Ethiopia

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Ethiopia Country Report

Ethiopia is a land-locked country located in East Africa, and is bordered by Eritrea, Djibouti, Somalia, Kenya and Sudan. With an estimated population of more than 85,000,000, Ethiopia is Africa's second most populous country. Although Ethiopia's official language is Amharic, there are a variety of officially recognized regional languages which are spoken among Ethiopia's ethnically diverse population. According to a census taken in 2007, 34.5 percent of Ethiopians are ethnic Oromo, 26.91 percent Amhara, 6.2 percent Somali, 6.07 percent Tigraway, with the remaining percentage divided among the Guragie, Sidama, Welaita, among others.

History

Ethiopia is considered one of the oldest centers of civilization in the world with evidence of hominid habitation of the area from as early as 3.2 million years ago. Ethiopia has been the home of many expansive empires, examples of which include the D'mt in the 8th century BCE, the Aksumite reign in the 4th century BCE, the Zagwe dynasty which ruled from 1137 CE until it was overthrown by the Solomonid dynasty in 1270 CE. The Solomonid dynasty ruled the Abyssinian empire which at that time included almost the entirety of the current geographic areas of Ethiopia and Eritrea. The Solomonids reigned until a Marxist-Leninist military junta, the "Derg", led by Mengistu Haile Mariam, deposed Haile Selassie, the last Emporer of Ethiopia, and established a one-party communist state.

The communist regime which was established after the military coup that deposed the last Emperor of Ethiopia in 1974 was plagued by a series of ensuing coups, drought and famines which contributed to wide-scale population migrations and displacement of populations. In the 1980s, large scale famines killed 1 million Ethiopians and impacted the lives of 8 million more.

Demonstrations against communist rule began in the northern regions of Ethiopia and Eritrea. In 1990 the Soviet Union completely cut all aid to Ethiopia furthering weakening the rule of the communist leader, Mengistu Haile Mariam. Mengistu fled the country in 1991, and sought asylum in Zimbabwe where he resides to this day. A referendum was held in 1993, in which Eritreans overwhelmingly voted in favor of seceding from Ethiopia, and Eritrean independence was declared on May 24, 1993. Ethiopia's first multiparty elections were held in 1995, after a constitution was adopted the previous year. A border dispute with Eritrea resulted in the Ethiopian-Eritrean was that began in 1998 and lasted until June 2000.

General Facts	
Capital	Addis Ababa
Total Population	85,237,338
Addis Ababa Population	3,627,934
Total Area	1,104,300 sq km (426,371 sq mi)
Kampala Area	176 sq km (68 sq mi)
Gross national income per capita	630 USD
Life expectancy at birth m/f	55/58 years
Infant Mortality Rate	166 deaths/1,000 live births
Total expenditure on health per capita	22 USD (2006)
Total expenditure on health, % of GDP (2006)	4.6% (2006)

Politics

The Federal Democratic Republic of Ethiopia is described in its constitution, drafted in 2004, as a federal parliamentary republic. Executive power is exercised by the Prime Minister who presides over a cabinet. Legislative authority is vested in two chambers of parliament, leaving judicial powers completely independent of both the legislative and executive powers. Ethiopia's current government is led by EPRDF's Prime Minister, Meles Zenawi, whose policies have, according to an assessment by the non-profit Freedom House, "promoted a policy of ethnic federalism, devolving significant powers to regional, ethnically-based authorities. Ethiopia today has nine semi-autonomous administrative regions that have the power to raise and spend their own revenues".[1]

Ethiopia's first multiparty elections were held in 1995, however many opposition parties abstained from participation which resulted in an overwhelming victory for the Ethiopian People's Revolutionary Democratic Front (EPRDF). EPRDF's Prime Minister, Meles Zenawi,

[1] *Freedom House*. (n.d.). Retrieved August 1, 2009, from http://freedomhouse.org/template.cfm?page=22&country=7175&year=2007

was elected for a second 5-year term in the controversial 2000 elections in which opposition parties claim the polls and media coverage of the elections were heavily biased towards the incumbent EPRDF party. Human Rights Watch has reported that access to non-state run media has been severely affected by Zenawi's policies, indicating that private newspapers are routinely shut-down by the government.

Economics

Ethiopia had an estimated GDP of $70.995 billion in 2008. Despite being a landlocked country in Eastern Africa, Ethiopia has one of the most significant water reserved in Africa due to the 14 rivers that run throughout the country. Despite the large amount of available water, only a small percent (approximately 2.5 percent) is currently being used to generate power, and for irrigation. Agriculture accounts for the largest percentage of Ethiopia's Gross Domestic Product, principle exported products include coffee, beans, cereals, potatoes, sugarcane and vegetables, as well as livestock which accounts for approximately 15 percent of GDP. Other notable exports include khat, gold, leather products and flower and plant exports.

Ethiopia's Public Health Care System

When the Marxist regime of Mengistu Hailemariam was toppled in 1991 after years of civil strife, the transitional government drafted a health policy (1) that established a decentralized system of health care based on the newly created administrative divisions of the country (Figures

Figure 1, Tables

Table 1). Ethiopia is divided into 9 ethnically-based administrative regions (also referred to as states) and 2 city administrations. Each of these 11 administrative units has its own Regional Health Bureau (RHB). The states are further subdivided into anywhere from 3 to 12 zones, each with a Zonal Health Department (ZHD), with the exception of Harari state which has no zonal divisions. Harari state, the 2 city administrations, and each of the 8 zones is divided into districts, or wordeas. There are a total of 558 woredas, each with a Wordea Health Office (WORHO). Finally, each woreda is comprised of a number of neighborhoods, or kebeles, which number over 15,000. As described below, the effort to expand access to and quality of health care services in Ethiopia has focused a great deal on delivery and organization at the kebele-level.

A 4-Tiered Model

Delivery of health care in the Ethiopian system follows a four-tiered model. The Primary Health Care Unit (PHCU) exists at the kebele level and forms the foundation of the health care system. Attempts are underway to build, equip, and staff PHCUs for every kebele, with expediency given to the rural neighborhoods where nearly 87% of Ethiopia's almost 80 million live. Each PHCU

is supervised by the WORHO presiding over its district and serves as the lead-point for the Health Service Extension Program (HSEP), a program designed to markedly increase the number of health care workers in Ethiopia. The main focus areas of the PHCU are hygiene and environmental sanitation, disease prevention and control, and family health services. Although not mentioned explicitly, medical imaging, particularly radiography, can potentially improve and facilitate diagnosis and monitoring of communicable diseases and chronic conditions. The expanded use of medical sonography may also facilitate the goal of improved prenatal care and reduction of maternal and prenatal mortality. For example, according to the World Health Organization (WHO) mechanical dystocia and postpartum hemorrhage are important causes of maternal and fetal morbidity/mortality. Medical sonography, with good prenatal medical care and follow-up, plays an important role in predicting and preventing these undesired outcomes.

Each PHCU is composed of one or more Health Posts (HP), each located in a different kebele, and one Health Center (HC). HP's are staffed by Health Extension Workers (HEW's), women with at least a high school diploma who undergo specialized training in basic curative and preventative health services. The federal government receives support from various NGO's in this effort, including the Earth Institute of Columbia University (2) and the ACCESS program at USAID (3) . The ACCESS program includes collaborations with Johns Hopkins University (4) and the Carter Center (5). According to the Ethiopian Federal Ministry of Health (FMOH, (6)) as of December 2008, 11,446 HPs out of the targeted 15,000 had been constructed with just over half of them fully equipped. The FMOH expects to complete construction and equipping of all HPs by the end of 2009.

The HC within a PHCU provides higher-level curative health services and technical assistance to the HEW's staffing the HPs. Each HC is staffed by a Health Officer (HO), an allied health professional with training similar to that of a physician assistant or nurse practitioner in the United States. According to the FMOH (6), construction and equipping of HCs is not as far along as that of HPs. As of January 2009, 962 of the targeted 3,200 HCs were fully constructed. Of these, 721 had been fully equipped. An additional 1,163 HCs were under construction in January 2009.

Each fully equipped HC and HP is provided with an Essential Health Care Package (EHCP) designed for the level of care provided at the facility. EHCPs have also been designed for the woreda hospitals (the next level up from the PHCU in the 4-tiered system). Each EHCP contains relevant medical equipment, health care consumables, literature, and other supplies.

The remaining components of the 4-tiered health care delivery system are district/woreda hospitals which report to WORHOs, zonal hospitals which report to ZHDs, and specialized regional hospitals that report to RHBs. There are also 4 federally run hospitals supervised directly by the FMOH. Vertical and horizontal referral patterns and mechanisms exist between the different levels of the health care delivery system. However, gaps in the referral system have been identified as areas for future improvement (7).

The Federal Ministry of Health: Administrative Subdivisions as a Framework for Analyzing the Ethiopian Health Care System

Funding and strategic guidance of the Ethiopian health care system originates from the FMOH, which is subdivided into 8 directorates and 4 agencies. The current administrative divisions of the FMOH are the product of a recent reorganization undertaken as part of a nation-wide business process reengineering initiative to introduce "effectiveness and efficiency in the execution of business practices, … [enabling] the government to achieve dramatic improvement in critical, contemporary measures of performance such as cost, quality, service and speed" (6). The subdivisions of the FMOH, described below, also serve as a good framework for discussing the Ethiopian public health care system.

Planning and Finance Directorate

According to the FMOH website, the Planning and Finance Directorate mission is to develop "an effective and efficient health system through … improved performance enhanced by informed decision making at all levels of the health sector." The directorate also "aims to improve, strengthen, integrate and align" implementation of the strategic objectives of the health care system and collaboration between the federal government, the WHO, NGO's, and other stakeholders (6).

Health Sector Development Program

The strategic objectives of the FMOH serve as guiding principles for the Health Sector Development Program (HSDP), a detailed 20-year plan designed to implement the three health care components of the United Nations Millennium Development goals (7), namely:

1. Reduction in child mortality: Under-5 mortality in 2004 was 166 per 1000 live births, 30% of whom die in the neonatal period (8).
2. Improvement of maternal health: Maternal mortality in 2000 was 850 per 100,000 live births with only 6% of births attended by skilled personnel (8).
3. Prevention, detection, and treatment of HIV/AIDS, malaria, Tuberculosis (TB), and other diseases: HIV prevalence in 2003 among adults aged 15-49 was 4.4%. TB prevalence in 2004 was 533 per 100,000 with a 36% detection rate and a 70% cure rate. 80 per 100,000 died of malaria in 2000 (8).

There are 4-stages of the HSDP. A mid-term review (MTR) of the third stage (HSDP III) was published in July 2008 and is available for viewing at the FMOH website (7). HSDP III will be

completed in September 2011. The final stage, HSDP IV, will be completed in September 2016. Please refer to the HSDP III MTR for a detailed discussion including analysis of health care delivery and quality of care; finance and governance of the system; and support services including facility construction and rehabilitation, human resource development, pharmaceutical supplies and logistics, development of the Health Management and Information System (HMIS), and systems for monitoring and evaluating progress and performance in the health care sector.

Health Sector Development Program Harmonization

The FMOH published the HSDP Harmonization Manual (HHM, (9)) in 2007 for use by Ethiopian health officials at all levels, as well as foreign stakeholders in the Ethiopian health care system including NGOs, the United Nations (UN), the WHO, and others. The HHM was designed to improve efficiency of health sector planning and implementation by coordinating efforts and removing unnecessary redundancies in the system. The thesis of the manual is "one plan, one budget, one report". With respect to budgeting, whenever possible, all money from donations and aid are "pooled and channeled" through government accounts and disbursed via government procedures without specific earmarks. According to the HHM, inability to accurately predict available funds year-to-year has placed constraints on planning and limited efficiency of decentralization. If necessary or required by the funding source, alternative channels of disbursement may be used. However, according to the HHM, this may make resource allocation more difficult.

The HHM also emphasizes the importance of using the HSDP as a singular, nation-wide strategic plan, used as a template by each region, zone, and woreda. Annual plans are required at each level of the health system (FMOH, RHB, ZHD, and WORHO). Coordination of NGOs and the Ethiopian diaspora for are considered essential to the planning process, especially in the area of developing best practices. Resource mapping and mobilization is required as a part of every annual plan. The Planning and Finance Directorate helps facilitate the supply of goods and services necessary for successful implementation of the annual plans.

The HHM also provides guidance for reporting and evaluation. A uniform set of indicators for monitoring progress has been developed, with routine data collection and aggregation and quality improvement required at all levels. Nothing specifically relating to medical imaging is included among the set of indicators.

Finally, the HHM is considered "required reading" for all stakeholders in the Ethiopian health care system, including NGO's. The HHM includes a "Code of Conduct" for donors, NGOs, and other foreign aid sources (Table 2).

Expansion of the Ethiopian Health Insurance System

The FMOH, in collaboration with USAID and subcontractor Abt Associates, has undertaken a 5-year project (started in 2008) to create a national health insurance system and implement financing of the health sector at the regional level. The project, called the USAID Health Sector Financing Reform (HSFR) project, builds on smaller scale financing projects already operating in Oromiya, SNNP, and Amhara states (10).

At a legislative level, the Ethiopian government has authored a bill that mandates health insurance for anyone formally employed in Ethiopia. Approximately 1 million Ethiopians are formally employed in the public and private sectors. In its current form, the bill would require employees to pay half the premium amount with the employer also contributing half the cost. The bill was submitted to the Council of Ministers in January 2009 before being returned to the FMOH for further amendment (11).

Medical Services Directorate and Health Infrastructure Directorate

According to the FMOH website, the objective of the Medical Services Directorate is to "improve the quality of health services and utilization by the population through reorganizing the health service delivery system" (6). Its aims include implementation of decentralized management and full community participation, development of EHCPs and improvement of the referral system, and development of health facility standards and staff as well as equipping health facilities.

The stated objective of the Health Infrastructure Directorate is to "increase access to, and improve the quality of health services through the rehabilitation of existing health facilities and construction of new facilities. It aims to provide adequately equipped, staffed and governed health facilities, [a] customer friendly and standard health facility layout, sustainable facility and equipment maintenance and [an information technology] supported health system" (6) .

Health care informatics has been identified as a critical area in need of extensive improvement. In June 2008, the FMOH began a large, nation-wide development initiative to reform the Ethiopian Health Management Information System (HMIS). The stated purpose of reform is to create a simplified, standardized and integrated National Health Information System. According to the FMOH website, "The reform covers a wide range of activities that will be implemented in phases and produce vital information for planning, monitoring, and decision-making. These activities include management of individual medical records, abstraction of data for quarterly based reporting, and indicator review for activity monitoring & performance improvement" (6).

Health care informatics development is also occurring in the area of telemedicine, including teleradiology. Ethiopia's Black Lion Hospital in Addis Ababa was one of the initial test sites for development of the telemedicine component of the Pan-African e-network (12), a joint project

between India and the African Union to provide telemedicine and teleradiology services to over 50 African nations. The Pan African e-network is also being developed for nonmedical purposes including distance education, e-commerce, e-governance, resource mapping, and meteorological services.

The Pan-African e-network is an integrated satellite, fiber optics, and wireless network (Figure 2). Numerous network nodes located at Indian universities and hospitals are connected to each other and a data center in Delhi on a Multiprotocol Label Switching (MPLS) network. The data center router communicates directly with a router in Dakar, Senegal through a fiber optic International Private Leased Circuit (IPLC), a dedicated, point-to-point private line. The Senegalese router communicates wirelessly through a hub station to the (13)Regional African Satellite Communications Organization (RASCOM, {{60 Anonymous}}) satellite. Wireless connections are being created between the RASCOM satellite and 58 learning centers and 58 hospitals, including 8 regional learning centers and hospitals in different parts of the continent. There is also wireless connectivity between the satellite and VVIP (Very Very Important Person) nodes used for communication between African governments. A detailed presentation on the Pan-African e-network can be found on the internet (14).

Radiology specific infrastructure in Ethiopia is underdeveloped. According to the HSDP III MTR, "[d]ue to shortage of resources, both past and present, the functionality of some hospitals is reported to have decreased, e.g. district hospitals functioning as [health centers], essential services such as emergency surgery not available in hospitals, *X-ray and ultrasound services are not functional*, [and] range of laboratory services limited due to shortages of equipment and reagents" (7). However, accurate, quantitative data is not readily accessible on the internet. Some specifics are provided by the Radiology Department of Addis Ababa University (AAU) on their website (15). These specifics support the findings of HSDP III MTR and include a nonfunctioning CT scanner, a nonfunctioning Doppler ultrasound machine, and suboptimal radiography units. Although the AAU Department of Radiology recognizes that "[t]he quality of [radiology resident] training is directly related to the quality of equipment available, and both will have a direct bearing on the eventual quality of health service[s]…rendered to the public," they feel that radiology and radiology services receive "[l]ow priority in budget allocation and national attention" (15) .

Drug Administration and Control Authority (DACA) and Pharmaceutical Fund and Supply Agency (PFSA)

Adequate and sustainable availability of safe, effective pharmaceutical grade dugs is vital to the success of any health care system. The Ethiopian DACA serves a role similar to the United States Food and Drug Administration. According to the FMOH website, the DACA is an agency within the ministry whose mission is to "promote and protect public and animal health by ensuring the safety, efficacy, and quality as well as the proper use of the drugs that are made available in the country" (6). The DACA is currently revising a comprehensive national drug

policy, which is available online (16). The national drug formulary and a list of licensed drug importers and wholesalers is also readily available (17).

The key logistic roles of the PFSA include health care commodity procurement and distribution, management of the national health commodity fund, building the logistics capacity at hospitals and health centers, coordinating health care commodity forecasting efforts, and improving evidence-based and rational use by providers (18). The PFSA works closely with the USAID Deliver project (19).

The lack of availability of essential drugs on a sustainable basis has been a major limitation (20). The PFSA and DACA are addressing this through a partnership with US-AID. 150 so-called "Special Pharmacies" have been created in public health facilities across the country to increase access and affordability. Initial studies suggest there has been reduction in costs and increased access in the special pharmacies as compared to the traditional model (20).

Human Resource Development Directorate

According to the FMOH website, the objective of the Human Resource Development Directorate is to "train and supply qualified health workers of different categories governed by professional ethics. It also aims to design new system[s] of human resource development and retention" (6) The FMOH recognizes that although great progress has been made in the recruitment and training of low-level health care providers, like HEW's, there is a manpower crisis at higher levels, particularly among physicians. According to the HSDP III MTR, Ethiopia is below target for all health care-related human resources (Table 3). Notably, there is only 1 physician for every 38,000 Ethiopians, almost half the HSDP III goal of 1:21,500. Compare this to the WHO recommended minimum of 1:10000, the 1:400 ratio in the United States, the 1:1700 ratio in India, and the 1:4500 ratio in Sudan, and you begin to appreciate the enormity of the physician manpower problem in Ethiopia. Ethiopia is also far below target for number of radiographers, with only 87 radiographers for the entire country compared to the HSDP III goal of 620 (Table 3). The HSDP III MTR does not provide specific data on radiologists. However, according to the AAU Radiology website, the nation-wide radiologist to patient ratio is approximately 1:1,000,000. If this ratio is applied to the HSDP III MTR data, it implies a total of 60-80 radiologists for the entire country. Data or information on the number of medical physicists is not readily available on the internet.

The extreme shortage of radiologists and allied professionals highlights the importance of teleradiology, especially since almost all radiologists live in urban areas. However, the FMOH recognizes that telemedicine can only partially address its physician manpower problem. The need for "home grown" talent has been recognized, and the country has responded by massively increasing training of health care workers at all levels (Table 4).

Unfortunately, increased numbers of trained physicians does not equate to an increase in physicians within the Ethiopian public health care system since huge numbers of physicians leave the country or enter private health care systems, primarily for financial reasons. According to a presentation by Dr. Yifru Berhan M.D., Dean of the Hawassa University Medical Faculty (21), the physician-patient ratio has declined continuously since 1989. In the public sector alone, the situation is even direr, with a ratio of 1:118,000 and a rapidly declining number of public sector physicians since the fall of the communist regime in 1991 (Figure 3). Of the 4629 Ethiopian physicians trained at home and abroad between 1987 and 2006, only 932, or 20%, are practicing in the public Ethiopian system.

Remaining FMOH Directorates

The remaining directorates in the FMOH include:

1. The Office of the Minister
2. The Health Promotion and Disease Prevention Directorate oversees the HSEP
3. The General Services Directorate has an important role in education and training through organization of workshops, events, meetings and conferences conducted by other directorates at the Ministry. The General Services Directorate also processes entry clearance applications and provides protocol services to employees travelling abroad on official business. It is unclear from the FMOH website if training programs and conferences sponsored by NGOs should be channeled through this directorate (6).
4. The Ethiopian Health and Nutrition Research Institute (EHNRI) is the public health agency of the FMOH. EHNRI is involved in epidemiological studies, promotion of health science and technology, but most relevant to radiology readiness provides “referral medical laboratory services relating to the occurrence, causes, prevention and diagnosis of major diseases in the country and supports National Laboratory Quality Assurance Programs and systems” (22).
5. The HIV/AIDS Prevention and Control Office is also an agency within the FMOH
6. The Quality and Compliance Directorate is involved with ethical and legal issues

Ethiopia’s Private Health Care System

The 1993 Health Care Policy of the Transitional Government of Ethiopia established the beginnings of a partnership between public health care providers, private health care entities, and non-governmental organizations (1). This partnership has gradually grown and evolved over the ensuing years. According to the Federal Ministry of Health (FMoH), "There is a need for a policy and guidelines to guide public private partnership in terms of delivery of services and establishing roles and responsibilities for regulations and reporting responsibilities. This is especially urgent as the private sector is growing in Ethiopia" (7). For example, private wings have been established in a number of government hospitals. Despite its rapid growth, the private

health care system still only services a very small percentage of the Ethiopian public, primarily in the major urban areas where less than 15% of the population lives.

Collaboration between the public and private systems is also seen as a viable way to increase physician manpower in the public system. Dual appointments, adjunct professorships, and mutual beneficiary agreements between medical schools and local hospitals are examples of such collaboration designed to off-set the effect of physician migration from the public sector to the private sector (21). The establishment of community based health insurance programs is another avenue of public-private partnership under active development (23).

Potential Areas of Collaboration between RAD-AID and Ethiopia

An adequately trained and staffed health care workforce is necessary for developing an efficient, effective, and sustainable health care system in Ethiopia. According Dr. Yifru Berhan M.D., Dean of the Hawassa University Medical Faculty, assistance from foreign sources is needed in Ethiopia's effort to strengthen its health care workforce, particularly physicians (21). He lists help with CME programs and teaching and training at all levels as important, immediate needs. RAD-AID and its partners are in a unique position to contribute considerable training and education resources to develop the radiology workforce in Ethiopia. For example, the Johns Hopkins Department of Radiology has a strong radiology CME curriculum that could potentially be adapted to assist Ethiopia. Additionally, Johns Hopkins Radiology is in the early stages of implementing a radiology distance e-learning initiative that will be offered free-of-charge to underdeveloped nations. Potential areas of collaboration between Johns Hopkins, RAD-AID, and its other partners with the Pan-African e-network's tele-education initiative can also be explored.

As mentioned previously, descriptions of radiology-specific areas of need are not readily available on the internet. However, on its website the AAU Department of Radiology does list some of its weaknesses. Included among these are a lack of sufficient working space; inadequate internet services and poor communication facilities; lack of service and maintenance protocols; old or unavailable equipment; lack of needed references, journal access, and text books; limited opportunities for research and academic publication; and absence or lack of staff training (15). RAD-AID can be of assistance in many of these areas. However, a more detailed needs analysis must be undertaken to generate a better understanding of Ethiopia's radiology infrastructure. A dialogue between RAD-AID and both the public and private health care sectors and the FMOH should be initiated to begin this process.

Tables

Table 1: Health sector statistics by administrative region (†FMOH, based on 2007 census data (6); ‡HSDP III, MTR (7).)

State	†Population	†Percentage rural	†Total number of zones	†Total number of Hospitals (public and private)	†Total number of health centers	†Total number of health posts	‡Public Sector Physicians and Health Officers per 10000 pop. (2007)
Addis Ababa (city administration)	3,147,000	0%	6	33	28	35	4.3
Afar	1,449,000	90.5%	5	2	14	112	1.8
Amhara	20,136,000	88%	11	20	182	2664	2.1
Benshangul-Gumaz	656,000	89.8%	3	2	17	166	3.7
Dire Dawa (city administration)	428,000	0%	0	3	6	39	9.5
Gambela	259,000	80.3%	4	1	9	51	5.5
Harari	209,000	37.3%	0	4	3	23	25.6
Oromiya	28,067,000	86.2%	12	31	242	3758	2.5
Somali	4,560,000	82.4%	10	8	21	290	1.7
Southern Nations, Nationalities and Peoples (SNNP)	15,745,000	91.1%	9	20	181	256	2.0

Region							
Tigray	4,565,000	80.5%	4	15	123	796	5.0
Totals/Average	**79,221,000**	**86.6% (avg)**	**64**	**139**	**826**	**8190**	**5.8 (avg)**

Table 2: Code of Conduct in HSDP Harmonization Manual (9).

Code of Conduct for Donors
Recognize HSDP-III as the centerpiece of health policy. Donor support should follow the priorities and procedures specified in this plan. Government and donors should engage in active debate about the contents and implementation of the plan
Help reduce the number of financing channels to a minimum. Funds will be pooled wherever possible - opportunities for pooling arrangements should be actively explored
Use the Ethiopian fiscal year and chart of accounts for financial reports
Commit to greater coordination of reports, analytical work, reviews and missions. Findings of studies should be openly shared. Single-donor activities should be kept to a minimum; wherever possible donors should work together on particular issues

Table 3: Available Human Resources (7).

Human resources category	HSDP III target	Actual status in 2007 at time of HSDP III MTR
Doctors (not including HOs)	3250	1806
Nurses (not including midwives)	18310	17134
Midwives	3570	1012
Health Officers	5000	792
Pharmacy Professionals	6600	1201
Laboratory Technicians	4200	1816
Radiographers	620	87
Health Assistants	n/a	3184
Environmental Health Workers	1650	1109
Front Line Health Workers	n/a	1738
Health Extension Workers	30000	17653

Table 4: Output of Graduates from Various Training Institutions (7).

Categories of Graduates	1999-2002		2004-2007		Difference between 1999 and 2007	
	BS	F	BS	F	BS	F
Medical Doctor	517	51	939	108	81% increase	110% increase
Health officer	511	89	1584	279	200% increase	210% increase
Pharmacist	118	18	226	63	91% increase	250% increase
Nurse BSc	79	32	435	196	450% increase	510% increase
Senior Clinical Nurse	1355	741	5450	2689	300% increase	260% increase
Junior Clinical Nurse	1414	997	2978	556	110% increase	44% decrease
Senior Midwife Nurse	120	112	237	140	98% increase	25% increase
Junior Midwife Nurse	695	350	97	66	86% decrease	81% decrease
Senior Pharmacy Technician	335	54	n/a	n/a	n/a	n/a
Junior Pharmacy Technician	263	60	39	12	85% decrease	80 % decrease
Senior Lab Technician	982	89	241	23	75% decrease	74 % decrease
Junior Lab Technician	448	134	422	105	5% decrease	20% decrease
Senior Environmental Health Technician	729	82	515	97	29% decrease	18% increase
Junior Environmental Health Technician	51	11	514	64	900% increase	480% increase

Senior Radiographer	52	2	25	3	52% decrease	50% increase
Junior Radiographer	21	0	46	4	110% increase	400% increase

Figures

Figure 1: Administrative Map of Ethiopia (24).

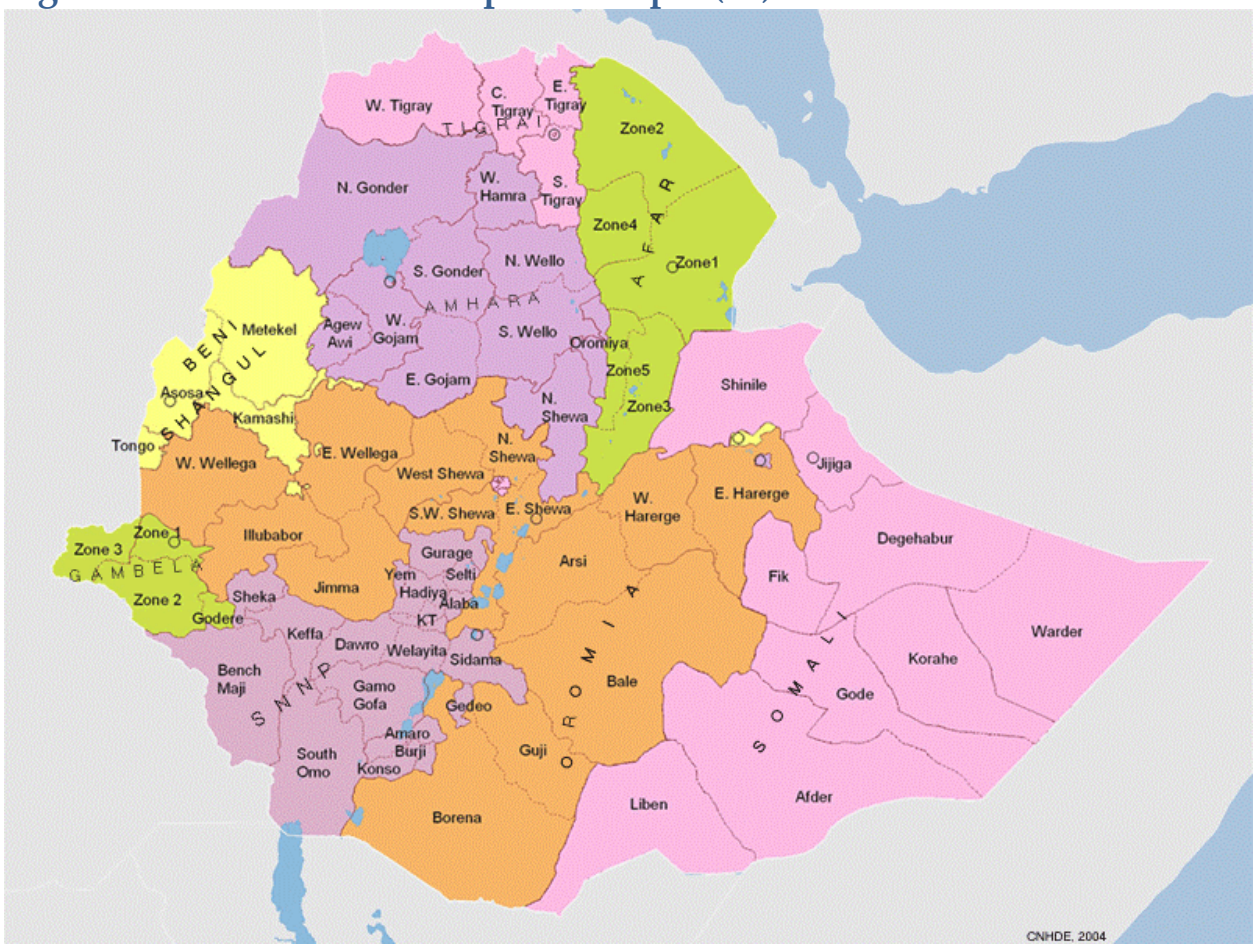


Figure 2: Network structure of Pan-African e-network, (12).

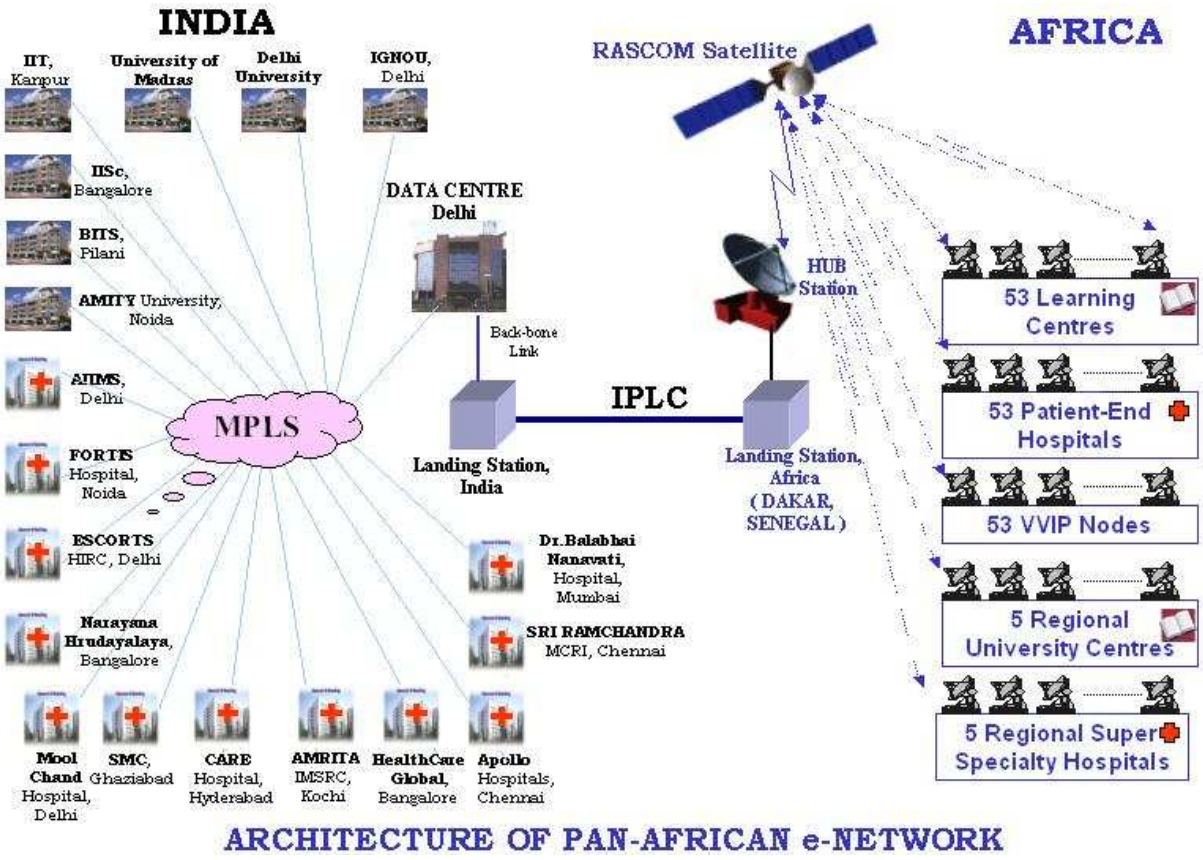
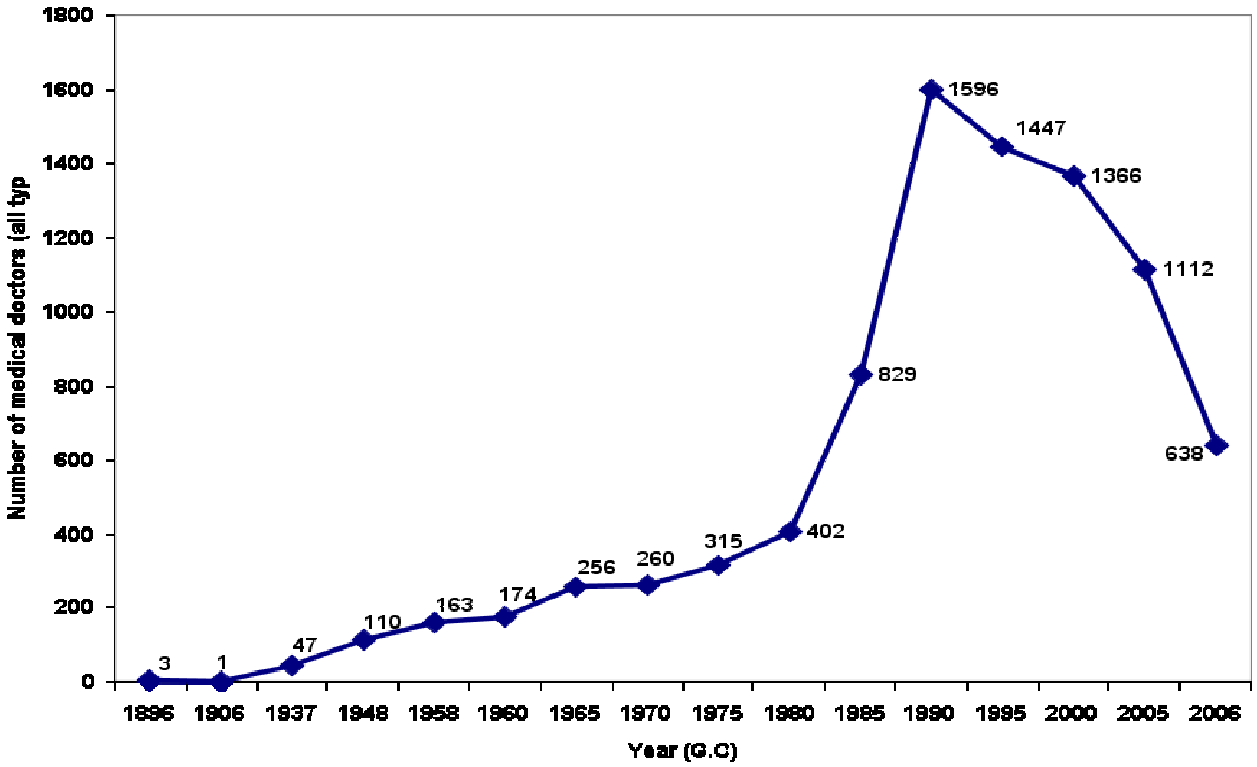


Figure 3: Total doctors in Ethiopia since 1896 in public health institutions (21).



Appendix 1: Abbreviations

Abbreviation	Meaning
AAU	Addis Ababa University
AIDS	Acquired Immunodeficiency Syndrome
CME	Continuing Medical Education
CT	Computed Tomography
DACA	Drug Administration and Control Authority
EHCP	Essential Health Care Package
EHNRI	Ethiopian Health and Nutrition Research Institute
FMOH	Federal Ministry of Health
HC	Health Center
HEW	Health Extension Worker
HHM	HSDP Harmonization Manual
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HO	Health Officer
HP	Health Post
HSDP	Health Sector Development Program
HSEP	Health Service Extension Program
HSFR	Health Sector Financing Reform
IPLC	International Private Leased Circuit
MPLS	Multiprotocol Label Switching

MTR	Mid-Term Review
NGO	Nongovernmental Organization
PFSA	Pharmaceutical Fund and Supply Agency
PHCU	Primary Health Care Unit
RHB	Regional Health Bureau
TB	Tuberculosis
UN	United Nations
USAID	Unites States Agency for International Development
VVIP	Very Very Important Person
WHO	World Health Organization
WORHO	Woreda Health Office
ZHD	Zonal Health Department

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