitudes. The zenith attrition rate were in 1989, 1996, and 2000, while the nadir or highest medical doctors annual attrition rates (20% - 54.3%) were found in 1991-1992, 1998, 2002-2006. In general, in the 19-year period from 1987-2006, 73.2% of Ethiopian medical doctors left the public sector mainly due to attractive remuneration overseas and by local NGOs or private-sector employment.

Fig. 1. Medical doctors' annual gain versus annual loss in public sector, Ministry of Health (1987-2006)



In an effort to maximize medical doctors' retention in the public sector in 2006, the author of this manuscript recommended short-and long-term solutions. These solutions were offered so that retention becomes a strategy and producing new doctors becomes a program. These production scale-up options were discussed in detail and strongly recommended to achieve physician-to-population ratio 1:15,000 and 1:8,000 by the year 2015 and 2020, respectively. The following solutions were offered:

- Provide land plot for physicians for residential house construction.
- Give priority to physicians in providing low-cost houses.
- Offer low interest or interest-free loans for residential house construction and automobile procurement.
- Offer different remuneration options.
- Adopt experience in other countries of dual employment of academic staff working in teaching hospitals or university hospitals.
- Establish hospital organizational structure in the Ministry of Education or allow them to be under auspices of MOH.
- Establish joint appointment agreement between medical schools and local hospitals.
- Direct donors and stakeholders to work at reducing internal/external medical doctors' brain drain.

The government's response to the preceding recommendations was prompt and rewarding. Between 2006 and 2011, the issue of a medical-doctor crisis has become a hot discussion in every health-related forum, and, as a result, medical-doctor production became a big agenda of the government. The Federal MOH publicly announced the scale-up program (enrolling >1,000 medical students per year). Currently, the annual intake of medical students is more than 2,000, which is nearly a six-fold increase from previous years. The bigger medical schools are admitting more than 200 medical students per year and some medical schools are working with nearby university-affiliated hospitals.

To maximize the retention in the public sector, medical doctors' salary was increased by more than 170%. These days, the other types of payments (allowances) for medical doctors are more than five-fold of their current salary. Budgeted research and laptop – as incentives for rural doctors – were implemented by MOH. In several places, land plot for residential house construction was given free for specialists working in the public sector.

As a result, these days, the number of doctors working in the public sector, particularly general practitioners, has significantly increased. This is in spite of more than a 40% increase in public hospitals in the last six years. According to the FMOH report, the number of

public hospitals increased from 86 in 2006 to 122 in 2011. Similarly, physicians who were working in the public sector were reported to be more than 1,500. In addition, the physician-to-population ratio increased from 1:118,000 in 2006 to 1:53,000. (It should be noted, however, that in some regional states the physician-to-population ratio is as high as 1:8,000 [Harari regional state] and as low as 1:118,000 [Amhara regional state]).

In conclusion, although Ethiopia's modern medical practice dates back for more than 100 years, the achievement in terms of balancing the number of physicians with the population size lagged significantly behind. Similarly, the number of public hospitals was in short supply compared to the population size. Several factors have contributed to the extreme shortage of both medical doctors and hospitals in Ethiopia. In the last six years, however, the government expressed its huge commitment with breakthrough programs to make a significant difference in terms of availing an adequate number of hospitals and physicians to the majority in their close vicinity. Provided that the government commitment and partners support continue, the author is confident that the 2020 target of achieving the WHO physician-to-population ratio of 1:10,000 is indeed achievable.

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An Overview of Health-Delivery Service, Medical and Health Sciences Education, and Human Resources Development in Ethiopia 1941-2011

A Module for Training Medical Students in Ethiopia

The Ethiopian Health Care Delivery Services: Historical Crossroads on Evolution, Revolution and Transformation Trends and Policies in 20th and 21st Centuries

By Admasu Mengesha, Ph. D., and Ahmed A. Moen, Ph. D.

Section 1: The Structures and Functions of Health-Delivery Services: Historic Perspective

Ethiopian Health Policies Implementation: Modern medicine was introduced to Ethiopia in the 16th century by European missionaries and other explorers, but Western modern medicine was not available to the royal courts and educated aristocracy until the establishment of the first Russian tent hospital in 1889. Emperor Menelik II inaugurated the foundation of the first Ethiopian hospital, which was named after him, in Addis Ababa in 1906. Menelik II dedicated eight blocks to the new hospital – on the same site as the first Russian tent hospital – and it is also the same spot where Dr. Workneh, Ethiopia's first medical doctor, gave free medical care.

From 1941 to 1947, public health services were administered by the Department of Health in the Ministry of Interior. The primary responsibility of the Department of Health was to support and sustain the basic hospitals and clinic systems left in the aftermath of liberation from the Italian occupation in 1941. Ultimately, Proclamation No. 91 of 1947 directed the decentralization of public health services down to the provincial and/or regional levels. These responsibilities included planning, organizing, staffing, budgeting and controlling health taxes and related general revenues and expenditures, which were finally disbursed from the Ministry of Finance in Addis Ababa to the provincial hospitals, health centers and health stations.

Proclamation No. 100 of 1948 of the Registration of the Medical Practitioners and Proclamation No. 91 of 1947, on the other hand, consolidated these services and led to the establishment of the Ministry of Public Health, which superseded the Department of Health in the Ministry of Interior. The Ministry of Public Health focused on training and staffing the Ethiopian health-delivery services with qualified middle-level allied health professionals.

As a result, the first nursing school was founded by the Ethiopian Red Cross Society in 1949. By the 1970s, there were nine schools for training allied health professionals, nurses and technicians, all of which mainly served under the auspices of the Ministry of Public Health. The training of nurses and dressers (i.e. medical assistants) mostly occurred in hospitals and facilities owned by the Ministry of Health as well as a few missionary hospitals in the country. In the 1950s, training missions shifted to developing multidisciplinary health teams, consisting of health officers, community nurses, sanitarians and laboratory technicians in the Gondar School of Public Health, which pioneered the concept of college-based diploma education at community colleges. This was a new model for Ethiopia; the focus of hospital-based certificate training was designed for practical nurses, elementary and secondary dressers (medical assistants) – who were trained anywhere from six months or more – as well as the training of laboratory, radiology and pharmacy assistants in more compressed programs.

By 1972, these training facilities graduated more than 1,260 health professionals.¹ Medical school training, on the other hand, took place outside Ethiopia. Most of them were employed by the Ministry of Public Health and a few missionary-owned hospitals and health clinics. In 1972, the total number of medical doctors of all categories and nationalities ranged from 750 to 900. Ethiopian medical doctors often trained in Beirut, Europe and America.²

The reasons why the health-delivery services – prior to the 1974 Socialist Revolution – were unable to close the wide gap in health disparities was due to a lack of resources to manage preventable or chronic care, which were most of the preventable health problems in Ethiopia. Among the major reasons were:

- Most of the health institutions were founded and located in a few urban areas and focused on the duplication of complex and high cost medical technologies applicable to curative care rather than population-based public health prevention, such as health education, prevention and control of communicable and water-borne diseases, malnutrition and other emerging diseases, such as TB, Malaria, Sexually Transmitted Diseases – in a country that had a high infant mortality (114/1,000) coupled with a child mortality (1-4 years) rate of 92/1,000, a life expectancy of 46 years and an annual population growth rate of 2.9%.
- In addition, the acute shortage of physicians contributed and aggravated health disparities. For example, in 1972, the number of primary care physicians and specialists of all categories was below 1,000. Of these, fewer than 100 physicians and 400 other health officers were trained at Addis Ababa University and Gondar Public Health College respectively.³

The concept of decentralization of the three-tier level – primary, secondary and tertiary health services – was perpetuated by the cyclical exercise to produce several five-year, health-care development projects since the 1960s. A cursory review of the plan from the 1960s to the 1970s revealed chronic problems, not only of underestimated capacity of building, physical and human resources but also an intractable logistics system to manage efficient and affordable access to health care – where people work and live, which in Ethiopia is mostly in rural areas. This complex imbalance in the supply-and-demand equation before the 1974 Socialist Revolution affected the fast-growing population of 29 million, who earned less than \$2.00 USD a day, and had a low GNP and health and social services budget. Ethiopia was like many other underdeveloped countries in the world. For example, comparing the results achieved during the People's Democratic Republic of Ethiopia (1974-1990), the difference in capacity building was statistically insignificant given the increased demand by the exponential rate of increase in the population and as a result of regime changes. Here are some statistics from the 1970s- 1980s:

1. There were 84 hospitals with 86,245 beds and a low ratio of patients to bed
2. 93 out of the 650 health stations were inaccessible to transportation due to natural barriers of valleys, mountains, rivers and deserts
3. Health professionals increased from 766 to 1,627. Considering the population growth, the increase in services was negligible during that time.

After the 1974 Revolution, the policy of the People's Democratic Socialist Republic of Ethiopia was on a fast-track of radical political and ideological reconstruction of the health care-delivery services, but they were vulnerable to continuous civil war and a socioeconomic instability that created a health crisis not only in Ethiopia but also in the Horn of Africa, most of which was generated by the Cold War rivalry that dominated Africa since the end of World War II and up to the 1980s.

Ethiopia did not gain much from the demise of the feudal and imperial system. Actually, in the final analysis, it continued to suffer from the same crippling, unrealistic planning with meager resources. The results contributed to a continuous command economy and a centralization of power and the decision-making process that impacted health care-delivery services in Ethiopia. It also became a vicious cycle for perpetuating resource disparities due to poverty, disease patterns and the doubling of the population in 20 years by a 2.9% an-

nual growth rate. By the time the current Federal Democratic Republic of Ethiopia assumed power in 1991, the population of Ethiopia doubled to 42 million. In 2010, keeping the 2.6 % growth rate, the population has approximately increased from 29 million in 1970 to 80 million in 2010.⁵

The good news is that during the continuous regime changes that took place in Ethiopia since 1930 international organizations have stepped in and offered technical and financial assistance. WHO, UNDP, UNICEF, USAID, EU, World Bank, SIDA, CIDA have helped boost the immunization rates for major childhood diseases. In addition, slow but sure primary care access has been implemented for the prevention and treatment of communicable and emerging diseases, such as TB, Malaria and HIV/AIDS. And maternal and child care (as well as social and development programs) aim to close the wide gap in health and social services disparities for the poorest of the poor in Ethiopia.

To measure the impact of health and social services, reliable statistical and census data needs to be collected to account for sustainable socio-economic development to help reduce poverty, which is the underlying reason for disparities. Included in these measures – to achieve a gold standard – is the need for supervision, monitoring and evaluation for health policy decision-making.

Section 2: Health Reforms and Policies of the Ministry of Health – 2010/11-2015

Demographics: Projections from the 2007 population and housing census estimate a total population in 2010 of 79.8 million. Ethiopia is a mosaic of nationalities and ethnic groups, varying in size from more than 18 million to fewer than 1,000 and having more than 80 different spoken languages. According to the 2007 census, the country is one of the least urbanized countries in the world – with about 5/6th of its population living in rural areas (83.6% rural versus 16.4% urban). The largest city in the country is the capital, Addis Ababa, with 2.7 million people (about 4% of the total population). Nationally, the average household size is 4.7 persons. The population age pyramid has remained predominately young: 44% are under 15 years, more than half (52%) are between 15 to 65 years, and only 3% of all persons are over the age of 65. The sex ratio between male and female is almost equal, and women in the reproductive ages constitute 24% of the population. While average lifetime fertility has declined in the past 15 years from a 1990 level of 6.4 births per woman down to 5.4 births (DHS 2005), rural women still have an average of three more births per woman compared to women in urban areas. Overall, even with the fertility decline, the population is still growing at an annual rate of 2.6%. The lowest rate of population growth is in the Amhara region, which, at 1.7%, is lower than population replacement.

Government and Administration: Under the 1994 Constitution, Ethiopia is a Federal Democratic Republic with three branches of governance and administration. The executive branch includes the Prime Minister, Council of Ministers and Council of State. The legislative branch has a bicameral Parliament consisting of the House of Federation (or Upper Chamber) and the House of People's Representatives (or Lower Chamber). The judicial branch is comprised of federal and regional courts. The Federal Democratic Republic of Ethiopia has nine Regional States and City Administration Councils for two cities: Dire Dawa and Addis Ababa. The regional states and city administrations are subdivided into 817 administrative Woredas (districts). A Woreda is the basic decentralized administrative unit and has an administrative council composed of elected members. The 817 Woredas are further divided into about 16,253 Kebeles, the smallest administrative unit. There are also two zones and seven Woredas designated as "special". These are medium-size towns or traditional sites of various population groups.

Socioeconomics: Under the Federal Democratic Republic, the annual per capita earnings of \$235 USD remain below the Sub-Saharan average. The overall economic dependency ratio for the country is estimated at 93 dependents per 100 persons in the working age group of 15-64 years.

Current Health Status: Despite major strides to improve the health of the population in the last 15 years, Ethiopia's population still faces a high rate of morbidity and mortality and the health status remains relatively poor. Vital health indicators from the DHS 2005 show a life expectancy of 54 years (53.4 years for male and 55.4 for female), and an IMR of 77/1000. The under 5-year-old mortality rate has been reduced to 101/1000 in 2010. Although the rates have declined in the past 15 years, these are still very high levels.

The major health problems of the country are largely preventable, communicable diseases and nutritional disorders. More than 90% of child deaths are due to pneumonia, diarrhea, Malaria, neonatal problems, malnutrition and HIV/AIDS, and often a combination of these conditions.

In terms of women's health, the MMR has declined to 590/100,000, but this is still among the world's highest. The major causes of maternal death are obstructed/prolonged labor (13%), ruptured uterus (12%), severe pre-eclampsia/eclampsia (11%) and Malaria (9%). Significantly, 6% of all maternal deaths were attributable to complications from abortion. The major supply-side constraints affecting maternal health are shortages of skilled midwives, a weak referral system at health-center levels, lack of inadequate availability of BEmONC and CEmONC equipment, and under-financing of the service. On the demand side, cultural and societal norms, distances to functioning health centers and financial barriers were the major constraints.

Government Initiatives in Health Care: Following the change of government in 1991, the new government of Ethiopia put in place many political and socio-economic transformation measures. The formulation of policy and the first Health Sector Development Plan were based on critical reviews of prevailing national health problems and a broader awareness of newly emerging health problems in the country.

The core elements of the health policy are decentralization of the health care system; development of the preventive and curative components of health care; assurance of accessibility of health care for all segments of the population; and encouraging private and NGO participation in the health sector. There are also strategies on free service for key maternal and child health services (Health Care Financing Strategy), the training and deployment of new workforce of female Health Extension Workers (HEWs) for institutionalizing community health care with clean and safe delivery at Health Post (HP) level, and deployment of Health Officers (HOs) with M.Sc. training in Integrated Emergency Obstetric and Surgery (IEOS) skills. The Ministry has also established the MDG Performance Package Fund and given priority to maternal health, which is expected to facilitate mobilizing additional funding opportunities.⁶

Three-Tier Health Care: The recently implemented Business Process Reengineering (BPR) of the health sector has introduced a three-tier health care delivery system:

Level One is a Woreda/District health system comprised of a primary hospital (to cover 60,000-100,000 people), health centers (1/15,000-25,000 population) and their satellite Health Posts (1/3,000-5,000 population) connected to each other by a referral system. The hospital, health center and health posts form a Primary Health Care Unit (PHCU).

Level Two is a general hospital covering a population of 1-1.5 million people.

Level Three is a specialized hospital covering a population of 3.5-5 million people.⁷

The devolution of power to regional governments has resulted in largely shifting the decision-making for public service delivery from the center to being under the authority of the regions and down to the district level. The Ministry and the RHBs focus more on policy matters and technical support while Woreda Health Offices manage and coordinate the operation of the district health system under their jurisdiction.

Rapid expansion of the private for-profit and NGO sectors is augmenting the public/private NGO partnership for health and boosting health-service coverage and utilization.⁸

Section 3: Legislation and Integration of Modern/Traditional Practices Policies Since 1948

The Medical Practitioners Registration Proclamation No. 100 of 1948 in the Negarit Gazeta said: “Nothing in this Section (Proclamation) shall be construed to so as to prohibit or prevent the practice of a system of therapeutics according to indigenous methods by person recognized by the [local community] to which they belong to be [duly trained] in such practice”. Furthermore, “medicine” means and includes “a physician, surgeon, dentist, pharmacist, midwife and nurse and any other person who holds himself out to the Public as being able or prepared to examine, diagnose, treat, prescribe for or dispense for patients for gain.”⁹

The above Proclamation legitimized a dual track of health practices under credentialed modern health professions and their counterparts in indigenous healing arts. The unanswered concern of the modern health practitioners was the harmonizing of the quality of health services for providers who are not regulated through structured medical and health education principles of modern evidence-based health arts. The idea of incorporating traditional medicine into the new curriculum of the undergraduate of medical and public health curriculum as a policy issue supported and promoted by the members of the People to People Organization mostly made of postgraduate medical doctors is a unique call to improve access and the quality of health care for the majority of the young health professionals who live and practice in the medically underserved rural and urban areas of Ethiopia.

The consensus was that two-track, modern-traditional health care will eventually converge and be regulated to protect the common good and the do-no-harm principle of medicine. Time and time again, political radicalization of the health care professions during the Socialist Revolution in many parts of Africa in the 1960s-1970s seem to have lost the battle against entrenched health beliefs and practices when there were no better alternatives to equitably share human and financial resources. Recognizing partnership was indispensable to win the battle against ignorance, poverty and disease. Regulating traditional medicine was meant to protect quality patient care by enforcing peer reviews and evidence-based core curriculum of education and medical practice guidelines by whoever practices the healing arts in Ethiopia.

In principle, the pioneers who were culturally sensitive and politically competent leaders saw self-reliance as their challenge. They encouraged and regulated medical care as a national priority. And then there were others who refused to recognize minimal technology-based care as opposed to the high technology-based care in Europe and America. By accepting to trade places, the reward for being “pioneers” was gratifying and a good reason for lifetime achievement in public health service. Because of their sacrifice to see both sides of the equation, we can understand how self-reliance was driven by national pride to minimize continuous external cultural dependency. From the ideas and ideals of rugged “situational leadership” emerged a group of people leaving an intergenerational legacy in medicine and public health in Ethiopia. In the process of working in frontline health care-delivery systems and engagement with the policy-makers, they have acted as peers and consultants to the public health establishment in order to change and resolve core health and development needs, despite the limited resources at their disposal.

Self-sufficiency and this continuity of a health services-delivery system mean simple technology, the promotion of good health, disease prevention and cost-effective care are accessible to the medically underserved and economically marginalized populations. Hospital-based medicine is often high tech, steeped in logistics and offers specialized medical care (which is tied to unbreakable two-way referral linkages). But the national health policy is slowly tilting to introduce simple primacy care technology with a heavy load of preventive

education and public health supported by secondary and tertiary hospital-based best practice models. The leadership for enforcing a partnership paradigm between the specialist and generalist will emerge when everyone accepts the inevitable shared responsibility between the medical and public health practitioners and the impermeable bureaucracy.

The early signs of change in public education and practice started with the establishment of the Gondar Public Health College in 1954 and continued when the Medical School was established in Addis Ababa University in 1964. The country was mostly driven by transformation and change. It was evident that slowly but surely the pioneers of self-reliance were using their unique partnership status to attract the attention of policy-makers. Both medical doctors and public health practitioners put “people’s health first” in their minds and hearts and looked at the bigger picture.

The uniqueness of organized medicine and public health is its understanding of the necessity for cooperation under moderate leadership in a volatile political transition period. It was also a matter of survival. The elite and the masses must protect their mutual interests and recognize that they are all in this together. The nation’s health needs to be a priority. Getting along is not just a matter of choice. It is a necessity if we are to move forward. Public service is an altruistic mission and the reward is a constructive engagement to sustain acceptable standards for quality health care and also guaranteeing access for all in Ethiopia.

The relationship between the founders and the public health establishment in the 1940s and 1950s are lessons for the new generation – and all those passionate young physicians, educators, engineers, and economists involved in public health services. The huge shortage of health professionals for a poor private sector created a premature flight of the best brains to serve in lucrative places in Europe and America. It wasn’t until the medical pioneers of the 20th century constructively engaged with those in charge of resources for health care that a foundation for public health could be laid down and improved upon.

Section 4: A Partnership Paradigm for Consensus, Consultation and Expertise – 1940s-1970s

Constructive engagement in state affairs was a citizen’s bona fide duty to safeguard self-reliance. In so doing, ideas and actions – intended or unintended - were committed to preserve the legacy of the common good during the reconstruction period at the end of the Italian Occupation in 1941. The Ministry of Public Health was established in 1948; almost all medical and public health practitioners were employees of the Ministry of Health. They also served without fringe financial benefits as technical consultants in their respective specialties. They truly believed and practiced “do no harm” and the “people’s health” comes first.

The founders of organized health professions in that formative and transitional period sought not only autonomy but also a team of members for the embryonic association’s medical doctors and public health officers. The imperial charts were mediated by the lay Ministers of Public Health and their expatriated medical advisers in the 1950s-1960s. Emulating the autonomy of the medical profession was only a small demand of the early strategy of the Ethiopian Medical Association and the Ethiopian Public Health Association in order to win acceptance for their professional expertise. Moreover, when EMA and EPHA were established more than 40 years ago, their autonomy was neither a critical nor a fundamental reason for survival as nongovernmental service organizations. The founding members have had cordial relationships with the power structure and policy-makers by virtue of their status as appointed advisers on the National Medical Advisory Board of the Ministry of Health, technical committees and special projects.

There were more opportunities to collaborate and share technical expertise in exchange for instituting credibility and integrity to the profession. That’s what drove them; not their desire to protect their interests and the command of the lay ministers, who were already under the influence of a WHO advisory group in the Ministry of Public Health since the 1940s. The presence of the Ethiopian medical doctors and various other health professionals on the Medical Advisory Board seemed to have helped the politically appointed lay ministers and bureaucrats to depend largely on their indigenous consensus to improve the health delivery services in Ethiopia.

Section 5: Selective Profile of Ethiopian Health Professional Pioneers and Leadership

Nation building and the demands for modern medical (as well as general) education in the 20th century created an environment where “greatness was thrust” on select pioneers in the health care professions. They were people of action who helped the country to pursue self-reliance as well as an intergenerational legacy. These role models were driven by ideals, values and a willingness to take risks to make a difference in the lives of others. This section will offer a glimpse of some these Ethiopian pioneers. Many of these health care professionals were educated in Europe and America, but they paid back their share of the knowledge that they gained in Diaspora to benefit the common man and woman in Ethiopia.

Dr. Martin Workneh was born in October 1865. He was only 3-years-old when his family was seized by Emperor Tewodros and taken to Maqdala. When the young boy wandered away from his parents, Colonel Charles Chamberlain assumed he was lost and took him under his wing and brought him to India. He went to a missionary school, which gave him a Christian name. Charles Martin, a.k.a. Hakim Workneh, graduated from Lahore Medical College in India with a degree in Medicine and Surgery in 1882 – graduating third in his class. In 1890, he obtained his diploma of L.R.C.P, I.R.C.S of Edinburgh and the F.P. and S of Glasgow and returned to serve as medical officer civil surgeon in Burma. Having heard of the Battle of Adwa in 1896, he volunteered to serve his country of origin as a medical practitioner but was denied permission by the British District Office in Aden and then returned to Burma. His dream to serve in Ethiopia materialized in 1898 when he was invited by the same British District Officer in Aden to serve in Ethiopia at the request of Emperor Menelik II. He became a pioneer in medicine and served until his death in Ethiopia. At the site where Menelik II built his hospital, Dr. Workneh pitched a tent and offered free medical care to Ethiopians. (See also “Hakim Workneh Eshete and Melaku Beyan: Pioneers in Medicine” by Drs. Asfaw and Alemayehu.)

Dr. Melaku Beyan was a medical student and a political activist who studied medicine at Howard University – a renowned 141-year-old university in Washington, D.C. He was an African scholar who helped bridge the African-American quest for freedom with Ethiopia in its struggle for liberation from Italian occupation. He interrupted his studies when he was a senior medical student but went back to graduate. He was the “first” Ethiopian to get an American degree and to practice general medicine in Ethiopia. Always a political activist, he died in the 1940s of a preventable illness at the prime of his life.

Dr. Widad Kidane-Mariam was born to an Ethiopian émigré family in Palestine during the Italian Occupation. Her father served in the Ethiopian Legation in Jerusalem. Her brother Yohanis Kidane-Mariam studied political science at the American University of Beirut. Dr. Widad studied medicine at the American University of Beirut and also served in the Ministry of Public Health for many years. She was the “first female” medical practitioner and physician administrator in charge of medical services division in the Ministry of Health in 1960s-1970s. Beside her official duties, she served as one of the founders of the first Ethiopian Family Planning Association; a founder of the Not-for-Profit Maternal and Child Care, as well as a physician who provided free health care in Addis Ababa and practiced as one of the first Ethiopian female gynecologists. She generated hundreds of thousands of grants from the Swedish Save the Children Fund project in Addis Ababa. Like Dr. Melaku Beyan, she died in her prime at the age of 55 while still one of the most notable pioneers in medical and public health services in 1960s.

Dr. Asrat Woldeyes was also born and raised in Ethiopia during the Italian Occupation and graduated many decades later in the 1950s to follow in the footsteps of Dr. Martin Workneh. Woldeyes also became an eminent surgeon and educator on his return from Edinburgh, Scotland, and became the first Ethiopian medical director and general surgeon at the Princess Tsahai Memorial Hospital in the 1950s-1960s and later as the third (but first Ethiopian) dean at the Addis Ababa University Medical University.

All these Ethiopian pioneers were “firsts” – dreamers who served their people in different capacities. They were nation builders who gave everything they had to make a better place. They were unique, but the leadership of the People-to-People Organization of Ethiopian Health Professionals is replicating their work in the 21st century. Kudos goes to all the primary-care gatekeeper physicians who are serving the underserved in Ethiopia. Many of these individuals have given up opportunities to practice in high tech, high status medical centers.

These early pioneers were leaders – professionally and on the civic front – while studying and practicing their healing arts several decades apart from one another when Ethiopia was a resource-poor country and the world was in state of war and/or economic depression. The leaders’ views converged on the primacy of self-reliance and national pride for independence. They were change agents who answered the call.

In principle, it didn’t matter whether Dr. Widad was born in Jerusalem or Drs. Workneh, Melaku and Woldeyes were born in Ethiopia and educated abroad. What matters most was their pioneering spirit for public health service. At one point in time, they led Ethiopia on its pathway to self-reliance and thereby made their personal dream mutually inclusive with the Ethiopian modern state at the turn of the 20th century – a state that believes that good health care is a fundamental human right. They shared their knowledge as citizens of the world. It was a personal responsibility to improve the quality of life and eliminate the disparities in the social, educational and economic welfare of the masses.

Section 6: Medical and Health Sciences Education and Human Resources – University of Gondar

The University of Gondar (UoG) was officially established with its current status and autonomy in 2004, but in 1954, the university was initially created as a Public Health College and Training Centre (PHC & TC) – now known as the College of Medicine and Health Sciences (CMHS). Located in the historic town of Gondar, CMHS is the oldest medical training institution in the country. The establishment of the Public Health and Training Centers (PHC & TC) was dictated by the pressing and enormous health problems that existed in the 1940s and early 1950s.

The aim of the PHC & TC was to train teams of middle-level health personnel. This was the beginning of a new philosophy of community-based and team-oriented teaching of health care professionals. Until 1960, the Ministry of Health ran the college. In 1961, the college joined forces with Haile Selassie I University, which is now known as Addis Ababa University, by the act of the internal decree known as “Charter of Haile Selassie I University”. In 1978, announcements were made for the establishment of a medical faculty in the Gondar PHC&TC by a bilateral agreement reached between Karl Marx University, (now known as the University of Leipzig in Germany) and Addis Ababa University. It was a landmark in the lengthy history of the college as it was a major transformation that resulted in the practical establishment of medical education. In the academic year 1980/81, the name Gondar College of Medical Sciences (GCMS) was given to the PHC&TC.

Medical training was initially given mainly by German medical experts. In 1978, the bilateral agreement created an opportunity for the successive training of Ethiopians in Germany to substitute the German specialists to whom the college’s success was fully attributed. The college was detached from Addis Ababa University and became autonomous in 1992. Currently, the UoG owns 52 undergraduate and 61 postgraduate programs (including a Public Health Ph.D. program in collaboration with Addis Continental Institute of Public Health) in its regular, extension, distance and summer programs. The University has so far graduated 18,333 students, both in the undergraduate and postgraduate programs: 1,357 medical doctors, 1,627 health officers, 7,068 in health sciences (nurses, midwives, laboratory technicians, pharmacists, sanitarians, etc.), 3,590 in business and economics (managers, accountants, economists, etc.), 2,142 in natural computational sciences (biologists, chemists, mathematicians, etc.), 1,965 in social sciences and humanities, including psychologists, sociologists, 234 lawyers and 350 in veterinary medicine.

UoG has unidentified 20 research thematic areas and its staff is undertaking a prioritized and societal problem-solving project with a research budget allocated by the Ministry of Finance and Economic Development or other internal/external granting schemes. Its staff members have so far published more than 800 scientific articles in national and international journals. The university also renders diverse community services, such as hospital-based, out-patient and in-patient health services, community-based clinical and public health services, chronic illness follow-up, veterinary clinical services, free legal aid services, continuing and distance education, tourism development, need-based training and consultancy services, panel discussions, seminars and conferences.

Taken together, the UoG is playing a vital role in the socioeconomic development of Ethiopia through quality education, research and community services and has received awards of recognition from Sasakawa Global in 1998, Ethiopian Public Health Association in 2004 and the Federal Ministry of Education in 2011.

Community-Based Health and Social Outreaches – The Gown Meets the Town

The University of Gondar is currently delivering the following service to the community:

- The Gondar University Hospital is rendering health services for more than five million people in Northwest Ethiopia.
- Through team-training programs (TTP) the University is providing outreach health services for more than 50,000 households in Debarq, Dabat, Koladeba, Addis Zemen and the Woreta areas.
- Health service is also rendered via its innovative health care services, such as the continuous care for the chronically ill and community-based rehabilitation (CBR).
- Kalazar project, located in the university hospital campus, has a clinic with 24 beds, and is also engaged in a new drug trial for patients' treatment.
- Dabat Rural Health project performs longitudinal health research, which helps identify the top 10 health problems and their trends in the Dabat district.
- Continuing and distance education service are also provided for the community.
- In line with clinical practice for students of veterinary medicine, a subsidized veterinary clinic and artificial insemination services are offered to the community.
- Legal aid service to community members who cannot afford hiring legal for court is provided by the school of law.
- The university is also providing tourism-related services and sharing its facilities, such as the conference halls and sport utilities, with the local community. The university is organizing panel discussions, workshops, seminars and conferences on contemporary issues of local, regional, national and international relevance.

This overview of health-delivery service, medical and health education and human resources development in Ethiopia was prepared for students as a training module. Ethiopia's history from 1941 to 2011 is so rich with innovation, progress and achievement that it is impossible to cover all facets of our country's development in medicine and health science, but we do hope that we have provided a broad learning objective, so that students may now be able to:

1. Identify historical trends of the health-delivery services in Ethiopia.
2. Identify the structures and functions of health-delivery services.
3. Describe and understand the structure and function of the Ministry of Health in Ethiopia from 1941-2011.
4. Identify the history of proclamations that established the Ministry of Health at national, regional and local levels through three regime changes, from 1930-1991.
5. Identify and understand the implications of the planning and reform policies of the Federal Democratic Republic of Ethiopia – Health Sector Strategic Development Plan, from 2010-2015.
6. Identify the partnership between health professional associations (EMA/EPHA) and the Ministry of Health in the decision-making process and policy implementation and describe the important involvement of autonomous non-governmental organization for health professionals in Ethiopia.
7. Describe selective narratives of Ethiopian health professional pioneers and their leadership: a paradigm from dependence to self-reliance to nation building.

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The Impact of the Gondar Public Health College and Training Centre

By Dennis G. Carlson, MD

When the Italian Occupation ended in 1941, rampant disease in Ethiopia ravaged the country's 10 million people. Epidemics of infectious diseases – including Smallpox, Malaria, Measles, Diarrheal Diseases (including Cholera), Tuberculosis, Typhus, Relapsing Fever, Tetanus, Leprosy, and Yellow Fever – swept the country.¹ Other communicable diseases – such as Trachoma, intestinal parasites and Sexually Transmitted Diseases – were highly endemic.²

In addition, recurring droughts punctuated nearly every decade and caused innumerable deaths due to famine.³ As a result, serious malnutrition problems weakened and disabled many Ethiopians, causing significant population losses, especially among rural populations. Even in times of favorable weather conditions, severe under-nutrition resulted in the stunting of children and adults. Micro-nutrient deficiencies were prevalent (especially vitamin A, iron and iodine) and produced widespread disabilities, such as blindness, anemia, goiter and nervous system disorders. In this time of upheaval, injuries due to vehicle accidents and interpersonal conflict increased – adding to the distress of Ethiopians.

Ethiopia after the Italian Occupation

After the Italians were defeated for the second time, it took several years for Emperor Haile Selassie I to regain clear control of the government and renew the process of building a modern society.⁴ Governmental infrastructure had to be rebuilt and strengthened and it was not until 1947 that the Ministry of Health was institutionalized as a major service organization – two years after the United Nations was established. While hospitals built by the Italians often served the general population, people in more remote regions had to rely on the hospitals and clinics operated by religious missions from abroad. Some European governments rallied behind Ethiopia after the Occupation – Germany, France, Italy and the Soviet Union, for instance – but usually these countries supported hospitals in the urban centers.

Still a lack of accessible hospitals at that time was not the most critical impediment to the health of the people of Ethiopia. The most severe shortage of resources was the lack of Ethiopian physicians, nurses, laboratory technicians and other health personnel. While the government ran a two-year "dresser" training program at Menelik Hospital in Addis Ababa to prepare low-level assistants in hospitals and clinics and a few mission hospitals trained dressers under a Ministry of Health curriculum, Ethiopia had neither its own medical school nor any kind of training for nurses. In fact, the first professional nursing school did not open until 1951 and it was not until 1954 that the first Ethiopian physician trained abroad returned to practice medicine.⁵ The only advantage of not having indigenous health professionals in Ethiopia was that there was no vested interest to challenge the new form of health services being put in place.

Emperor Haile Selassie had won an international reputation in the 1930s and 1940s by his courageous battle in the League of Nations to prevent the invasion of the Italian military in 1935. By the late 1940s, as the United Nations was cementing its own foundation, Haile Selassie was considered a significant global leader. Selassie's prominent international reputation helped Ethiopia gain access and resources from UN organizations, such as WHO, UNICEF, FAO, UNESCO and others. WHO and UNICEF, as well as the U.S. government, responded favorably to the Ethiopian government's request for professional assistance and financial support in establishing modern health services. WHO supplied valuable professional and technical assistance and UNICEF provided financial help and equipment. The United States was the primary source of funding and technical assistance.⁶

The government of Ethiopia – with the Ministry of Health as lead government agency – signed an agreement in 1951 with WHO, UNICEF and the United States to support the development of modern health services in Ethiopia. After extensive surveys, consultations and negotiations, the Ethiopian government signed another agreement in 1953 with these same donors to proceed with the implementation of a radically different system for providing health care.

The plan was unique in many ways and had not been used anywhere before and reflected the recently adopted definition of health by the World Health Organization in 1948 that stated, “Health is a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity”. The WHO Mission Statement emphasized integration of preventive, promotional and curative health services. It spoke specifically about improving nutrition, housing, sanitation, recreation and economic conditions. As a result, the organization of health care would require different kinds of health personnel working in different settings other than hospitals and clinics.

National Health Demonstration Project

The Ethiopian government agreed with its partner agencies to develop a demonstration project in one region to test the WHO ideals and principles in actual practice in a population of clearly defined needs. If positive results were achieved in the demonstration region, it would expand to the whole country. The new plan required that an integrated package of health services be provided by professional health teams in decentralized facilities known as “health centers”. The roles of the team members would be determined by the tasks they would need to perform to control most prevalent diseases. A major new training institution would develop curricula where students learned to perform these tasks while functioning in teams under realistic conditions.

Because Ethiopia’s most common diseases were caused by a combination of environmental conditions and health behavior patterns, the challenge would be to treat illnesses while at the same time modifying living situations and health behavior. The core of the team would be comprised of health officers, community nurses and sanitarians.

The health officer was assigned as the team leader and would be trained to perform clinical tasks while managing health-center programs and participating in preventive care and promotional health in homes and communities. Community nurses learned basic nursing skills as well a broad range of public health measures, such as maternal and child care, clinic and home deliveries, health education and immunization. Sanitarians would work both with households and communities to develop water supply protection, waste disposal facilities, food sanitation, housing measures, mapping, census taking and immunization programs. Team members would need to understand clearly how members would carry out their roles in order to perform effectively. Some functions, such as health education, were required of all three categories, while other tasks were unique to each category, such as water source protection by sanitarians, home deliveries by community nurses, and clinical diagnoses by health officers.

Learning Program

Theoretical and practical training needed to be closely integrated so that students would be safe, competent and confident practitioners immediately upon graduation. To achieve this integration, all students would have progressively increasing practical experience during their professional training. In their first year, all students and teaching staff participated in core courses where public health principles were introduced, patients with different common disease conditions presented and current epidemics discussed. After completing the first year, all students had four days of classroom learning and one day a week in small communities practicing their new roles under close supervision. In their final years, they spent six months in actually running all programs in training health centers under close supervision. During the other six months, interns would live on the college campus and work in the hospital and clinics. Intern health officers would also be assigned to epidemic control teams to diagnose and control epidemics and conduct individual applied research projects. Sanitarians would get practical training in environmental laboratories and in community practice.

Project Implementation

Before implementation could begin in 1954, choosing the actual location of this important new endeavor led to intense competition between supporters in different parts of the country. Gondar was chosen over Jimma in the final selection. Three new health centers were constructed in Kolladuba (35 km south of Gondar), Gorgora (50 km south of Gondar on the shore of Lake Tana) and Dabat (60 km north of Gondar) to be used for practical training for interns as they managed the health centers. The new training health centers included student dormitories, bedrooms for supervisory staff and classrooms, as well as clinic rooms, small laboratories, and space for emergency surgery and the delivery of babies. The hospital in Gondar, built by the Italians, was renovated and additional student dormitories built on campus. One hospital ward was converted to a dormitory for girls in one section and a library at the other end. A dispensary in the center of the old Imperial capital city – originally built by the Italians – was renovated as a health center and residences were prepared for senior academic staff.

Recruitment of Ethiopians for teaching positions was difficult since there were so few health professionals in Ethiopia. (The one exception was in environmental health where several Ethiopians were already employed.) WHO and USAID provided most of the senior teaching staff, many of whom came from North America, Europe and Asia. Some clinicians, who were paid with Ethiopian funds, were recruited from India, Taiwan, Europe, Canada and the United States. The United States technical assistance program appointed

the director of the project as well as several senior public health nurses and the hospital “matron”. WHO sent a senior physician from China to act as dean of the college as well as three other public health physicians and a midwifery tutor.

The first class of 21 health officer students – of which nine would be trained for the Ethiopian police and military – began their four-year training in the fall of 1954. The first class of community health nurses began a three-year curriculum a year later. Sanitary science students started their two-year curriculum in 1956, though their program would soon be extended to three years. When recruitment first began, the nationwide numbers of female students completing secondary school were so few that the earliest classes in community health nursing only required completion of eighth grade. In addition, the need for training of medical laboratory technicians was soon recognized and a two-year program added.

National Spread of Health Centers

Within a few years, it became clear that the initial health centers in the Gondar region were working well and the government expanded the program to a national level quickly. By July 1958, the first cohort of health-center team members had been trained and ready to work. But opening new health centers was more difficult and slower than expected because construction and equipping schedules were often delayed. Moreover, the desire to live in urban centers, especially Addis Ababa, was strong and many graduates resisted taking rural assignments. Several graduates left government service altogether and joined pharmaceutical companies instead. Despite these obstacles, health centers began to spread during the next few years, with growth accelerating thereafter.

Haile Selassie I University Established

After three years and just as the first classes graduated from Gondar College, a new challenge for the young training institution occurred. In late 1961, Emperor Haile Selassie announced plans to develop a national university. Selassie would serve as Chancellor and his grand-daughter’s husband, Lij Kassa Wolde Mariam, would be appointed its first president. All existing post-secondary training institutions would be brought under the umbrella of the new institution, which included the Gondar Public Health College, along with the University College, Alemaya Agricultural College, and the Building College. New faculties of arts, science, engineering, education, law, business, theology, and social work were planned and faculty mainly from India, Europe and North America were recruited. A faculty of medicine in Addis Ababa was expected to be added in the near future.

The establishment of the new university had a profound impact on Gondar College. First and foremost, the Ministry of Health lost control of its prized institution, which was created in collaboration with its global partners. Since the Gondar Project included the hospital and the provincial health services for the entire Beghemder and Siemen region surrounding Gondar, the Ministry lost covered budgeted funding as well. Initially, it had been agreed at the highest levels that the Gondar Project would be jointly coordinated by the university and the Ministry of Health. This did not happen in an effective way. As a result, some Ministry of Health officials vowed never to visit the Gondar campus as long as the university was in charge. “Joint management” was limited to informal visits by college leaders to the Ministry of Health. The university then moved to consolidate its control over the entire training and service activities in 1962. The project director provided by USAID resigned and the academic dean from WHO also left his post. The university appointed an Ethiopian health scientist as dean and co-director under university administration. A new American appointee was recruited by the MOH, with help from USAID, to share responsibilities as the other “co-director” of the overall project.

Since health officers would now receive a bachelor of science degree in public health, the newly established university insisted that the curriculum be expanded and upgraded, particularly in mathematics, physical sciences, social sciences and humanities. Health officers who had previously been awarded a diploma in public health were allowed to take additional science studies and receive a bachelor of science in public health degree. The university also constructed new buildings for a new library and science laboratories on campus.

Development of the College Faculty

The need to develop an Ethiopian teaching staff was clear and pressing. A few baccalaureate graduates in the arts and sciences from Addis Ababa and others with diploma training in nursing were willing to join the teaching staff in Gondar with expectations that they would be sent to the United States or the American University of Beirut for advanced studies. Of those sent abroad, only a few returned to Ethiopia and almost no one came back to teach in Gondar.

With the opening of the medical faculty in Addis Ababa in 1964, the obvious question was raised as to whether health officers would be admitted or not. At first, there was complete refusal, but eventually the policy was changed so that some health officers could be admitted on condition they take the entire five-year curriculum, with exemption only from public health courses. The Gondar College administration realized this was an opportunity to help build an Ethiopian teaching staff.

Two health officers already on the college staff were sent to study medicine in Addis Ababa. Both returned and served in teaching and administrative roles. One later became the dean of the college. Since the Ministry of Health refused to allow experienced health center staff to join the program, the college decided to retain several outstanding graduates each year as junior teaching staff. After spending some years teaching and supervising students, these graduates were supported to go abroad for advanced studies or to join the medical faculty in Addis Ababa. This strategy was successful, with most returning to join the Gondar teaching staff. Within a few years, these

graduates were effectively carrying the major part of the teaching and supervisory tasks and relatively few expatriates were necessary to boost the staff.

Nationwide Student Recruitment

The number of secondary school graduates eligible for admission to the university was limited in the 1950s and 1960s. Most provinces had only one secondary school in the regional capital. In addition, very few high school students even knew what health centers, health officers, community nurses or sanitarians were. Recruitment and selection of candidates for the Public Health College was largely a passive process; student selection was made mostly from among students living in Addis Ababa, larger cities or those able to travel to find out what educational opportunities were available. In the first few years, the number of eligible students was small but sufficient. By the early 1960s, however, the number of graduating students had fallen to such a level that the Ministry of Health was unable to staff new health centers in rural locations.

In 1965, the college began an aggressive public relations and recruitment campaign – with teams consisting mostly of Ethiopian teaching staff visiting secondary schools in every province. The number of applicants soared, so that 55 health officer students were selected in 1967 and 43 students graduated four years later. The total student body almost doubled from 210 in 1963 to 410 in 1967. This allowed the Ministry of Health to open new service health centers in small towns and cities. By 1972, there were 93 health centers throughout Ethiopia.⁷

Visiting Professionals

The successful establishment of the Public Health College and Training Centre became an international success story, particularly among those involved in global public health. Gondar became the most frequently visited training institution by WHO personnel in the 1960s. Nearly every week, new visitors to the campus and training health centers arrived. As a “contribution” to the college, many health professionals were asked to present a guest lecture or share their expertise in other ways. When the Commissioner of Health for New York City visited, she remarked that it would be valuable if health systems in industrialized countries had comparable training.

Evaluation and Monitoring

National and international observers were intrigued by the effectiveness of the Gondar Project because of its unique approach. Administrators from WHO were especially attentive. When university control was instituted, questions were raised as to whether academic training could translate into a practical defense against the major diseases prevailing at health centers. The USAID health program conducted a long-term “Demonstration and Evaluation” impact study, which examined whether the presence or absence of health centers made significant differences.⁸ And the college staff conducted its own evaluation to determine whether the graduates actually were performing their roles according to their academic training. The findings and outcome surprised many. Around the country, strong community acceptance and support were noted in conversations with officials and community leaders at public events. One district governor was so impressed with the health-center staff in his area that he asked how students were trained in such a way that they were motivated to engage in all kinds of community health development activities. Within a decade, health centers staffed by health center teams became successful institutions.

The Mengistu Regime

The fall of Emperor Haile Selassie in September 1974 led to abrupt changes in government health policies. Ethiopia became a client state under Soviet dominance and Western influence diminished sharply. The effects of Derg (Mengistu’s political party) policy and practice had a negative impact on earlier developments. Professional technical assistance and funding now came from the East. Soviet, Eastern Europe and Cuban advisers gained significant influence in the Ministry of Health. In 1976, profound changes in health policies were announced.

Under heavy pressure by Soviet advisers in the Ministry of Public Health, the national policy of basing most health services in health centers staffed by health officers, community health nurses, sanitarians and laboratory technicians was drastically curtailed. Clinical services in hospitals now dominated national health services. Since the Public Health College and Training Centre was deemed “unnecessary”, it would be phased out. The last classes graduated in 1978. The Public Health College was replaced by the Gondar Medical Sciences College, where students would be trained as physicians and hospital nurses instead of health officers, community nurses, sanitarians and laboratory technicians. Expatriate teaching staff came from East Germany to begin the new phase.

Lasting Impact of the Public Health College

Were there lasting positive effects from the Public Health College and Training Centre Program that functioned for 24 years? Yes, absolutely. From 1954 to 1974, a total of 1,147 graduates were trained in the first 20 years; this included 351 health officers, 359 community health nurses, 332 sanitarians and 105 laboratory technicians – for an average of 76 new health center staff per year. Approximately 60 more health officers were graduated in 1975 and 1976. In 1973, 62% of health officer graduates were still employed by the Ministry of Health, 65% of community nurses and 69% of the sanitarians.⁹ Ultimately, about 70 health officers entered the faculty of medicine in Addis Ababa and graduated as physicians. At one time, all 12 provincial health departments were headed by health officers who had gone on to study medicine. Moreover, the management staffs of Ministry of Health organizations at provincial to national levels were usually led by health officers, some of whom had gone abroad to study for Master of Public Health degrees. A

number of experienced health officers, community nurses and sanitarians became key leaders in the new universities established during the Mengistu and Meles regimes. One community nurse with advanced public health training became Minister of Health during the Meles government. Several eventually became full professors. At least one became a university president.

A highly significant outcome occurred when the Meles government came to power in 1991. A major element in its new policies and programs was the decision to re-institute the utilization of health centers as an integral part of national health services, in addition to establishing more district and regional hospitals. The high priority on primary health care resulted in a campaign to build and staff more than 3,000 health centers throughout the country. To achieve this goal, several new programs were created in 1997 in university health science faculties to train more than 5,000 health officers. Trainees came both from new secondary school graduates as well as post-basic nurses who had extensive work experience. This resulted in a progressively successful expansion of modern health services throughout Ethiopia.

In addition to preparing large numbers of health officers, baccalaureate training of nurses, sanitarians and medical laboratory technicians was instituted. Another highly beneficial development was the opening of master of public health degree programs in several universities, which was open to all categories of health professionals. Masters degree training also was established in emergency surgery for graduate health officers so that emergency operations, such as Cesarean sections, could be performed in health centers.

Lessons to Be Learned

Valuable lessons can be learned from the 24 years of the Gondar Public Health College and Training Centre. A long-range comprehensive planning process that looked ahead for 15 or 20 years would have helped in many strategic ways:

- It would have been highly advantageous if the Ministry of Public Health and Haile Selassie I University had worked together closely in shaping the policies and programs of the college.
- It would have been helpful if the university had designed a smooth transition for significant numbers of health officers to enter the faculty of medicine and receive appropriate credit for what they had already learned.
- There would have been major benefits to the graduates if other career development opportunities had been established.
- The Gondar college staff proposed a Master of Public Health program to the university and the Ministry of Health in the mid-1960s, but nothing came of these suggestions. Many people considered health center team training to be a “temporary measure” and that it didn’t matter what happened to health officers when sufficient numbers of physicians had been trained and served in rural areas. Few observers expected that such high percentages of medical graduates would leave Ethiopia permanently.

In Retrospect

It has become abundantly clear from the perspective of more than 50 years that the training of health officers and other members of the health center teams was far more than a “temporary measure”. The graduates of the Gondar Public Health College played critically important roles in the evolution of Ethiopia’s national health services. They have demonstrated time and again that there are innumerable advantages to a health system that positions health centers close to where the various populations reside. Health center staffs will continue to make highly significant contributions to the overall health of the Ethiopians for the foreseeable future.

Questions to Ponder

1. Why is teamwork so essential in health services?
2. Why is it clear that health center teams are strategically important in providing health services for rural communities?

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History of Epidemics in Ethiopia

By Kinfe Gebeyehu, MD

Epidemic, a term more commonly associated with infections or vector-transmitted diseases, refers to an occurrence of a disease in an identified community, region, locality or country in a given span of time and in excess of the usual trend of its occurrence. Past documented historical examples of epidemics in Ethiopia included: Malaria, Meningitis, Typhus, Typhoid, Relapsing Fever, Influenza, Cholera and many sexually transmitted infections, including HIV, Gonorrhoea, Syphilis and Chlamydia. Food-borne infections of different etiologies, and many insect-transmitted diseases – Malaria, Filariasis, Leishmaniasis, Onchocerciasis, Yellow Fever and numerous parasitic infestations acquired through hand-to-mouth transmission as a result of inadequate disposal of human excrement and lack of adequate personal hygiene and sanitary environment – are common occurrences at epidemic or endemic levels.

Even though historically many of the man-to-man transmissions and vector-borne transmissions occur in communities at a low but consistent scale where they may be categorized as endemic, several have resulted in a large and abnormal scale to be identified as epidemics. It was quite common that diseases such as Typhus, Typhoid and Enteric diseases – examples of which are served by Salmonella and Pathogenic e coli and other more serious meningococcal infections – often follow natural or manmade disasters that disturb or largely tip the equanimity of the environment. Wars, famines, droughts, heavy rains, floods, hurricanes and other natural disasters and displacements have historically heavily contributed to the occurrence of epidemics concurrent with or following those incidents.

Major Epidemics in Ethiopia

This article will limit the discussion to major epidemics of historical significance and proportion in Ethiopia and to diseases that had a major impact at community, regional and national levels. It will provide a concise overview of the diseases as much as their historical significance merits and with the intention of helping the reader formulate a mechanism by which to build on the historical experience gained in dealing with assessment, management and prevention of modern day epidemics. This article will help the reader gain insight on the following points:

- The nature of epidemic diseases and the disruption of life caused by these epidemics in the historical past
- The ability to compare occurrences and magnitude with modern epidemics
- The ability to compare containment of epidemics and progress in preventive measures
- Provide understanding of the factors contributing to the spread of epidemics and community efforts then and now in prevention of such a spread
- Recognize how community, national and international cooperation helps to confine the epidemic in the treatment, prevention, control and eradication of the disease

Investigating Cholera

In Steven Johnson's fascinating book, *The Ghost Map*, about the 1854 Cholera epidemic in London, the author introduces the reader to the following scenario: In the summer of 1854, Cholera seized London with unprecedented intensity. A metropolis of more than 2 million people, London had just emerged as one of the first modern cities. But lacking the infrastructure necessary to support its dense population – garbage removal, clean water, sewers – the city became a perfect breeding ground for a terrifying disease that no one knew how to cure. As neighbors began to die, two men addressed the crisis: the Rev. Henry Whitehead, whose faith was shaken by the seemingly random nature of the disease, and Dr. John Snow, a man whose ideas about contagion were dismissed by the scientific community but who was convinced that he knew how the disease was being transmitted. Dr. Snow and Rev. Whitehead disregarded the conventional wisdom of the day and instead began to investigate the real culprit of the epidemic – the neighborhood water pump.¹

In another book, *Africa in the Time of Cholera, A History of Pandemics from 1817 to the Present*, Myron Echenberg, from McGill University, explains how even an inexpensive investment in potable water and sewage infrastructure can avert major outbreaks of the disease. Covering Cholera from a historic perspective, the author notes that Africa was vulnerable to the Cholera pandemics precisely because of its access to the Red Sea, Mecca and the Nile. Trade, large migrations of pilgrims and war were critical factors in the spread of the disease.²

The Winds of Cholera

The epidemic that occurred in the mid-1860s, during Tewodros's reign, was devastating. In spite of the fact that 100,000 people – in fear of the disease – fled from the lowlands to the northern highlands by Lake Tana, many still lost their lives before the disease moved farther south to Shoa and Oromo lands. Many assumed that the disease was brought by the winds (that's why it was called Yebird Beshita) because it was thought to have traveled inland from the eastern coasts. The misery encountered at that time was complicated by famine: those fleeing the farm no longer had any source of sustenance and it was compounded by the cattle plague (Rinderpest) that devastated agriculture production.

Professor Zewde Bahru depicts a graphic account of an epidemic that was the scourge of both humans and animals in his book, *A History of Modern Ethiopia, 1855-1991*:

At a time when the geopolitical centre of the country was moving southwards, Ethiopia found herself in the grip of famine with serious internal and external repercussions. The process of territorial expansion was partly spurred on by this social cataclysm. Although the famine was most intense in the Northern provinces, few areas in the empire escaped it. Nor was it confined to the Ethiopian region: it was evident in Sudan and East Africa as well. In the north, the social and economic dislocation that attended the famine facilitated the Italian advance to the highlands and the creation in 1890 of their colony of Eritrea. One reason for Menilek's failure to consummate the Adwa victory by pushing the Italians out of Eritrea was the acute problem of supplies that he faced. Even after its immediate impact had died, the memory of the famine, known as Kefu Qan (Evil Days) in popular parlance, endured. It has survived to this day as a gauge to measure and compare the intensity of subsequent famines.

On the surface, the famine started as a result of the outbreak of a Rinderpest epidemic triggered by Italian importation of infected cattle through Massawa. The consequent death of cattle (up to 90% in many areas, and up to 100% of personal possessions in some cases) deprived the peasant of his chief means of production. Drought and locust invasions wiped out what was left of the previous harvests. But the roots of the famine lay deeper in the social and political fabric of the country. The intermittent wars of the century had reduced the peasantry to the very edge of subsistence. Even the relatively more pacific collection of tribute left behind little surplus grain to tide over such moments of scarcity and deprivation. The immediate consequence of the epidemic and drought was spiraling inflation in the prices of grain and cattle. This was inevitably followed by widespread starvation and death. There were some desperate efforts to survive. Food that was hitherto considered taboo was eaten. Some looked for grain in the excrement of cattle. Others ate the carcasses of animals, only to die painfully from the diseased meat. Still others resorted to the extreme of cannibalism. A few sought survival in enslavement. There were also those who, giving up all hope, committed suicide.”

Nowadays, though Cholera outbreaks continue to occur occasionally, early detection and improved public health measures in containing the infection have helped to minimize its spread. As Cholera is one of many infections in which food and water contamination and hand-to-mouth transmission are the primary vehicle of spread, countries lacking sanitary establishments and/or lifestyles based on poverty and poor personal hygiene continue to suffer. Not only are they impacted by the loss of life, but economically it can have a negative outcome on tourism.

In 1971, the Lake Chad Basin became a springboard for Cholera heading all the way east to the Horn of Africa. In Ethiopia, which reported Cholera in 1971 for the first time in 65 years, thousands traveled through the porous border to refugee camps supported by the United Nations High Commission for Refugees (UNHCR) in neighboring Sudan. Cholera broke out soon after their arrival.

Practical Improvised Steps in Managing Cholera in the Field

The incidence of a Cholera epidemic that waged its threat to life and well-being in the early 1970s was shared by the pioneering field experience of Dr. Demissie Habte and Dr. Pawlos Quana'a in their article in the *Journal of Tropical Pediatrics*. The then-young physicians describe the construction of a field hospital and use of community resources to assess and manage Cholera victims in the field. The hallmark of their preventive and curative fieldwork was based on simplicity and resourcefulness. The logistics and action plans for tackling the epidemic – while struggling to preserve lives – follows:

1. Get in touch with the staff of the local health center or health station (if there is one), and through them to local government representatives and village elders. They should be informed of the purpose of the mission and asked to help.
2. Choose a site for the field hospital nearest to the health center or health station. This should be a large tent from the community self-help organization or a barrack built with wood and grass by the community. The local prison may be asked to give the labor force and the community to give the materials.
3. Patients should be brought in their own beds without mattresses. Almost all varieties of local beds are porous and allow watery stools to pass through. Underneath each bed, a shallow latrine, 25cm diameter and about 20cm deep, should be dug right beneath the buttocks. The family of each patient should be asked to bring a Y-Shaped stick of wood to serve as a drip stand.
4. The shallow latrine should be frequently drenched with disinfectant (Evant or Sedex). On discharge of the patient, benzene should be sprinkled in and around the pit and then lit with a match. Fresh earth can then be thrown on it.

5. A large metal container (barrel) should be secured to boil water with local wood supplied by the community. This serves as an education to the people and provides the necessary water for drinking, preparation of oral hydrating fluids, and for cleaning hands.
6. Used I.V. fluid containers and feeding-sets should not be discarded. They will be used for oral hydration. Even the plastic envelopes can be used for giving tablets or tetracycline etc.
7. A garbage pit should be dug nearby where waste and contaminated objects should be burnt.
8. If no latrines are available, one should be constructed with help of a sanitarian.
9. Call the Ministry of Public Health (by phone) once a day preferably at a previously agreed time to inform of progress of work and report on the number of cases.
10. Dispatch stool specimens for bacteriological identification of Cholera on the first 5-10 cases.

The Virulence of Smallpox

The earliest clinical evidence of Smallpox is documented to be found in the Egyptian mummy of Ramses, who died more than 3,000 years ago in 1145 BC. Because medical writings from ancient India and China (as early as 1500 BC and 1122 BC) have shown evidence of diseases that resemble Smallpox, there was speculation that Egyptian traders brought it to India. The term Smallpox was first used in Europe in the 15th century to distinguish Variola from the Great Pox (Syphilis). Smallpox was one of the most common and probably ancient diseases that remained virulent in many facets of the world during the early modern period.

The pocks and scarred faces of those who survived this horrific viral infection marked them for life. The only centuries-old effective way of controlling transmission of the infection was through immunization by variolation, which started in 1717, when, according to Mary Dobson, Lady Mary Wortley Montague had her 6-year-old son inoculated against Smallpox in Constantinople. In 1796, Edward Jenner, a physician epidemiologist in England, tried out his cowpox vaccine after realizing that ladies who came in contact with poxes in cows while milking them did not contract smallpox. Variolation – from secretions taken from infected person's pustule and inoculated into an open skin of a healthy person – has been in practice in Ethiopia well until modern vaccination was introduced and widely used.

In *A Medical History of Ethiopia*, Richard Pankhurst quotes the notes made by Harris, Merab and Petit about the process of variolation. "The patient's skin would be folded at the lower front part of the forearm, four finger breadths above the wrist, after which an incision was made with a razor to introduce the virus". A physician who visited Shawa in the 1840s said that care was taken to obtain the pus from free men and not from slaves, a statement confirmed by Harris as follows: "A free boy of pure blood is selected from among the number of the infected, and carefully secluded until the pustules are ripe". Courbon added that variolation was not usually carried out on children under the age of 15 to 18 and was seldom repeated on persons already inoculated".

The disease killed an estimated 400,000 Europeans per year during the closing years of the 18th century and was responsible for a third of all blindness. It is estimated that Smallpox was responsible for 300-500 million deaths in the 20th century. The last naturally occurring case of Smallpox was diagnosed on Oct. 26, 1977.

After effective vaccinations in the 19th and 20th centuries and a productive case-finding scheme, the WHO certified the eradication of Smallpox in 1979. In 1967, the WHO estimated that 15 million people can be traced with the disease worldwide and that 2 million died as a result. Because of years of massive worldwide vaccination programs, by the end of 1975, Smallpox persisted only in the Horn of Africa.

Conditions were very difficult in Ethiopia and Somalia, where there were few roads and civil war. Famine and refugees made the task even more difficult and in mid-1977, under the direction of the Australian Microbiologist Frank Fenner and his team, the campaign measured its goal and verified eradication of Smallpox. The last naturally occurring case of indigenous Smallpox (*Variola minor*) was diagnosed in Ali Maow Maalin, a hospital cook in Merca, Somalia, on Oct. 26, 1977. The last naturally occurring case of the more deadly *Variola major* had been detected in October 1975 in a 2-year-old Bangladeshi girl, Rahima Banu.

The global eradication of Smallpox was then certified based on intense verification activities by a commission of eminent scientists in December 1979 and subsequently endorsed by the WHO assembly on May 8, 1980. The resolution stated: "Having considered the development and results of the global program on Smallpox eradication initiated by WHO in 1958 and intensified since 1967... [We] declare solemnly that the world and its peoples have won freedom from Smallpox, which was a most devastating disease sweeping in epidemic form through many countries since earliest time, leaving death, blindness and disfigurement in its wake and which only a decade ago was rampant in Africa, Asia and South America."

Some challenging sites in case-finding and vaccination in Ethiopia toward the end of final containment and eradication (1974-1977) were the extensive Blue Nile Gorge area in the north and the Ogaden area in the southeast. The WHO team and the national staff were on occasion confronted by hostile dwellers and guerrilla fighters out in the field. In *Smallpox and Its Eradication*, an article in a WHO publication dramatically recalls an instance where a hostage was taken from the staff in Ogaden. A quick-thinking helicopter pilot managed to save the day and gain the release of the hostage, but these dangerous conditions were not unusual at that time.

The team of WHO and Ethiopian epidemiologists, surveillance and vaccination staff, which later on included some students among those sent out by the Derg government for literacy campaigns, have carried out a remarkable job under those pressing circumstances. They experienced innumerable hardships and sacrifices while hunting down naturally occurring Smallpox. They have contributed significantly to the eradication of this disease. Special honor should go to Tekeste Yemane, a product of the Public Health College and Training Centre of Gondar, who was the director of an Ethiopian small pox eradication team during the final stages of the eradication.

Smallpox Timeline

1796: Edward Jenner invents a Smallpox vaccine.

1966: The World Health Organization (WHO) launches a massive global campaign to eradicate Smallpox.

1972: Smallpox vaccinations are discontinued in the U.S.

1975 and 1977: The last cases of the two known variants of Smallpox occur in the world – in Bangladesh and Somalia.

1978: Two people are sickened in a lab accident in England; one dies.

1980: The WHO declares smallpox eradicated.

1991: Smallpox virus DNA is mapped.

1999: The WHO sets this deadline, by which remaining lab stocks of the virus are to be destroyed. The deadline will be postponed again and again.

2003: Millions of doses of vaccine are produced to hedge against a biological attack.

2011: WHO's decision-making body will meet in May to again vote on whether to kill the remaining live viruses.

SOURCE: Smallpox Zero, by Jonathan Roy, CDC

Typhus, Influenza and Diarrheal Diseases

Narratives on historical accounts of epidemics would never be complete without a review of Typhus, Influenza and Diarrheal diseases and their influence on the course of wars, decimation of populations and their effect on life and living in general.

Though documented incidences of Typhus are recorded as early as in 1489-90 – during the Spanish occupation of Granada that resulted in the death of 17,000 Spanish soldiers and as early as 1494 that brought about the death of 30,000 French soldiers in Italy – relatively more recent incidences in the 18th and 19th centuries are dramatically depicted and clearly identified with Typhus. The following excerpt is from Mary Dobson's book, *Disease*, which details the detrimental outcome of wars not only in casualties but also in diseases born by vectors. Typhus and Relapsing Fever are now known to be transmitted by lice and Diarrheal Diseases, including Cholera, Shiegella, and Salmonella infections as well as Typhoid, Influenza and Meningitis.

The close association of Typhus with conditions of poor hygiene, overcrowding, cold, hunger and – above all – unwashed bodies and clothes, singled it out as a classic disease of dirt and distress. It plagued prisoners, seafarers, beggars, slum dwellers and soldiers, and, in Europe from the late 15th century when the disease first made its appearance, it repeatedly devastated armies. Typhus – along with other pestilences such as dysentery (the “bloody flux”), relapsing fever, scurvy and typhoid – was an almost invariable accompaniment to warfare, and such diseases accounted for far more losses than the actual fighting.

One of the most striking epidemics of “camp fever” occurred in 1812. That summer the French Emperor Napoleon (1769-1821), with his “Grande Armee” numbering more than half a million men, embarked on the ill-fated invasion of Russia. During the course of the advance, many of his troops sickened or died of Typhus and Dysentery, and roughly constructed hospitals had to be erected en route for the wounded and the victims of disease. By mid-September, following the Battle of Borodino, Napoleon reached Moscow with a depleted army of only 90,000 men. But the Russians were one step ahead of him. Taking with them most of the supplies and provisions, they had abandoned the city and put it to the torch. Napoleon entered a city that was silent, empty and smoldering. Despondent and wretched, the Grande Armee began its long retreat west as the ferocious Russian winter began to close in.

It was a bedraggled mob who started out on the long cold trek back to France. The hospitals set up on the outward march were by now in a deplorable condition – crowded, filthy, smelly and filled with unwashed, starving, diseased, frostbitten and emaciated men. They could hardly handle any more sick and dying soldiers. Horse meat became the staple diet of desperate soldiers – they even gnawed at leather or drank their own urine, for want of victuals. Some simply froze to death. By mid-December, Napoleon had just 30,000 of his original 600,000-strong Grande Armee left alive – and only a thousand of these were ever again fit for duty. The majority of men in this catastrophic campaign had succumbed to Typhus or extreme cold and hunger, and Napoleon's dream of a vast French empire extending through Russia to India had come to a staggering halt”.⁸

Typhus epidemic – either singly by itself or concurrently with Influenza and Diarrheal Diseases – has also received its share of dramatic depiction in Ethiopian history, leaving its mark on the people of Ethiopia in the 18th and 19th centuries. Richard Pankhurst quotes numerous references describing the living conditions (both for the Ethiopian army and for the public) that propelled the spread of the epidemic and cost thousands of lives – in war and peace. During the 1896 Ethiopian war against Italian aggression at Adwa, the fight

was not only against the visible aggressor but also against such troubling illnesses as Typhus, Dysentery and Influenza – at a time when there was no effective means of controlling them. When vector-borne diseases, such as Typhus, and water-borne diarrheal illnesses wipe out and/or debilitate those at war, it is not difficult to imagine what our ancestors endured while defending Ethiopia’s freedom and independence.

Typhus Timeline

1909: The body louse is found to be the vector that transmits Typhus.

1914-22: Typhus kills several million during World War I on the Eastern Front and subsequently in the Soviet Union and Eastern Europe.

1937: The first Typhus vaccine is produced.

1943-44: During the latter part of World War II, DDT is used for the first time to delouse soldiers.

1940s: Antibiotics prove effective against the organism causing Typhus.

21st Century: Although now rare, Typhus is still endemic in the mountainous regions of Mexico, in Central and South America, in central and eastern Africa and in many countries in Asia. Epidemics may occur during war and famine.

The 1866 Epidemics

In 1866, epidemics were noted among the soldiers of Emperor Tewodros who were camping near Lake Tana. Wars were frequently declared against unyielding regional chiefs and kings in the 19th century, so soldiers often migrated from one skirmish to another. The camps’ lack of proper sanitation and the soldier’s inability to practice good hygiene exacerbated an already dangerous situation. The camps were breeding grounds for the spread of epidemics, chief among them being Typhus, Diarrheal Diseases and Influenza. In reference to these epidemics, Pankhurst states that from 1888 to 1892 these outbreaks resulted in the loss of 15% of Menelik’s army; but was not confined to the soldiers. Civilians were also impacted by these diseases – even by Smallpox.

The 1918 Pandemic of Influenza

The Influenza pandemic of 1918 (often referred to as the Spanish Flu) was one of the most infamous and devastating outbreaks of the 20th century. It has been reported that the disease, which most likely appeared in Philadelphia for the first time, spread around the world and killed more people than any other outbreak of disease in human history; more than plague then and more than AIDS now. A conservative estimate of the pandemic’s worldwide death toll is 20 million (estimates vary between 20 to 100 million), when the population of the world was a third less than it is today.¹⁰

The spread of the 1918 Influenza pandemic to Africa and Ethiopia – as in other parts of the world – occurred in two waves: the first in the spring and summer and the second, which was more virulent, in autumn. Pankhurst asserts that the epidemic, which was the last prior to the introduction of modern medicine, provides a dramatic case study of the advent and impact of a killer disease in a still largely traditional society.

In Ethiopia, the name coined for the epidemic (frequently quoted in the pages of the history of illnesses in Ethiopia) is Yehedar Beshita, which translates as “The October Illness”. It may not be coincidental that Ethiopia’s national cleaning campaign, including the burning of trash, is nationally referred to as Hedar Sitaten – and is practiced every year in the month of October in Ethiopia.

Much has been written about Yehedar Beshita, both by foreign writers and Ethiopian historians and clerics. Professor Pankhurst frequently refers to Aleqa Kenfe and the diary the Aleqa kept on Hedar Beshita. Earlier in the course of the epidemic in July of 1918, Pankhurst writes that the Italian minister in Addis requested help with the epidemic, and Dr. Pasqual Vetuschi, traveling via Djibuti, came through with 100,000 doses of Smallpox vaccine.

Considering the assessment and diagnostic limitations of the time, it is hard to discredit the Italian solution as the need for Smallpox vaccination was also immense then. Over the succeeding months, the epidemic continued to spread more fiercely and with an increasingly high toll on mortality to the point where a scarcity of graves and grave diggers was witnessed. What added to the distress in Ethiopia was the severe affliction of the young Ras Tafari (later Emperor Haile Selassie), who was at death’s door from the Influenza infection or its complications, and the loss of his committed, 35-year-old Lebanese physician, Dr. Assad Chaiban, who succumbed to the Spanish Flu. Though not as virulent as it was during earlier epidemics, Influenza is still a killer disease and is most often lethal to the elderly and those with compromised immunity or other debilitating illnesses.

Vanderbilt University is credited with the first isolation of the flu virus and the development of the flu vaccine for use by the U.S. military during World War II. It was a pioneering achievement. Since then, the flu vaccine has been improved significantly – in both quality and potency – and there is much wider acceptance and effective prevention or modification of Influenza infection and its complications. But affordability issues, access, inadequate information and/or lack of priorities still impede many governments and individuals from distributing and/or receiving the vaccine. In 2012, up to 200,000 to 500,000 deaths worldwide are related to Influenza, with nearly 30,000 deaths occurring in the U.S. each year.

Yellow Fever History

Some references conjecture that Yellow Fever was diagnosed as early as the 1660s in the “New World”: San Domingo, West Africa, Cuba, West Indies and Barbados, but the first generally accepted epidemic occurred in 1730 in Spain with 2,200 deaths – following a good description of the presentation of the disease in 1768 by Lind and on epidemiological evidence in Senegal by Schoffe in 1782. In 1900, Walter Reed, a doctor and major in the U.S. Army, along with Dr. Carlos Finlay, confirmed that Yellow Fever was transmitted by the mosquito, *Aedes aegypti*. In the 1930s, serological surveys in Africa helped mass-immunization work for Yellow Fever, and the first Yellow Fever vaccine was developed in 1931. Mass immunization campaigns began soon after; in Brazil in 1938 and in the French-speaking countries in West Africa in 1940. Delineations of Yellow Fever geographic areas were also created and vaccination became a requirement for International travel.

In 1960, with the active participation of the World Health Organization, East African countries – including Ethiopia, Kenya, Sudan and Uganda – formed a Yellow Fever Survey Committee, which consisted of epidemiologists, virologists, immunologists and entomologists. The committee determined the extent of the epidemic that threatened these countries – and also began extensive mass immunizations as well as maps to delineate the countries requiring travel immunization law. On the basis of the immunity study, the survey helped also to determine the extent and intensity of the disease in various regions in Ethiopia. The western and southwestern regions of Ethiopia bordering Sudan were determined to be high risk and the eastern portions endemic.

Because of a decreasing number of Yellow Fever cases (following the extensive surveillance and mass immunization in the 1960-61 epidemic in Ethiopia), a lack of interest prevailed until 1985 when a severe epidemic hit, which forced active surveillance in all Yellow Fever-prone localities with an emphasis on starting large scale use of immunization. An active period was 1986-1991; 17 out of 34 at-risk countries were extremely active, Ethiopia being one of the extremely active regions.

Meningococcal Meningitis

Africa had more than its fair share of epidemics of Meningococcal Meningitis, the *Neisseria meningitidis* bacterial infection that spreads in epidemic form and can claim tens of thousands of lives. The African Meningitis Belt, which spans from Senegal on the west to Ethiopia on the east, suffered the largest epidemic in history in 1996-1997 – sweeping across the belt and causing more than 250,000 cases with an estimated 25,000 deaths and approximately 50,000 disabilities.

The African Meningitis Belt

Several types of vaccines developed and used during past 20-30 years against prevalent strains of meningococci, (most predominant strains in Africa being serogroup A and C) have been tried with varying protective efficacy. In 2010, a new conjugate vaccine introduced nationwide in Burkina Faso and in selected regions in Mali and Niger resulted in the lowest number of confirmed Meningitis A cases ever recorded during an epidemic period.

Even though it is costly, mass immunization of both children and adults in the Meningitis Belt will be a cost-effective endeavor. Tens of thousands of deaths and many more disabilities – ranging from mental retardation, neurological complications and deafness that many survivors of Meningococcal Meningitis may face – can be prevented.¹³

The African Meningitis Belt



Malaria

Malaria is one of the oldest recorded diseases in human history. It had a heavy worldwide mortality and morbidity impact for millennia until the 19th century when knowledge of transmission of the disease by the female anopheles mosquito and discovery of the DDT and anti-malarial drugs contributed in its disappearance from most of the developed countries. Today the parasitic disease is confined to the poorest countries in the tropical and subtropical regions of Africa, Asia and Latin America where it causes immense suffering. National Malaria control programs in these countries have been receiving increasing funding and commitment from various international health organizations in the fight against this serious global menace. Interesting early documentation of Malaria in James Bruce's diary, which was quoted by Pankhurst in his book, relates to the experience the African traveler had in treating various ailments, including “fever” – nedad in Amharic, which we now know as Malaria. Bruce used the bark of the Cinchona tree in the 1770s for patients he described as

having intermittent fever, shivering and sweating. His patients included Ras Mikael, Ras Goshu and many of the inhabitants of various localities of Dembia, Enfraz, Belesa and others surrounding Lake Tana in the low lying Begemidir (Gondar) area. The Cinchona bark, from which quinine is extracted, has been in use for various ailments and in particular with remarkable effect on certain species of Malaria parasites.

The patients with attacks of Malaria in Bruce's time presented with surprisingly severe symptoms quoted below.

In modern times, such drastic presentation of symptoms though not very common are occasionally noted in patients lacking immunity from previous exposure to the parasitic infection and have had no timely access to effective parasite specific and supportive treatment.

History of Malaria Control in Ethiopia

Malaria control in Ethiopia was started as a pilot project in the 1950s, proceeding to a national eradication program in the 1960s. The focus was to survey mosquitoes and the harboring environment in all regions of seasonal Malaria epidemics. The work was intensified and the wide use of DDT spray in houses and mosquito breeding sites eventually paid off by a remarkable reduction in cases and deaths. Because of the disintegration of the systematic eradication plan during the earlier part of the Communist rule of the Derg Regime, matters got out of hand and mosquitoes started breeding fast. Malaria resumed, becoming a menace once again to life and living. An organization named National Organization for the Control of Malaria and other vector diseases (NOCMVD) that evolved later on tried to tackle the problem but was not able to achieve the level of success that the 50s and 60s brought - partly because of a cohort of a generation of an unexposed population following the success in the 50s and 60s and partly because of a heavy resurgence of the disease in the 1970s and 1980s. Large epidemics and mortalities occurred as a result.

Later on, the added insult by HIV/AIDS pushed the number of deaths up – attracting more international attention and organized approaches in facing the scourge of Malaria, HIV/AIDS and TB. The wide use of mosquito nets besides mosquito control and treatment of patients with the most appropriate medication became the hallmark of the plan. In 2001, the Federal government finalized a Roll Back Malaria 5-year plan with a determination to achieve 80% coverage and utilization rate of insecticide-treated mosquito nets in all regions by 2010, as well as effective treatment of at least 60% of Malaria patients within 24 hrs.¹⁴

Malaria Timeline

2700 BC: The Chinese medical classic, Nei Ching, contains a description of what is thought to be Malaria.

4th Century BC: Hippocrates describes malarial symptoms and classifies fevers as quotidian (daily), tertian (occurring every other day) and quartan (occurring every third day).

323 BC: Alexander the Great dies, possibly from Malaria.

168 BC: The medicinal value of qinghaosu – sweet wormwood (*Artemisia annu*) – is mentioned in a Chinese book of recipes (as a remedy for hemorrhoids).

AD 1630s: The Spanish bring back Cinchona bark from South America.

1740: The word Malaria; from the Italian word mala aria (bad air), is first introduced to the English language by Horace Walpole (1717-97), 4th Earl of Orford.

1820: Quinine is isolated from Cinchona bark.

1877: Patrick Manson (1844-1922) discovers that the filarial worms that cause lymphatic filariasis are transmitted by mosquitoes.

1880: Charles Louis Alphonse Laveran (1845-1922), a French army surgeon working in Algeria, first recognizes malaria parasites in the blood of a soldier.

1889: The Italian scientists Ettore Marchiafava (1847-1935) and Angelo Celli (1857-1914) identify parasites under the microscope and give the organism its generic name, Plasmodium. Other Italian scientists distinguish three different forms of the plasmodium – *P. vivax*, *P. falciparum*, *P. malariae*.

1897: In India, Ronald Ross (1857-1932) discovers Malaria parasites in mosquitoes, and in the following year, he elucidates the life cycle of Malaria in birds.

1898: The Italian scientists Giovanni Battista Grassi (1854-1925), Amico Bignami (1862-1929) and Giuseppe Bastianelli (1862-1959) show experimentally that malaria is transmitted to humans by Anopheles mosquitoes.

1912/15: In the U.S., 1 million cases of malaria occur every year among a population of 25 million in the 12 southern states.

1922/23: One of Europe's most devastating Malaria epidemics in modern era spreads across Russia from the central Volga basin and reaches as far north as the Arctic Circle, with an estimated 7-12 million people infected and thousands of deaths.

Late 1920s-1940s: Development of first new synthetic anti-malarial drugs, including atebriane in 1928 and chloroquine, synthesized in Germany in the 1930s and developed after WWII.

1939: The Swiss Chemist Paul Muller (1899-1965) synthesizes and discovers the insecticidal properties of DDT, which is used toward the end of the World War II for destroying body lice in typhus epidemics, and by the late 1940s in Malaria and Yellow-Fever control programs.

1950s: Malaria is virtually eradicated from the U.S., recorded cases declining from around 5,000 in 1949 to 97 in 1958. A more substantial decline in cases had occurred in the period 1938-42, even prior to the intensive use of DDT from the late 1940s.

1955: The World Health Organization (WHO) launches the Global Malaria Eradication Programs. By 1969, it is acknowledged that it has failed to reach its goal.

1970s: The Chinese rediscover the ancient remedy *Artemisia annua* as an effective anti-malarial drug.

1970s Onwards: Malaria resurges dramatically in many sub-tropical and tropical areas.

1975: WHO declares that Europe is free of Malaria.

1980s Onwards: A few episodes of locally acquired Malaria in the U.S. are reported as well as around 1,600 imported cases every year in the U.S. and 2,000 a year in the United Kingdom.

1990: Artemisinin and its derivatives are found to be effective in treating drug resistant Malaria.

1997: International agencies establish the Multilateral Initiative on Malaria (MIM).

1998: WHO launches its Roll Back Malaria program with the aim of cutting Malaria in half by 2010.

2000: The United Nations and its member states endorse their commitment to key Millennium Development Goals – a set of global goals (that include reducing the burden of Malaria) to lift millions of people out of extreme poverty.

2001: Establishment of the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), an international financing initiative aimed at ending the 5.6 million deaths every year from the world's three leading infectious diseases.

2002: The complete genome sequence of *Plasmodium falciparum* is announced.

2003: The complete genome sequence of the *Anopheles gambiae* mosquito is announced.

2007: Malaria is estimated to kill between 1 and 3 million per annum worldwide, and seriously affect the lives of millions of others, especially in sub-Saharan Africa.

Disease (The Extraordinary Stories Behind History's Deadliest Killers) by Mary Dobson

**Progress in Childhood Immunization:
Percent Rates of Immunization Coverage of Children from 1980 to 2011**

	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	
BCG Bacille Calmette Guérin vaccine	69	69	76	81	72	72	67	67	57	55	56	51	50	48	54	57	61	65	36	26	29	64	44	27	28	13	11	8	7	6	5		
DTP1 First dose of diphtheria toxoid tetanus toxoid and pertussis vaccine	61	64	61	64	59	60	59	58	49	50	56	47	50	64	78	78	80	80	53	35	45	73	51	39	39	27	25	22	22	21	21		
DTP3 Third dose of diphtheria toxoid tetanus toxoid and pertussis vaccine	51	50	44	49	42	42	42	40	28	30	33	27	27	37	55	55	57	57	28	13	21	49	26	16	16	7	6	4	4	3	3		
hepb3 Third Dose of hepatitis B vaccine	51	50	44	49	42																												
hib3 Third dose of Haemo philus influenzae type B vaccine	51	50	44	49	42																												
MCV Measles-containing vaccine	57	56	51	50	42	41	38	35	27	30	31	33	32	42	51	54	38	54	22	12	17	38	23	15	13	10	12	8	7	7	3	4	
PAB Protection at birth against tetanus	88	88	88	84	83	8	80	77	71	67	60	54	48	42	51	39	34	25	20	17	17	24	27	13	9	7	5	4	4	2	2		
Pol3 Third dose of polio vaccine	62	61	52	54	51	51	50	51	44	49	55	53	57	66	83	73	65	57	28	13	21	49	26	16	16	7	6	4	4	3	3	3	

Source: WHO vaccine-preventable diseases: monitoring system 2012 global summary

Historical overview of HIV/AIDS^{15,16}

International

Pre-1981: While 1981 is generally referred to as the beginning of the HIV/AIDS epidemic, scientists believe that HIV was present years before the first case was brought to public attention.

1981: U.S. Centers for Disease Control and Prevention (CDC) reports the first cases of a rare pneumonia in young gay men in June 5 MMWR, later determined to be AIDS.

1982: U.S. CDC formally establishes term Acquired Immune Deficiency Syndrome (AIDS) and refers to four identified risk factors: male homosexuality, IV drug abuse, Haitian origin and Hemophilia.

1983: Dr. Luc Montagnier of the Pasteur Institute in France isolates a lymphadenopathy-associated virus (LAV). Dr. Robert Gallo of the U.S. National Cancer Institute successfully cultivates LAV, which he identifies as HTLV-III proposing that a retrovirus causes AIDS.

Ethiopia

1984: The first evidence of HIV infection in Ethiopia.

1986: First two AIDS cases reported to MOH.

1989: HIV/AIDS surveillance started.

2004: HAPCO-Federal HIV/AIDS prevention and control office established for strategic plan.

2005: Free ART program started for intensifying multinational HIV/AIDS response.

2011: Ethiopia hosts the 16th. International Conference on AIDS and STI in Addis Ababa (ICASA) with close to ten thousand in attendance.

International

1999: President Clinton of USA announces “Leadership and Investment in Fighting an Epidemic (LIFE), which leads to increased funding for HIV/AIDS.

2001: U.N. General Assembly convenes first ever special session on HIV/AIDS.

2002: Global Fund for AIDS created.

2003: President Bush’s PEPFAR – Five year, \$15 billion plan for HIV/AIDS.

2007: PEPFAR reauthorized by U.S. Congress for \$48 billion for five years.

2009: President Obama launches Global Health Initiative.

Developing nations face huge hurdles in preventing and managing epidemics. New emerging viral infections for which there are no vaccines or unavailable or are costly for poor nations to use for mass immunization continue to pose ongoing problems before older vaccine preventable diseases are effectively controlled. In the pre-vaccine era or at a time when there were only a few vaccines developed, nations used quarantine as a means for preventing illnesses - basically limiting or avoiding contact with a child or an adult known or suspected of having an infectious disease. Self-quarantine had some advantages, but how effectively and how consistently these measures were practiced in a pre-vaccine era is questionable. Quarantine may have curbed the spread of the disease, but it by no means eradicated it. Medical history is rife with documentations of childhood air-borne diseases, such as Measles, Diphtheria, Pertussis, Polio Smallpox, Influenza, viral Hepatitis and meningococcal Meningitis having heavily contributed to deaths and disabilities in children in the pre-vaccine era of presently developed nations. As vaccines started becoming available and accessible to children, the rates of diseases, disabilities and deaths began to fall sharply. Why hasn’t this happened quickly in the present era in developing nations when the discovery of effective vaccines was solved long ago?

The answer is complicated. If with a slight twist, we use a similar host, agent and environment principle in formulating an answer to this question:

- The host is the parent, who would need to be given a profound education and information about immunization so that it will obtain the highest priority in the child’s health care.
- The agent is the product, or in other words, the vaccine, which the parent must be given access to – either for free or at a subsidized or affordable cost.
- The environment, represented by governmental, nongovernmental global and international agencies, must accept that investment in immunization is a risk-free investment, with the dividends being the preservation of human life and well-being.

These three factors must come together and we must work cooperatively so that vaccine-preventable diseases can be prevented and epidemics of those diseases averted. That takes a concerted effort by individuals, the medical community and global organizations – from developing nations as well as nations that have already conquered these diseases.

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History of Aklilu Lemma Institute of Pathobiology

By Teklemariam Ayele, MD, MPH

Addis Ababa University (AAU) – formerly Haile Selassie I University, University College of Addis Ababa – is the vanguard university in Ethiopia. It was established in 1950 and was originally named University College of Addis Ababa (1950-1962) and later renamed Haile Selassie I University in 1962 (1962-1975). The current name was acquired in 1975.

Addis Ababa University is comprised of faculties, colleges, schools and research institutes. The research institutes include: Aklilu Lemma Institute of Pathobiology (formerly called the Institute of Pathobiology); Institute of Ethiopian Studies; Institute of Development Research; Institute of Educational Research; Department of Ethiopian Literature and Folklore (formerly called Institute of Language Studies).

Policy Objectives

The AAU Senate Legislation policy objective states: "Institutes established under the aegis of AAU shall have as their primary aims the promotion of scholarship and the pursuit of research, which shall contribute to the continued development of the AAU and Ethiopian arts, sciences and technology. ... The University shall be in a position to take due advantage of the academic capabilities of the staff of an Institute through joint appointments."

All staff members in research institutes under AAU are primarily conducting research (75%) and teach in their respective home-base faculties or colleges (25%). Faculties of the university, on the other hand, mainly teach (75%) and conduct research (25%).

When a new staff member is recruited for the institutes, the respective faculty and institute jointly interview candidates and select the most qualified person for the post. Research institutes provide a research base for staff and students from any faculty of AAU and also foreign students.

Establishment Objectives

The specific objectives of the Aklilu Lemma Institute of Pathobiology (ALIP) are summarized as follows:

1. Engage in applied biological and/or paramedical research that is applicable to the framework of an overall national development plan of Ethiopia.
2. Utilize the property and staff for teaching specialized subjects to senior university students and graduate students.
3. Supervise and train M.Sc. and doctoral candidates, as well as other training programs in applied biological sciences.
4. Seek research/development grants.
5. Publish results in various forms.
6. Engage in collaborative/joint research and educational programs with relevant institutions.

Organizational Structure

Aklilu Lemma Institute of Pathobiology is run by a director and reports to the academic vice president of AAU. The Research and Publication Office, under the academic vice president, oversees the activities of the research institutes and each unit has a specialized function. The institute is advised by selected board members.

ALIP is located in the southern campus within the premise of Building College and is housed in a modified apartment complex. ALIP, formerly known as the Institute of Pathobiology, was established in 1967. The institute started as a Parasitology Research Unit, under the Faculty of Medicine, and later moved to the Faculty of Science, and existed as such for three years. The late Dr. Aklilu Lemma (Sc.D.), who graduated from Johns Hopkins University, upgraded the unit to the level of an Institute and became its first director. The Institute had the following units:

Endod Unit
Schistosomiasis Unit
Leishmaniasis Unit
Microbiology Unit
Radiobiology Unit
Radiation and Environmental Protection Unit
Vector Biology and Control Unit
Medicinal Plants and Chemistry Unit

The following is a summary of unit research activities and output:

Endod Unit (*Phytolaca dodecandra*): Endod is an indigenous plant widely grown in Ethiopia and Africa. Its botanical name is *Phytolaca dodecandra*. The berry of Endod was used as detergent for washing clothes in Ethiopia. Dr. Aklilu Lemma discovered the molluscicidal property of Endod in 1965 during epidemiological and ecological study of schistosomiasis in Adwa, northern Ethiopia. He observed that in areas immediately where people washed clothes with Endod more dead snails were found than in areas upstream or elsewhere.¹ Dr. Aklilu and his team decided to test the efficacy of Endod to control schistosomiasis in the town of Adwa. The results of the study were encouraging. Many studies on molluscicidal properties of the plant were carried out and highly promising results were obtained (Lemma et al, 1972, 1973, 1975; Parkhurst et al. 1973, 1975). The berry of Endod is known to contain a glycoside compound that possesses strong molluscicidal properties.

Prior and following the successful field testing of Endod in Adwa, the product was widely promoted as a cheap and locally available material to control schistosomiasis. During and after the schistosomiasis control project in Adwa, efforts were directed to design Endod extraction plant for large-scale production for further field testing and control of schistosomiasis in communities. The construction of the plant started at IPB and later transferred to the Faculty of Technology. Several parts of the plant were modified to overcome successive challenges encountered in the process of refinement.

The future plans were made to complete the testing and commissioning of the pilot plant and production of molluscicide and to conduct agrobotanical and toxicity studies of Endod on stream flora and fauna and mammals for eventual use of the extract for the control of schistosomiasis at Tinsae Berhan community.² The Endod extraction plant was designed and redesigned several times and finally water extract was found to be most practical as the extraction procedure was simple, cheap and readily accomplished in the field. The pilot plant, however, was replaced by simple water extract of ground berries, which may be used on a self-help basis by each community.

Early research focused on collection of Endod berries and cuttings from all over Ethiopia, setting up nurseries to grow cuttings and seedlings, and to conduct different field and laboratory tests. Finally, Dr. Ch. B. Lugt, through the support of the Dutch Government, collected 65 different strains and varieties of *Phytolaca dodecandra*. The three most promising were selected on the basis of their rapid growth, high molluscicidal potency, and high berry yields as well as resistance to insects, pathogens and drought.³ Many toxicological studies of Endod were carried out by individuals. The studies failed to use standardized test methods and/or the same test material and results could not be compared. Sometimes findings were contradictory. Endod, like other molluscicides, is toxic to fish. The expert group meeting to evaluate the toxicity of Endod recommended proceeding with rigorous standardized tests and getting the long-delayed development phase underway.³ To date, this did not materialize due to lack of funds. Also a toxicity study required by the WHO was not met. By and large, delayed rigorous standardized toxicological studies have hampered the immediate use of Endod for the control of Schistosomiasis in Ethiopia and the rest of Africa. In addition, Dr Aklilu tried to collaborate with the National Research Development Corporation in London and the University of Toledo in the United States. Unfortunately, the collaboration ended with a dispute over patent ownership. The latter two had each obtained a patent after carrying out tests in their respective laboratories.

Encouraging results of preliminary studies of Endod in detergent formulation at Steifel Research Institute, a detergent research and testing laboratory in the state of New York, has generated interest and stimulated collaborative work in Ethiopia by scientists from

Addis Ababa University, the Industrial Project Services of the Ministry of Industry, as well as the National Chemical Corporation, which operates the National detergent and Soap factories at Rappi in Addis Ababa. Dr. Legesse Woldeyohanes at the IPB spearheaded the project and brought it to its conclusion. It is now well-established that either water extract or butanol (or any other alcohol) extract of Endod can be used as an effective substitute for dodecyl benzenesulfonic acid (DDBSA) as surfactant in commercial detergent formulated for washing fine grades of cotton, linen and wool.⁴

Schistosomiasis Unit: The unit was supported by AAU, the Ministry of Health (MOH), the World Health Organization (WHO) Regional Office for Africa/Brazzaville, UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases, WHO, Geneva (TDR), the then Provincial Health Departments, and District officials in communities where IPB worked. With the MOH and WHO/Brazzaville supported the project the unit conducted in a country-wide epidemiological study of intestinal and urinary schistosomiasis. More than 365 communities were surveyed until 1986. The results of the study were published in reputable journals.

Intestinal schistosomiasis, a major health concern, occurs in an expansive area in different ecological zones. With the support of TDR, three ecological habitats were studied – namely, highland streams, lakes, and water-irrigated farms. These large-scale, longitudinal epidemiological studies culminated in a community-based, multidisciplinary intestinal schistosomiasis control in Kemise, then known as Wello Province. The results are published in IPB Technical Report. WHO/Brazzaville, with the agreement of the Ministry of Health, assigned one expatriate malacologist to the unit.

With the support of TDR, two staff members were sent abroad for an M.P.H., one for an M.A. in sociology and one for a Ph.D. in parasitology and malacology. Two staff members were sent abroad for a masters in tropical medicine and a P.H.D. After a service period of two years, the two M.P.H. returnees were sent abroad again for P.H.Ds. Several training workshops for IPB staff members were conducted by national and international staff. Four laboratory technicians have undergone training in Denmark with the support of the Danish Bilharziasis Laboratory. An international symposium on schistosomiasis was organized by IPB, under the auspices of the MOH, and held in Ethiopia in 1982. The proceedings of the symposium are published by IPB. The unit also conducted a country-wide survey of intestinal parasites along with a schistosomiasis study and results are published. Similarly, a country-wide survey of the intermediate hosts of schistosome parasites was studied. Clinical trials were conducted to determine optimum dose of oxamniquine for the treatment of intestinal schistosomiasis. TDR generously provided logistic support that included vehicles, camping equipment, boat, laboratory equipment and supplies.

Leishmaniasis Unit: The institute in its early stage of development carried out extensive study on the epidemiology of cutaneous leishmaniasis (CL). A Vector study was conducted in suspected visceral leishmaniasis (VL) and CL areas. Several papers have been published. The unit has attempted to develop an irradiation-attenuated vaccine for the control of leishmaniasis. Vaccine trial was conducted in hamsters and guinea pigs.

Later in the 1980s, a (VL) study was initiated through the support of TDR. A country-wide epidemiological survey was conducted and endemic foci identified. A longitudinal study on the dynamics of transmission of VL was also conducted, in Aba Roba, then known as Gomu Gofa Province. VL cases were diagnosed in communities and hospitals and treated throughout the study. Organisms were isolated and characterized by an isoenzyme study at the Liverpool School of Tropical Medicine and the London School of Hygiene and Tropical Medicine. Sandfly vectors of VL were identified and vector behavior and habitat were also studied. Results of the study have been published in scientific journals. IPB has published *Leishmaniasis in Ethiopia: A Handbook*. IPB provided diagnostic service to hospitals that regularly see cases of VL. TDR provided support for research and training. TDR supported two staff members for Ph.D. training in immunology and epidemiology. One laboratory technician was trained for six months at the Liverpool School of Tropical Medicine. TDR supported staff members to participate in international and local workshops and conferences. The unit received generous support that included vehicles, field equipment, laboratory supplies, and pentostam for the treatment of VL cases.

Microbiology Unit: Preliminary studies have been conducted to determine the antimicrobial effects of Endod. A butanol extract of Endod has been tried on *T. vaginalis*, various fungi and bacteria. Studies included food contaminants. The unit head was sent for Ph.D. training with the preceding group of students.

Radiobiology Unit: The unit conducted epidemiological study of parasitic diseases of domestic ruminants. It also conducted epidemiological studies of zoonotic diseases. The unit pioneered the development of an irradiated vaccine for the prevention of sheep lungworm (*Dictyocaulus filaria*). IAEA installed a gamma-irradiation source at IPB to irradiate larvae of Sheep lungworm for production of the vaccine. An irradiated vaccine was produced in mass for testing the product at Debre Berhan. The efficacy of the vaccine was promising and the Research Coordination Committee of the Ministry of Agriculture (MA) recommended mass production of the vaccine for vaccinating sheep. The International Atomic Energy Agency (IAEA)/United Nations Development Program (UNDP) provided support for an epidemiological study of liver fluke and sheep lungworm infections in domestic ruminants. IAEA provided vehicles and veterinary equipment and supplies. IAEA also assigned international staff and consultants at the unit to assist and train staff members. The research work was done in collaboration with veterinary and animal resources (MA) and the National Veterinary Institute. The MA provided one technician to assist the unit.

By and large, the unit has improved laboratory and field techniques and has modern facilities for research in animal science, especially in animal parasitology and immunology. IAEA/UNDP provided grant, logistic support, equipment and supplies.

Two staff members received training in parasitology and immunology at the M.Sc. level. Two technicians were trained in nuclear techniques and immunology. Two additional staff members were sent abroad for training.

Radiation and Environmental Protection Unit: Ionizing radiation sources in use for various purposes and natural sources of radiation are emerging health problems in developing economies. The unit was supported by IAEA to develop a national film dosimetry laboratory at IPB and prepare draft legislation to protect the public against radiation. A committee was formed, comprised of MOH and IPB staff members, to prepare the draft legislation. A weekly meeting was held at the MOH until the final draft legislation was prepared. The draft proposal was submitted to the government for possible legislation. The unit conducted a study on limited radiation safety standards and environmental control. The findings are published in the Ethiopian Medical Journal.

WHO Regional Office and MOH supported monitoring and evaluating the dose of radiation received by patients in x-ray rooms, x-ray technicians and workers in various centers using ionizing radiation sources. The unit also inspected sources of radiation. Some 65 institutions, including hospitals and clinics in the country, received regular dosimetry service from the unit. The results of the findings – with recommendations - have been sent back to all the institutions.

Vector Biology and Control Unit: The unit has worked closely with the CL and VL leishmaniasis research team. In the epidemiological study of CL, the unit played a pivotal role in the collection and identification of sandflies in all transmission sites. Studies included sandfly density, habitat, biting habits and biting time. CL parasite isolation was done by dissecting sandflies. Rock hyrax was the reservoir host of CL. The sandfly, hyrax and human connection was elucidated in the early days of IPB. Later, when the epidemiological study of VL started, the vector study was an important component of the study. Sandfly collection, identification, dissection and parasite isolation were carried out. Sandflies were collected and sent to the London School of Hygiene and Tropical medicine for species identification. The unit has successfully identified vectors of leishmaniasis and sent parasites abroad for characterization.

The unit was run by one entomologist, assisted by a senior entomologist and entomology technicians. The entomologist received a Ph.D. in entomology at the London School of Hygiene and Tropical Medicine through the support of TDR. The unit had a small laboratory for breeding sandflies and experimental studies.

Medicinal Plants and Chemistry Unit: The unit screened and studied Ethiopian plants for molluscicidal, anthelmintic and insecticidal properties. The chemistry section extracted and isolated the active ingredients of different medicinal plants. IPB has published more than 262 scientific papers until 1996.

Other services by ALIP:

1. **Diagnostic services:** ALIP provides free diagnostic services to patients referred from hospitals, health centers and self-reported patients.
2. **Consultancy services:** ALIP also provided expertise on the health impact of water and agricultural development projects.

As of February 2005, ALIP has started a master of science, and as of November 2010, Ph.D. programs in Tropical and Infectious Diseases. ALIP has launched a full-scale teaching program. The institute currently has microbiology, vector biology and control, Endod and other medicinal plants, human parasitic diseases and animal health and zoonotic diseases research programs.

Teklemariam Ayele, M.D., M.P.H., is the former director, from 1979-1989, of the Institute of Pathobiology.

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Palliative Care and Traditional Medicine in Ethiopia

By Anteneh Habte, MD, and Enawgaw Mehari, MD

Ethiopia is one of the oldest nations of the world and has a rich history of traditional medicine and indigenous practices. The strong social fabric and communal responsibility for the sick have always been basic tenets for Ethiopians. The focus, as has been the case with most other civilizations, was to alleviate pain and suffering, and not necessarily to seek a cure.

Pain and suffering are as old as mankind itself. The Bible describes the emotional turmoil of Adam and Eve after they partook of the “forbidden fruit” in direct defiance of God’s instructions. In many cultures and civilizations, pain and suffering are attributed to a personal or societal transgression – good succumbing to evil – and disease and pestilence were often seen as punishment on a physical level. Many Ethiopians have a different interpretation than is commonly assumed in Western societies.¹ Pain and suffering, for the Ethiopian, must be addressed on a psycho-social dimension as well.

The majority of Ethiopians, up to 80% in some estimates, continue to rely on traditional healers and remedies for their health care needs.² Among those seeking modern medical care for chronic non-curable illnesses, a significant proportion simultaneously uses non-prescribed medications and herbs, and/or religious rituals like *tebel* (holy water) and communal prayers. Traditional and spiritual practitioners, like *Debteras*, who practice their craft through prayers (*degemit*), holy water (*tebel*) and *kitab*, an amulet worn to ward off evil spirits, are widely sought after. There is evidence that traditional medicine remains popular among Ethiopian migrant populations all over the world, indicating that it is not necessarily practiced as a last resort but rather as the preferred alternative in some cases.³

Ethiopian traditional medicine is concerned not only with the curing of diseases but also with the protection and promotion of physical, spiritual, social, mental and material well-being. This is consistent with the palliative care philosophy where holistic care by an interdisciplinary team is emphasized. There are striking similarities between palliative care and traditional medicine in overall philosophy and approach to symptom control. Some of the major concepts addressed by these disciplines and the historical background will be discussed.

Philosophy of Care

The World Health Organization (WHO) defines traditional medicine as “health practices, approaches, knowledge, and beliefs incorporating plant, animal and mineral-based medicines, spiritual therapies, manual techniques, and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses and maintain well-being”.⁴ It defines palliative care as an approach that “improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual”.⁵ The focus for both disciplines is maintaining well-being of the “whole person” with due attention to the non-physical aspects of health. There is the recognition that “bodies do not suffer; only persons do”.⁶ Common features of traditional medicine and palliative care include:

Holistic: The target is not only a patient’s physical ailing but also the psycho-social dimensions. The emphasis is not in curing but promoting spiritual, social and psychological well-being. Cicely Saunders, founder of the modern hospice movement, conceptualized suffering as having four elements. She termed it “total pain” and identified the elements of physical, psychological (emotional), social (including practical), and spiritual pain.⁷ Likewise, traditional medicine acknowledges the psycho-social and spiritual domains of pain and suffering and employs cultural and spiritual elements in its approach. This concept dates back all the way to Hippocrates, who was quoted by the Nobel Prize Laureate, Dr. Dickinson Richards, as saying: “It is necessary for the physician to provide not only the needed treatment, but to provide for the sick man himself, and for those beside him, and to provide for his outside affairs”.⁸

Symptom Control: One of the main objectives of palliative care is relief of distressing symptoms. This is achieved through pharmacological and non-pharmacological interventions. Traditional medicine encourages the use of medicinal plants for symptom control. This is coupled with spiritual and cultural rituals consistent with the patient’s belief and value system with the goal of restoring his/her personhood. Pain is the most common symptom reported by patients with a life-threatening illness.⁹ It is usually a physiologic consequence of tissue injury and serves a vital protective function. But pain itself sometimes becomes the disease when it persists despite appropriate healing of the injured tissue. A chronic-pain state such as this can often be incapacitating and have considerable impact on an individual’s life. Over the years, evidence has emerged that unrelieved acute/chronic pain results in potentially life-threatening adverse physiologic effects and may cause major psychological disturbances.

The scientific approach to pain management was conceived during the Renaissance and developed slowly until the mid-19th century, when progress was rapid on three fronts: administration of opiates and hypnotics, inhalation of analgesic and anesthetic gases, and administration of anesthetic agents by a variety of techniques. In Ethiopia, the introduction of a pain monograph that combines culturally sensitive traditional approaches with contemporary theoretical information will be an important resource for medical students and practitioners alike. The Ministry of Health “National Pain Management Guideline”¹⁰ is a good beginning.

Patient/Family Unit: Traditional medicine and palliative care address the patient and family as one whole unit. Family is broadly defined as anyone whom the patient considers family, whether related by blood or marriage or neither. Most patients need a family member as a caregiver, which is usually a full-time and demanding task. Recognizing the family unit facilitates the delivery of care, which addresses the complex needs associated with serious illness.

Care Continuum: Palliative care is applicable throughout the spectrum of illness, including death and bereavement. It does not preclude the concomitant use of traditional or modern disease modifying treatment. Patients and families usually have an ongoing relationship with a traditional practitioner and/or a spiritual leader. Successful integration of information gathered during a patient’s journey through the various health systems provides important clues to their needs and goals. This establishes a “story” of a patient’s past, present and future. Figure 1 illustrates the palliative model of care for serious illness with advanced cancer as an example.

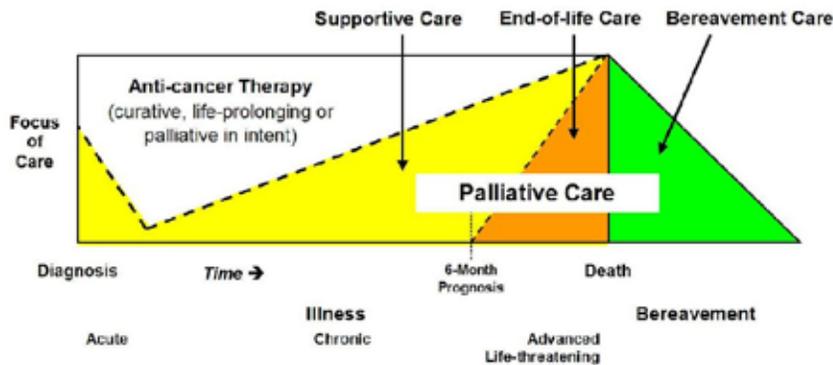


Figure 1: Palliative Model of Care

The integrated model of palliative care allows patients and physicians to navigate through the disease trajectory with appropriate adjustment of treatment goals as disease progresses and function declines. The alleviation of pain and suffering becomes paramount towards the end of life and patients should be reassured that distressing symptoms will be actively managed. Traditional medicine lends itself to a similar approach.

Historical Perspective

Throughout history, humans have been faced with disastrous catastrophes that must be endured in order to survive. One of the earliest recorded calamities, the Athenian plague of 430 B.C., is believed to have originated from Ethiopia, and spread to Egypt and Greece. The Justinianic plague of the mid-6th century is also believed to have originated in Ethiopia and travelled along the trading routes to Egypt and Central Asia.

Ethiopia always had a wide array of traditional medical practitioners and practices running the gamut from birth to death. Most deliveries are still conducted by traditional birth attendants and circumcisions and uvulectomies are performed by traditional healers. They lance wounds, extract teeth and set bones. They extricate demons, protect from the “evil eye” and provide antidotes for poisons. Purgings, bleeding and cupping were widely practiced and the merits of these interventions have since been validated.

The concept of hospice care dates back to the time of the pilgrims when travelers were provided a place to rest during their long journey. It was towards the end of the 19th century that hospice started becoming associated with terminal illness.⁷ These centers were for the most part run by community volunteers and civic organizations, and hardly interfaced with the health care structure. More recently, they were used as an alternative care setting by patients who were either disillusioned by what modern medicine had to offer, or were abandoned by their professional care providers as there was “nothing more to do”. It was only in 1967 that Dr. Cicely Saunders, widely regarded as the founder of the modern hospice movement, opened the first-team based facility in the United Kingdom.

Ethiopians have a long history of caring for strangers and travelers. The sense of communal responsibility for the sick and dying is also deeply ingrained in the culture and tradition. Historians have documented how Ethiopians accepted and cared for both Christians and Muslims, who were displaced during the various holy wars. But the modern hospice movement in Ethiopia started more as a response to the health system’s inadequacy to respond to the HIV/AIDS epidemic, than a desire to provide an alternative-care setting. Hospice centers were the only alternatives in the absence of anti-retroviral therapy. Most of the care was provided by minimally trained personnel in the form of nutritional and non-skilled support and limited resources to address pain-related issues.

It is notable that both traditional medicine and hospice/palliative care started outside of the conventional medical framework and were shaped by the culture and belief system of the local community. Traditional medicine in Ethiopia is not a subject that should be of interest only to historians and to the intellectually curious. The modern clinician does his/her patients a disservice if no attempt is made to incorporate this widely practiced craft into the overall care. This phenomenon, which is culturally widely accepted, has a relatively low cost and is easy accessible. And it is under appreciated by many in the medical community.

Complementary and alternative medicine is also becoming more mainstream in Western countries, while in Asia traditional medicine has been recognized as a viable option for any number of medical problems.¹⁴ Osteopathic medicine, which teaches its students manipulative techniques along with the other aspects of modern medicine, is becoming increasingly popular in the United States. Currently, more than 20% of U.S. medical students are training to be osteopathic physicians.¹⁵ The emphasis is on hands-on technique to alleviate pain, restore wellness, support the body’s natural functions and influence the body’s structure to help it function more efficiently. This holistic approach is not unlike the tenets of traditional medicine.

It is common for patients to experience multiple symptoms in advanced disease and during the last phase of life. The most common symptoms are pain, weakness/fatigue, dyspnea, insomnia, weight loss, confusion, constipation, anxiety, nausea/vomiting, and depression. The symptom may be related to the primary illness, other illnesses, or the effects of medications. A patient with advanced cancer has an average of 10 to 13 symptoms.¹¹ Conventional medical practice does not have the conceptual framework to address these multi-domain challenges effectively.

Palliative medicine is a relatively new discipline that has emerged in the Western world and developed nations as a response to the challenges of cancer care and other chronic life-threatening illnesses. In the developing world, particularly sub-Saharan Africa, it had been the only available option for HIV/AIDS care before the era of antiretroviral drugs and remains relevant despite improved ART access.¹³ It focuses on quality-of-life rather than longevity. It recognizes and deals with psychological, social and spiritual needs and is not limited to meeting the physical needs of the patient. It also concerns itself with the invisible victims of chronic illness – the family members. Affordable and culturally appropriate models have been pioneered and proven effective in resource-limited countries, such as Uganda and India. These models integrate traditional medicine with modern palliative care in order to meet the multidimensional needs of patients and families with serious illness.

The use of medicinal plants for various ailments is a long established practice in Ethiopia.¹⁷ These ingredients come from diverse sources, including plants, animals and minerals and their potency has been validated in several observational studies. It is estimated that there are between 650 and 1,000 medicinal plants in Ethiopia, with about 200 being commonly used. One of the biggest challenges is the paucity of research in the dose, side-effect profile and interaction of such formulations with other drugs. The type and part of plants used for medicinal purposes varies widely in the different areas, cultures, and ethnicities. Some studies indicate that leaves are most popular with the preferred routes of administration being oral, topical, and inhalation. They are often minced and mixed with honey to make them palatable. The most frequently targeted symptoms are gastrointestinal, cold symptoms, wounds and other skin conditions, tumors, and inflammation. While most information about indigenous medicine is still shrouded in secrecy and has not been subjected to scientific rigor, there are some that have been demonstrably useful. A short list includes Bahrzaf (*Eucalyptus*) for cold symptoms; Gulo Zeit (*Ricinus communis*) as a laxative; Metere (*Glinus lotoides*) as an anthelmintic; Tikur Azmud (*Nigella sativa*) for inflammation, infection and cancer; kebericho (*Echinops kebericho*) as an antipyretic and Kosso (*Hagenia abyssinica*) as an anthelmintic. Endod (*Phytolacca dodecandra*) has multiple proven uses including schistosomiasis control, and treatment of malaria and venereal diseases.³

Some herbs are popular ingredients in Ethiopian cuisine. They are believed not only to ameliorate symptoms but also prevent illness. These include basil, black mustard, black seed, capsicum and cayenne pepper, cinnamon, ginger, turmeric, coriander, cumin, garlic, and fenugreek.³ A heightened awareness for herb-drug reaction is absolutely essential to safely manage such patients. The ethnic background and geographic area of residence may clue in the clinician what traditional medicines could be in play. Ethiopians are predominantly of the Christian and Islam faith. Both religions have a deep tradition and played a major role in the history of disease and healing through the centuries. It is not surprising that Ethiopians seek healing and alleviation of suffering from their spiritual leaders, given the belief that supernatural forces are central in both the cause and treatment of ailments.¹ The influence of religious rituals is especially apparent in chronic non-curable illnesses and mental-health afflictions. More effort is needed to include religious leaders in the care of patients with serious illnesses and help allay their fear that seeking modern treatment will run counter to the divine intervention needed to get well.

Holy water is the most widely used ritual by the church. It is especially popular for mental illnesses and is often administered for seven or 28 consecutive days. Infertility is also believed to be overcome by bathing in holy water and praying for intercession by the Virgin Mary. A strong faith is required for Tebel to be effective and when intervention is not successful, it is often attributed to lapses in the patient's belief system. Devout believers attest that disease is a punishment from God for either a personal or society's collective indiscretion. This belief corresponded more with strength of faith than level of education.¹⁷ The Ethiopian Orthodox Church bases its healing power on the Bible (both Old and New Testament) and this is believed to have been bestowed on Solomon directly from God and passed on to his descendants. The Bible is full of instances where Jesus and his disciples performed various miracles and cured the sick.

Filling the Void

The WHO acknowledges and supports the integration of traditional medicine into the national health system of member countries.⁴ In Ethiopia, the practice of traditional medicine is legal and guidelines are provided in the civil and penal code of the country.² There is an office to coordinate the efforts under the Ministry of Health, and it has been identified as a health-policy priority area. There is, however, neither regulation nor restriction of herbal medicine at this time and practitioners are not required to register.

Traditional medicine continues to fill the void in the health care system of Ethiopia and it is widely popular among different cross sections of the population. Contrary to popular belief, most Ethiopian physicians are not averse to their patients using indigenous medicine or participating in religious rituals.¹⁸ They acknowledge the relevance of traditional medicine and support increased collaboration. At the dawn of the second decade of the 21st century, there are only about 2,100 Ethiopian physicians and close to 150 hospitals serving a nation of 80 million people.² The critical shortage of trained manpower gives further credence to the idea of bringing traditional practitioners to the fold at every level.

Traditional medicine and palliative care share several core attributes. They both approach health holistically and not as the mere absence of disease. All domains – including physical, spiritual, social, emotional and material – are encompassed in both disciplines. The patient, family and friends are considered a unit and are actively involved in the care plan. The medical intervention to control distressing symptoms can be seamlessly integrated with traditional remedies and religious rituals. The focus is not only in curing but promoting spiritual, social, and psychological well-being. The mind and body function in tandem and it has long been established that spirituality has a positive effect in both physical healing and coping with an infirmity. Spiritual wellness is one of the domains that are emphasized in end-of-life care and there is an increasing body of knowledge that people of faith have fewer incidences of suicide, lower illness severity ratings, and fewer hospital admissions.¹¹

Our current knowledge of the physical and chemical workings of the body has come about through a process of observation and experimentation that has been particularly intense over the last 500 years and is by no means complete. As health care professionals, it is important that we have a comprehensive framework from which to operate if we are to relieve suffering and enhance quality of life. Although Ethiopia is rich in traditional medical lore, most of it has never been recorded. The practice has been to keep this knowledge shrouded in mystery and pass it on to the oldest son who will do the same. Medicinal plants and herbs, as well as their preparation and administration, are not divulged to the public. The quest to preserve this rich culture should gain more urgency as medical folklore becomes extinct with a dying and migrating generation, and medicinal plants are disappearing because of unsustainable eco systems. Efforts to archive this knowledge by dedicated professionals and civil society should be actively supported. The yet untapped sources of traditional and alternative medicine may be the future hope of modern medical practice.

Our history of health care evolution is a matter of national dignity, symbol of self reliance, and it provides a forum for many interested in research. It is untenable to have such a widespread practice remain at the margins of organized medicine. Integration of traditional practices into mainstream medicine will help regulate the delivery while acknowledging its legitimate place in the broad health policy of the country.

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The Contribution of Women in the Fields of Medical Science and Medical Care in Ethiopia

Senay Aregawi, MD, Bezawit Tekola, MD and Kinfe Gebeyehu, MD

It is a well known fact that Ethiopian women, despite the lack of access to education and equal rights with men, have contributed to their country immensely in various fields of life right from the home to the most arduous war fields. In this respect they might rightly be called the unsung heroines of their country. The object of this review is not to mention all women who have had prominent roles in the history of our country nor lament the lack of enough credit for their valiant efforts but to bring to the public's attention those extraordinary women in the field of medicine who have been or are being forgotten in the mists of history before their incomparable efforts are registered in the annals of history, thereby stimulating more capable historians to do the job with more professional precision and skill than our humble efforts.

"...Given the well-established fact that exceptional creativity is normally distributed and that half of humanity has always been female, the systematic denial of equal education for women amounts to the suppression of roughly half of all the exceptionally creative human spirits in history."

William S. Hatcher, Reflections of a Human Spirit in a Male Body

We hope the cursory look that we have attempted at the life history of the few women who had outstanding contributions to the development of medical science and medical care in Ethiopia will prove, to many a citizen, that given the chance of equal access to education and to full participation in the social, political and economic arena women can and do contribute as much as, if not more than, men to significant positive changes in society in all spheres of human life. Given this, the fact that women have been denied these chances for so long is a historical tragedy. The above mentioned author adds "How, then, can we ever measure what we have lost forever as a result of the historical persistence of patriarchy? Just as women should feel an equal sense of cultural ownership as men, men should feel the loss of female creativity to history just as keenly as (if not more than) do women." ^{ibid}

It is in this vein then that we will continue to our narratives of the valiant women in the history of medicine in our beloved Ethiopia.



Dr. Widad Kidanemariam (1935-1988)

Dr. Widad is the first recognized Ethiopian woman to have been trained in western medicine and to practice as a full fledged physician. According to Dr. Ahmad Moen¹, "Dr. Widad was born to an Ethiopian émigré family in Palestine" during the fascist occupation of Ethiopia. She was among the first few foreign trained gynecologists who started service in the 1960's and 1970's², and hence the first female Ethiopian gynecologist. She received her MD in Beirut American University. Upon return to Ethiopia she became the founding member of the Ethiopian Family Guidance Association and also served in various capacities in the Ministry of Health. She published many articles on diseases of women and maternal health.

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Dr. Catherine Hamlin (1924 -)

This name is arguably one of the most beloved names in Ethiopian households. It represents a life dedicated to the care of the poor and the disadvantage. Dr. Hamlin (an Australian) with her late husband Dr. Reginald (a New Zealander) arrived in Addis Ababa in 1959. They later established what would permanently be attached with their names- the Addis Ababa Fistula Hospital that cares for women with obstetric fistulae. Dr. Hamlin and her husband also developed the most effective surgical procedure for fistula repair with a 93% cure rate. Dr. Hamlin is a recipient of many honors for this and other humanitarian services the last one being the bestowal of Honorary Citizenship of Ethiopia vested in the hands of none other than the late prime minister himself in April 2012. When asked what her greatest satisfaction has been in her endeavor, Dr. Hamlin responded "It is in knowing that I am working somewhere where God has placed me to work. And I think that we gained more by living [here] and working with these women than we lost by leaving our own countries."



Dr. Adanech Kidanemariam (1943 - 2006)

Dr. Adanech Kidanemariam is remembered by many Ethiopians as being the first woman minister of health. She started service as a community nurse and midwife after she graduated in the medical school formerly known as Gondar College of Public Health. She also taught public health and was head of this same department in AAU-MF. She became minister of health in 1991 and served in that capacity for 3 years.



Professor Yewoinhareg Feleke

A specialist in Internal Medicine at the Faculty of Medicine, Addis Ababa University, is the first woman ever to be honored with the rank of professorship in medicine in Ethiopia. She is an endocrinologist and has worked extensively on diabetes. In these areas she has conducted many studies and published over 25 articles. Also popular and widely used is a book she authored on the subject of diabetes. Working hand in hand with other scholars from around the globe, she has played a great role in forming research consortia and deserves a credit for the upbringing of many medical doctors and specialists in Internal Medicine. She has also inspired a number of young scholars to undertake and pursue research.

Besides her commitment as a teacher, the professor has served in various capacities in the university and as a committee member in various professional associations in her area of specialization. Especially outstanding are her contributions in helping the community battle diabetes and endocrinological illnesses.



Colonel Dr. Yodit Abraham

Internist, Medical Director Armed Forces General Hospital Addis Ababa, Ethiopia

Since 1995, Dr. Yodit Abraham Kelit has been Medical Director and Commander of the Armed Forces General Hospital in Addis Ababa, a teaching hospital under the Defense University, the first woman commander ever. Between 1984 and 1991, she was affiliated with Central Command Hospital and she was its Medical Director and Commander between 1991 and 1995. She has served as member of the HIV/AIDS Prevention and Control Committee of the Ministry of National Defense, the chairperson of the Technical Committee on the TB Control Program in the Army, and member of the National AIDS Council of Ethiopia. Dr. Yodit Abraham completed her specialty training in Internal Medicine in 1991 at Addis Ababa University, where she received an

MD in 1984. She received certificates for postgraduate training in the areas of HIV Prevention, Epidemiology, Laboratory Diagnosis and Medical Management in January 2003 from the University of California at San Diego and the Naval Medical Center in San Diego, California. In 2002, she also received certificates in Epidemiology of HIV/AIDS from Johns Hopkins University and in Management Development from the Ethiopian Management Institute, Addis Ababa. She has authored and co-authored articles on leishmaniasis and HIV/AIDS in medical and AIDS journals.

Dr. Shitaye Alemu, Associate Professor

Gondar University, Health Science/Internal Medicine. Shitaye Alemu is Associate Professor of Internal Medicine at Gondar University. She obtained a Doctor of Medicine degree from Addis Ababa University (1982) and a specialty certificate in Internal Medicine (1988). Shitaye has special interest in the care of chronic non-communicable diseases and she also works in the area of HIV/AIDS, mostly in prevention among youth in school and out of school, with adults and children who are living with the virus and also in the general community in collaboration with Save the Children Norway and CDC. Shitaye has extensive publications in the area of diabetes, epilepsy and HIV/AIDS in rural Ethiopia. Her published works amount close to 20 in various fields.

In her unquenchable thirst for knowledge and her continuous effort to improve her skills, besides her love for reading and constant medical practice, Shitaye has attended close to 20 short and medium course international trainings between 1991 and 211 alone. Her awards and recognitions include, but are not limited to: National Lottery UK Award for Chronic Illness Outreach (1997); Sasakawa Prize (1998); Award by the Federal Teachers' Association of Ethiopia for long term service in higher educational institution (2009); Recognition by People to People organization (2009); and Recognition by Ethiopian Medical Association for long term membership (2009). Shitaye is recognized and respected by many generations of medical students for her unrelenting dedication to teaching and her lifetime service in medicine.



Dr. Mulualem Gessesse:

Dr. Mulualem Gessesse was born on January 17, 1964. She studied medicine, pediatrics and then neonatology in Cuba. Dr. Mulualem got the opportunity to work on newborns with a Cuban specialist at Tikur Anbessa and she worked with her and saw the circumstances at Tikur Anbessa. She witnessed the lack of equipment and personnel and the miserable conditions first hand and was determined to improve the situation. And thus was born the first well organized neonatology service in Ethiopia, thanks to this incredibly indefatigable mother and the support that her effort inevitably attracted. She believes she has imparted her passion for newborns to the people she has trained, and they will in turn share this passion wherever they go. Her dream is to see more and more pediatricians as well as other people who are concerned with the issue of newborns come on board.



Dr. Fisseha Tekle-Wold:

Fisseha Tekle-Wold was born in Addis Ababa and was a 1963 graduate of what is now Addis Ababa University. She studied medicine at the American University of Beirut for two years before finishing her medical degree at Addis Ababa University in 1967, becoming the first Ethiopian physician to graduate from that school. She completed her pediatric residency at New York University Medical Center. Dr. Tekle-Wold, a Bethesda resident, opened her

practice at Washington Hospital Center in 1978 and later expanded to a second office in Silver Spring. She was a practicing physician until her death while on vacation in Ethiopia, on Sep 17,2011.



Dr. Zufan Lakew:

A gynaecologist-obstetrician by profession, Dr Zufan made history in that she was the first woman ever to become Dean of the Faculty of Medicine of the Addis Ababa University.

The role Ethiopian women play in health and social wellbeing of their family and community

This section of the manual of History of Medicine in Ethiopia is to the most meant to encourage the student of history to research more on the part women in Ethiopia historically played and are continuing to play especially in health and wellbeing of their families and society in general. Though a few instances of spectacular roles many of our women have played have been documented here and there in the pages of history books, especially their decisive bravery during conflicts and wars of foreign aggression, the burden women carried and are continuing to carry for the welfare of their family, society and nation remained far from receiving unwavering open and genuine recognition.

Childhood upbringing and role assigning based on gender is a phenomenon that is practiced worldwide regardless of how far up the developmental ladder a particular country climbed. It is also only in the last 100 years or so that women in western countries started making strong points and more organized demands for faded gender demarcation lines when it comes to qualifying for and serving their nations. The demand so exerted has not only succeeded to a great extent in many highly educated societies but has proved them right in many fields including strong leadership roles in science, technology, government, health, administration and the military. Though developing countries did not have to reinvent the wheel, yet have been hesitantly tracking the trail, some with obvious vigor and others at variable paces depending on the force they exert themselves and their male supporters and of course depending on opposing established forces they have to reckon with.

Role assignment and upbringing of women as children and youths in Ethiopia by and large follows the traditional track of roles already defined more distinctly for boys and girls for the overwhelming majority. Those who have not been rescued by schooling through high school and beyond for opportunities and choices out of the rigid role, for generations have continued to be expected to follow the “mothering” trend which in broad terms consists of caring for all family needs including health and social wellbeing. These are important roles no one in his right mind would undermine and dispute and there is no doubt that such a role of mothers who with tender loving care address basic demands and health and social needs of their children better than their male partners to the most, have contributed to survival of their children.

Let us think of breast feeding of a child which of course is second nature for Ethiopian women and has been in practice by most women worldwide from time immemorial. It does not appear much of a deal to many until the mother stops breast feeding at a much younger age of the child when the child starts to show nutritional deficiency illnesses and sometimes with added insults of gastroenteritis from a formula or contaminated cow milk. The breast feeding mother never considers it a burden; to the contrary it gives her a complete satisfying sense of fulfillment, with smell, visual and tactile connection with her child and bonding that additionally contribute to the social development of the infant. Untold economic contribution that a more affluent mother can put in dollar figures are right in there as well.

In conclusion it is very important that we recognize that women in Ethiopia have played and are continuing to play a significant role in the health and wellbeing of the family and especially their children. They are unsung heroes whose roles especially in family and child health are least recognized.

A student of medical history of Ethiopia venturing to know the role women played and are continuing to play in their society in the country would need to keep the following outline in perspective:

1. Culture of raising female children and the female youth.
2. Household responsibilities and community expectations of female youths.
3. Female youths in adult roles.
4. Playing a role of marriage partner and raising a family.
5. The role played by women as adults in society; then and now.
6. Leadership roles at various regional and national levels.
7. Are men, culture, laws and women themselves changing fast enough to defend women’s rights in society?

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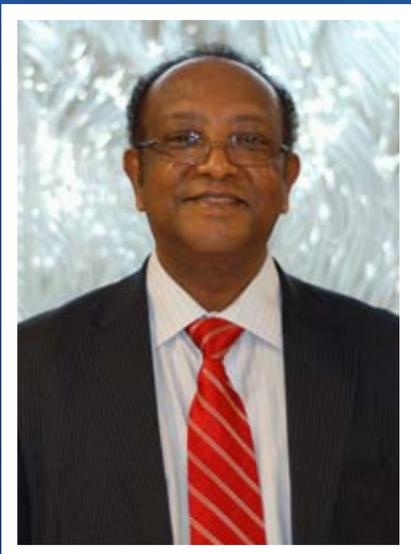
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