Human Resource Development for Health in Ethiopia: Challenges of Achieving the Millennium development Goals

Samuel Girma[1], Asfawesen G/Yohannes[1], Yayehyirad Kitaw[1], Yemane Ye-Ebiyo[1], Aklilu Seyoum[1], Hailay Desta[1], and Awash Teklehaimanot[1].

Abstract

Review of different documents on human resource for health was undertaken. Particular attention was given to documents from Ethiopia. Generally there is shortage in number of different groups of professionals, mal distribution of professionals between regions, urban and rural setting, and governmental and non governmental/private organizations. There is no policy specific to human resource development (HRD) for health and no proper mechanism to manage the existing health workforce. A number of measures are being taken to alleviate these problems. The enrollment of students has been increased in different categories and new trainings started in professions like dentistry. The process to develop policy and strategy for managing human resource for health has been started. The implications of these for HRD by 2015 are explored briefly. [*Ethiop.J.Health Dev.* 2007;21(3):216-231]

Introduction

Developing capable, motivated and supported health workers is essential for overcoming bottle necks to achieve national and global health goals. At the heart of each and every health system, the work force is central to advancing health. (1). There should be optimum number and professional mix of human resource for the effective coverage and quality of the intended services (1).

Health services are labor intensive and personal in nature. As additional funds become available from various initiatives (e.g. Global Fund against HIV/AIDS, Tuberculosis and Malaria, Highly Indebted Poor Countries Initiative and other processes), the ability to absorb them will be constrained without appropriate human resources (2).

The rapid expansion of training and health service institutions creates a major gap in terms of human resource for health (HRH) as trainers, service providers and managers. There have been a lot of efforts by the government to bridge this gap. This paper tries to put squarely the HRH crisis within the framework of the development efforts of the country and to examine the steps taken by the government to mitigate this critical problem and its implications for the future.

There is a large body of literature on HRH. Particular attention was given to documents from Ministries of Health and Education. Different documents were examined for their consistency, feasibility and whether the steps that have been taken with regard to HRH would enable the country to achieve its development goals including the Millennium Development Goals (MDGs).

Current Situation

Health and Health Services: Health problems in Ethiopia are dominated by communicable and nutrition-related diseases. But because it is mostly a high altitude country, it also suffers some of the diseases of the temperate climates. Recognized since the early 1980s, HIV/AIDS has become a major problem (3). The epidemiological transition, towards more chronic diseases, is also being felt though not recognized well.

Health services are limited and of poor quality. In (1997 EC or 2005) there were 600 Health Centers (HC), 1662 Health Stations (HS) i.e. remnants of the phasing out process, and 4211 Health Posts (HP) mostly owned by government (Table 1). These are estimated to cover 43% of the population estimated at 73 million (4)[1].

More importantly, utilization is very low with only 0.3 per capita OPD consultations, 1.5% admission rate, 25% CPR, ANC 32%, attended delivery 12% and DPT3 70% (4).

Policy, Strategy and Human Resources Management: The health policy of Ethiopia emphasizes training of community based task-oriented frontline and mid level health workers. As a mechanism to retain health workers the policy supports developing an attractive career structure, remuneration and incentives for all categories of workers within their respective systems of employment. Besides there will be a focus on developing appropriate continuing education for all categories of workers in the health sector. Strengthening administration and management of health systems is one of the areas given priority by the policy. (5)

Overall, there is supportive policy environment (health policy and strategy (6), capacity building policy and strategy, civil service reform etc) and a growing recognition at policy level that "Health is not only a by-product of social changes but an instrument to promote such changes and health workers are in the vanguard" (7). However, most policy and strategy documents are dated (early 1990s) and there are no specific policy and strategy documents on HRH.

[1] There is a lot of controversy on coverage calculation. The above coverage is calculated on the basis that a HC could serve 25000 and HS 10000 people; if HP are included it could go up to 72% (4)

[1]Center for National Health Development in Ethiopia, P.O.Box: 664/1250, Addis Ababa, Ethiopia Dr Samuel Girm Email: samuelcnhde@ethionet.et

Table 1: **Health Services in Ethiopia by Ownership*, 1997 EC (2005)**

Ownership	HP	HS	HC	Hospital	Clinic	Pharmacy	Drug shop	Rural Drug S
MOH	4211	1283	583	85	-	-	-	-
OGA/NGO	-	-	-	27	-	-	-	-
Private	-	**	-	19	1578	-	-	-
Others***	-	379	17	-	-	276	381	1787
Total	**4211**	**1662**	**600**	**131**	**1578**	**276**	**381**	**1787**
1990 EC (1997/98)	**802**	**2331**	**282**	**96**	**712**	**292**	**222**	**1659**

Source: MOH 2005 *** Total i**ncludes SNNPR for which disaggregated figures are not available ****** See clinics
*** Other than MOH

A survey on quality of health services management (8) also mentioned the following as key problems: work overload, staff shortages, unclear or misunderstood job descriptions, budget shortages, unfair promotions, not getting annual leave at the right time, lack of transport facilities, lack of a safety policy and protective materials, and inadequate care for sick health workers (9). HRH information system is highly under developed with scanty information for policy and strategy development.

Management capacity at all levels; woredas in particular is very poor. It is a neglected field with poor training, and inadequate incentives to mention just a few factors. Almost all woredas are understaffed (10, 11). Even at the FMOH level, there are a large number of vacancies in a downsized (mainly due to Structural Adjustment Program) structure. The shortage is being stop-gapped by staff seconded by WHO and UNICEF. As the health service system expands, there is need for a strong cadre of managers and leader with appropriate and accountable organizational systems (12). However, even though considered as "the invisible backbone of the health system" (1), this is a difficult area to plan with few countries having any plan at all (13). Management capacity is critical because it determines what is currently being tooted as 'absorptive capacity' (14). A 2003 World Bank report on Ethiopia (15), indicted 60-100% increase in donor funding, which is enough to achieve most MDGs, but the micromanagement challenges could hinder full utilization. The impact of such a major scaling up on the economy in general could also be of concern (16, 17).

Health System Structure and Staffing Pattern: The health services strategy is for the deployment of a four-tier system with a supervisory and referral relationship composed of one Primary Health Care Unit (a HC and 5 satellite HP) per 25000 population; one district hospital for 250 000; population and one Zonal hospital for 1 million population.

Staffing pattern is different in different documents and there is inconsistency even in some of the same documents. For example (HSDP) III (18) aims to avail basic emergency obstetric care (BEOC) in all health centers and comprehensive emergency obstetric care (CEOC) in 20% of the health centers. The strategies to achieve BEOC and CEOC are by midwives and health officers respectively. However it assigns two diploma midwives and one health officer in each health center, implying both basic and comprehensive emergency obstetric care services are provided with 100% coverage in all health centers. HRH Development Framework (19), contrary to HSDP III, assigns health officers in only Grade 1 health centers, and assigns only one midwife in the rest. The Accelerated Expansion of PHC Coverage in Ethiopia (20), on the other hand assigns three midwives one of them with diploma.

Available Human Resource

WHO has identified a threshold in workforce density below which high coverage of essential interventions, including those necessary to meet the health-related Millennium Development Goals (MDGs), is very unlikely. Based on these estimates, there are currently 57 countries, including Ethiopia, with critical shortages equivalent to a global deficit of 2.4 million doctors, nurses and midwives. (1).

Shortage of staff in Ethiopia has always been critical. Health worker/population ratios, for example are 3 to 4 times lower than even East African standards. This has been exacerbated by the rapid expansion of facilities in the 1st years of HSDP. Allocation not related to workload has also meant severe shortage in some areas while some health workers in other locations remain idle. Performance at most levels is also considered low (21). The shortage is in all functions: health delivery, management, training and research.

In 2005 in Ethiopia, there were 2453 medical doctors (MD), 776 Health Officers (HO) and 18,809 nurses, all categories. There were still 6363 Health Assistants (HA), a group that is being phased out. There were 4379 frontline health workers (FLHW) in 2001 (low as they were expected to reach 6450 by 2002) (22) but they are being phased out. There are 2737 health extension workers (HEW) and planned to grow rapidly to 30,000 by 2009. Thus there are a total of 34,660 health workers (professional) excluding FLHW (4) [The HRH Framework (18) leaves them out because they 'cannot strictly be considered professionals"]. There are also a large number of voluntary workers - over 20 different types of community agents (23) - [CHA and TTBA, in Tigray in particular, CBRHA in almost all regions, malaria agents, and more recently Health Promoters in

the four bigger regions (ESHE). All these work for free (or some small stipend). Ethiopian (24) and international (25) experience shows that unless some reasonable remuneration is provided, they will eventually cease to carry out their functions. These categories of health workers require a more elaborate analysis as policy and strategic positions seem flux and there are recommendations to strengthen/upscale certain categories such as CBRHA (26).

The density of health workers to population is much lower than the average for Sub Sahara Africa (Fig. 1). The minimum level of health workforce (MD, nurses and midwives) density required to achieve MDGs in Africa, for example, has been estimated at 2.5 per 1000 population (27). The current 0.2 per 1000 in Ethiopia clearly indicates the challenges ahead. Put simply, there is insufficient human capacity in Ethiopia, as in many developing countries, to absorb, apply and make efficient use of the interventions being contemplated through the various initiatives related to child survival, safe motherhood, HIV/AIDS, malaria. Countries with such extreme shortages need to increase rapidly the number of health workers particularly at the (rural) community level where the needs are greatest.

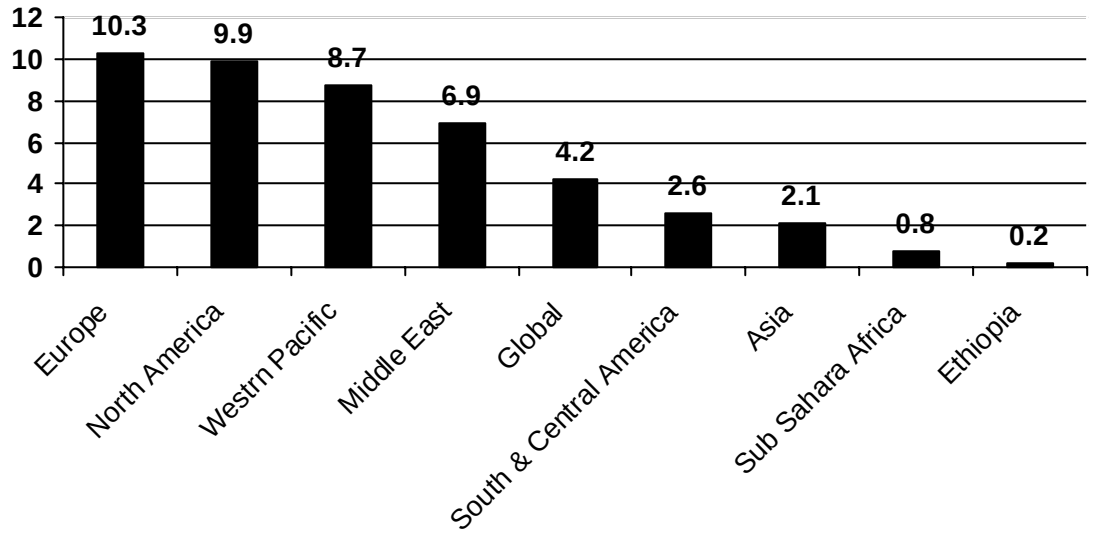


Figure 1: **Density of Health Workers per 1000 population (Source: Adapted from Abuja 2004)**

In Ethiopia, there is shortage in all categories (Table 2) but more marked in Health Officers of which there are only 776 compared to 600 Health Centers, 40 district hospitals and some 550 woredas. This deficiency appears to be temporary as the number of health officers training is growing fast.

There is also a major shortage of pharmacists, with very few in the public sector with very high attrition towards the private sector. This shortage is an important factor that drags back the drug and supplies management component of the HSDP.

There is also clear shortage of dentists, of which there are only few in the public sector (declining steadily since 2001). Training has been started recently in new locations: for example in Jimma University.

Another marked shortage is for clinical specialists in all categories but marked in those for acute life-saving situations i.e. only 164 surgeons, and only 174 Obstetrician/Gynecologists. The concept of emergency medicine as specialty has not yet evolved into program.

Over all in all there are very few female workers - only 11% of medical doctors, 15% health officers are female. Even in nursing which, in most countries is dominated by women, only 29% were women and 49% of midwives were male (4).

Growth in the size of the workforce in the last decade has been relatively slow even though it was within HSDP plan for most categories (23, 28). While there was 8 fold increase in the number of health officers, there was a decrease in the number of health assistants (policy decision probably compensated by growth in junior nurses) and in pharmacists at least in the public sector (Table 2).

Table 2: **Number of Health Workers Available in Selected Years, Ethiopia (number in bracket indicate number per 100,000).**

Category	1983 EC (1990/91)	1989 (1996/7)	1994 (2001/2)	1995 (2002/3)		1997 (2004/5)		Growth % 1983-97	
	Total	Total	Total	Total	F(%)	Total	F(%)	Total	Per year
Health Officer	84	30	484(0.7)	631(0.9)	13	776(1.1)	15	824	59
Physicians	1658	1440	1236(1.8)	2032(2.9)	12	2453(3.4)	11	48	3.4
Nurses	3575	3114	12838(19.1)	14160(20.5)	46	18809(25.8)	48	426	30
Health assistants	10045	10625	8149	6856	36	6363	40	-37	-2.6
Pharmacists	377	156	118(0.2)	125(0.2)	18	191(0.3)	19	-49	-3.5
Pharmacy tech.	283		793(1.2)	1046(1.5)	25	1428(2)	23	405	28.9
Lab tech.		621	1695(2.5)	2145(3.1)	19	2837(3.9)	22		
X-ray tech.	238	139	247(0.4)	271(0.4)	13	491(0.7)	22	106	7.6
Sanitarians	389	657	971(1.4)	1054(1.5)	11	1312(1.8)	17	237	17
HEW						2737	100		

Source: Adapted from MOH Health Indicators, various years.

Little study has been undertaken on the impact of HIV/AIDS on HRH in Ethiopia but the few data available confirm that "AIDS now constitutes a new and irreversible brain drain" (29). There are indications that the toll among health workers could be high in terms of mortality, PLWHA, and burnouts (30, 31).

The distribution of health professionals is uneven between regions as demonstrated in Table 3. If we leave out the mainly urban 'regions' (Addis Ababa, Dire Dawa and Harari) the emerging regions seem to have a better population/professional ratio (Table 3). The reverse is true for specialists. Thus, in 1997 EC (true for most years) there was no specialist in Gambella and Afar and limited numbers in Benishangul Gumuz (5 public health specialists) and Somali (13 of which 4 public health specialists).

Many factors influence the geographical variation that is observed in health worker density. Areas with teaching hospitals and a population that can afford to pay for health services invariably attract more health workers than regions without such facilities or financial support. As a result, health worker density is generally highest in urban centers where teaching hospitals and higher incomes are most common (32).

Measures Taken by the Government to Alleviate the Problem

Policy, Strategy, Human Resource Management: HRH has always been a concern of the health sector but serious scrutiny of the problem started as part of the international movement in this direction. Recently, a Human Resource Development Framework (19) has been prepared indicating required number of different categories of health professionals in the coming five years. However, a specific HRH policy has not yet been developed.

The government has also taken some measures to motivate the health work force by establishing a rather comprehensive career structure and an improved salary scale (Table 4) and other incentives are under study or being tried in the regions. Whether these meet the vertical and horizontal mobility aspirations of the health workers over time will have to be seen. HSDP I evaluation (28) indicates some impact of the measures taken as complaints seem limited and attrition to the private sector seem to have subsided. However a more recent MOH document (19) implies that the measures "have not made significant inroad into the problems". There is little information on migration (brain-drain) in Ethiopia but there are clear indications that it is high and growing (33).

Available data indicate that "health sector salaries seem more or less in line with the minimum cost-of-living increases and are favorable relative to other factors. "Base salaries of health personnel increased by at least 21% from 1999-2003 in nominal terms (40% in real terms)' [9]. HR management is a dynamic process and there will be need to adjust to changing situations.

Some regions are taking specific measure (2 to 3 times more contractual salary and other benefits, for example, for surgeons in Gambella) to attract and retain scarce HR.

An audacious plan to achieve universal access to primary health care has been prepared and embedded in HSDP III. This plan aims to address the service coverage problem of the health system through an accelerated expansion and strengthening of primary health care services. It focuses on both physical availability and accessibility of essential health services by sufficiently reducing physical distance between primary health care facilities and health care users and by making essential health services available in the facilities. The prime target is expansion of essential health services to rural Ethiopia and enhancing health system inputs towards the achievement of the millennium development goals (MDGs) (20).

Table 3: **HRH distribution by region, 1997 E.C. (2004/2005)**

Profession	Tigray	Afar	Amhara	Oromia	Benishangul gumuz	SNNPR	Gambela	Somali	Harar	AA	DD	Central	NGO	OGO	Private	Total
HEWs	400 (9.5)	0	718 (3.9)	740 (2.9)	30 (4.9)	750 (5.2)	0	0	49 (25.9)	0	50 (13)	0	0	0	0	2737 (3.8)
Physicians	77 (1.8)	17 (1.3)	131 (0.7)	186 (0.7)	14 (2.3)	106 (0.7)	6 (2.5)	55 (1.3)	41 (21.6)	167 (5.8)	30 (7.8)	247	578	354	444	2453 (3.4)
Health Officers	108 (2.6)	11 (0.8)	115 (0.6)	149 (0.6)	12 (2)	118 (0.8)	15 (6.2)	15 (0.4)	4 (2.1)	2 (0.1)	6 (1.6)	13	42	134	32	776 (1.1)
Pharmacist	4 (0.1)	5 (0.4)	1 (0.01)	22 (0.1)	2 (0.3)	8 (0.1)	0	5 (0.1)	1 (0.5)	5 (0.2)	3 (0.8)	14	31	69	21	191 (0.3)
Nurses	1414 (33.5)	230 (16.9)	2004 (10.8)	3389 (13.1)	277 (45.5)	2336 (16.1)	248 (103.2)	385 (9.1)	214 (113)	610 (21.1)	190 (49.6)	713	912	5403	484	18809 (25.7)
Env't health	100 (2.4)	15 (1.1)	332 (1.8)	383 (1.5)	18 (3)	258 (1.8)	11 (4.6)	23 (0.6)	11 (5.8)	4 (0.1)	15 (3.9)	11	19	105	7	1312 (1.8)
Lab. technicians	154 (3.7)	36 (1.9)	259 (1.4)	502 (2)	26 (4.3)	336 (2.3)	12 (5)	57 (1.4)	20 (10.6)	96 (3.3)	29 (7.6)	80	355	586	299	2837 (3.9)
Radiographers	57 (1.4)	2 (0.2)	36 (0.2)	47 (0.2)	5 (0.8)	22 (0.2)	0	4 (0.1)	8 (4.2)	36 (1.3)	4 (1)	34	51	146	39	491 (0.7)
Pharm. technicians	232 (5.5)	5 (0.4)	174 (0.9)	283 (1.1)	14 (2.3)	189 (1.3)	0	18 (0.4)	12 (6.3)	36 (1.3)	12 (3)	29	62	322	40	1428 (2)
HA	879 (20.8)	58 (4.3)	980 (4.7)	1789 (6.9)	43 (7.1)	549 (3.8)	32 (13.3)	112 (2.7)	29 (15.3)	252 (8.8)	34 (8.9)	142	704	417	444	6363 (8.7)
FLHW	2867 (67.9)	218 (16)	1033 (5.6)	424 (1.6)	104 (17.1)	983 (6.8)	0	458 (10.9)	42 (22.2)	0	0	1	42	5028	0	11200 (15.3)
Total	**5892 (139.5)**	**587 (43.2)**	**4964 (26.7)**	**7174 (27.8)**	**515 (84.5)**	**4905 (33.9)**	**324 (134.8)**	**1132 (26.8)**	**382 (201.5)**	**1208 (41.8)**	**323 (84.2)**	**1284**	**2796**	**12564**	**1810**	**45860 (62.8)**

Numbers in parenthesis are professional to population ratio

AA=Addis Ababa; DD=Dire Dawa; NGO=Non-Governmental Organizations; OGO= Other Governmental Organizations; SNNPR= Southern Nations, Nationalities and People Region; HA=Health Assistant; FLHW=Front Line Health Workers

Table 4: **Career structure and salary scale MOH**

Base Salary 2006	Aids [i] *	Assistant [ii]	Technician [iii]	Technician I [iv]	Technician II [v]	Tutor [vi]	Professional [vii]	Specialist (Technical)	GP	Specialist (Medical)
426	J(10+1.5)									
502	"	J(12+1)								
595	S	"								
716	C	S	J							
850	E	C	"							
942							J			
990		E	S	J		JI				
1092						JII	"			
1145			C	"	J	"I, JII				
1255							S			
1310			E	S	"	SI, "II				
1435							C		J	
1500				C	S	CI, SII				
1635							E		"	
1707					C	CII				
1853							SE	J	S	
2075							CE	"	C	
2325								S	E	"
2645								C		S
3010								E		C
3430								Co		E
3865										Co

[i] Health Assistants; Technical Aids: Physiotherapy, laboratory, radiography

[ii] Assistant/Specialized/Advanced Specialized/Professional Clinical Nurse, Public health nurse, Midwife, Medical equipment maintenance man, Environmental health, Druggist, Lab technician, Radiographer, Physiotherapist, Ophthalmic technician

[iii] Assistant/Specialized/Advanced Specialized/Professional Clinical Nurse, Public health nurse, Midwife, Medical equipment maintenance man, Environmental health, Druggist, Lab technician, Radiographer, Physiotherapist, Ophthalmic technician

[iv] " Midwife, MCH, Psychiatry, Surgery, Ophthalmic etc, Druggist I (II for Advanced), Radiographer I(II for Advanced)

[v] " Midwife, MCH, Psychiatry, Surgery, Ophthalmic etc, Druggist I (II for Advanced), Radiographer I(II for Advanced)

[vi] Tutor: Nurse, Lab, Physiotherapy, Radiography, Environmental health etc I 12+ 2-2.5+1 in educational methods; II 12+2-2.5+ 2 years educational methods.

[vii] Specialist

Source: MOH Personal Communication. * J = junior, S = senior, C = chief, E = expert, SE = Senior Expert, CE = Chief Expert, Co = consultant, T = tutor

Ethiopia has recently established HRH Platform in April 2006, Observatory and Secretariat. National HRH Platform is an overall forum for consultation and wider involvement of all the potential stakeholders on HRH. National HRH Observatory deals with the details of HRH issues and gives operational inputs. The day to day activities of the observatory shall be dealt with by the HRH Secretariat. The Observatory plans to prepare HRH strategy and HRD plan soon. The activity has been in progress and is expected to solve most of the prevailing human resource crisis.

Training of health workers

Training Institutions[2]: There is an important drive to increase intake in higher education in general with intakes growing by leaps and bounds in the last few years. The new intake in 2006/7 academic year for example is over 41,000 compared to less than 10,000 a few years ago.

In HRH, 5 universities and the Defense Health College train a number of categories of health personnel (34). There are also 16 Senior Health Professional Training Schools (SHPTS) and 17 Junior HPTS (4).

Thirteen new higher education institutions, which will ultimately grow to universities, are being established. These institutions will be in Dessie/Kombolcha, Debrebirhan, Debremarkos, Nekempt, Bale-Robe, Nazareth, Sodo, Dilla, Mizan/Tepi, Jijiga, Semera, Diredawa and Axum. At the end of the planning period each of these new institutions will have a capacity to enroll 9 – 10 thousand students. (35) Nine of these will train health workers.

During HSDP II almost all training institutions have increased significantly their intake. Thus the number of graduates (Fig 2) has increased and will increase even more when the high intakes during HSDP II start to graduate in subsequent years.

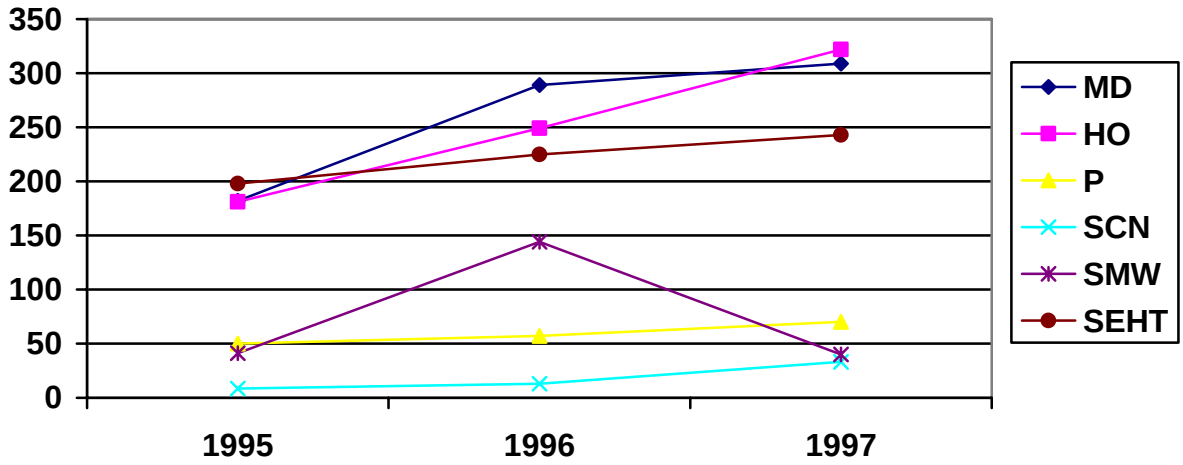
The enrollment in public and private institutions has increased. The number of clinical nursing, health officers and community health specialists has been increasing significantly. With the expansion of health centers and the responsibility of health officers to do emergency operations, the need for anesthetists is clear. In response anesthesiology has been started at Addis Ababa University (AAU), Jimma University and Gondar University. The other discipline with extreme shortage is dentistry and has been started recently. The uptake of students for medicine has been increased at the existing Universities and a new program started at Mekelle and Debub Universities. Pharmacy degree programs have started at Mekelle, Jimma and Gondar Universities in addition to the existing program in AAU. Jimma and Gondar Universities have started post graduate training in the major clinical specialties and the intake at Addis Ababa University has been increased.

An important concern is that faculty staff development has not gone at par with the high intake and might erode the quality of education. Thus, staff/student ratio in the health sector (1:9) is the same as in engineering. Even though lower than in other programs (e.g.1:55 in social sciences) the quality (level of expertise, experience etc) of the teaching staff is low and declining. For example, the proportion of PhD holders has declined in the universities as a whole (29). On the other hand, there are a number of new initiatives in the education sector related to the health sector (e.g. curriculum change in medical education, cost sharing in higher education [36]) in which MOH seem to play no role.

A major initiative during HSDP II is the Accelerated Expansion of Health Officers (HO) training in selected hospitals. All universities and some 20 selected hospitals are involved in an effort to meet the HO requirement by 2009. This is in response to the accelerated expansion of primary health care facilities. A total of 5000 HO are needed in the coming five years. However, the output of HO from the existing four universities (Alemaya, Debub, Gondar and Jimma) ranges from 200-300 graduates annually and there are only 683 HO currently working in the health system. With this pace it will take 15-20 years to adequately staff health centers and woreda health offices. Therefore innovative and cost effective approaches that will ensure the training of required number of health officers through accelerated training program in selected hospitals has been proposed (37).

The commencement of the Health Services Extension Program (HSEP) during the HSDP II aims to improve equitable access to preventive essential health interventions by deploying Health Extension Workers (HEWs) in each kebele. Reports indicate that 2767 were trained in 1996 EC and another 7090 in 1997. Training was carried out in Technical and Vocational Training Institutes/Centers in all regions except Afar, Gambella, Benishangul Gumuz and Somali regions. Training conditions were overall inadequate (Table 6). No text or reference material was provided to trainees. The quality of training in practical skills (practical and apprenticeship) was low and would need reinforcing by systematic in-service training/continuing education. (11)

[2] There are a number of institutions outside of the health and medical colleges that train health related workers (e.g. The Demographic Research and Training Center, The Institute of Development Research) but the focus here will be on those whose main goal is HRH.



Key: MD- medical doctor; P- pharmacist; SMW- senior midwife; HO- health officer; SCN-senior clinical nurse; SEHT- senior environmental health technician
Source: health and health related indicators, various years.

Figure 2: **Number of Graduates of Selected Health Workers 1995-97 (NB: SCN in 100)**

Table 5: **Summary of Student Enrollment in Public Institution, 2005**

	Year I		Year II		Year III		Year IV		Year V & above		Total	
	BS	F	BS	F	BS	F	BS	F	BS	F	BS	F
DEGREE STUDENTS												
Pharmacy	341	80	180	74	149	27	132	32	65	18	867	231
Anesthesia	82	13	31	15							113	28
Lab technology	305	78	365	90	202	33	44	3			916	204
Medicine	443	145	385	115	277	52	196	35	298	41	1599	388
Dentistry	90	28	32	8							122	36
Nursing	468	189	569	151	164	46					1201	386
Radiography	45	5									45	5
HO	322	106	484	75	193	35	99	25			1098	241
Env't health	242	44	300	28	109	8					651	80
Health edu.	79	20	39	10							118	30
Midwifery nurse			24	12							24	12
Physiotherapy			45	12							45	12
Health science	524	171										
DIPLOMA STUDENTS												
Nursing	132	58	288	122							420	180
Radiography			56	5							56	5
Pharmacy			131	21							131	21
Lab technician			36	2							36	2
Dental therapist			25	8							25	8
Env't health			32								32	

Source: Education Management Information Systems, MOE, December 2005, AA, Ethiopia

The number of private training schools has increased dramatically during the period. MOH inventoried 11 in three disciplines by 1997 (Table 7) but anecdotal data indicate there were many issues that necessitate adequate regulation and supervision.

Projected HRH Requirements to Achieve Development Goals in Ethiopia: Progress towards achieving the Millennium Development Goals (MDGs) has been poor so far; many countries and regions are out

Table 6: **Selected Indicators of Training Conditions of HEW 2005**

TVET	NO. Student	Class-room	Student/classroom	Number of Trainers[1]	Student/Trainer
Axum	200	4	50	4	50
Mekele	197	4	49	4	49
Dessie	396	8	50	11	36
D/Marcos	323	6	54	14	25
Assela	154	3	51	5	31
Fiche	150	6	25	5	30
Gobi	135	3	51	5	31
Shashemene	146	3	49	7	21
Butajira	375	6	63	5	75
Dilla	375	13	29	6	63
Average	**247**	**6**	**47**	**6.6**	**41**

Source: CN

of track, especially in Sub-Saharan Africa due to institutional weaknesses in these countries (38). Many countries in Africa are not progressing at a rate commensurate with the speed required to achieve the MDGs, for example, the maternal rate and child health targets by 2015. The child mortality in Ethiopia is improving only at 1.9 per year which is much lower than 5.2 per year-the rate which is required to meet the prescribed child mortality target by 2015 (39).

Based on existing evidences the UN Millennium Project has identified sets of health interventions which should be integral part of the health systems of countries in order to meet the MDGs in health. (40). Many of the interventions can be implemented by mid-level health professionals, while some interventions like such as provision of Anti retroviral therapy (ARV), comprehensive emergency obstetric care, neonatal interventions, multi drug resistant Tb heavily rely on the presence of well equipped health facilities and highly qualified professionals.

There are many methods of estimating human resources requirement in health but all have their advantages and disadvantages. It is important, however, that the human resource planning be in congruence with the structure of the national system which dictates the number, type and distribution of the workforce in health (19).

Therefore, the following estimates and projections of the human resource requirement in health are made based on the projection of the number of health facilities commensurate with the population growth till 2015. Some of the assumptions on which the estimates are based are the following.

- The public sector will remain the major provider of health service in the country. It is assumed that 100% coverage in health service delivery using all levels of health facility will be achieved by the year 2015.
- Even though, the workforce required to run specific interventions such as anti retroviral therapy ARV program in HIV have been estimated separately (Table 8), it is assumed that the HRH required for these initiatives will be subsumed in the general staffing standard.
- Although there is a standard of staffing pattern for private health facilities set by the government, the reality seems to be that none of them adhere to this standard. The private sector, as a profit oriented organization, defines the number and the mix of its workforce as dictated by the market. It is not uncommon to find a medium clinic run by a specialist physician, and a higher clinic run by a general practitioner without a specialist. Another common feature of the private clinics and hospitals is that they are largely dependent on part-time (from the public sector) or retired professionals. It is, therefore, assumed that the number and mix in the private sector will be of a much higher order than the standard set by MOH.

The atmosphere which nurtures the very existence and increase of private health facilities in the country is expanding rapidly. Consequent to the national economic growth, the livelihood of the populace is improving, rural business towns are emerging, and the demand for quality health service is growing more than ever. General practitioners have started to leave the public sector and open their own clinics in remote but economically booming towns in the country. Private hospitals are appearing in all regional towns. Therefore, contrary to the assumption of the MOH HRH framework document (19) that the expansion of private sector is limited and the market is saturated, the assumption in this paper is that the momentum of opening generic and specialized private health facilities in the country will continue in the foreseeable future. Therefore, a substantial proportion (5-50% depending on category) of total HRH is allocated to NGO and the private sector.

- It is expected that each training institution has/will evolve its own standard staffing pattern. Short of this information, an educated guesstimate is that 10-30% of the number in the health sector will be needed by the public training institutions. The demand by private training institutions is considered to be small at this stage because it is assumed that almost all will

continue to heavily rely on part-time instructors from the public institutions.

- Information on attrition rate form the health service is not well established. Factors involved include migration out of country, retirement, death, or leaving the profession. Attrition rate for each professional category has been estimated based on the reports on yearly HRH pattern from 1991-97 EC by FMOH. Significant change from the previous decade in attrition of health workers is not expected in the foreseeable future as high demand from the private and NGO sectors will persist and only limited mitigation in brain-drain is anticipated.

Table 7: **Number of Private Health workers Training Schools and Graduates 1997 E.C**

Type	Number of Schools	Number of Graduates
Clinical Nurse	11	1680
Druggist	5	415
Medical Lab Technician	2	36
Total	**11**	**2131**

Source: Adapted from MOH 2006

Overall, the attempt at projection of the required HRH for 2010 and 2015 could only be highly tentative and made only in the hope that it will stimulate further discussion and exploration.

Based on the above assumptions, the standard staffing patterns and indications given in the HRH Framework and HSDP III, the number of human resource required by 2010 and 2015 is projected in Table 9.

In projecting availability, the number of students in training mainly in the universities has been considered. This is a reliable source of information on the number doctors and pharmacists who will be graduating until 2010. However, reliable source of data is not available for the other categories because they graduate from regional training centers and private institutions. Therefore the estimation made by FMOH as reported in the Health Sector HRD Framework (2006-2010) is adopted. For the years beyond 2010, nine of the 13 new government universities are expected to start graduating students in health sciences holding degrees in nursing, public health, pharmacy; environmental health, and laboratory technology (35).

If our assumptions and the indications in MOH strategic documents hold true, Ethiopia will achieve the required number of professionals for most categories (Table 9). The attrition, under current conditions, is expected to be particularly high for physicians, health officers and pharmacists. This indicates the urgency to develop human resource management system and policy in order to retain a motivated health work force.

Production of clinical nurses seems very high, and, unless a corrective measure is taken early, it is possible that there will be over-production of nurses (even though the nurse/population ratio will not be very high). Therefore it would be wise to design ways of diversifying the functions of the nurse. One strategy could be to expand further the scope of practice of nurses. Nurses could, for example, be offered short trainings to run ART clinics at least at the health center levels and follow up clinics in hospitals. This could play a major role in mitigating HRH shortage as the huge burden of HIV treatment is due to the accumulation of patients for follow up (Table 8). Nurses could also provide midwifery services at all levels by either revising the curriculum or offering in-service training. Nurses, particularly BSc holders, could also take some of the responsibilities of health officers.

Human resource for ARV

HIV/AIDS poses a serious challenge to mitigating the HRH crisis. HIV/AIDS, on the one hand, drains the health system of its workforce, and on the other hand due to the increasing number of patients it gradually puts tremendous pressure on the remaining and diminishing health workers causing exhaustion, frustration, loss of morale and possible attrition from the system.

Interventions against HIV involve prevention, clinical care, and support of PLWHA and it demands the participation of a broad type and high number of professionals. With regards to HRH requirement, the most demanding task is running the clinical care part of the intervention.

The ART implementation guideline of FMOH of Ethiopia recommends that each ART site should be composed of two medical doctors, two nurses, two pharmacy professionals, and two laboratory professionals. At health center level the MD can be replaced by health officer. Therefore, the ARV delivery model is doctor based.

The guide line however does not put any fixed number of patients which should be served per day by each medical doctor. WHO performed a study on the workload and staffing pattern of Antiretroviral therapy (ART) sites in different Sub Sahara African (SSA) countries, and had demonstrated that the staffing pattern and work load

Table 8: **Number of health workers required to provide antiretroviral Therapy services in Ethiopia (2006-2015)**

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Population	77,431	79,289	81,176	83,091	85,033	86,998	88,988	91,001	93,034	95,087	97,155
Eligible for ARV	275,963	282,587	289,313	296,138	303,057	310,062	325,375	332,735	340,171	347,675	355,238
New enrollment	27,596	28,259	57,863	88,841	121,223	155,031	195,225	232,914	272,137	312,907	355,238
New and follow up	27,596	53,095	105,648	183,925	286,755	413,111	567,025	743,236	941,050	1,159,852	1,399,104
Doctors	69	133	264	460	717	1,033	1,418	1,858	2,353	2,900	3,498
Nurses	69	133	264	460	717	1,033	1,418	1,858	2,353	2,900	3,498
Pharmacy	32	126	239	371	521	516	709	929	1,176	1,450	1,749
Lab Tech	32	126	239	371	521	516	709	929	1,176	1,450	1,749

Assumptions:

- Prevalence of HIV in adult population is maintained at 4.4%.
- Eligible group for ART is determined to be 15% of adult HIV infected population.
- Enrollment for ARV is increased every year by 10% to reach 100% enrollment of all eligible population by 2015.
- One MD is assumed to see 400 new and on follow up patients per year, and.
- According to the FMOH an ART team will have at least one MD, One ART nurse, one pharmacist and one lab technician.
- Requirement for counseling in PMTCT and VCT is not included

Table 9: **Total number of health professionals available and required by 2015**

Category	All HRH in 2005	Estimated Graduate # 2006/10	Attrition* Number	Available by 2010	Requirement by 2010	Balance (e-d)	Estimated Graduate # 2011/15	Attrition* Number	Available by 2015	Requirement by 2015	Balance (i-j)
Physicians	2453	1600	1013	3040	4125	-1085	2500	1385	4155	9895	-5740
Health Officers	776	5000	1444	4332	3600	732	7665	2999	8998	4639	4359
Nurses	18809	22500	4131	37178	23631	13548	25500	6268	56410	42567	13843
Clinical Nurse	10517	17500	2802	25215	9585	15630	20500	4572	41144	17603	23541
Midwife Nurse	1509	2500	401	3608	4671	-1063	2500	1527	4581	7074	-2493
Anesthetist N	284	400	68	616	500	116	500	279	837	1592	-755
Assistant Nurse	6499	2500	900	8099	8875	-776	2500	2650	7949	16299	-8349
Lab. Technician	2837	3700	654	5883	4739	1145	5950	2958	8875	7517	1358
Pharmacist	191	870	265	796	490	306	2935	933	2798	945	1853
Pharmacy Tech.	1428	3000	443	3985	6105	-2120	4500	2121	6364	9121	-2757
Radiographers	491	450	94	846.9	810	37	750	399	1198	2598	-1401
Sanitarian	1312	1085	240	2157	173	1985	3085	1311	3932	612	3320
Health Extension	2737	36000	3874	34863	33200	1663		8716	26147	38862	-12715
	a	b	c	d	e	f	g	h	i	j	

*Attrition Number=the number of health professionals expected to leave the public sector in five year (2006-10). Attrition number was calculated from the FMOH data that shows about 5% attrition rate per year for physicians and health officers, 3% for other health workers.

Source: Health & Health Related Indicators (2000-05)

varies considerably across countries. The number of patients on ART per full-time equivalent (FTE) doctor varied between 700 per doctor in Botswana and 50 patients per doctor in Kenya (41).

USAID has done a human resource and financial requirement for scaling up of HIV Service in Ethiopia using the funding from PEPFAR. The projection of HRH for ART considers that each year starting 2006 the enrollment will be increased by 10% each year to achieve 100% coverage of ART to all eligible adults. It does not include pediatric age group in the estimation of eligible candidates. About 15% of the adult PLWHA are considered eligible for ART and death rate among those who started ART is considered.

As depicted in Table 8 the number of physicians required to achieve a 50% and a 100% of coverage in ART by 2010 and 2015, will be 1033 and 3498 doctors, respectively. In other words 34% and 84% of the doctors will be fully occupied in running the ARV service. This will absolutely lead to the crowding-out of other non-HIV infected patients.

The total pool of nurses by 2015 is expected to satisfy the need for ART nurses. The demand for counselors to run VCT services however could be large in number and may cause diversion of a significant number of nurses from the general health services.

Concluding Remarks

HRH Policy, Strategy: Both the causes and the solutions of human resource problems in the health sector are complex. The problems are rooted in political, economic, cultural, and health systems. The solutions depend on numerous inputs - funds, education and training programs, data and working conditions - over which HRH policy makers often lack direct control (42).

A number of documents have indicated that there is poor HRH management system in Ethiopia. The absence of adequate HRH policies has been shown as being responsible, in many countries, for a chronic staffing imbalance with different effects on the health work force and the health system in general: quantitative mismatch, quality disparity, unequal distribution, and a lack of coordination between population needs and the management of the human resources available. Putting human resources issues on the political agenda would enable these disparities to be addressed (2). WHO has proposed a ten year action plan to resolve HRH problems, bringing forth national leadership backed by global solidarity. The components of the framework are policy, health workforce management, finance, education, partnerships and leadership. This framework can be adapted for use for our country.

HRH policy should be formulated as soon as possible. Establishing sound HRH information system is vital for the policy formulation process. The process of policy formulation is critical for its adoption and implementation. Four components of the process have been identified as influential: 1) consultation with key stakeholders, 2) ownership by the country, rather than being donor driven, 3) based on sound data, and 4) supported by adequate human and financial resources (42). Encouraging steps have been taken in this regard by the FMOH. The FMOH has developed a HRD Framework and the government has adopted HSDP III. These are important instruments for HRH development in the short run. There are plans to develop, through the HRH Observatory, an HRH Strategy. However, the development of an HRH policy has been put on the low burner. This seems to be due to reluctance to go through the long and arduous process of adopting policy papers through the Prime Minster's Office and Parliament. It might be useful to consider the development of what could be termed a 'policy guideline' - a document with the same role as policy but to be approved at MOH level with the necessary consultation with all stakeholders including higher government hierarchies. A number of African countries have effectively used this approach.

The 'policy guideline' should have clear statements on 1) professional standards, licensing and accreditation; 2) authorized scopes of practice for health work force categories; 3) political, social and financial decisions that affect HRH; and 4) employment law and rules for civil service (43). It should, among others, lay the ground for flexible management of HR; establish public-private partnership so that some interventions can be contracted out to the private sector.

HRH Number and Mix

Staffing pattern: The current staffing pattern is rigid with no guidelines for adapting to local reality. Consequently the staffing of a health centre, for example, in a densely or sparsely populated areas are the same. The proposed division into two grades (19) will only solve the problem partially. There is no provision for starting with lower complement in a new setting and increasing as workload increases. In general the staffing norms are not based on specific workload.

Under this circumstance, the regions are creating their own staffing patterns. While the merits of adapting to local conditions in as divers a country as Ethiopia is recognized, there is clear and immediate need for guiding the process in order to avoid unnecessary mismatch and competition among regions.

The HRD Framework (19) assumes eight and five technical staff for grade one and two health centers respectively a substantial drop from the current 13 staff. Covering the necessary services with this low level of

staffing seems improbable. For example in a type A health center, if there is an operation to be done, minimum of four people are required. The remaining four will not be adequate to run the other services of health center. The limited number could also mean highly reduced level of service most of the year when staffs take their annual and other leaves. Another limitation is that the staffing doesn't include anesthetists where as (some) health centers are expected to provide comprehensive emergency obstetric care.

HSDP III envisages the assignment of midwives at health post level. While the intentions are commendable, it does not seem feasible with the present midwife training capacity.

Training: Large number of professionals is expected to be trained in the coming decade. The challenges in producing these professionals will be that the existing and upcoming universities and colleges themselves require high quality instructors which will be difficult to recruit and retain. As is, the quality/appropriateness of the training programs has been questioned[3]. Concerns include the lack of team training even though the policy (5) and the curricula of certain training institutions (previously Gondar and more recently Jimma) stress the importance of team planning and training. However, the practice is still working in the 'silos' of profession specific approaches. The curriculums also need revision to reorient training from body system focused to problem based which is currently the preferred approach. This is particularly so for professionals like health officers, nurses and mid wives.

Mono-valent health workers, in 'nursing' in particular are considered dysfunctional and expensive as they create too many categories of often under-trained cadres as in nursing. Most regions would prefer polyvalent workers who can cover several functions and act as substitutes and it seems that they are tacitly being phased out.

Major effort is required in preparing teaching aids: books relevant particularly to mid-level professionals as these are inadequate/inexistent in many fields in spite of commendable beginnings through the Carter Center.

Training of health professionals is skill based and needs an adequate exposure to adequate number of patients (like attending delivery or operation). With the current health service utilization rate and the hospital bed number in the country and the desired high number of production, it is likely that many students will be released without getting the basic clinical skill to work independently.

Graduate program enrollments are rising rapidly in the effort to boost the supply of academic staff for the expanding system. The enrollment at AAU was increased and new programs started at Jimma and Gondar Universities. All existing diploma programs (50% of public enrollments in 2003) are being transferred to technical colleges over the coming two years so that universities may concentrate on degree training. (29) The over all principle when applied to health sciences should be assessed carefully. Universities have stopped training nurses, pharmacy, laboratory and environmental health technicians at diploma level. The accelerated expansion of primary health care facilities requires a large number of these categories. The degree program is time consuming and the Human Resource Development Framework envisages very few of them in the health system. It is, therefore, important to ensure that diploma training programs for technicians is given the appropriate place in the training system.

The regional mid-level training institutions have been producing professionals at diploma and certificate level. Training at certificate level is phasing out. Most centers have started upgrading the junior professionals and health assistants. These are commendable measures because it would be difficult for students to acquire the necessary skills in just one year in mostly crowded situation. It proved difficult to get information on the enrollment in mid-level training institutions except for Oromia, (44) as the situation is evolving rapidly in the different regions.

The number of midwives trained is relatively low. The regional institutions have increased the uptake (example Oromia, 44) but the required number for 2010 seems not achievable unless their training is also accelerated.

A final consideration is whether Ethiopia can achieve its development goals including MDGs with the strategy being followed. The main components for achieving these goals in the health sector are the accelerated expansion of primary health care with accelerated training of Health Extension Workers (HEWs) and health officers. The goals (even those related to maternal mortality) seem achievable if the accelerated expansion programs are achieved as planned with the anticipated quality levels (in training and staffing).

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[3] This is a perennial issue in HRH in Ethiopia often a headline in journals and newspapers (What kind of a 'doctor' does Ethiopia need?). There have been continuous shifts (for example, from HO to nurse practitioner back to HO), often as part of the many paradigm shifts on the international scene (45, also 46 for brief discussion).

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