The National Regional State of Tigray
Bureau of Health

Tigray Regional Health Bureau
Ten Years Health Bulletin (EFY 1998-2007)

Mekelle, Ethiopia
November 2008 EC

CDC Centers for Disease Control and Prevention
Tulane University

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MESSAGE FROM THE BUREAU HEAD

The Tigray Regional Health Bureau envisions seeing healthy, productive and prosperous people in every household of Tigray, through delivering the comprehensive package of promotive, preventive, curative, regulating, palliative, and rehabilitative health services within a decentralized and democratized health system that fosters the full ownership and empowerment of the community. In the last ten years, health has been at the center of regional, national, and global development agendas. As a result, all of the health related MDGs have been achieved in Tigray Region as of 2007 EFY (2015 GC) as per the set target. Child mortality (MDG4) dropped from 204 deaths per 1,000 live births in 1983 EFY (1990 GC) to 67 deaths per 1000 live births by 2005EFY (2013 GC), a 67% decrease. The region achieved MDG5 based on the estimation of WHO, UNICEF, World Bank, and UN, realizing a 72% reduction in maternal mortality ratio from 1250 deaths per 100,000 live births in 1983 EFY to 353 deaths per 100,000 live births in 2007 EFY. Research conducted in 2007 EFY found an MMR of 266/100,000 live births using community-based survey methods. Similarly, MDG6 was achieved successfully through halting and reversing the spread of HIV, malaria, and other communicable diseases, and ensuring universal access to treatment of HIV/AIDS.

The flagship Health Extension Program, the community engagement made possible by the Women's Development Groups of the Health Development Army, the involvement of civic societies such as Women's and Youth Associations, the full commitment of our development partners, and the persistent courage and effort from our health professionals have all

contributed enormously to the health related gains seen in Tigray over the past ten years. Governmental commitment and political engagement at all levels has been demonstrated through the design and implementation of the twenty years Health Sector Development Program [1996-2015 GC] and the first Growth and Transformation Plan [2011-2015 GC].

Going forward, our focus will inevitably shift from mere coverage of health services towards improvement of the quality and equity of health services across the region. The TRHB will continue to strive to achieve the global targets stated in the Sustainable Development Goals as well as the second GTP[2016–2020 GC] and the comprised Health Sector Transformation Plan. Therefore, we have prepared this bulletin in order to present the ten years health profile of the Tigray Region and the important lessons learnt to date, believing that by recognizing the legacy of the past we can create a shared vision to shape the future.

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ACKNOWLEDGEMENT

TRHB would like to extend its heartfelt appreciation for the respected people of Tigray, who have taken full ownership of health related initiatives during all the ups and downs in the last ten years. Due credit is owed to the health care providers and managers at all levels, the region's dedicated Health Extension Workers, Women's Development Groups, and political leaders. TRHB also wishes to recognize all of its committed development partners (UN Agencies, CDC, USAID, Irish Aid) with special thanks to the Italian Cooperation, which has been the right hand of TRHB over the past ten years. Thanks to Ato Yayneshet Gebreyohanes, Ato Estifanos G/Meskel, Ato Solomon Nigusse, and Wrt. Hannah Yang for their editorial support in preparing this bulletin.

ACRONYMS AND ABBREVIATIONS

ANC	Antenatal Care	HSTP	Health Sector Transformation Plan
ART	Antiretroviral Therapy	IPLS	Integrated Pharmaceuticals Logistics System
BEmONC	Basic Emergency Obstetric and Neonatal Care	IPT	Isoniazide Prophylactic Therapy
BPR	Business Process Reengineering	ISS	Integrated Supportive Supervision
CBHI	Community Based Health Insurance	KPI	Key Performance Indicator
CBNC	Community Based Newborn Care	ICCM	Integrated Community Childhood Management
CEmOC	Comprehensive Emergency Obstetric Care	IMNCI	Integrated Management of Neonatal and Childhood Illnesses
CHIS	Community Health Information System	MDG	Millennium Development Goal
DBS/PCR	Dried Blood Spot/Polymerase Chain Reaction	MDSR	Maternal Death Surveillance and Response
DOTs	Direct Observation Treatments	MNCH	Maternal, Neonatal, and Child health
EC	Ethiopian Calendar	NASG	Non Pneumotic Antishock Garment
eHMIS	Electronic Health Management Information System	NICU	Neonatal Intensive Care Unit
EHRIG	Ethiopian Hospitals Reform Implementation Guideline	ODF	Open Defecation Free
EMR	Electronic Medical Record	OPD	Outpatient Department
ePHEM	Electronic Public Health Emergency Management	OPV	Oral Polio Vaccine
EPHI	Ethiopian Public Health Institution	PFSA	Pharmaceutical Fund and Supply Agency
EPI	Expanded Program on Immunization	PHCU	Primary Health Care Unit

ANC	Antenatal Care	HSTP	Health Sector Transformation Plan
FMOH	Federal Ministry of Health	PITC	Provider Initiated Testing and Counseling
GC	Gregorian Calendar	PLHIV	People Living with HIV/AIDS
GTP	Growth and Transformation Plan	PMTCT	Prevention of Mother to Child Transmission
HC	Health Centre	PNC	Postnatal Care
HDA	Health Development Army	PPM	Public Private Mix
HCT	HIV Counseling and Testing	RDF	Revolving Drug Fund
HEP	Health Extension Program	RDT	Rapid Diagnostic Test
HEW	Health Extension Worker	SHI	Social Health Insurance
HIT	Health Information Technicians	TRHB	Tigray Regional Health Bureau
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome	VCT	Voluntary Counseling and Testing
HMIS	Health Management Information System	VOD	Veno-occlusive Disease
HRH	Human Resources for Health	WDG	Women's Development Group
HRIS	Human Resource Information System	WHO	World Health Organization
HSDP	Health Sector Development Program	WoHO	Woreda Health Office

INTRODUCTION

Tigray Region is one of the nine regional states of the Federal Democratic Republic of Ethiopia located in the northern part of the country. It is bordered by Eritrea to the north, Sudan to the west, Afar Region to the east and Amhara Region to the south. The total area of the region is about 54,569.25 km² and the elevation ranges from 600-2700 meters above sea level. There are 7 administrative zones including one special zone, Mekelle Zone (Figure 1). The region has 52 Woredas (34 rural and 18 urban) and 814 Kebeles (753 rural and 61 urban). The climate of the region is characterized as 39% kola (semi-arid), 49% woyna dega (warm temperate), and 12% dega (temperate), seeing an annual rainfall ranging from 450 to 980mm. According to the 2007 EC census projection, the region has a total population of 5,055,999 (49.2% male and 50.8% female). The road network includes 4,949km of dry weather roads, 2,522 km of all weather roads, and at least 497 km of paved road. The national grid provides 100% of urban and 15% of rural regional electricity coverage.

Figure 1 Map of Tigray Region

HEALTH SERVICE COVERAGE

The Ethiopian health system is structured into a three-tier system with the primary care level comprised of Health Posts, Health Centers and Primary Hospitals, the secondary care Level including General Hospitals, and the tertiary care level of Specialized Hospitals (Figure 2). TRHB has emphasized health promotion and disease prevention by investing heavily in PHCUs over the last decade, constructing new facilities as well as upgrading them to the next level. As of 2007 EFY, the region has reached overall primary health care coverage of 96%with a total of712 health posts,204 health centers, and 20 primary hospitals in 2007 EFY (Figure 3).Secondary and Tertiary level health services are delivered in the public sector through 1 public specialized referral hospital and 15 public general hospitals, and there are around 500 health facilities operating in the private sector (Table 1).

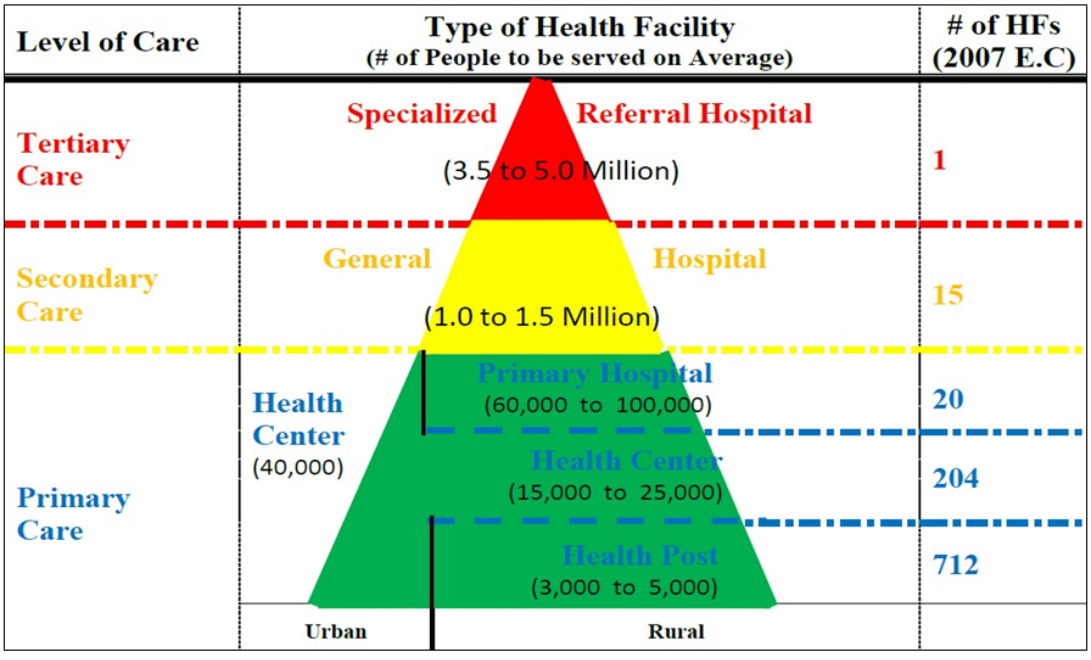
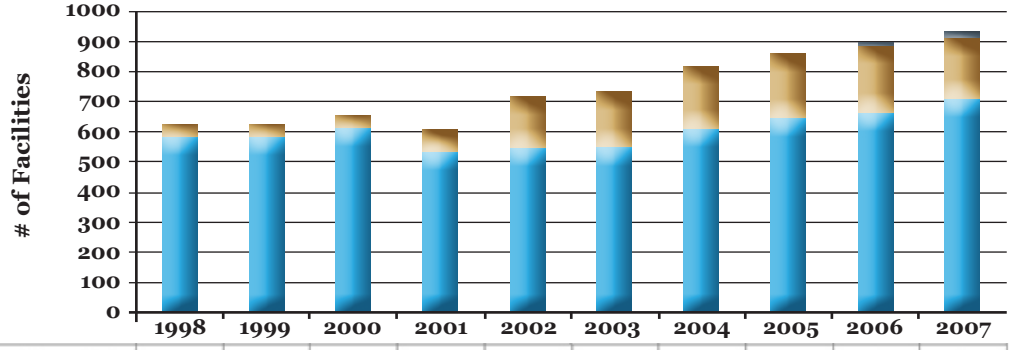


Figure 2 The three-tiered health system and number of public health facilities in Tigray



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Primary Hospitals									7	20
Health Centers	40	42	40	70	170	183	211	214	224	204
Health Posts	586	589	614	538	552	552	613	650	668	712

Figure 3 Primary Healthcare Facilities in Tigray, 1998-2007 EFY

Table 1 Private Health facilities 2003-2007 EFY

Type of Facility	2003	2004	2005	2006	2007
Hospitals	4	3	3	3	2
Specialty Clinic	0	0	0	0	2
Clinics all types	166	167	170	192	187
Medicine retail outlets	248	308	310	301	431
Diagnostic Lab	8	8	11	11	7

TIGRAY HEALTH RESEARCH INSTITUTE

The Regional Health Bureau has also been actively engaged in the establishment of the Tigray Health Research Institute, which was initiated in 2006 EFY and is in the final stages of staff recruitment as of 2007 EFY. The establishment of the institute is meant to serve as a center of excellence in conducting basic and operational research and deliver advanced diagnostic services. Moreover, capacity building to the health work force will be carried out on need basis and new research findings

Photo 1 Tigray Health Research Institute

LEADERSHIP AND GOVERNANCE

POLITICAL COMMITMENT

The constant political commitment demonstrated by the government of Tigray Region over the past ten years has been exemplary, including budget allocation for the health sector, ratification of free maternity services, deploying ambulances across the region, allowing the private health sector to flourish, and continually building the region's human resources for health.

HEALTH DEVELOPMENT ARMY

The Health Development Army (HDA) philosophy was introduced in the last five years and integrated with the PHCU structure it has proven to be a powerful mechanism through which to achieve the targets set in HSDP-IV, GTP-1, and the MDGs. The advantage of the HDA approach is its capacity to create strong linkages through integrating community involvement with the government health care system and political leadership structures, conceptualized as three pillars in Figure 4.

At the core of Pillar 1 (community involvement) are the WDGs, which contribute immensely to the health sector as well as other development areas through their communication and mobilization capacity. WDGs are the cornerstone of community ownership in Tigray, creating demand for health, wellness, and improved access to health care services through organized voluntary groups of women. Each WDG is composed of 25-30 women, and within each WDG there are 5 sub-groups called 1-to-5 networks which have 1 democratically elected network leader and 5 members (Figure 5). As of 2007 EFY, 917,072 (99.3%) women are organized under 29,920 WDGs and 136,997 one-to-five networks.

Photo 2 A rural Women's Development Group meeting

The WDGs are integrated under the government health care system (Pillar 2) PHCUs as shown in Figure 5, with the leader of the WDG working closely under the HEWs at HP level. In this way, the WDGs are considered as the "blood line" for successful implementation of the HEP. The main activities of WDG in supporting HEP implementation are:

- Preparing a community profile based on identified gaps, creating an action plan, and conducting weekly performance evaluation for individuals and networks based on HEP package areas: Family Health, Nutrition, Malaria, HIV/AIDS, and WASH
- Conducting regular discussions about their health needs
- Follow up and support for pregnant women to ensure the continuum of care from pregnancy to postnatal
- Supporting the community referral system by organizing traditional ambulances
- Providing need-based psychosocial support to the community
- Conducting review meetings to monitor and evaluate their day to day activities

Political leadership (Pillar 3) is realized through Kebele level steering committees and command posts ensure that household leaders are involved in the administration of health centers and health posts, cascading upwards to command posts and steering committees at woreda and regional level. Health facilities governing boards tie all three pillars together by including representatives from Zonal and Woreda executive organs, Women's and Youth Associations, religious leaders, and elders, as well as holding community conferences to discuss issues and develop local solutions.

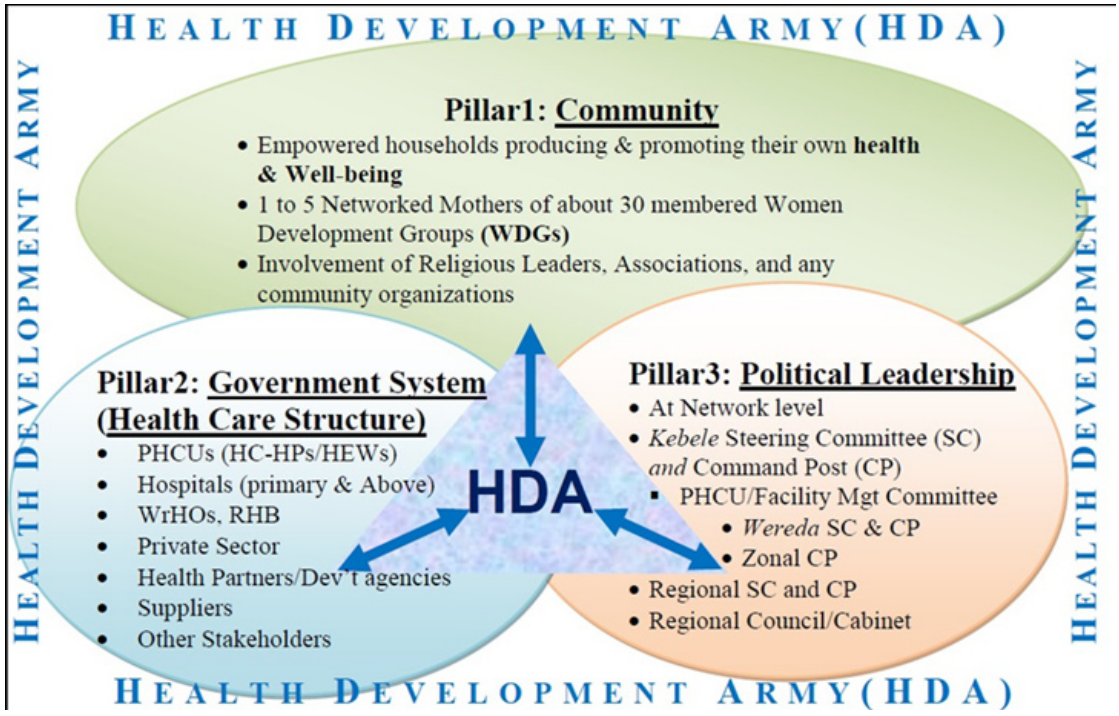


Figure 4 The HDA Concept in Tigray Region

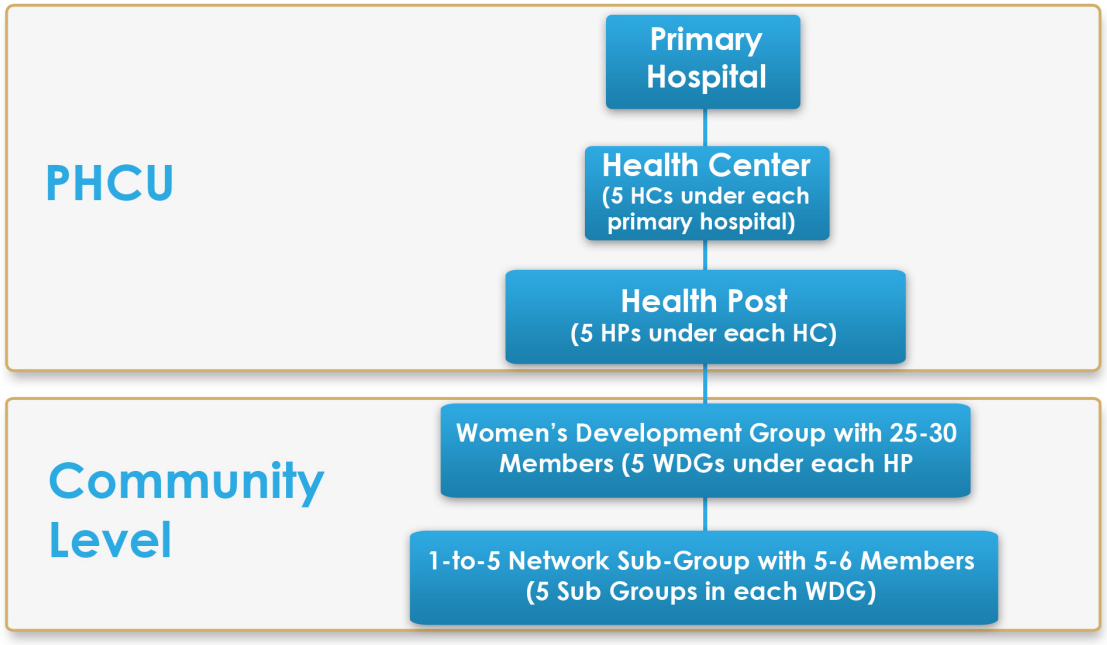
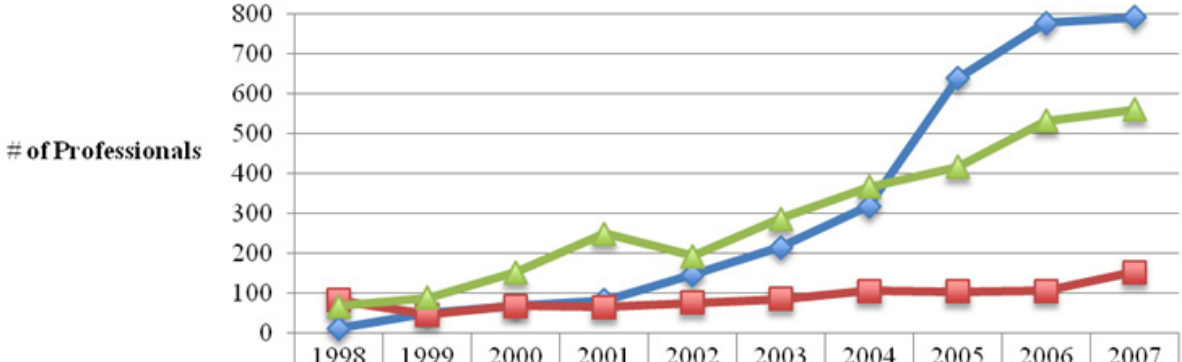


Figure 5 PHCU and Community Networking

HEALTH WORK FORCE

Ensuring demand driven production of human resources is one of the most important concepts to achieve health goals. In this regard, TRHB has worked hard to meet the human resource needs of the health sector, with increased deployment of health professionals observed especially within the last four years (Figure 6). WHO provider-to-population ratio standards have been met for nurses, but the ratios of midwives and physicians remain below the standard as seen in Table 2. As of 2007 EFY there are 51 specialist doctors, 87 general practitioners, 15 specialist surgeons, 3067 nurses, 792 midwives, more than 1914 HEWs (202 urban, 1712 rural), and other professionals providing preventive and curative services in the region. Each HP in Tigray is staffed with at least two HEWs, each HC is staffed with midwives, nurses, and health officers, and each primary hospital is staffed with one integrated emergency surgery and obstetrics officer to provide emergency obstetric surgery, among other professionals. The region has also targeted to deploy a minimum of one general surgeon and one gynecologist in all general and referral hospitals, among other professionals.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Midwives	13	52	70	84	147	217	319	639	778	792
Physicians	84	47	69	66	77	86	107	105	107	153
Health Officers	70	90	154	251	195	288	367	418	534	562

Figure 6 Tigray Region HRH Distribution by category, 1998-2007 EFY

Table 2 Health Professionals in Tigray Region

Category	WHO Standard	Tigray Provider to population ratio	Number of Health Professionals by Year	
			1998 EFY	2007 EFY
Physicians	1: 10,000	1: 36,637	84	138
Midwife	1: 2500 women	1: 3140	13	792
Nurse	1: 4,725	1: 1,648	1,379	3067

HEALTH CARE FINANCING

In the last ten years, Tigray Region has demonstrated the fullest support and commitment to strengthening the financial capacity of the health system by mobilizing and efficiently utilizing internal and external resources. As shown in Figure 7, the annual regional health budget allocated and utilized has increased dramatically since 1998 EFY, especially after 2003 EFY due to health facility infrastructure expansions including upgrading of 20 Health Centers to Primary Hospitals and upgrading of 13 Health Posts to Health Centers. In addition to the governmentally allocated budget, hospitals and health centers also maintain their own budgets managed by the facility governing board.

In order to ensure quality of care, create long-term sustainability in health system financing, and bring national self-reliance in health development, and also the government of Ethiopia has committed itself to introducing two schemes of health care insurance. The CBHI scheme that addresses people in the informal sector was successfully pilot tested in 3 Woredas of the region starting in 2002 EFY, and is currently being scaled up to 15 Woredas. The SHI scheme that addresses people in the formal sector and is implemented on a payroll basis is not yet implemented.

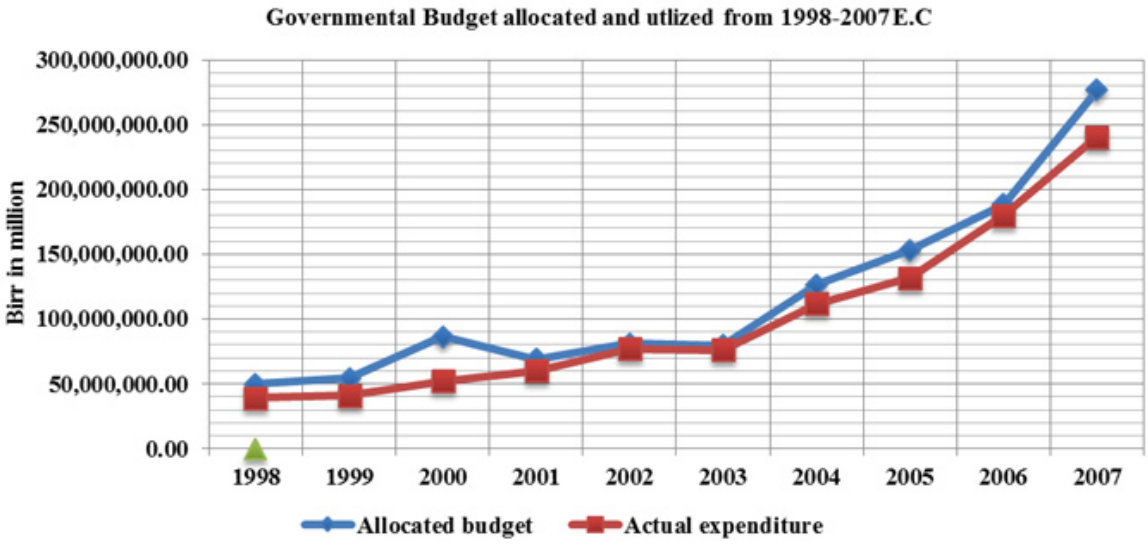
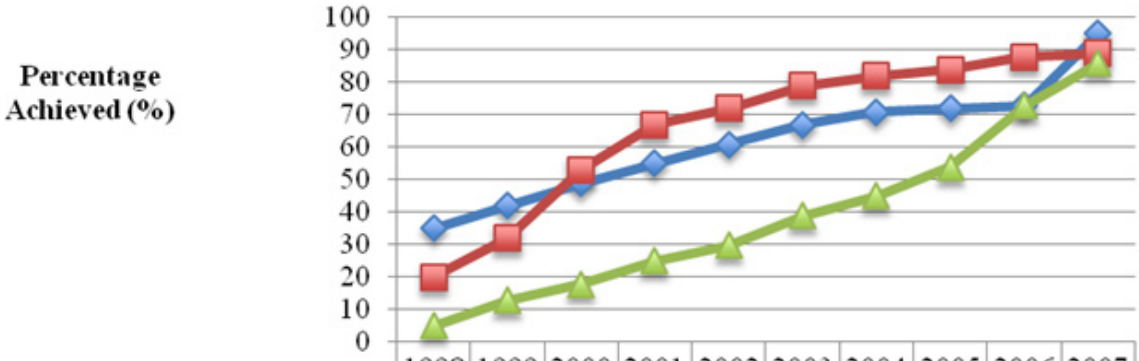


Figure 7 TRHB Governmental budget allocated and utilized from 1998-2007 EFY

HYGIENE AND ENVIRONMENTAL HEALTH

Over the ten-year period there have been substantial improvements in household level hygiene and sanitation as seen in Figure 8. Access to safe water supply, access to excreta disposal, and latrine utilization have all increased dramatically, but the levels are not yet satisfactory. 461outof814 Kebeles(57%)havebeendeclared"OpenDefecationFree" as of2007 EFY.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Access to safe water	35	42	49	55	61	67	71	72	73	95
Access to excreta disposal	20	32	53	67	72	79	82	84	88	89
Latrine Utilization in HH	5	13	18	25	30	39	45	54	73	86

Figure 8 Household level hygiene and sanitation in Tigray Region, 1998-2007 EFY

Various efforts have been undertaken to address the water, sanitation, and hygiene problems at health facilities and schools in collaboration with WASH partners. In this regard, the Regional Water Resource Bureau has initiated water supply projects at 46 PHCUs. Latrine facilities are also under construction in 10 schools, 36 Health Facilities, and 9 public places.

BEST PRACTICE IN SANITATION PROMOTION

MARKETING TO CREATE JOBS AND PROMOTE SANITATION

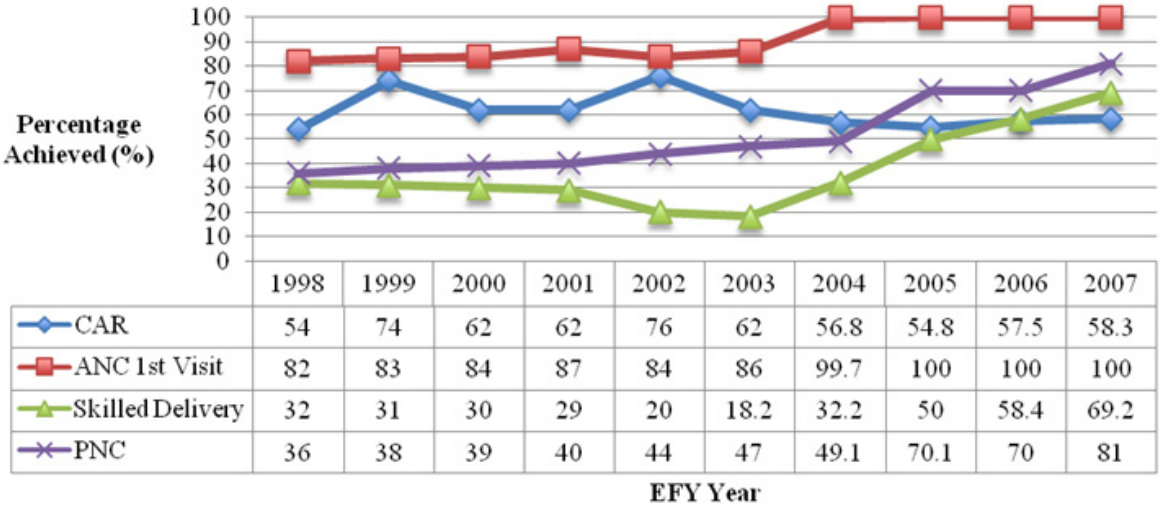
The application of marketing principles to sanitation promotion is a fairly new approach used as a business model to create job opportunities for unemployed women and youth, while simultaneously improving the status of sanitation. The goal of sanitation marketing is to increase the demand for and uptake of improved sanitation, and establish a sustainable supply mechanism for users to gain access to improved sanitation. In 2007 EFY, Medebay Zana WoHO and Small and Micro-enterprise Office supported 10 women from different WDGs in Selekleka town to organize legally and begin selling slabs for building improved latrines. The WoHO mobilized a supply of slabs and community members collected the initial business investment to finance the purchase of the slabs amounting to 11,500.00 Birr. In addition, the Woreda administration provided the women with a workplace, a casted yard for slab production, and a store as a support and motivation for the women to achieve specific activities. A four-day training on hygiene and sanitation and sanitation marketing was also provided in partnership with World Vision Ethiopia. The slabs are now being produced at reasonable and affordable cost of 150.00 birr or "one slab is equivalent to the cost of two hens" –yielding a profit of 20 birr per slab. The design of the slab is 60 cm width by 90 cm length by 5 cm thickness. Within 6 months, the group produced 350 slabs and 301 were sold to the community. This venture created job opportunities and the community benefitted from the affordable cost. Most importantly, 301 households were transformed from using traditional latrines to using improved latrine. This practice is an important input and lesson for national, regional, and other WoHOs.

Photo 3 A group of women produce slabs for building improved latrines

HEALTH SERVICE DELIVERY

MATERNAL HEALTH

Tigray Region saw a 72% reduction in maternal mortality ratio over the past 25 years from 1250 deaths per 100,000 live births in 1983EFY to 353 deaths per 100,000 live births in 2007EFY. A recent research study conducted in 2007 EFY found an MMR of 266 deaths per 100,000 live births using community-based survey methods. The reduction in maternal mortality has resulted from greatly improved coverage of the four primary maternal health services (family planning, ANC, institutional delivery, and PNC) in the last ten years as seen in Figure 9, although increasing the contraceptive acceptance rate and institutional delivery rate have been particularly challenging. For the past three years, full coverage of ANC 1st Visit has been achieved, however, only 56% of mothers attended 4th ANC visit in a health facility in 2007 EFY.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CAR	54	74	62	62	76	62	56.8	54.8	57.5	58.3
ANC 1st Visit	82	83	84	87	84	86	99.7	100	100	100
Skilled Delivery	32	31	30	29	20	18.2	32.2	50	58.4	69.2
PNC	36	38	39	40	44	47	49.1	70.1	70	81

Figure 9 Maternal Health Indicators in Tigray, 1998-2007 EFY

Over the last ten years, the TRHB has undertaken integrated strategies for reduction of maternal death and improved maternal health service access including:

- All types of maternal and newborn care services were exempted from payment at all levels of health facilities, as of 2004 EFY
- MDSR was implemented in 2004 EFY and adapted as MPNDSR in 2007 EFY as an awareness, accountability, and capacity building mechanism
- Blood banks and distribution networks were established in Mekelle (2004 EFY) and Axum (2005 EFY) in order to maintain a supply of blood for mothers
- 156 ambulances have been procured and distributed throughout the region, including 35 procured through community contribution fund-matching agreement, as of 2007 EFY
- 189 facilities provide BEmONC services and 25 facilities provide CEmOC services, as of 2007 EFY
- NASG technology introduced in 2004 EFY to reduce maternal death due to post-partum hemorrhage
- Moreover, all the Woreda administrative bodies have decided any sector vehicle to give free service to laboring mothers to bring to nearby health facilities.

TRHB and it's partners provide need-based and schedule-based trainings as well as conducting regular quarterly integrated supportive supervision in order to empower health care providers according to the updated clinical guidelines and protocols for the management of maternal health and enable them to acquire core competencies to provide comprehensive and quality MNCH services. In addition, the HEWs and WDGs support social mobilization in the community to increase the uptake of HCT and PMTCT services, reduce harmful traditional practices, and reduce underage marriage.

Maternal Death Surveillance and Response (MDSR) was introduced nationally in 2004 EFY as an awareness, accountability, and capacity building mechanism. The absolute number of maternal deaths reported through MDSR decreased from 217 in 2004 EFY to 122 in 2007 EFY (Figure 10). In 2007 EFY, TRHB launched Maternal, Perinatal, and Neonatal Death Surveillance and Response (MPNDSR), which incorporates neonatal and perinatal deaths as an ongoing strategy for improving maternal and newborn health comprehensively.

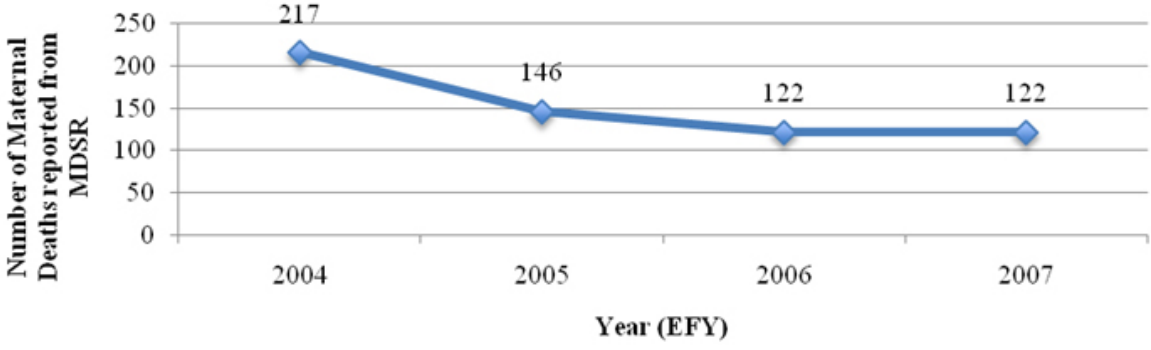


Figure 10 MDSR Maternal Death Capture, 2004-2007 EFY

YOUTHS ORGANIZING AS TRADITIONAL AMBULANCE

Transportation plays a vital role in the attainment of MDG 4 and 5. Youths in some areas have organized themselves under the theme of "a mother should not die while she gives life" and schedule themselves to serve as "Traditional Ambulances" for laboring mothers. These youths have made stretchers from locally available materials and carry the laboring mother on their shoulders to the nearby health facility or to a place accessible by vehicle ambulance. The mobile phone number of the youth group is written boldly over the back of the local ambulance/ stretcher. The estimated time of delivery of each pregnant mother is given in written form to each youth group, so that they are ready to carry laboring mother. In most areas, youths have even registered and scheduled to donate blood to save the lives of pregnant mothers.

Photo 4 Traditional ambulance

WDGS MAKING HEALTH FACILITIES "MOTHER FRIENDLY"

According to local assessments, one of the reasons why mothers were choosing to deliver at home rather than at health institution was due to the absence of traditional ceremonies in the health facilities. For example, if a mother does not immediately eat locally made porridge "Ge-at" after delivery, she is believed to be in danger of being touched by evil. To address this belief, the WDGs started a community initiative to contribute cereal grains, flour, and money to the nearby health centers for the preparation of porridge for mothers delivering at the facility. This idea was a break through for delivering mothers to feel at ease and eventually bring about community ownership of the health facilities.

Another reason why mothers were delivering at home was lack of network coverage and lack of transportation to facilitate their travel to the health facility when delivery was imminent. Especially in areas with difficult topography, it could be dangerous for laboring mothers to travel. Some health centers established temporary housing, known as "maternity waiting homes" so that mothers could come and stay at the health facility at a safe time interval prior to their delivery. While staying at the waiting home, mothers can receive daily ANC consultations and ultimately deliver with a skilled attendant present.

Photo 4 Traditional ambulance

Photo 6 Maternity waiting home at Health Center

PREGNANT MOTHERS' FORUM

Some WDGs arranged a pregnant mother's forum for all pregnant mothers in the area to discuss on ANC and birth preparedness, including where to give birth. The forum allowed women to share their experiences with and solutions to pregnancy-related problems, including how to approach challenges arising when husbands or other influential relatives restrict the pregnant mothers from getting maternal health services. This forum has been indispensable and ultimately, those influential individuals were invited to participate in the Kebele level steering committee and convinced to support skilled delivery at health facility.

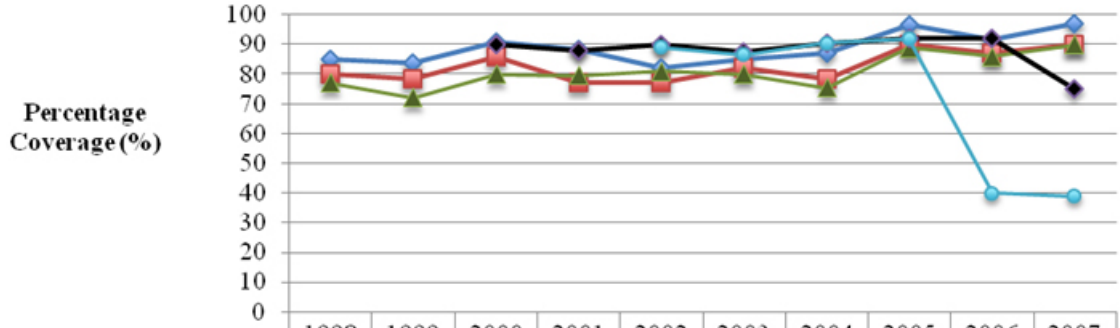
NEONATAL AND CHILD HEALTH

Child mortality in Tigray has dropped from 204 deaths per 1,000 live births in 1983 EFY to 67 deaths per 1000 live births by 2006 EFY, a 67% decrease. The reduction of child mortality was achieved due to :

- Strengthening of routine immunization through EPI implementation
- National supplemental immunization campaigns
- Expansion of community based ICCM and CBNC and facility-based IMNCI
- Establishing 'newborn corners' and Neonatal ICUs
- Building capacity for child health program management

The region reached universal coverage status (90%) on Pentavalent-3 vaccine in 2005 EFY, and on measles vaccine and full vaccination in 2007 EFY. Fluctuations in vaccine coverage were observed in particular from 2000-2004 EFY Vitamin A supplementation coverage has remained constant around 90% since its roll out in 2000 EFY, but declined to 75% in 2007 EFY because of a change in the service delivery strategy from community health days to routine health days. Similarly, screening for SAM among children aged 6-59 months has remained around 90% from EFY 2002 to 2005 EFY but declined to around 40% in 2006 and 2007 EFY due to shifting the screening from community health days to routine health days (Figure 11). The rate of severe malnutrition identified through screening decreased steadily from 1.3% in 2002 EFY to a minimum value of 0.23% in 2006 EFY, but increased again to 0.4% in 2007 EFY.

Photo 7: Regional Health Bureau Head giving oral polio vaccine



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Penta-3	85	83.8	91	88.3	82	85	87.2	96.7	91.5	97.2
Measles	80	78.5	86	77	77	82	78.5	89.9	87.1	90
Fully Immunized U1	77	72	80	79.6	81	80	75.3	88.8	86	90
Vitamin A			90	88	90	87.4	90.4	92	92	75
SAM Screening					89	86.5	90.5	92	40	39

Year (EFY)

Figure 11 Child Health Indicators in Tigray, 1998-2007 EFY

New initiative in neonatal health: Establishing Neonatal Intensive Care Units in hospitals to reduce neonatal death

The risk of neonatal death is highest in the first 24 hours of life and about three-quarters of all neonatal deaths occur within the first week of life. Therefore, as of 2007 EFY Neonatal Intensive Care Unit (NICU) have been established in all public hospitals of Tigray except HEWO Hospital. The smallest babies who survived in the NICU at Ayder Referral Hospital included a 650 gm male neonate at a gestational age of 28 weeks and a 750 gm female neonate at a gestational age of 26-28 weeks from Mekelle, a 800 gm male neonate with gestational age of 28 weeks from HintaloWojerat, and a 900 gm female neonate with gestational age of 30 weeks from HagereSelam. In general, there are having been several innovations in the region's health facilities to improve the health outcomes of children. Adigrat Hospital, in particular, has taken commendable initiative in this area by engineering locally made resuscitators, radiant warmers and phototherapy machines that have contributed to saving 421 neonates in the hospital.

COMMUNICABLE DISEASES

Communicable disease prevention and control has been a constant priority for the Government of Tigray, TRHB, and its health partners over the past ten years, with emphasis on HIV/AIDS, tuberculosis, and malaria.

MALARIA

Malaria is consistently a leading cause of morbidity in the health facilities of Tigray, but the case fatality rate has been steadily decreasing since 1998 EFY except for a surge in 2002 and 2003 EFY. Environmental management, indoor residual spraying, LLIN distribution, and early detection and treatment are the major strategies for malaria prevention and control undertaken by TRHB in collaboration with development partners. As of EFY 2007, there is an estimated 387,720 households (95.7%) covered by IRS, and 503,612 households (99%) covered by LLIN distribution in the region with 1,244,708 LLINs distributed in the region.

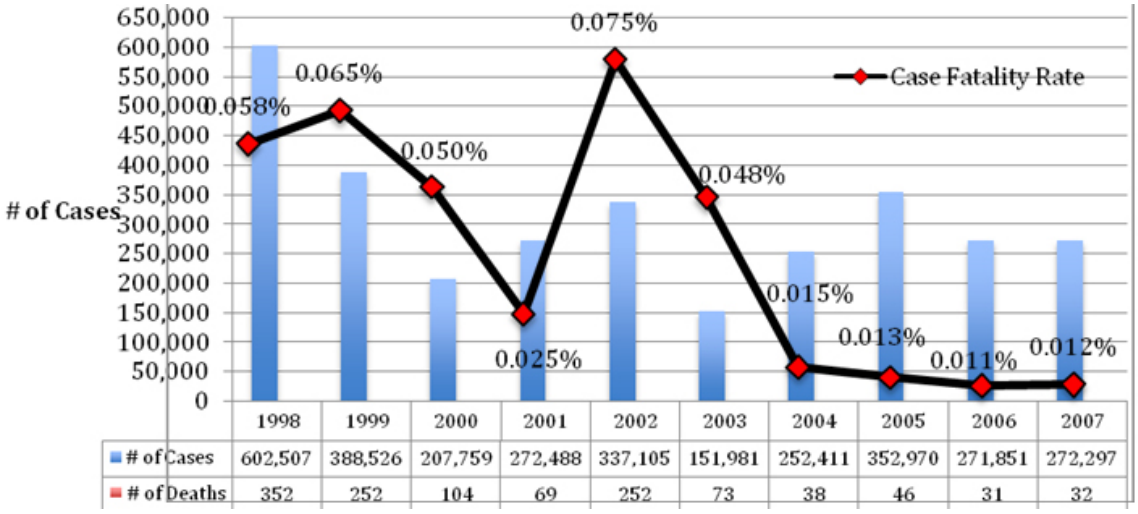
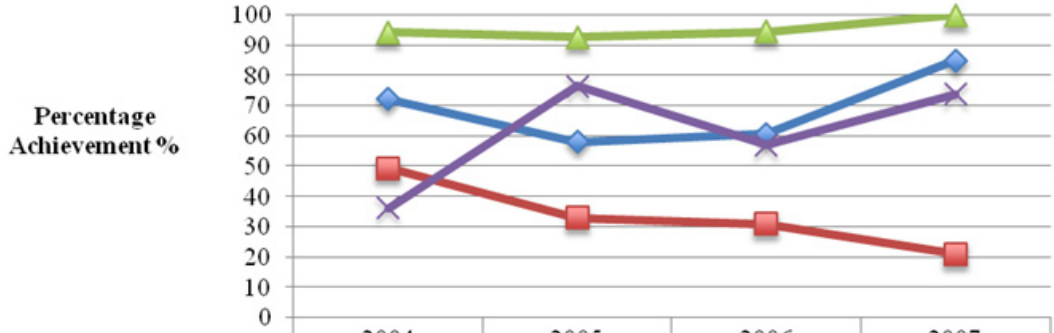


Figure 12 Malaria cases, deaths, and case fatality rate, 1998-2007 EFY

TUBERCULOSIS

In Tigray region, the tuberculosis case detection rate declined from 2004 to 2006 EFY, but there was an improvement in 2007 EFY. The proportion of smear positive pulmonary TB has steadily declined, while the treatment success rate has remained relatively constant from 2004-2007 EFY. The tuberculosis cure rate increased from 36% to 74% over the same time period, but has shown significant fluctuation year to year. Emergence of MDR-TB presents a challenge despite the efforts to expand MDR-TB wards in regional hospitals.



	2004	2005	2006	2007
Case detection rate (all forms)	72.3	58.1	60.7	85
% Smear + Pulmonary TB	49.5	33	31	21
Treatment success rate	94.3	92.8	94.5	100
Cure rate	36.3	76.5	57.1	74

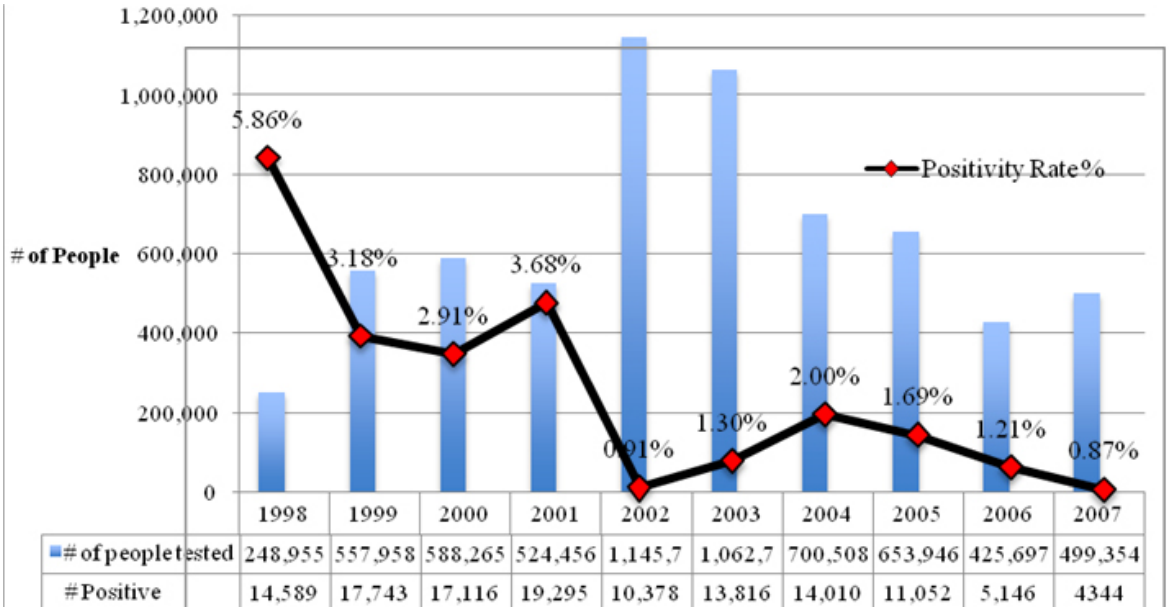
Figure 13 Tuberculosis Indicators, 2004-2007 EFY

HIV/AIDS

As of 2007 EFY, 242 health facilities are providing HCT and PMTCT services, and 108 of them are giving the full package of HIV care and treatment services including ART. The number of facilities offering PMTCT has increased from 10 in 1998 EFY to 242 in 2007 EFY.

HIV COUNSELING AND TESTING (HCT)

The number of people receiving HCT annually reached a peak in EFY 2002 but has declined since 2004 EFY due to HIV test kit shortages. To address the shortage, TRHB worked collaboratively with regional, federal and other stakeholders to target HIV testing to PMTCT, selected VCT, PITC clients, and most at risk populations. The increase in positivity rate can be associated with the target testing focused on screening to the most at risk populations.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
# of people tested	248,955	557,958	588,265	524,456	1,145,7	1,062,7	700,508	653,946	425,697	499,354
#Positive	14,589	17,743	17,116	19,295	10,378	13,816	14,010	11,052	5,146	4344

Figure 14 Number of annual HCT clients and HIV positivity rate, 1998-2007 EFY

PREVENTION OF MOTHER TO CHILD TRANSMISSION (PMTCT)

The number of annual ANC clients has increased from 34,077 in 1998 EFY to 173,061 in 2007 EFY and the overall improvements in ANC coverage over the past ten years has enabled greater consistency in HIV testing among mothers, with 83.7% of mothers getting HIV tested at their first ANC visit as of 2007 EFY (increased from 13.2% in 1998 EFY, but with significant fluctuations in between). In addition, the HIV positivity rate among women at first ANC visit decreased steadily from 6.8% in 1998 to 0.5% in 2007 EFY. In 2003 EFY DBS/PCR technology was introduced and has enabled quantification of the improvements in PMTCT service quality: In 2003, 9% of HIV-Exposed newborns were HIV positive (DNA-PCR confirmed) and this dropped to 3.1% by 2007 EFY. Table 3 shows the trends in PMTCT access and quality.

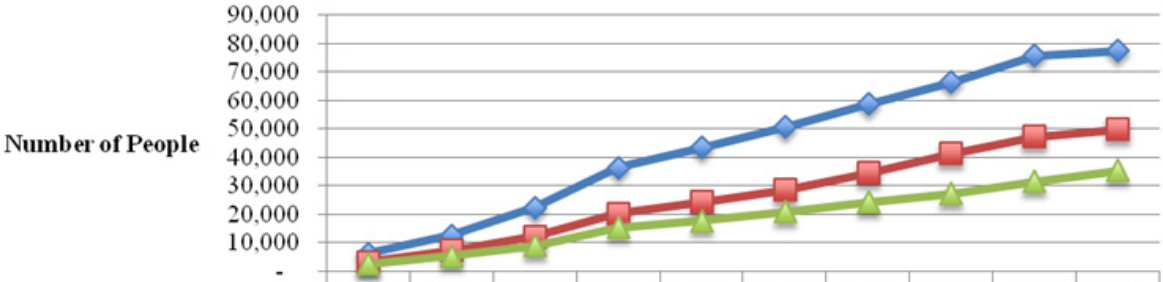
Table 3 PMTCT Components, 1998-2007 EFY

Year	ANC clients	Pregnant women				HIV+ Women		# Newborn got prophylaxis
		# Tested for HIV	Testing Rate (%)	# Positive	Positivity Rate (%)	# got prophylaxis	%	
1998	34,077	4,493	13.18%	305	6.79%	135	44.26%	95
1999	17,472	11,847	67.81%	633	5.34%	302	47.71%	280
2000	80,804	28,656	35.46%	1,092	3.81%	516	47.25%	447
2001	44,188	37,018	83.77%	1,253	3.38%	619	49.40%	484
2002	82,478	75,037	90.98%	1,306	1.74%	626	47.93%	352
2003	161,819	100,293	61.98%	1,063	1.06%	446	41.96%	614
2004	165,968	117,159	70.59%	2,401	2.05%	1,233	51.35%	1,233
2005	170,117	151,039	88.79%	2,291	1.52%	1,319	57.57%	533
2006	155,377	138,300	89.00%	1,852	1.34%	700*	37.79%	1,158
2007	206,890	173,061	83.65%	816	0.47%	1,036*	126.96%	1,005

** PMTCT data capture experienced some interruptions during the process of HMIS revision. Revised HMIS was launched in 2007 EFY.*

ANTI-RETROVIRAL THERAPY (ART)

The launch of free of-charge ART in EFY 1997 followed by the national level expansion of ART provision to health centers in 2000 EFY have greatly increased the accessibility of HIV chronic care and treatment services. The regional government has approached ART provision within the context of universal and equitable access for all. However, despite increases in the number of people initially accessing HIV clinical care and the policy mandating free-of-charge ART, many PLHIV are lost to follow-up as seen in Figure 15.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Ever Enrolled	6,23	12,4	22,2	36,4	43,5	50,7	58,8	66,6	76,0	77,5
Ever Started	3,28	7,24	12,0	20,2	24,3	28,6	34,6	41,4	47,4	49,8
Currently on ART	2,51	5,38	8,93	15,4	17,7	20,8	24,2	27,3	31,4	35,2

Figure 15 HIV Care and Treatment selected indicators 1998-2007 EFY

PUBLIC HEALTH EMERGENCY MANAGEMENT

The regional PHEM is organized under the health promotion and disease prevention core process of TRHB. Surveillance experts in all Woredas collaborate with HEWs, WDGs, and the community to strengthen the early notification and identification of cases of notifiable diseases including malaria, meningitis, endemic typhus, dysentery, typhoid fever, relapsing fever, AFP, measles, anthrax, neonatal tetanus, rabies, acute watery diarrhea, severe acute malnutrition, yellow fever, and hepatic veno-occlusive disease (VOD). VOD is a liver disease of unknown etiologic origin that emerged in 2001 EFY in Tigray Region, particularly in North Western zone with significant morbidity and mortality, affecting both human and animals with similar clinical manifestations. Through epidemiological and laboratory investigations, it was conclusively determined that the definitive etiological origin of the disease was pyrrolizidine alkaloid (PA), possibly arising from the contamination of Ageratum weed. The disease was named "Hepatic Veno-Occlusive Disease" or Hepatic VOD. A total of 934 cases have been observed since the disease was identified, though the appearance of new cases has slowed from 286 cases in 2001 EFY with a 76% case fatality rate to only 60cases in 2007 EFY with a 10% case fatality rate.

HEALTH REGULATORY SYSTEM

Business process reengineering (BPR) was carried out in EFY 2002 and health regulation was identified as one of the three pillars of health sector reform (regulator, provider, and purchaser). Accordingly, a health sector regulatory core process has been established in 2001 EFY at both the regional and Woreda levels. Development of necessary legal instruments to effectively carry out regulatory activities, such as standardizing service quality, is one of the functions expected from the process. Food, medicine, and health care administration and control regulation has been ratified and endorsed by the regional cabinet as of 2001 EFY and various directives are being developed in consultation with relevant stakeholders.

The Bureau regulates all public health facilities, around 500 private health facilities, and other health related establishments aiming to protect the population's health and promote quality and equitable health service provision. Notably, a ban on tobacco smoking in public places has been enforced in food and drink establishments across the region starting in 2006 EFY. Regional health regulators also conduct external assessments of the health and health related facilities according to a set of standards organized by 4 P's (premises, professionals, products and practices) with the results from 2006-2007 EFY shown below.

Health institutions	# Inspected	
	2006	2007
Specialized Hospital – Public	0	1
General Hospital – Public	12	14
Primary Hospital - Public	-	18
Health centers (by Woreda inspectors)	196	183
Health Posts – Public	502	-----
General hospital - Private	198	3
Specialty clinic - Private		43
Medium clinic- Private		64
Pharmacy	313	45
Drug shops		330
RDV		67
Traditional healers		216

Health-related institutions	# Inspected	
	2006	2007
Food and Drink establishment	14031	11648
Small and micro enterprises	7116	11290
Supermarkets and Minimarkets	9166	-------
Medical checkup for food handlers		11682
Positive result for IP		1465 (13%)
Prisons		8
Schools		984
Water institutions	9124	11286
Water sample taking		198
Positive result for coliform		56

MONITORING AND EVALUATION

Reformed HMIS was introduced in 2002 EFY and implemented at TRHB, all WoHOs, hospitals, and health centers in line with the national effort to harmonize data elements and improve information quality and use at all levels. In 2004 EFY, eHMIS was introduced and as of 2007 EFY most facilities are staffed with biostatisticians and/or HITs to manage eHMIS. CHIS has been implemented in all HPs of Tigray via the Family Folder, which is a paper-based health register integrated to feed data into the HMIS system.

Photo 8 Family Folders in use at a health post

HEALTH FACILITY SERVICE QUALITY

Tigray Region has been a pioneer in implementing reform to strengthen health facility performance monitoring and evaluation with an established set of standardized indicators, such as "Barometers" for health centers and KPIs for hospitals, a programme of supportive supervision to all the public hospitals, and regular hospital review meetings. In 2005 EFY the region initiated use of the Balanced Score Card to measure the performance of health care professionals, reaching varied levels of implementation by 2007 EFY. Health Facility HMIS units regularly compile the requisite data elements for the performance monitoring KPIs and it is reviewed and utilized for decision making at all levels.

HOSPITAL MANAGEMENT

Hospital management is monitored through the EHRIG operational standards for hospital reform, a set of 124 performance measures organized into 13 management areas that all regional hospitals are expected to meet. The national launch of EHRIG took place in 2003 EFY. Tigray hospitals' average EHRIG attainment increased from 64% in 2004 EFY to 84.5% in 2007 EFY, meeting the regional target of 80%. Thus the regional target was raised to 85% as of 2007 EFY. Based on the past 4 years of data, the EHRIG Chapters that need increased attention are Facilities Management, Medical Equipment Management, Human Resource Management, and Finance and Asset Management.

Photo 9 Hospital review meeting

OUTPATIENT SERVICES

The regional outpatient attendance per capita (average number of outpatient visits to a Health center or Hospital per person per year) increased from 0.6 times in 2003 EFY to 1.75 times in 2007 EFY. This was an improvement from past years, but still less than the WHO standard of 2.5 visits per person per year, implying that physical (distance), economic (cost to patient), cultural (low awareness and health care seeking behavior) or technical (poor quality of health care) barriers are still affecting accessibility of health services. The gross number of outpatient attendances at both Health Centers and Hospitals has increased from 1,236,968 in 2004 EFY to 2,569,250 in 2007 EFY. Management of outpatient waiting time remains a challenge for health facilities as the community increases its health seeking behaviors.

EMERGENCY SERVICES

The region has seen a decrease in the average number of emergency attendances annually per hospital, from 7850 in 2004 EFY to 6498 in 2007 EFY. However, this apparent decrease is thought to be due to miscounting of emergency attendances as private wing attendances; the private wing reporting has increased in the same time period. Improvement of emergency services at hospitals has been prioritized as of 2005-2007 EFY. TRHB organized a region-wide emergency training to relevant professionals and included emergency services as one of the supportive supervision focus areas in 2006 EFY.

INPATIENT SERVICES

The average number of inpatient admissions annually per hospital has increased from 4185 in 2004 EFY to 5183 in 2007 EFY while the gross number of Inpatient Admissions have increased from 87,136 in 2004 EFY to 104,134 in 2007 EFY. Inpatient mortality has decreased from 3.4% in 2004 EFY to 2.8% in 2007 EFY. BOR measures the efficiency of inpatient services and is expected to be 80% – 90%. The regional BOR has increased from 50.3% in 2004 EFY to 61.4% in 2007, but remains far below the national standard; this is indicative of resource wastage. Monitoring ALOS at hospitals has also played a great role in assessing the quality and efficiency of health services. ALOS in Tigray hospitals was 6.1 days in 2004 EFY and decreased to 5.3 days by 2007 EFY.

New initiative in inpatient services: centralized medication handling at hospitals

In the past, medication safety was compromised and medication administration even posed a risk for patients. Patients used to take oral medication as they please, skip night time medication, and keep their medications stored with other items like hot food, liquids, and clothes. Thus, centralized control of inpatients medication was implemented to improve the appropriate administration of medication for inpatients. It was first piloted at Mekelle Hospital and then scaled up in all hospitals.

In order to centralize the control of medications, the nurses store them in individual lockers secured with keys and provide medication to patients at the appropriate time. The nurse is able to observe the client taking the medication and ensure that the correct dosage and protocol is followed. To prevent the nurses from mixing up patient medication each locker is labeled with the patient bed number as well as the patient's first name. This practice has enabled patients to take their medications consistently and has improved patient satisfaction. In addition, it has reduced medication wastage since wards are able to redistribute leftover medications to those who need support, either due to economic reasons or medication unavailability. The nursing profession has benefitted indirectly as well. Community acceptance of the nursing profession has increased, and nurses gained professional pride in increased their knowledge about the medication indications, contra indications, and side effects. Centralized control of inpatients medication was first piloted at Mekelle hospital and then scaled up to all regional hospitals. Implementation success is determined by sufficient discussion with hospital leadership, nursing staff, patients and caregivers. In addition, hospitals had to allocate a budget for the medication cupboards to store each patient's medication at the nursing station.

Photo 10: Medication cabinet with individual patient locks

New Initiative in service quality improvement: Implementation of Laboratory quality essentials and accreditation

All laboratory professionals are networked according to HDA under the theme "A Poor quality test result is worse than no test result" in order to ensure the implementation of laboratory quality essentials. As a result, all available client tests have SOPs according to a master list of SOPs, and internal quality controls are in place such as standard formats, equipment, and reagents. Laboratory equipment undergoes regular preventive maintenance. Competence assessments for senior and new staff have been prepared regularly as a policy. Regular customer satisfaction surveys are done and the results are used as constructive feedback for the laboratory team. There have been regular internal audits, surveys, and evaluations of laboratory External Quality Assessment Feedback to ensure the proper implementation of laboratory quality essentials. Four laboratories from Tigray (Lemlem Karl, St Marry, Mekelle Hospital, and the regional lab) are in the process of implementing the WHO accreditation system in collaboration with ENAO and ICAP SLIPTA/ Strengthening Laboratory Improvement Process Towards Accreditation. This initiative has enabled regional hospitals' laboratories to improve their attitude towards scientific thinking, organization, resource management, internal capacity building, quality assurance, good governance, and human resource management. As evidence of the success, laboratory service is consistently the leading best performances among the 13 EHRIG chapters. Best practices have been disseminated between the regions hospitals through EHAQ cluster meetings, JISS, hospital review meetings and hospitals catchment area review meetings.

ACCESS TO ESSENTIAL MEDICINES, PRODUCTS, EQUIPMENT, AND INFRASTRUCTURE

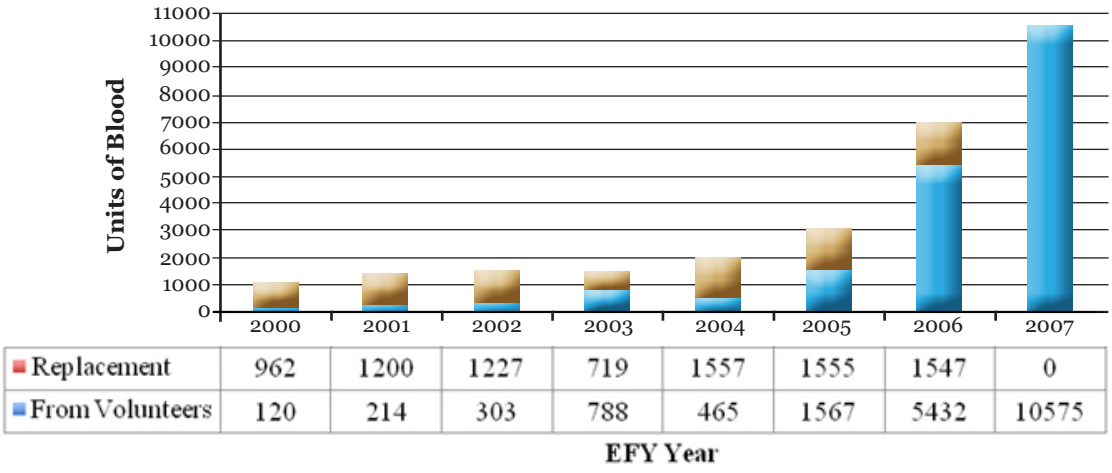
PHARMACEUTICAL SUPPLY AND SERVICES

The government in its BPR reform established Pharmaceuticals Fund and Supply Agency (PFSA) in 2000 EFY aiming at effective and sustainable supply of safe, quality and affordable medicines and to ensure their rational usage. Integrated pharmaceuticals logistics system (IPLS) is designed to streamline the procurement, storage, and distribution of pharmaceuticals and scientifically estimate consumption. The health facilities procure medical supplies through revolving drug fund (RDF) scheme. PFSA started operation with a seed money of 50 Million ETB and later it reached its capacity into 150 Million and 600 Million ETB in 2003 and 2007 EFY respectively.

Despite these remarkable efforts, sustainable supply and rational usage still needs due attention at all levels. Private sector engagement in both supplying and manufacturing should be encouraged.

BLOOD BANK AND BLOOD TRANSFUSION SERVICE

There are two Blood Bank sites in the region, in Mekelle (established 2004 EFY) and Axum (established 2005 EFY). The number of non-remunerated voluntary blood donors has been increasing annually (Figure 16), due to better awareness, promotion, and community mobilization activities regarding blood donation. Blood is discarded due to communicable disease contamination, insufficiencies, and expiration.



	2000	2001	2002	2003	2004	2005	2006	2007
Replacement	962	1200	1227	719	1557	1555	1547	0
From Volunteers	120	214	303	788	465	1567	5432	10575

Figure 16: Tigray RHB Blood Bank Service in Units from 2000-2007 EFY

AMBULANCE SERVICE

Since 2004 EFY, the Ethiopian government has addressed challenges of increasing institutional delivery rates and access to emergency obstetric care by an innovative approach of supplying free-of-charge 24 hours a day, 7 days a week 4-wheel drive ambulance service in every rural District of the country, a unique program in sub-Saharan Africa. Currently the number of ambulances availed in Tigray Region has reached 156 which means each Woreda has 2 to 3 ambulances. A memorandum of understanding (MoU) was signed among RHB, Ethiopian Red Cross Society (ERCS), and WoHOs so as to include service returning home for postnatal mothers home after delivering at health facilities, in addition to transporting mothers to health facilities for delivery no matter how rural their residence.

Totally 139,598 patients have received ambulance services in EFY 2007. Among these 70,898 (51%) were laboring mothers and the remaining were other types of emergency patients.

TELECOMMUNICATIONS NETWORK, WATER, AND ELECTRICITY AVAILABILITY

The region's network coverage is increasing over time, reaching 100% in all hospitals and HCs as of 2007 EFY. However, only 621 HPs (87%) have network coverage. All hospitals, 120(53%) of HCs and 263 (37%) of HPs have an improved water source in their facility. To help solve the water supply challenge, the RHB has distributed one plastic reservoir (10,000 liter capacity) per HC.

Currently all general and primary hospitals and 198 (88%) of the HCs have regular access to grid electric power, generator, or solar, while only 34% of HPs have an electricity supply. In Tigray, rural Kebeles are connected with the Universal Rural Road Access Program (URRAP), creating better access to health care through strategic expansion of the road network. Hence, road access coverage reached 100% for hospitals, 190(85%) for HCs, and 88% for HPs in EFY 2007.

PARTNERSHIP AND NETWORKING

TIGRAY HEALTH PARTNERS FORUM

Tigray RHB works to develop global partnerships in alliance with many local and international partners, government sectors, and UN agencies in attaining its shared goals. In an effort to align and harmonize stakeholders' plans, budgets, and monitoring mechanisms, the TRHB has formed the Tigray Regional Health Partners Forum under the theme "one plan-one budget and one monitoring system". The forum is led by the TRHB Head and it has a consultative leadership committee composed of 15 elected members (3 from TRHB, 12 from representing partners) technically supported by seven working groups. The forum at large has members from morethan50localandinternational NGOs, and from other sectors. It is a critical mechanism to bring different stakeholders to the table for experience sharing, to promote government ownership, and to facilitate unified follow-up of action plans and program specific challenges.

TIGRAY HEALTH PROFESSIONALS NETWORK

TRHB believes that a strong professional network is critical for promoting scientific dialogue and producing evidence and knowledge that could inform the decision making process. Therefore, the Tigray Health Professionals Network (THPN) has been formed from the community of health and allied professionals of Tigrayan origin. The aims of THPN are to provide high-level technical and advisory assistance to TRHB on key health related issues, assist in the development and implementation of new heath programs and strategic documents, and advocate the development of evidence based policy. The network engages in resource mobilization as well as binding collaborative partnerships with national and international partners.

TRHB in collaboration with stakeholders, organized a Health System Consultative Forum in 2006 EFY that focused on gathering many of the THPN members to discuss the major achievements made in the health sector in the last decade with special emphasis on health system strengthening in the following areas: Quality of Health Care, Leadership and Governance, Health Infrastructure and Supply Chain Management, Human Resources for Health, and Health Care Financing. In addition, THPN supports the region's health sector by volunteering, networking, convening conferences and workshops, supporting in-service training, education, and research, and contributing funds for construction and medical equipment. The diaspora community are also contributing their role in improving the health care delivery system of Tigray via different modalities like networking with various partners, professional volunteerism and constructing health facilities (Health centers and Hospitals). The partnership with the diaspora yet need to harness in areas of research and technology transfer.

FUTURE PRIORITIES, AND AREAS FOR COLLABORATION

In the past 10 years, the health sector has focused primarily on improving service coverage and accessibility. Looking to the future, the focus will be on improving the quality of care. One of the main challenges will be to establish sustainable health care financing mechanisms. The health workforce must be improved both in number and in caliber by investing on human capital development, and human resources must be deployed based on evidence-based algorithms. In addition, proper medical equipment management including strategic prioritization and streamlined procurement will allow health facilities to avail necessary medical equipment to provide a highst and ardofcare. Overall improvements in the quality of health care will not only uplift the health status of the community, but also contribute to the future vision of establishing Tigray as a health tourism destination.

Strengthening the public-private partnership is another important agenda for the future. Private facilities in Tigray work closely with TRHB and line offices (town health office, Woreda health office and regional lab) to provide different public health services like (PPM)-DOTS/HCT, ART/PMTCT, reproductive health services, and Malaria services. The Tigray Private Health Facility Association was established in EFY 2005 to coordinate the work of over 500 private facilities. Private health facilities are an important alternative choice for the community and thus engaging them is essential to achieving equitable and quality health service delivery. The private sector has marked potential to participate in health professional training and developing sustainable pharmaceutical supply and production.

Locally relevant research will be increasingly important as the region enters the epidemiological transition from predominantly communicable disease burden to both communicable and non-communicable diseases including mental illness and injuries. Allies of the health sector can help to support health research and innovation by volunteering for knowledge and skill transfer, and conducting operational research to inform health policy and interventions. In summary, a shared vision to shape the future can only be created through sustainable collaboration and consensus. The Ethiopian health sector in the coming five years' time has planned to work focusing on the four transformation agenda, namely

1. Maitaining quality and equitable health service
2. Wereda transformation
3. Information revolution and
4. Inculcating caring, respectful and compassionate health professionals

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