Tigrai Regional State Synthesis of the HIV Epidemic and Response



UNAIDS
JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS
UNHCR UNICEF WFP UNDP UNFPA UNODC ILO UNESCO WHO WORLD BANK

TIGRAY HEALTH BUREAU

May 2012

This report is dedicated to the memory of **Mark Colvin** (picture, centre) the team leader of the Tigrai HIV epidemic synthesis, whose premature death in the midst of this assignment came as a great loss. A South African epidemiologist and scientist who over the past twenty years had worked in many countries in both Eastern and Southern Africa, Mark's contribution to HIV research, capacity-building and training will be long remembered.

Tigrai MoT Core Study Team

Mark Colvin (Consultant), Gebreab Barnabas (Consultant), Elisabetta Pegurri (UNAIDS), Hiwot Haile-Selassie (UNAIDS), Lawrence Gelmon (Consultant), Samuel Zemariam (Head Tigrai HAPCO)

Technical Task Team

Moges Belay, Mekelle University
Abraham Kahsai, Tigrai Health Bureau/I-TECH
Mulumebet MerhaTsidk, UNAIDS country office
Genet Arefe, Tigrai Health Bureau/Tigrai HAPCO
Goitom Gebremedhin, M&E Specialist/Tigrai HAPCO
Mulu Hadush, Tigrai Health Bureau/Tigrai HAPCO
Werede Emlaele, Tigrai Health Bureau/Tigrai HAPCO
Letai Teka: Tigrai Health Bureau/Mekelle Hospital
Aregai Grebremedhin: Mekelle University, Biostatistics and health informatics
Leul Grebremedhin, Mekelle University, Biostatistics and health informatics
Alem Desta, Mekelle University, Biostatistics and health informatics
Fantaw Bihonegn, Tigrai health Bureau/HIV/AIDS team leader
Helen Ibbetson, MAROMI, South Africa/Researcher

Acknowledgments

This review was commissioned and led by the Tigrai Health Bureau and Tigrai HAPCO. The study was funded by UNAIDS Ethiopia Country Office and UNAIDS RST. Additional technical support was provided by TSF-CAF Nairobi.

Tigrai Health Bureau and Tigrai HAPCO would like to thank all the participants of the focus group discussions, all key informants, members of the Technical Reference Group and all participants involved in the report validation workshop. A special thanks goes to the USAID TransACTION project for making available data on key populations and Federal HAPCO in particular Dr Betru Tekle, Meskele Lera and Dr Yilbetal Assefa for their overall guidance and support.

Tigrai Regional State Synthesis of the HIV Epidemic and Response

UNAIDS
JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS
UNHCR UNICEF WFP UNDP UNFPA UNODC ILO UNESCO WHO WORLD BANK

TIGRAY HEALTH BUREAU

May 2012

Table of Contents

Figures

Tables

Abbreviations/Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
ARRA	Administration for Refugee and Returnees Affairs
ART	Antiretroviral treatment/therapy
BCC	Behaviour change communication
BSS	Behavioural Surveillance Surveys
CSO	Civil Society Organisation
CSWs	Commercial sex workers
DHS	Distribution Health Survey
ERCS	Ethiopian Red Cross Society
EDHS	Ethiopia Demographic and Health Survey
FBO	Faith Based Organisation
FGDs	Focus Group Discussions
FGM	Female Genital Mutilation
FHAPCO	Federal HIV Prevention and Control Office
FSWs	Female sex workers
GAMET	World Bank's Global AIDS Monitoring & Evaluation Team
GBV	Gender based violence
GFATM	Global Fund for AIDS, TB & Malaria
HCT	HIV counselling and testing
HEW	Health extension worker
HF	Health facility
HAPCO	HIV and Aids Prevention and Control Office
HIV	Human Immunodeficiency Virus
IDU	Injection drug users
IEC	Information Education Communication
IGA	Income generation activities
IOM	Organisation for Migration
IRC	International Rescue Committee
KIs	Key Informant Interviews
MARPS	Most At Risk Populations
MoH	Ministry of Health
MoT	Modes of Transmission
MSM	Men who have sex with men
OSSA	Organization for Social Support against AIDS
PICT	Provider Initiated Counselling and Testing
PLHIV	People living with HIV
PMTCT	Prevention of mother-to-child transmission
REST	Relief Society of Tigrai
SPM	Strategic Plan for Intensifying Multi-Sectoral HIV/AIDS Response
SNNP	Southern Nations Nationalities and Peoples
STI	Sexually transmitted infection
SWs	Sex workers
TDA	Tigrai Development Association
T-HAPCO	Tigrai HIV and AIDS Prevention and Control Office
UNHCR	United Nations High Commission for Refugees
VCT	Voluntary Counselling and Testing
WAT	Women's Association of Tigrai
WB	World Bank
YAT	Youth Association of Tigrai

Administrative Region and Woreda Map of Tigrai

Tigrai

Amhara

Afar

Tahtay Adiyabo
Laelay Adiyabo
Mereb Lehe
Enticho
Erob
Gulomahda
Ganta Afeshum
Saesi Tsaedaemba
Adwa
Laelay Maychew
Tahtay Maychew
Tahtay Koraro
Kafta Humera
Asegede Tsimbela
Werie Lehe
Hawzen
Medebay Zana
Naeder Adet
Atsbi Wenberta
Welkait
Wukro
Kola Temben
Degua Temben
Tsilemti
Tsegede
Mekele
Enderta
Abergele
Samre
Hintalo Wajirat
Alaje
Endamehoni
Raya Azebo
Ofla
Alamata

37 38 39 40

15 14 13 12

EXECUTIVE SUMMARY

The 2008 World Bank/HAPCO National HIV Synthesis Report for Ethiopia noted that *"the HIV epidemic may be less severe, less generalized and more heterogeneous than previously believed, with marked regional variations. Therefore, HIV/AIDS programmes... need to be more focused geographically, and directed to those regions, districts or communities exhibiting higher prevalence rates"*. As a result, the Tigrai HAPCO and Regional Health Bureau, in collaboration with UNAIDS, commissioned a study for the Tigrai Region, with the objectives being to:

- Describe and analyse the epidemiological situation in Tigrai ("Know your epidemic", KYE)
- Describe and analyse the HIV prevention response in Tigrai ("Know your response", KYR)
- Synthesise and link the epidemic and response data (KYE-KYR synthesis) to understand the scope, relevance and comprehensiveness of HIV prevention policies and programmes in Tigrai, the alignment of prevention programmes and resources to strategic prevention priorities, and gaps in strategic information about HIV prevention.
- Make recommendations for improvements in HIV prevention policies, programmatic action, and resource allocation.

Guided by a Technical Task Team and a Technical Reference Group, a team of local and international consultants carried out the study in late 2011-2012, using a methodology beginning with an extensive literature review, including a review of the existing data from research studies, HIV surveillance and HIV routine clinic data, academic publications and reports, programme reports, HIV policies, technical guidelines, strategic plans and monitoring and evaluation reports.

Site visits, key informant interviews and focus group discussions with stakeholders including HIV service providers and users as well as key populations vulnerable to HIV infection were conducted to provide additional data that was not available through the literature review. Data from these sources were extracted, referenced and, where possible, triangulated. No new surveys were conducted, however existing data were reanalysed. The draft synthesis was reviewed and validated in a workshop with key stakeholders. Based on findings from the 2008 National HIV Synthesis Report the study began with three main hypotheses:

- **Hypothesis 1**. Over the last 10 years, the HIV prevalence has stabilized or declined in the major urban centres while increasing in the smaller towns.
  - **Partly confirmed**: there is a declining HIV epidemic across urban sites in Tigrai. There is no evidence that the epidemic is increasing in smaller towns.
- **Hypothesis 2**. The rural epidemic is heterogeneous with most districts having a relatively low HIV prevalence but some areas demonstrating higher prevalence levels.
  - **Partly confirmed**: The prevalence of HIV in rural areas of Tigrai is consistently and substantially lower than in the urban areas, with a few important exceptions.
- **Hypothesis 3.** There may be a higher HIV prevalence in certain key population groups.
  - **Confirmed**: seasonal workers/settlers, sex workers, discordant couples
  - **Partly confirmed**: miners, military/police, university students
  - **Not confirmed**: refugees, prisoners, truck drivers (partly due to limited data)
  - **No data** : MSMs, IDUs, miners, certain youth (street children, OVCs)

Key findings of the Know Your Epidemic Synthesis:

- ANC surveillance data (2009) states that the HIV prevalence in Tigrai is 2.2% (5.0% urban and 1.3% rural). The 2011 DHS estimates overall HIV adult prevalence (15-49 years) to be **1.8%** (1.9% women and 1.0% men), with indications of **a decrease in the overall prevalence in Tigrai over the past seven years** in both the male and female populations.
- The Federal HAPCO estimated that there were about **56,900 PLHIV in Tigrai in 2012**: 43,600 adults more than 15 years old and 13,300 children (0-14 years old).
- **HIV prevalence in Tigrai varies widely across zones** from 0.4% (Central zone) to 2.2% (Western). There is a higher prevalence in urban centres, areas in the Western zone where there is both a large population of migrant farm workers as well as rapid urbanisation, areas in the Southern zone where there is also rapid expansion, and towns along the main highways. HIV prevalence is consistently low and does not vary greatly across rural districts, with a few exceptions, such as Degua Tembien.

There is some knowledge about HIV prevalence and risk factors in certain key populations, but very little is known about other high-risk groups:

- Sexually active, never-married women in Tigrai are at a much higher risk of being HIV positive (2.8%) than never-married men (1.6%) (DHS 2011). There is no data in Tigrai on prevalence in specific youth sub-populations such as university students, OVCs, and street children that may be at higher risk for HIV. However, studies in University students showed high levels for sexual activity and multiple partnership.
- Seasonal workers/settlers: HIV prevalence in the districts where there are larger populations of seasonal workers is higher than average at 2.2% (ANC, 2010).
- Sex workers: data vary in quality but all point to a high prevalence, ranging in recent studies from 10% to 20% There has been no size estimation of sex workers in Tigrai. Evidence indicates that sex workers are increasingly using condoms regularly with paying clients, but not so with non-paying partners. There is hardly any data on transactional sex.
- Truck drivers, refugees: HIV prevalence seems to be not appreciably different from the general population prevalence (although sample sizes are small)
- Military/police: higher prevalence (3.4%) but a small sample group
- Essentially no prevalence data exists for groups such as miners, MSM and IDUs.

The following is known about the drivers of the epidemic in Tigrai:

- Comprehensive knowledge about HIV/AIDS: the level of knowledge in Tigrai was above the national average, and there has been an improvement in every category between 2005 and 2011 (DHS 2011).
- Sexual behaviour: The number of current and lifetime partners is low for most of the Ethiopian population (compared to other countries in the region), and Tigraian women and men do not appear to be significantly different.
- HIV Transmission risk in marriage – discordant couples: A rough estimation suggests that there may be 10,000 discordant couples in Tigrai. It appears that no programmes are being specifically implemented to address this important group.

- Presence of sexually transmitted infections (STIs): Limited data on STI rates in Tigrai (self reported STIs and symptoms from DHS 2011 available only; 4.0% women and 1.3% men).
- Alcohol and drug use: DHS 2011 does not show a high prevalence in the general population of use of alcohol and drugs in relation to sex in Tigrai.

Key findings of the Know Your Response Synthesis:

- The high level of awareness of HIV in Tigrai could be ascribed to the various and active channels through which IEC is directed, including widespread use of radio and other media, community conversations, HIV awareness programmes in both the schools and the workplace, the formation of PLHIV organisations, and the widespread deployment of health extension workers.
- HIV testing in Tigrai has reached about 55.5% of women aged 15-49 years in Tigrai and 49.1% of the men.
- Tigrai has benefited from the expansion of HIV services including a significant increase in the number of PMTCT, ART and VCT sites as well as general health system strengthening which has supported the HIV response. HIV testing and treatment has increased, however coverage, particularly in relation to PMTCT, remains low.
- ART and PMTCT services are concentrated in the densely populated areas of the East, Southern Eastern and Southern part of the region: A fewer number of ART, PMTCT and hospital facilities in West Tigrai, where there is a higher HIV prevalence. Most programmes are piloted and preferentially introduced in urban areas
- Despite a significant increase in condom distribution coverage still remains less than optimal.
- There is an association of PLHIV in every major town in Tigrai.
- While there are adequate programmes being implemented for high-risk groups such as the military or refugees, there are gaps in HIV programming for key populations, namely sex workers, high risk youth, seasonal workers and settlers, miners, truck drivers, and prisoners.
- There are no programmes aimed at MSM, IDUs and discordant couples.
- There is a lack of strategic information on the coverage and quality of HIV services. There are gaps in relation to the evaluation of programmes and in particular their impact as well as data on the size of key populations to adequately assess coverage.

Data was not available to do a detailed analysis of resource allocations, but it was apparent that resources are not being directed towards prevention programmes in those populations who have a higher prevalence, such as sex workers and seasonal workers/settlers.

This report has demonstrated that while a large number of programmes have been implemented in Tigrai, both by government and civil society, to address issues of HIV surveillance, testing, prevention, treatment, care and impact mitigation, there are still gaps in each of these programmes, hampered in most cases by a lack of up-to-date and reliable data, not only on the size of the various populations at risk but also on the results of those programmes that have been implemented. The following conclusions and recommendations highlight those areas of greatest concern, with suggestions on strategies or initiatives that can be taken to address the issues.

Main Conclusions:

- There is not comprehensive strategic information on key populations of potential concern for the region. Disaggregated coverage data for HIV prevention that is not clinical is not readily available. More data on other potentially high-risk and vulnerable populations are needed, in particular for: seasonal workers/settlers, miners, sex worker census, university students and other high-risk youth (street children and OVC), IDU and MSM. Data are lacking to measure accurately the recent spread of HIV in these groups and their role in the further spread of HIV to the general population.
- The variation of HIV prevalence is at the zonal and district levels, but no evidence that programme planning is done on the basis of geographical considerations (HIV needs).
- There are few programmes in operation that address the needs and issues of high-risk groups.
- Discordant couples are a high-risk population that need increased attention.
- Enrolment and follow-up in the PMTCT programme is inadequate.
- There is a lack of knowledge at the regional level on how overall funds are allocated to different services and locations, the source of the funding, or the accounting of expenditures.

Main recommendations:

Information and data-gathering:

- Introduce small-scale prevalence and behavioural studies on key populations, starting with seasonal workers/settlers, miners, sex worker census, university students and other high-risk youth, progressing to formative research on MSMs and IDUs.
- Analysis of routine data on testing, treatment, care, etc. should be collected and reported disaggregated by sex and age.

Epidemiology:

- Programme planning at zonal/district level should factor in differences in HIV prevalence in addition to population size
- Conduct a study in Degua Tembien to determine factors accounting for the unexplained higher prevalence
- While HIV programmes should be focused on urban areas, programming should not neglect those rural areas that are of higher prevalence, or where location (such as proximity to transport corridors or high-risk populations) place the local population at risk.

High-risk populations:

- While research is needed to estimate the size and HIV prevalence of these high-risk groups, programmes should be started while research is ongoing on the assumption that there is a need.
- Implement the minimum package of services for high-risk populations[1].
- Establish systematic surveillance of HIV prevalence for all high risk groups.
- Programmes that do address issues in key populations need to be strengthened and expanded:
  - Youth: increased package of interventions specifically aimed at in & out of school youth and university students, focussing on improving knowledge & condom use; identify the higher-risk youth populations (e.g. street children, OVCs). Implement sexual & reproductive services for adolescent girls.
  - Seasonal workers/ settlers: current care and treatment programmes need to be expanded to include prevention interventions.
  - Miners: implement programmes and services targeting miners and conduct research on prevalence & behaviours.
  - Truck drivers: mobile VCT, distribution of condoms and BCC programmes for this group are needed.
  - Prisoners: Raise current programme to the level of the minimum package of services for prisoners including HIV information, peer based education, condoms, HCT, STI prevention
  - Sex workers: carry out a sex workers census and provide a consistent package of comprehensive services target at FSWs (outreach services, BCC, peer education, HCT, STIs services, condoms, ART).

Special programmes:

- Develop targeted services for discordant couples within the health system, including those focusing on positive prevention. Programmes beyond clinical services and impact mitigation are required, including positive living with HIV, safe sex, family planning.
- The PMTCT programme needs to be strengthened, to ensure that a higher proportion of pregnant women who visit the ANC are tested and are followed up to delivery and the breastfeeding period, and that they and their newborns receive appropriate services.

Resources and accountability:

- Surveys of expenditures carried out at the national level should be disaggregated by regions. Partners should be accountable for reporting on funding at the regional level so that this can be included during regional programme planning.

1 HIV Prevention Package, MARPS and vulnerable groups, FHAPCO, FMOH, September 2011, Addis Ababa

1. Introduction and Methods

The "Know your epidemic" "Know your response", modes of transmission (MoT) study is a methodology developed by the UNAIDS Regional Support Team and World Bank Globa HIV/AIDS Programme's Global AIDS Monitoring and Evaluation Team (GAMET). It is designed to enable countries to collect, synthesise and triangulate information from various sources on the epidemiological situation and the HIV response in order to provide strategic information to inform recommendations and improve HIV programming.

1.1. Rationale of the Study

The primary motivation for initiating the MoT process was the recognition that in many settings there is a lack of alignment between programmatic and financial HIV prevention responses and the prevailing prevention needs.

Outcome evaluations of the MoT process in many Eastern and Southern African countries have confirmed the value of the process and in the deliverables. In countries including Kenya, Uganda, Swaziland, Lesotho, Zimbabwe and South Africa, the MoT synthesis reports have proven to be key documents used in the development of their HIV/AIDS National Strategic Plans (NSPs).

In 2008, a World Bank/HAPCO National HIV Synthesis Report for Ethiopia noted that "the HIV epidemic may be less severe, less generalized and more heterogeneous than previously believed, with marked *regional variations. Therefore, HIV/AIDS programmes should not be based on national-level statistics, but need to be more focused geographically, and directed to those regions, districts or communities exhibiting higher prevalence rates. This will necessitate conducting research and disaggregating data to the district level in order to identify hot spots and communities at higher risk."*[2]

It is for this reason that a decision was taken to take the MoT down to the regional level in Ethiopia. As a result, the Tigrai HAPCO and Regional Health Bureau, in collaboration with UNAIDS, commissioned this MoT study for the Tigrai Region which is the first sub-national MoT in Ethiopia.

1.2. Purpose and Objectives

The purpose of this synthesis is to help Tigrai improve its HIV prevention response by allocating funding and effort to those programmes and interventions which will avert the most number of new infections over the shortest period of time. The research questions asked will be:

- Do HIV prevention policies and programmes respond to the key drivers of the epidemic in Tigrai?
- Is funding for HIV prevention allocated to where it is most needed?

To answer these questions, this synthesis has four objectives:

1. **Describe and analyse the epidemiological situation in Tigrai ("Know your epidemic", KYE) –** To describe the regional and district epidemic magnitude, phase and temporal trends over the past 10 years, the heterogeneity of the epidemic in different sub-populations and in different geographic areas, the modes of transmission and distribution of new infections, and changes in risk factors that may have given rise to the changes in epidemic trends.
2. **Describe and analyse the HIV prevention response in Tigrai ("Know your response", KYR)** – To describe the policy environment for HIV prevention; the availability of strategic information to inform prevention programming; the scope, coverage and content of implemented HIV prevention efforts in the region; the stakeholders involved in HIV prevention, and the expenditure for different types of prevention programmes.
3. **Synthesise and link the epidemic and response data (KYE-KYR synthesis)** to understand the scope, relevance and comprehensiveness of HIV prevention policies and programmes in Tigrai, the alignment of prevention programmes and resources to strategic prevention priorities, and gaps in strategic information about HIV prevention.
4. **Recommendations for improvements in HIV prevention policies, programmatic action, and resource allocation** to ensure greater success in prevention programmes, and fewer new HIV infections in Tigrai.

In order to reach these objectives, the following three components have been undertaken and are described in more detail in the methods section:

- Review of the epidemiology of HIV in the region
- Review of HIV prevention activities
- Review of resource use in HIV prevention

1.3. Study Coordination and Oversight

The study was conducted between June 2011 and May 2012 by a team of consultants, with technical oversight provided by the UNAIDS Ethiopia Country Office. A Technical Task Team (TTT) consisting primarily of members of the Tigrai HIV and Aids Prevention and Control Office (HAPCO), staff from the Regional Health Bureau and representatives from the University of Mekelle was established (members listed on page 2). The TTT was involved in data collection and in validation of the MoT process and findings.

A Technical Reference Group (TRG) was also established and comprised a broader grouping of individuals (see **Appendix 1**) who were consulted at the initiation of the MoT process and involved in agreeing the hypotheses, methods and verification of the MoT results. The draft report was presented and validated at a workshop (3rd May 2012, Mekelle) with key stakeholders and the study recommendations were finalised.

1.4. Methods for the KYE Synthesis

The KYE analysis was based on a review of the existing data from research studies, and HIV surveillance and HIV routine clinic data, focusing on the presumed drivers of the epidemic. The review also included academic publications and reports and qualitative data were collected from key groups. Data from these sources was extracted, referenced and, where possible triangulated. No new surveys were conducted, however existing data were reanalysed. The major sources for this were:

2 Ethiopia HIV/AIDS Prevention & Control Office (HAPCO) and Global HIV/AIDS Monitoring and Evaluation Team (GAMET). HIV/AIDS in Ethiopia – An epidemiological synthesis. The Global HIV/AIDS Program. The World Bank April 2008.

- **Antenatal Sentinel Surveillance Data**[3] - these surveys are unlinked and anonymous, with HIV testing performed on left-over blood collected for routine syphilis testing. Data and specimens were collected at national level from 114 sentinel sites in 2009 of which 73 were rural and 41 were urban. Eleven of those were in Tigrai (seven rural and four urban).
- **Analysis of Routine Antenatal Clinic Data -** 101 health facilities in Tigrai were mapped and allocated as urban (municipal cities) or rural. Facilities were also allocated to whether they were: 1) near a border town, 2) emerging towns in rular areas 3) where alluvial miners were active, 4) a resettlement area, 5) a locale where seasonal workers were employed, 6) a locale where refugee camps are situated and 7) within 10km of a main road. Calculations on the HIV prevalence levels for each facility were compared between 2008 and 2010 where possible. The total number of ANC tested and the total number positive for the different health facilities under the geographical areas were combined to give an overall HIV prevalence for the area. For more details, see **Appendix 3.**
- **Analysis of Tigrai HCT and PICT Data -** The Tigrai Health Bureau is responsible for compiling statistical data. An increasing number of clinics have been offering the services in recent years as HCT and PICT have been rolled out. HCT and PICT data is aggregated to district level, unlike the PMTCT data which is available at health facility level. The 12 municipal cities districts in Tigrai were considered as urban and all other districts were considered rural.
- **Analysis of the 2005 and 2011 Demographic and Health Surveys in Ethiopia –** this was performed to determine whether or not Tigrai was significantly different from the rest of Ethiopia in terms of transmission dynamics.
- **Incidence modelling** - Due to limited data on HIV prevalence, population size estimates and specific behaviours (condom use and frequency of HIV risk exposure) of key populations in Tigrai, it has not been possible to use a model4 to calculate the modes of transmission against the incidence of HIV infections among the adult population.
- **Focus group discussions and key informant interviews** – were conducted with key populations to gather information on risk behaviours and drivers of HIV transmission (refer to Table 1 below).

1.5. Methods for the KYR Synthesis

A systematic review of published and grey literature including programme reports, HIV policies, technical guidelines, strategic plans and monitoring and evaluation reports was undertaken. Site visits, key informant interviews and focus group discussions (FGDs) with stakeholders including HIV service providers and service users as well key populations vulnerable to HIV infection were conducted to provide additional data that was not available through the literature review. The following population groups were surveyed in the FGDs:

3 For a full description, see the Report on the 2009 Round Antenatal Care Sentinel HIV Surveillance in Ethiopia. Ethiopian Health and Nutrition Research Institute (EHNRI)

4 http://www.unaids.org/en/dataanalysis/tools/incidencebymodesoftransmission/

Table 1: Composition of the Focus Group Discussions

Group	Location	Numbers	Comments
Youth	Mekelle, Mai Chew & Adua	3 FGDs - 29 females 3 FGDs - 30 males	Age range 13-28 years; mean age 20.6 years for males and 19.4 years for females.
Female sex workers	Mekelle, Alamata, Mekhoni, Mvai Chew & Setit Humera	6 FGDs	Included only women who self-identified as SWs. Included a number of SWs < 20 yrs of age.
Alluvial Miners	Mai Hanse of Asgede Tsimbla district	1 FGD – 12 participants	Convenience sample.
Refugees	Mai Ayni & Shimelba camps	2 FGDs – 12 men and 12 women	Interviews also with health officials and the camp social worker.
Prisoners	Mekelle & Tafie prison centres (Alamata)	2 FGDs – 8 individuals from each prison	Interviews also with prison officials, head of the prison clinic.
People Living With HIV	Mekelle, Setit Humera & Alamata	6 FGDs – male and female – 8-12 participants in each FGD	Participants were people living with HIV (PLHIV) association members selected in consultation with team members from HAPCO.
Seasonal migrant workers	Ahferom and Weree Leke districts	2 FGDs – 9 men in each	Age range of participants 18-39 years with an average of 25 years. Convenience sample
Settlers	Tsegede district	2 FGDs – 12 male and 12 female	Included people who relocated spontaneously or as part of a government sponsored settlement programme
Armed forces	Three border military camps	3 FGDs-28 men	Included military personnel deployed in Tigrai

In addition 33 key informant interviews were conducted with truck drivers (5), health care workers (17), district HIV board members (2), non-governmental organisation representatives (3 international and 4 local) and government officials (2).

A review of resource allocation for HIV programming was also undertaken. As no National AIDS Spending Assessment (NASA) has been done in Ethiopia or Tigrai, other data sources for expenditure such as the Health Spending Accounts, the Regional Annual HIV Budget Plans and Reports and reports from World Bank, UN agencies and Global Fund were utilised.

1.6. Methods for KYE-KYR Synthesis

The methodology for the KYE-KYR synthesis followed the Modes of Transmission Guidelines (UNAIDS, GAMET WB), 2008[5] in an attempt to:

- Understand if policies and programmes are responding to the key risk factors drives of the epidemic in Tigrai
- Determine whether funding for HIV prevention, treatment and care is allocated to where it is needed

The draft synthesis was reviewed and validated in a workshop with key stakeholders (see **Appendix 1**).

1.7. Study Limitations and Challenges

There are a number of potential limitations and challenges to this MoT process, including:

- An absence of data and poor quality data. There is paucity of data on most-at-risk populations (MARPs) such as sex workers. There is also limited knowledge, attitudes, practice and behavioural (KAPB) data available. Data from small studies may be of questionable value and difficult to generalise from. These issues will limit how comprehensive the KYE will be and will limit the validity of any modelling exercises.
- A reliance on routine health facility data. In the absence of data from special studies, substantial reliance has to be placed on using routine data, such as that from antenatal HIV testing. It has traditionally been perceived that routine data is often not comprehensive or complete, may be biased and may not be representative of the general population. However, reasonably good records of routine data, particularly as it applies to HIV, has been obtained, compiled and reported. Also, although the absolute values obtained from routine data may not accurately reflect true population estimates[6], the biases over the region probably do not vary much which will allow for comparisons to be made[7].
- Limited programme evaluation data. Since few studies evaluating the outcomes of programmes or HIV services have been conducted, it has not been possible to assess the effectiveness of the various components of the HIV prevention response.

5 Available at http://www.unaidsrstesa.org/thematic-areas/hiv-prevention/know-your-epidemic-modes-transmission

6 At best, ANC data is a measure of HIV seroprevalence in fertile women who happen to be pregnant, aged approximately 15-45, which is not necessarily a reflection of a disease prevalence in the general population; while routine HCT data is likely to capture individuals who either have a higher risk of infection or risk perception and awareness which differs from the general population.

7 A study in Addis Ababa investigated the usefulness of using routine VCT data to estimate the magnitude and trend of the HIV/AIDS epidemic as an alternative data source to ANC sentinel surveillance studies. The authors concluded that "VCT based HIV prevalence data closely approximate the ANC based data. Therefore VCT data source can be valuable to complement the ANC data in monitoring the HIV epidemic and trend". Getachew Y, Gotu B, Enquselassie F. An estimate of the magnitude and trend of HIV/AIDS epidemic using data from the routine VCT services as an alternative data source to ANC sentinel surveillance in Addis Ababa, Ethiopia. Ethiop Med J. 2010; 48(4): 257-66

2. Know your Epidemic Synthesis

Reliable data on the epidemiology of HIV in the general population and various sub-populations are essential for planning an effective response to the HIV epidemic and dealing with its consequences. This chapter reviews the main features of the HIV epidemic in Ethiopia and then focuses on the Tigrai region, covering trends in HIV prevalence over time, high risk and vulnerable populations and behaviours and practices that drive transmission.

2.1. The HIV Epidemic in Ethiopia

The first AIDS cases were reported in Addis Ababa in 1986[8] and initial surveillance focused on high-risk groups including commercial sex workers and truck drivers. By the late 1980s, high HIV prevalence levels were reported in these groups, especially in urban centres and along major commercial routes and roadways[9],[10]. Surveillance in this early period was largely restricted to perceived high risk groups such as sex workers, truck drivers and military recruits.

Surveillance activities to monitor HIV prevalence in the general population started in 1989 with the establishment of sentinel surveillance of pregnant women attending an antenatal care (ANC) clinic in Addis Ababa, but until 1997 no other sites were included in the programme. In recent years, especially since 2000, the number of urban ANC surveillance sites has increased dramatically. Rural sites have also been added to improve the representation of the rural population. By 2005, there were 82 ANC surveillance sites nationwide (38 in urban areas and 44 rural) and by 2009 114 sites (41 urban and 73 rural)[11].

2.1.1. A Decreasing Prevalence Over the Past Ten Years

The first systematic national report on HIV was released in 1996[12] and it was found that HIV prevalence had risen from 1% in 1989 to an estimated 5.2% in 1996, indicating a generalized HIV epidemic in the country. Surveys were based on antenatal clinic attendees and were unlinked and anonymous, and provided no detailed information about risk factors. Little data on the rural epidemic was available until the Demographic and Health Survey (DHS) was conducted in 2005[13].

Based on the findings from ANC surveillance data, the prevalence of HIV among pregnant women 'fell' from 7.3% in 2000 to 3.5% in 2005 and further decreased to 2.2% in 2009. While some of this decrease was likely to be due to an actual decrease in HIV in the population, it was also likely to be due to the fact that representation of the rural sites was very low in the early days of ANC surveillance which has improved in subsequent years. This may have contributed to higher initial estimates as a product of the overrepresentation of urban sites.

8 Lester FT, Ayehunie S, Zewdie D.; Acquired immunodeficiency syndrome: seven cases in an Addis Ababa hospital; Ethiop Med J. 1988; 26(3):139-45

9 Mehret M, Khodakevich L, Shanko B, Ayohunie S, Gizaw G, Shanko B, et al; HIV-1 Infection and related risk factors among female sex workers in urban areas of Ethiopia; Ethiopian J Health Dev.1990a; 4:163-170.

10 Mehret M, Khodakevich L, Shanko B, Ayohunie S, Gizaw G, Shanko B, et al; HIV-1 infection among employees of the Ethiopian Freight Transport Corporation; Ethiopian J Health Dev. 1990b; 4:177-182.

11 Mishra, V., Rathavuth, H., & Pav G.; Evaluating HIV Seroprevalence Estimates from Ethiopia: Further Analysis of the 2005 Ethiopia Demographic and Health Survey. Calverton, Maryland, USA: Macro International Inc.; 2008

12 MOH; AIDS in Ethiopia; First Edition. 1996

13 CSA/ ORC Macro: Ethiopia Demographic and Health Survey (2005), August 2006

The 2005 DHS survey provided the first large-scale population-based estimates at the regional and national level. A lower HIV prevalence estimate of 1.4% was made for the general adult population aged 15-49 years (5.5% urban and 0.7% rural; 1.9% among females and 0.9% among males) which was less than half the 3.5% prevalence coming from that year's national ANC report. The 2005 DHS study was criticised because of the relatively small overall sample size and high refusal rates, but the large discrepancy between the two estimates resulted in the FMoH, in collaboration with partners, synthesizing the data sources and a single prevalence point estimate of 2.1% was agreed upon (7.7% urban and 0.9% rural)[14].

According to the latest 2011 DHS, overall HIV adult prevalence (15-49 years) is estimated at 1.5% (1.9% among women and 1.0% among men); 4.2% in urban areas and 0.6% in rural areas. Current data from the UNAIDS EPP/Spectrum model estimate there are about 790,000 PLHIV (608,000 adults and 182,000 children) and 953,000 AIDS orphans[15].

Data obtained from the ten urban sites that have been involved in at least three ANC surveillance cycles reveals a declining HIV prevalence since 2000, with very sharp declines in some areas[16]. While these declines may be partly due to self-selection bias due to self-screening before pregnancy and marriage, there does appear to be a significant downward trend in urban areas.

In contrast, there have been few studies describing the rural HIV epidemic in Ethiopia. A 2008 study commissioned by HAPCO[17] noted that most studies of HIV in the country were urban-based, and there was little information on the rural population where the majority of the population reside. Information was limited with regard to the extent of misconceptions, stigma and discrimination, and knowledge of PMTCT and HCT services. Urban-rural transmission of HIV and sexual networks were poorly understood. One study that did look at the rural epidemic was commissioned by the International Livestock Research Institute (ILRI) and described behavioural factors that could contribute to HIV transmission in ten rural ***woredas*** (districts; including two in Tigrai), mainly in relation to agricultural production and the rural economy[18].

The study found that potentially HIV-risky environments existed in and around each ***woreda*** that was studied, and noted that both bridging populations (people who are at higher risk providing links with other subpopulations who have lower risk behaviour) and cultural traditions and practices may hasten the spread of the disease once it is present in rural communities. As well, certain aspects of market-led agricultural growth may present additional risks of exposure to HIV infection to rural communities. The dominant factor is the huge seasonal movement of people throughout rural Ethiopia. Although this increase in mobility is a sign of economic empowerment, it is also a potential risk of exposure to HIV. The study suggested that in Tigrai, a "moderate" impact of HIV was already being felt, with urban communities already affected, and the epidemic having progressed to the "impending" stage among rural communities.

14 Mitike, G & Tamiru, M; The drivers of HIV/AIDS Epidemic and response in Ethiopia. Federal HIV/AIDS prevention and control office. 2008

15 Ethiopia Global AIDS Progress Report, 2012. 23 April 2012

16 Ethiopia HIV/AIDS Prevention & Control Office (HAPCO) and Global HIV/AIDS Monitoring and Evaluation Team (GAMET). HIV/AIDS in Ethiopia – An epidemiological synthesis. The Global HIV/AIDS Program. World Bank. April 2008.

17 Mitike, G & Tamiru, M. The drivers of HIV/AIDS Epidemic and response in Ethiopia. Federal HIV/AIDS prevention and control office. 2008

18 Bishop-Sambrook C; Dynamics of the HIV/AIDS epidemic in value chain development in rural Ethiopia and responses through market-led agricultural initiatives; International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia 2008

The 2008 World Bank Synthesis report stated that *"not only are prevalence or incidence data lacking, there has also been little research to describe the dynamics of rural spread or behavioural studies investigating sexual practices or attitudes, sexual networking, the existence of rural sex work, other local or traditional practices that might fuel or inhibit the epidemic, etc"*[19]. However, the 2008 World Bank report did make a number of statements on the epidemiology of HIV in Ethiopia based on the data that was available, including:

- The epidemic is highly heterogeneous: The HIV epidemic in Ethiopia as a whole may be less severe, less generalized and more heterogeneous than previously believed. It seems to have stabilized or even declined in most of the major urban centres, while increasing in the smaller towns. The rural epidemic appears to be heterogeneous, with most regions having a relatively low prevalence of HIV. There are marked regional variations.
- The epidemic is higher in small towns and market centres: Contrary to expectations, small towns included in the 2005 DHS survey exhibited a higher than expected prevalence of HIV compared to bigger towns. These small towns may be HIV hot-spots that have been neglected in HIV prevention efforts to date.

In summary, a trend analysis carried out for the country from 1982-2005 shows a continuous gradual rise of HIV/AIDS prevalence rate until the late 1990s and then a decline in the years since 2000. Although this appears encouraging, there is no guarantee that such a trend will continue into the future[20]. However, comparison of the 2005 and 2011 DHS estimates shows that over the last 6 years, HIV prevalence has not changed among women and men (see table A5, Appendix 2).

2.1.2. The Drivers of the HIV Epidemic in Ethiopia

The main sources of recent information about the HIV epidemic in Ethiopia are the two studies conducted in 2008 by HAPCO – the HIV Epidemiological Synthesis[21] and the desk review that was commissioned to identify behavioural, cultural, social, economic, policy, and other key factors influencing the spread of HIV in Ethiopia[22]. Key findings from these reviews not already mentioned include:

- Low levels of knowledge about HIV/AIDS: Although awareness of HIV/AIDS was high, knowledge on prevention methods was generally inadequate, particularly among women in the rural areas and the rural population in general. In most of the urban areas knowledge of prevention was considerably higher.
- Mixed sexual behaviour patterns and trends among the general population: Data indicates that while risky behaviour has levelled off or decreased slightly in recent years, there is still a substantial proportion of the adult population who are engaged in risky sexual practices, although condom usage and age of sexual initiation, at least for males, is increasing.

19 Ethiopia HIV/AIDS Prevention & Control Office (HAPCO) and Global HIV/AIDS Monitoring and Evaluation Team GAMET). HIV/AIDS in Ethiopia – An epidemiological synthesis. The Global HIV/AIDS Program. World Bank. April 2008

20 Factors fuelling the prevalence of HIV and contributing for regional variations. Findings from EDHS 2005 Ethiopian Society of population studies In-depth Analysis of the Ethiopian Demographic and Health Survey 2005.

21 Ethiopia HIV/AIDS Prevention & Control Office (HAPCO) and Global HIV/AIDS Monitoring and Evaluation Team (GAMET); HIV/AIDS in Ethiopia – An epidemiological synthesis. The Global HIV/AIDS Program. World Bank. April 2008

22 Mitike, G and Tamiru, M. The drivers of HIV/AIDS Epidemic and response in Ethiopia. Federal HIV/AIDS prevention and control office. 2008

- HIV Transmission risk in marriage – discordant couples: Most discordant couples (where one partner is HIV positive and one HIV negative) reside in urban areas, and their HIV-negative partners are a group at high risk of contracting HIV. Couple counselling is typically not offered by service providers.
- Sex work may be on the rise and sex workers are still at risk: There has been no survey of HIV prevalence among sex workers in the country over the past decade, nor studies estimating their size. The scant data suggest that the demand for paid sex is increasing and the median age of sex workers is decreasing.
- Presence of sexually transmitted infections (STIs): A number of studies have demonstrated a strong association between STIs and HIV transmission. In Ethiopia an increased risk of HIV transmission positively related with syphilis has been reported among various populations including sex workers23, truck drivers, factory workers24, blood donors25 and pregnant women attending ANC26.
- Young and unmarried women are at risk: Youth, especially never-married sexually-active females, are the most vulnerable to HIV infection in the country, with prevalence levels much higher than the average for both urban and rural areas as well as all women of reproductive age. This is associated with an early age of sexual debut and sexual mixing with high-risk older men. The prevalence of STIs and pregnancy was found to be high among youth in several studies, indicating the occurrence of unprotected sex, in spite of knowledge of protection measures. Generally young people were not equipped with negotiation skills or skills to maintain HIV prevention practices. Out-of-school youth were also confronted with limited opportunities for employment, a lack of recreation centres as well as no strategies to involve them in HIV prevention programmes.
- Alcohol and drug use: Among the risk factors identified in the review, alcohol abuse and drugs use, including Khat chewing; were reported to be factors that facilitated unprotected sex and multiple sexual partnerships.

However, both studies noted the paucity of published socio-cultural research in the country that focuses on attitudes, behaviours, cultural norms and practices and social conditions that protect people or make them more vulnerable to HIV infection. Most studies focus only on measuring knowledge, attitude and practice with regard to HIV, HIV counselling and testing (HCT) and prevention of mother to child transmission (PMTCT), and there is a need to look for factors that are more deeply rooted in culture, family, individual makeup and relationship linkages to explain behaviour choices, perception of risk and acceptance or rejection of HIV interventions. It is known that cultural practices such as polygamy exist to varying degrees in many parts of Ethiopia as does widow inheritance, although the contribution of such practices to the spread of HIV infection in the country are not known. In addition, there are various types of harmful traditional practices which may influence HIV vulnerability for which data is lacking.

23 Aklilu M, Messele T, Tsegaye A, Biru T, Mariam DH, Van Bethem B, Coutinho R, Rinke de Wit T, Fontanet A; Factors associated with HIV-1 infection among sex workers of Addis Ababa, Ethiopia; AIDS 2001, 15:87-96.

24 Mekonnen Y, Sanders E., Messele T, Wolday D, Dorigo-Zestma W, Schaap A, Mekonnen W, Meless H, Mihret W, Fontanet A, Coutinho RA, Dukers NH; Prevalence and incidence of, and risk factors for HIV-1 infection among factory workers in Ethiopia 1997-2001; J Health Popul Nutr 2005; 23(4):358-368

25 Assefa A, Rahlenbeck S, Molla K, Alemu S; Seroprevalence of HIV-1 and syphilis antibodies in blood donors in Gondar, Ethiopia, 1989-1993. Journal of Acquired Immune Deficiency Syndromes, 1994, 7(12):1282-1285.

26 Kidan KG, Fantahun M and Azeze B; Seroprevalence of Human Immunodeficiency Virus Infection and its association with Syphilis seropositivity among antenatal clinic attenders at Debretabor rural Hospital, Ethiopia; East African Medical Journal, 1995, 72(9):579-583.

As well, both studies noted that more data on other potentially high-risk and vulnerable populations are needed: uniformed services, truckers, refugees and displaced people, street children, daily labourers, students and other mobile populations may be among the most vulnerable groups in the country. However data are lacking to measure accurately the recent spread of HIV in these groups and their role in the further spread of HIV to the general population. In groups such as injection drug users (IDUs) and men who have sex with men (MSM), almost no data exists. These are critical gaps in attempting to understand the current transmission dynamics.

Arising out of the 2008 Synthesis Report were a number of hypotheses relating to the epidemiology of HIV in Ethiopia. A number of these were thought to be relevant to the Tigrai region and after holding a workshop of stakeholders in Mekelle on 24 June 2011 (see **Appendix 1**) the following three hypotheses were deemed to be appropriate for further investigation:

- Hypothesis 1. Over the last 10 years, the HIV prevalence has stabilized or declined in the major urban centres while increasing in the smaller towns.
- Hypothesis 2. The rural epidemic is heterogeneous with most districts having a relatively low HIV prevalence but some areas demonstrating higher prevalence levels.
- Hypothesis 3. There may be a higher HIV prevalence in certain key population groups including sex workers, seasonal workers and settlers, alluvial miners, military/police, populations of humanitarian concern (refugees), prisoners, youth and in particular university students as well as other high risk youth, and discordant couples.

While the focus of the analysis is on attempting to determine the veracity or otherwise of the above hypotheses, the analysis has included openness towards alternative hypotheses.

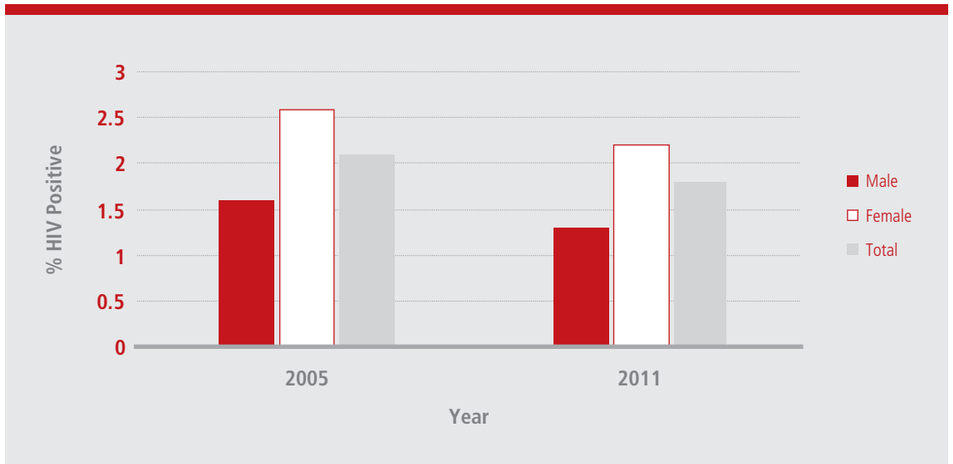
2.2. The HIV Epidemic in Tigrai

The Federal HAPCO (FHAPCO) estimated that there are an estimated 56,900 PLHIV in Tigrai in 2012: 43,600 adults above the age of 15 years (the total adult population is 2,689,600) and 13,300 children (0-14 years old) (EPP/Spectrum projection 2012). In 2012, there are 3,500 estimated pregnant women in need of PMTCT. If we take the national current HIV estimated MTC transmission rate at 20% in 2012, this might result in as many as 700 new infections in newborns for this cohort alone. **Recent data from the 2011 DHS estimated HIV prevalence for Tigrai as 1.8%**.

2.2.1. Prevalence Data from Tigrai

DHS data demonstrates **a slight decrease in overall prevalence in Tigrai over the past seven years but this was not statistically significant** (1.8% in 2011 vs. 2.1% in 2005, odds ratio (OR) 0.9, p=0.73) and in both the male and female populations (females: 2.2% in 2011 vs. 2.6 in 2005, OR 0.9, p=0.78; males 1.3% in 2011 vs. 1.6%, OR 0.9, p=0.88) (**Figure 1**). The small sample sizes make comparisons difficult but there were no significant differences between HIV prevalence in Tigrai and the rest of Ethiopia (Tigrai: 1.8% 95% C.I. 1.4-2.4 in 2011; Ethiopia excluding Tigrai: 1.4%, 95% C.I. 1.2-1.7 in 2011).

Figure 1: HIV Prevalence among women and men age 15-49 in Tigrai 2005 and 2011



Source: DHS 2005 and 2011

A total of 4 urban and 7 rural ANC sentinel sites are in the Tigrai region. According to the most recent ANC surveillance data (2009) HIV prevalence in Tigrai is 2.2% (5.0% urban and 1.3% rural)[27]. As there is no data on HIV incidence available for Tigrai, a proxy measure of HIV incidence is to determine HIV prevalence in young people[28]. **Figures 2 and 3** show HIV prevalence among pregnant women aged 15-24 attending antenatal care in urban and rural areas of Tigrai from 2001 to 2009. In each case it is clear that there has been a substantial decrease in HIV prevalence over this time period which is likely to reflect a decrease in HIV incidence.

27 Report on the 2009 Round Antenatal Care Sentinel HIV Surveillance in Ethiopia. Ethiopian Health and Nutrition Research Institute (EHNRI). 2011

28 It is assumed that cases of HIV occurring in the late teens and early 20s are relatively recent infections that were acquired during the early phases of sexual activity. However, if there is a high prevalence of early onset of sexual activity, the prevalence in 20-24 year olds (five-ten years later) may not be a very reliable proxy indicator of incidence.

Figure 2: HIV Prevalence in 15-24 year olds, from ANC survey data for urban sites in Tigrai 2000-2009[29]

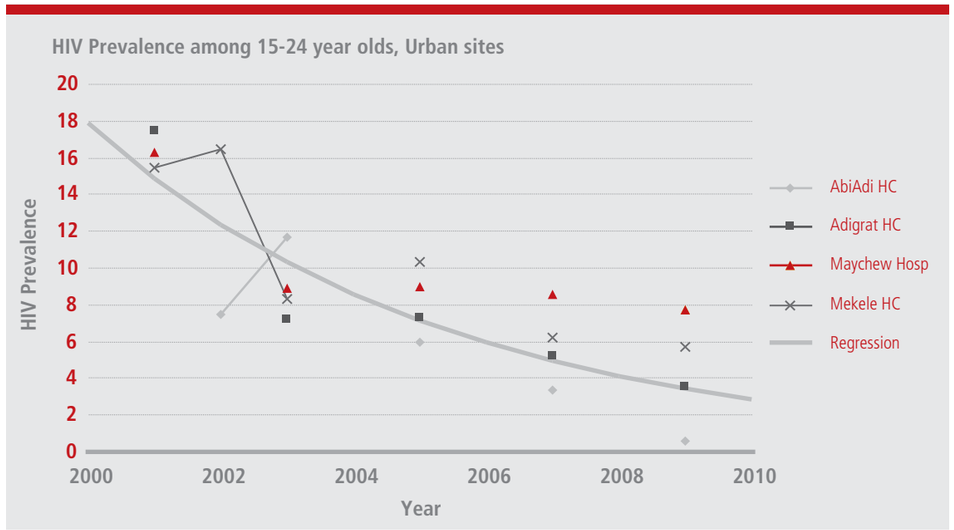
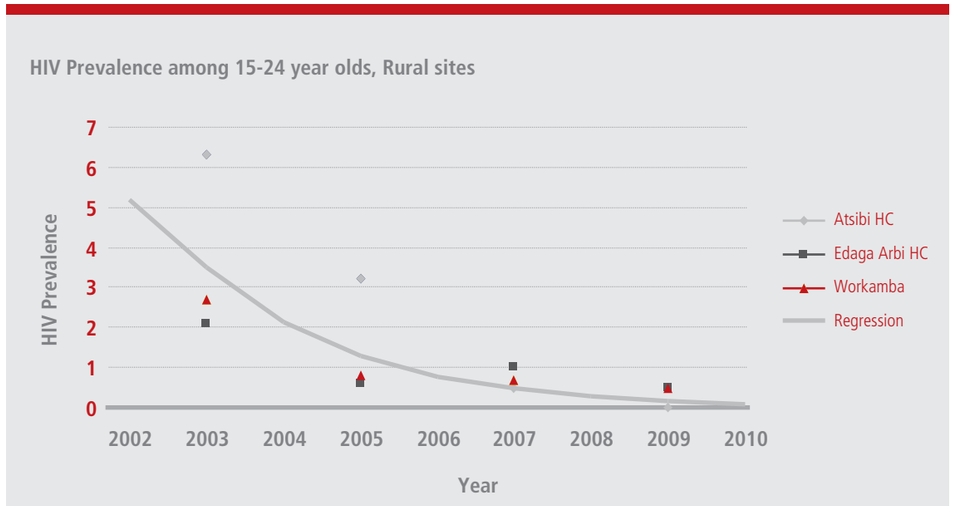


Figure 3: HIV Prevalence in 15-24 year olds, from ANC survey data for rural sites in Tigrai 2000-2009



Source: Data taken from ANC sentinel surveillance reports 2002-2010

A clearer picture of HIV prevalence trends emerges when routine data from all ANC sites (not only data from the eleven sentinel surveillance sites) is analysed (as part of the PMTCT programme). Data that is available from PITC and HCT sites was also analysed since in Tigrai it is believed that from 2007 onwards, routine data is comprehensive and valid.

29 Figures 2 and 3 only include trends for the sites that had at least 4 consecutive data points.

Table A17 in **Appendix 3** shows HIV prevalence per health facility (HF) by year 2008-2010 for ANC attendees (as part of the PMTCT programme/ routine data). It should be noted that for most HFs the HIV prevalence declined from 2008 to 2010. In many cases, the HIV prevalence is particularly high in 2008 and then decreased markedly. It is unlikely that this steep decline in prevalence is representative of the antenatal population (or the general population) in all HFs because the decline is too steep over a very short time period.

A more likely explanation is that in the early years, not all women were offered HIV tests but that mainly those who appeared to have AIDS were encouraged to test. This means that the data may be biased. However, bias alone will not account for the drop and because all other data sources also show a declining prevalence, this probably reflects a real decline in the epidemic.

It is also notable that the decline in HIV prevalence is across the board and there is no indication from this data that there is a rising prevalence in small towns or emerging cities.

Table 2 is a summary of the HC data disaggregated by various factors:

Table 2: HIV prevalence levels among antenatal clinic attendees at health facilities grouped by various factors.

Area	2008	2009	2010
Municipal Cities*	5.1%	4%	2.9%
Emerging Towns**	2.1%	2.2%	1.2%
Seasonal Migrant Workers/ settlers***	6.9%	5.0%	3.2%
Main road****	4.7%	3.5%	1.9%
Rural*****	0.9%	1.3%	0.3%

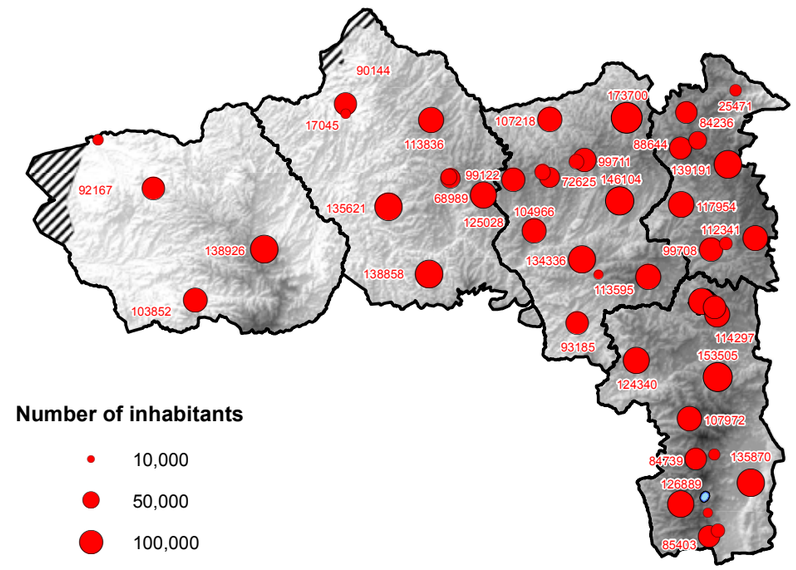
* *Municipal cities include the 12 urban districts of Tigrai and are classified as cities with their own municipality and administration.*
** *Emerging towns include health facilities in the capital of 34 rural districts plus growing towns in the growth corridors of Tigrai and those within 10km of a main tarmac road.*
*** *Health facilities located in areas where there are seasonal migrant workers and settlers in Western Tigrai.*
**** *Health facilities within 10km of a tarmac road were classified as on the main road including those in municipal cities, emerging towns, areas with seasonal migrant workers and settlers and rural areas.*
***** *Health facilities in all areas outside the municipal cities towns were classified as rural.*

As seen in **Table 2**:

- HIV prevalence is higher in major urban areas (municipal cities) when compared to the 'emerging' towns and much lower in rural areas.
- Health facilities in resettlement areas and commercial farms with seasonal migrant workers also have a higher HIV prevalence.
- Health facilities within 10km of a main road have a higher HIV prevalence.
- It should be noted that this analysis is not appropriate for determining HIV prevalence among alluvial miners and refugee camps. The numbers of people working as miners or living in refugee camps is probably only a small proportion of all the people living in the catchment area of a particular HF. Therefore, the data from the HF will not reflect the HIV prevalence in these sub-populations but rather the prevalence in the broader population.

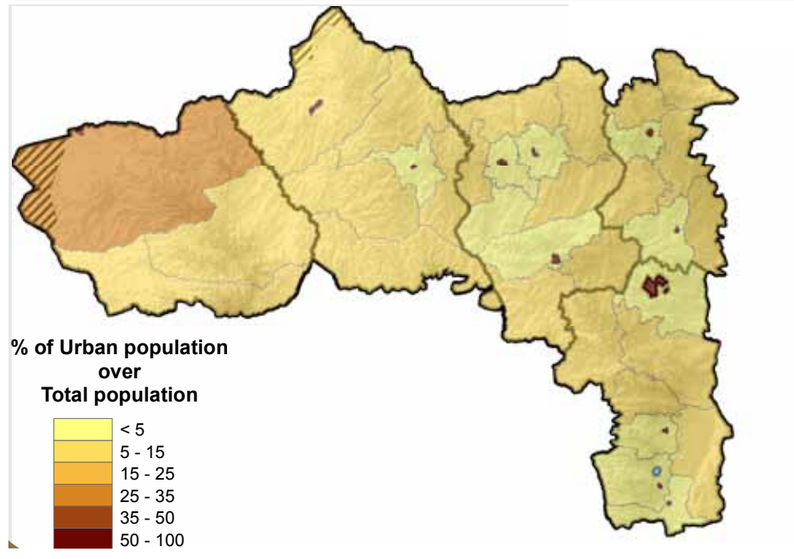
Figure 4 and **Figure 5** show the distribution of population in Tigrai as well as the areas of increasing urbanity. As can be seen, the population is concentrated in the Eastern half of the state, and while the main urban centres are also in the East, there is an area of increasing urbanisation in the Northwest, corresponding to the zone of higher prevalence seen in **Figures 6, 7 and 8**.

Figure 4: Distribution of population in Tigrai



Source: Central Statistical Agency of Ethiopia Atlas 2011

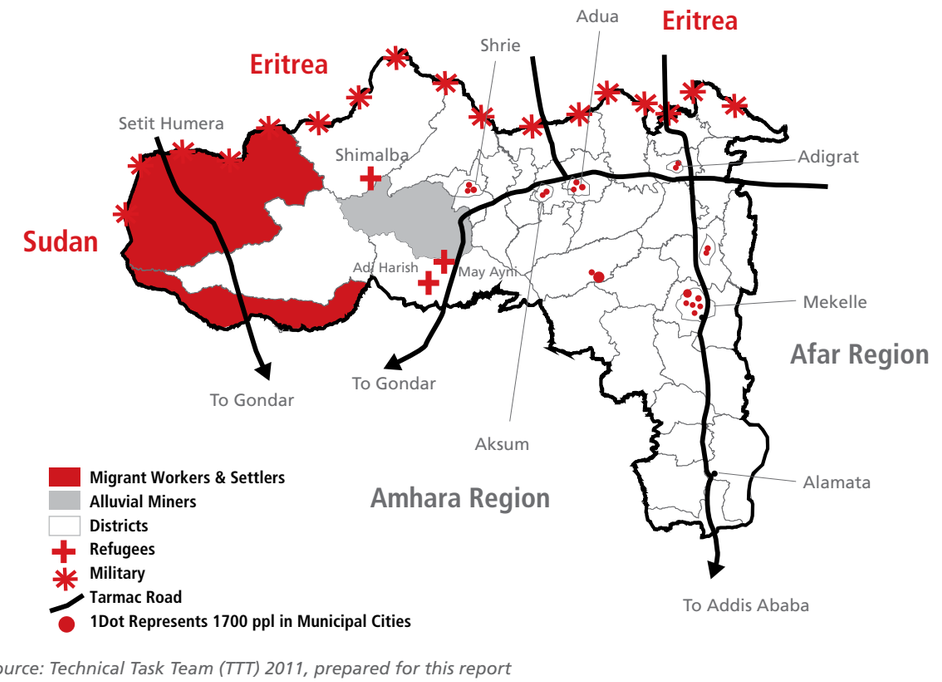
Figure 5: Areas of urban population in Tigrai



Source: Central Statistical Agency of Ethiopia Atlas 2011

Figure 6 shows the distribution in Tigrai of districts where there are a high number of migrant workers, miners, refugee camps, major roads and the size of municipal cities:

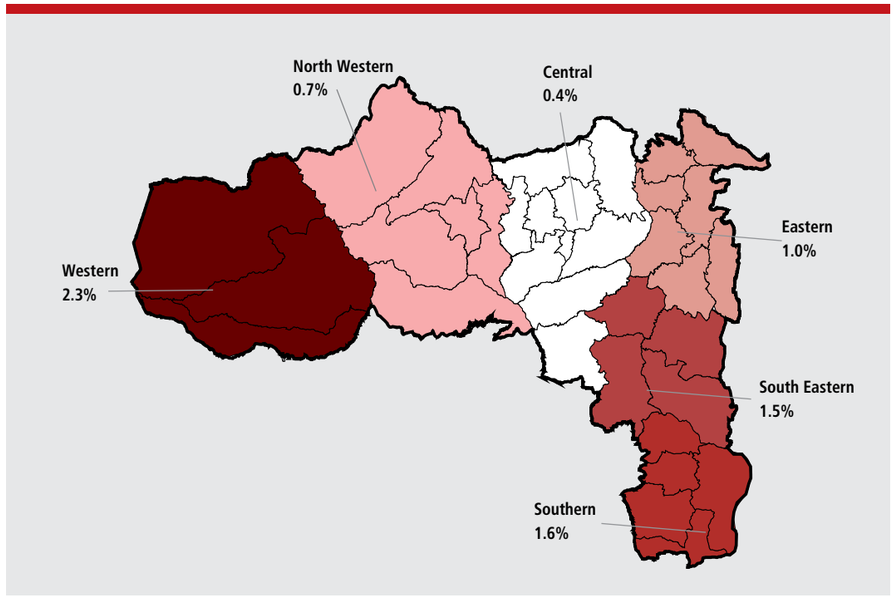
Figure 6: Distribution of factors which may influence the distribution of HIV in Tigrai.



Source: Technical Task Team (TTT) 2011, prepared for this report

Figure 7 demonstrates that just as in the whole of Ethiopia, there is **geographical** heterogeneity in HIV prevalence in Tigrai, ranging from 0.4% in the Central Zone to 2.2% in the Western Zone (ANC routine data, 2010). A number of factors may account for this, but it can be stated that the areas with the lowest prevalence - the North Western and Central zones - are less urbanized and comprise the rural hinterland of Tigrai. By contrast, the higher-prevalence Western zone is where there are concentrations of settlers and seasonal migrant workers and rapid urbanization. The Southern zone is a "growth corridor", with a booming economy and fast developing towns. It is along the old tarmac road (from Alamata to Adigrat) which is the main transport route into the region and runs through a number of major urban centres including Mekelle. Anecdotal reports state that the culture here is said to be less conservative than any other area in Tigrai, but there is no data to confirm this claim.

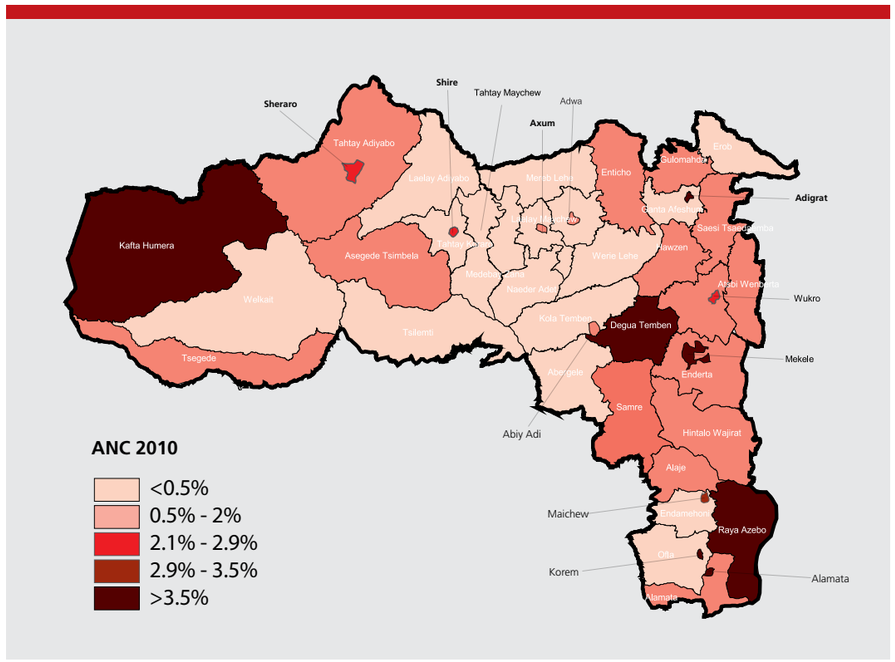
Figure 7: HIV prevalence in Tigrai by zone excluding municipal cities, based on ANC routine data (PMTCT programme), 2010.



Source: Technical Task Team (TTT) 2011, prepared for this report

Figure 8 breaks this down to the district level, including the urban population centres (urban districts):

Figure 8: HIV prevalence in Tigrai by district for 2010 based on routine ANC data (PMTCT programme).



Source: Technical Task Team (TTT) 2011, prepared for this report

Several important findings emerge from **Figure 8** including:

- A higher prevalence can be seen in the urban districts, Mekelle in particular as well as other urban centres such as Alamata town, Korem and Setit Humera town.
- The higher prevalence in the districts along the main road from Alamata to Adigrat and Adwa to Enda Selase Shire. This is the most accessible part of Tigrai with a number of urban areas including Mekelle and a high concentration of economic activity.
- The higher prevalence in Kafta Humera district where there are seasonal workers and settlers and a high urbanization rate.
- The higher prevalence in Degua Tembien district which needs further probing, one possibility (not confirmed) is that it is a 'hide out' from Mekelle for people to seek HIV services while avoiding stigma (the closest discreet location). Another hypothesis is that there is a holy water source (Enda Aba Hadera) in the district. PLHIV go there for healing and are encouraged to test. It might be that people from other areas go to the area for testing. There are no other known HIV drivers.
- The higher prevalence in Raya Azebo: this district is a designated economic zone where there are large commercial farms.

A further examination of the HIV prevalence for ANC attendees in rural areas (**Table A27 - Appendix 4**) shows that with the exception of the higher-prevalence districts noted above (i.e. Degua Tembien, Kafta Humera and Raya Azebo) **HIV prevalence is consistently low and does not vary greatly across *rural* districts** (i.e. between 0 and 1%). While it is true that the analysis *between* districts may mask "hot spots" *within* a district so it cannot be ascertained from the tables in Appendix 4 that prevalence is homogeneous within a district, it also is evident that rural HIV prevalence in Tigrai is generally low and very different from the urban prevalence.

The above routine data is based on HIV prevalence of ANC attendees within the PMTCT programme. An alternate source of HIV prevalence data can be found from HIV testing centres (HCT and PICT), which would include data from men and non-pregnant women from a wider age range than what is found in ANCs. Data based on HCT statistics may also be biased because people who go for HIV testing are typically not representative of the general population (most will have some reason to think that they might be HIV-positive), and the motivation for people to go for testing may change over time. The bias is likely to be even more exaggerated in the case of PICT data because health personnel will refer people for testing whom they suspect are HIV positive. So while the absolute estimates from HCT and PICT are unlikely to be truly representative of the population surrounding the health facilities, the trends may reflect overall changes in the general population, and the geographical differences may be a useful contribution to a triangulation to determine higher risk areas.

As can be seen from Table 3, the HCT data shows an approximate halving of HIV prevalence among all groups in those tested between 2008 and 2010. The PICT data shows an even more pronounced decrease over the same time period. Such rapid declines in HIV prevalence do not generally occur in the wider community and therefore it is unlikely that these prevalence levels represent the true prevalence in the community. What it may show, however, is a change in the methods and priorities for HIV testing: in earlier times, people tended to self refer for HCT and be referred for HIV testing by a health professional (PICT) mainly when it was strongly suspected that they were HIV positive. More recently, HIV testing has become more common and is done not only when the patient has strong symptoms and/or signs of AIDS.

With a larger proportion of HIV-negative persons being tested, the HIV prevalence among those being tested has decreased. This hypothesis is probably true for the PICT data, as the numbers tested in 2010 are many times those tested in 2008. However, it can also be seen that the numbers tested by HCT are fairly similar between 2008 and 2010, and so a stronger argument can be made that the HCT numbers are reflecting a real decline in HIV prevalence and similar to the declines seen in ANC data.

Table 3: Tigrai HCT and PICT: Numbers tested and HIV prevalence by sex, age group and method of testing for 2008, 2009 and 2010.

	2008		2009		2010	
	Number	% Positive	Number	% Positive	Number	% Positive
All Sites – HCT data						
Male 0-14 years	9 264	2.4	11 613	2.1	11 798	1.5
Female 0-14 years HIV	10 168	2.8	12 199	2.6	13 394	1.2
Male 15-24 years	116 329	1.0	90 407	0.8	124 985	0.4
Female 15-24 years	123 497	1.9	92 952	1.8	129 011	1.0
Male 25+ years	124 287	3.0	86 463	3.5	117 201	2.3
Female 25+ years	104 409	4.1	71 744	5.1	107 720	2.3
All Sites – PICT data						
Male 0-14 years	1 438	13.0	8 199	3.5	34 908	1.0
Female 0-14 years	1 410	12.7	9 017	3.3	31 090	2.0
Male 15-24 years	6 641	6.6	25 409	2.6	93 777	0.7
Female 15-24 years	10 199	7.7	44 411	3.3	120 362	1.4
Male 25+ years	11 126	13.6	35 390	6.4	127 502	2.4
Female 25+ years	13 763	13.2	50 399	6.1	152 506	2.7

Source: Tigrai Health Bureau profiles 2008-2010

Table 4 and **Table 5** show the prevalence by sex and age group, disaggregated by rural or urban residence. Once again, the decrease in prevalence between 2008 and 2010 is seen across all age groups, and in both urban and rural settings. These tables also dramatically show the differences between urban and rural prevalence in Tigrai, as well as giving credence to the proposition stated earlier that the great increase in the numbers tested by PITC has resulted in a dramatic fall in prevalence of positive tests from PICT clinics. However, the results from HTC also confirms the belief that people who voluntarily come forward for HIV testing have reason to – based on the HCT data, the high prevalence in urban females over 25 years could only have come from testing sites that served a high-risk population.

The number of children tested is smaller and selection biases may be even stronger than for the adult population. Nevertheless, the HIV prevalence among children 0-14 years old (not yet regarded as sexually active) is high in relation to the other age groups. If we consider that the MTC transmission rate at the end of the breastfeeding period was still estimated at 20% in 2012 at the national level (EPP/Spectrum estimates), the high prevalence in children is likely to reflect the cumulative result of a PMTCT programme lacking in coverage and quality over the years.

Table 4: Numbers tested and HIV prevalence by sex, age group, urban/rural for HCT for 2008, 2009 and 2010.

District	2008		2009		2010	
	Number	% Positive	Number	% Positive	Number	% Positive
Urban HCT Sites						
Male 0-14 years	1 641	10.1	3 402	5.3	1 214	9.6
Female 0-14 years	2 267	9.3	3 271	7.0	1 459	7.8
Male 15-24 years	28 354	2.8	24 822	2.0	32 650	0.9
Female 15-24 years	27 797	5.3	22 149	5.3	28 952	3.0
Male 25+ years HIV	21 279	11.7	25 142	9.0	33 796	6.1
Female 25+ years	10 251	24.8	12 032	21.3	13 749	15.3
Rural HCT Sites						
Male 0-14 years	7 623	0.8	8 211	0.8	3 310	0.7
Female 0-14 years	7 901	0.9	8 928	1.0	3 580	0.4
Male 15-24 years	87 975	0.5	65 585	0.4	92 335	0.2
Female 15-24 years	95 700	0.9	70 803	0.7	100 059	0.5
Male 25+ years	103 008	1.2	61 321	1.3	83 405	0.8
Female 25+ years	94 158	1.9	59 712	1.8	93 971	0.9

Source: Technical Task Team (TTT) 2011. Extracted for this report from the Tigrai Health Bureau profiles 2008-2010

Table 5: Numbers tested and HIV prevalence by sex, age group, urban/rural for PICT for 2008, 2009 and 2010.

District	2008		2009		2010	
	Number	% Positive	Number	% Positive	Number	% Positive
Urban PICT Sites						
Male 0-14 years	1 078	14.8	4 490	5.3	14 801	1.6
Female 0-14 years	1 028	15.2	5 211	4.6	13 139	1.5
Male 15-24 years	3 251	10.5	10 168	4.9	31 922	1.2
Female 15-24 years	5 457	11.2	21 914	4.7	51 123	2.1
Male 25+ years	5 538	13.5	15 680	10.7	43 907	4.7
Female 25+ years	7 031	11.0	23 283	9.3	58 518	4.6
Rural PICT Sites						
Male 0-14 years	360	7.5	3 709	1.2	9 055	0.7
Female 0-14 years	382	6.0	3 806	1.5	7 795	0.6
Male 15-24 years	3 390	2.8	15 241	1.2	61 855	0.4
Female 15-24 years	4 742	3.7	22 497	1.9	69 239	0.9
Male 25+ years	5 588	3.7	19 710	3.0	83 595	1.3
Female 25+ years	6 732	3.9	27 116	3.3	93 988	1.6

Source: Technical Task Team (TTT) 2011. Extracted for this report from the Tigrai Health Bureau profiles 2008-2010

2.3. HIV Infection among Key Populations in Tigrai

While it can be seen in section 2.2 that the HIV prevalence in Tigrai is generally declining among the general population sampled through DHS, antenatal surveillance, or testing/counselling centres, that may not be true for populations who are known or thought to be at higher risk of acquiring or transmitting infection. What data is available on the prevalence in these populations is summarised below:

2.3.1. Youth (15-24 years of age) and University Students

The 2008 synthesis report noted that, *"the pattern of HIV infection among young women (15-24 years) reveals the high concentration of HIV infection, especially among sexually active never-married women both in urban and rural areas"*[30]. The 2005 DHS estimated that the prevalence of HIV among 15 to 24 year old women in Tigrai to be 3.0% and among men of the same age to be 1.1%. HCT and PICT data for Tigrai also show the same trend with young women twice as likely to be HIV positive in comparison to their male counterparts (Table 6). However, the recent 2011 DHS estimated that the prevalence of HIV among women aged 15 to 24 years in Tigrai was 0.6%. Similar HIV prevalence was shown among males of the same age with 0.7% being HIV positive. While HIV prevalence among females 15-19 is higher than males of the same age (0.6% versus 0%), the opposite is true for the age group 19-24 (0.8% for females versus 1.8% for males). Multivariate analysis of socio economic factors (marital status, employment, education and wealth) associated with HIV infection in females in Tigrai (DHS 2011) found unmarried women had a higher risk of HIV infection compared to married or cohabiting females (OR 2.9, 95% C.I. 1.4-6.0, p=0.005).

Table 6: Comparisons of HIV prevalence between young men and women in Tigrai

Age Band	Data source	Females	Males
15-24 yrs	DHS 2005 (Tigrai)	3%	1.1%
15-24yrs	DHS 2011 (Tigrai)	0.6%	0.7%
15-24yrs	Tigrai HCT 2010	1.0%	0.4%
15-24yrs	Tigrai PICT 2010	1.4%	0.7%

DHS 2011 data shows as with the rest of Ethiopia, in Tigrai sexually active, never-married women were at higher risk of being HIV positive (2.8%) than never-married men (1.6%)[31]. A number of reasons for this finding in Ethiopia have been postulated and could equally apply to Tigrai although direct local evidence is lacking for some of the below (the relevant DHS 2011 indicators are not available disaggregated by region because of sample size issues):

- Tendency for girls to have sexual debut at an earlier age than boys. According to DHS 2011 39% of females and 13% of males in Ethiopia first had sex below the age of 18 years
- Tendency for girls to have older partners whereas boys are less likely to do so (in Ethiopia, 21% of women aged 15-19 who had intercourse in the past 12 months had sex with a man 10 years or older compared with less than 1% of men reporting sex with a women 10 year or older, 2011 DHS Ethiopia)

30 Ethiopia HIV/AIDS Prevention & Control Office (HAPCO) and Global HIV/AIDS Monitoring and Evaluation Team (GAMET); HIV/AIDS in Ethiopia – An epidemiological synthesis. The Global HIV/AIDS Program. World Bank. April 2008

31 Additional analysis of DHS 2011 data preformed for this study.

- Gender dynamics make girls less able to negotiate safe sex
- Reported condom use is lower in young women than among young men (in Ethiopia, 37% of women and 68% of men reported condom use at last sex in Ethiopia in the 2011 DHS).

VCT data[32] from the USAID Abt Associates Private Health Sector Programme (PHSP) among various sub-populations for Tigrai from June-September 2011 showed that students had the lowest HIV prevalence amongst all sub-populations with 0.3%. It was noted, however, that these are mainly secondary school and college students, and those who volunteered are usually biased by self selection. No break down by gender was given[33].

No other studies reporting HIV prevalence among university students were identified. Clinic data from one campus in Mekelle University on sexual and reproductive health indicators were available and in the absence of HIV prevalence data reported here. Between July 2010 and March 2011 232 students were treated for an STI, 50 female students received the emergency contraceptive pill and 27 had an abortion out of an estimated 5,000 students (approximately 2,500 female students)[34]. This is likely to reflect under reporting as a number of students opt to go to private clinics to avoid stigma[35].

Two groups of youth considered to be at risk of HIV are street children and orphans. In addition it is likely that some might have been infected as newborns and orphaned or made vulnerable due to HIV/AIDS. The overall number of children orphaned due to HIV/AIDS was estimated at 80,000 in 2012 (EPP/Spectrum). Very little data exists on the numbers of street children in Tigrai, and no data could be found on HIV prevalence in this population. Similarly, little prevalence data could be found on HIV prevalence in orphans and vulnerable children (OVCs) including AIDS orphans.

2.3.2. Seasonal Migrant Workers/Settlers

As seen in **Figure 6**, the Western and North western zones of Tigrai have been the agricultural hub of the region for a number of years. More recently, there have been a number of factors that have led to an increase in the number of seasonal workers migrating to the western zone including landlessness, land degradation as a result of overpopulation, the establishment of large scale privately owned commercial farms, improvements in road infrastructure and higher wages for daily labours in comparison to other areas in Tigrai. No census has ever been conducted to determine the exact number of migrant workers. However in 2007 approximately 200,000 migrant works were believed to be working in Kafta Humera[36]. It is estimated that most workers are from Tigrai (approximately 70%), while 25% are from Amhara and 5% from the Sudan.

Routine data from the Tigrai Health Bureau for the districts where seasonal migrant workers as well as settlers (people who relocate either as a result of a government sponsored programme or spontaneously) prevail i.e. Kafta Humera and Tsegede, was analysed. This is not subpopulation data, but the fact that the two areas are among the highest in HIV prevalence of rural Tigrai raises the potential that seasonal workers influence HIV transmission. An adjacent district Welkait,

32 This is not data collected as part of a research study but rather from a VCT programme targeting key populations in the main transport corridors of Ethiopia. This in addition to the same sample size limits the representativeness of this data. Moreover it may be biased due to self selection i.e. individuals with a different risk profile usually higher come forward for testing. This is true for all Abt data provided in this report.

33 Abt Associates PHSP. Unpublished data for Tigrai June-September 2011. (personal communication)

34 Adi Haki Campus Student's Clinic. 9 month report. July 2010-March 2011

35 KI Adi Haki campus clinic staff

36 Livelihood Profile (2007) Humera sesame and sorghum livelihood zone, Tigrai, Ethiopia.

where there are no or few seasonal workers or settlers has low HIV prevalence. The three districts plus a major town Setit Humera constitute the western zone of Tigrai. Setit Humera, together with Alamata and Mekelle are primary hot-spots for HIV in Tigrai.

Since the seasonal workers are males between the ages of 15-24 and some of them aged 25 years and above, HIV prevalence data for Kafta Humera and Tsegede was compared with Welkait for the age groups of 15-24 as well as 25+ years. Welkait is consistently lower than both rural districts of Kafta Humera and Tsegede where the migrant workers and settlers are found. The influence of Setit Humera, a hot-spot, cannot be written off, but if that is the case, then it should have had equal influence on Welkait. In fact, in terms of proximity to Setit Humera, Welkait is nearer than Tsegede. While Tsegede is accessible via a tarmac road to Setit Humera, Welkait is not.

Table 7: HIV Prevalence by district for males aged 15-24 years and males age 25+ years

District	2008		2009		2010	
	HCT	Prevalence	HCT	Prevalence	HCT	Prevalence
Kafta Humera						
Males 15-24 yrs	1635	1.2%	2468	0.8%	1724	0.5%
Males 25+ yrs	1882	6.0%	2081	3.2%	2286	2.5%
Tsegede						
Males 15-24 yrs	518	3.1%	1268	0.7%	2267	0.5%
Males 25+ yrs	255	8.2%	674	3.3%	1429	2.4%
Welkait						
Males 15-24 yrs	7	0.0%	83	1.2%	1589	0.3%
Males 25+ yrs	268	0.4%	1667	0.8%	1096	0.5%

2.3.3. Long Distance Truck Drivers

Truck drivers are considered at higher risk of HIV infection because they tend to be away from their partners and spouses for long periods of time, have disposable income which may provide access to sex workers and are harder to reach with HIV prevention services. The main route frequented by long distance truck drivers in Tigrai are the Addis Ababa–Alamata–Mekelle–Adigrat–Shire–Humera routes. As Mekelle is a major destination for Tigrai bound trucks originating from Djibouti and Addis Ababa along this route, towns such as Alamata, Mekhoni and Hiwane on the first part of this route are popular overnight stops for truckers. Unexpectedly, a recent study in Tigrai found low HIV prevalence among truck drivers (0.4% overall) with only one positive case being detected in the 228 drivers tested[37]. However the small number of truck drivers and study sampling which only included HCT attendees limits the generalisability of these findings.

2.3.4. Refugees

Refugees in Tigrai come mainly from Eritrea and most live in camps in the North western Zone in Tahatai Adiabo and Tselemti districts. Based on the UNHCR population of concern report, as of 31 January 2012 there were 39,495 refugees in three camps –Adi Harish, My Ayni and Shimelba in Tigrai region.

37 Abt Associates PHSP. Unpublished data for Tigrai June-September 2011. (personal communication).

Routine HCT and ANC data from My Ayni and Shimelba refugee camps is shown in **Table 8** below. It can be seen that HIV prevalence is low among refugees. However conditions are conducive to the spread of HIV and STIs: most refugees are young males who remain in the camps for years at a time whilst having little to do in terms of employment or recreation. This may lead to alcohol, khat and substance abuse and risky sexual behaviours.

Table 8: HIV prevalence among refugees in the two camps based on HCT and antenatal clinic data.

Refugee camp	HCT	HIV positive (%)	ANC tested	HIV positive (%)
Shimelba				
2009	1372	12 (0.9)	156	2 (1.3)
2010	1393	3 (0.2)	236	1 (0.4)
Mai Ayni				
2010	1114	3 (0.3)	296	0 (0.0)
Total refugees	3879	18 (0.5)	688	3 (0.4)

2.3.5. Armed Forces, Conflict and HIV in Tigrai

Tigrai shares a long border with Eritrea and the war between these countries from May 1998 to June 2000 resulted in tens of thousands of casualties and the displacement of an estimated 316,000 people. It was feared that the conflict would enhance the transmission of HIV through disrupting the existed socioeconomic situation of the community living in the border area; changing the demographic composition; destabilizing the economic means of the internally displaced people; increasing chances for commercial sex work activities; increasing the risk of gender-based violence and influencing existing cultures and traditions in the border area[38].

A study was conducted to investigate whether the war had an impact on the prevalence of HIV among the affected populations in Ethiopia[39]. The researchers had access to data from civilian populations in Tigrai, which was the principal theatre of operations for the war, and also access to data from the Ethiopian military.

During mobilisation in 1999–2000, mass mandatory screening of recruits for HIV was undertaken. A total of 71,626 recruits, young men aged 18-29, were tested. The prevalence of HIV was 7.2% among the nearly 10,000 urban recruits and 3.8 per cent among the 62,000 rural recruits (3.8% overall)40.

Although the authors concluded that the datasets were severely limited in both quality and quantity, they did not show clear evidence of an increase in HIV prevalence associated with the war. The authors concluded that there was no evidence of a general increase in HIV prevalence associated with the war in either civilian or military populations. However the authors compared HIV prevalence in army recruits with data from antenatal surveillance in mainly urban areas between 1999 and 2002 when HIV prevalence estimates were much higher i.e. 14% among pregnant women in Addis Ababa in 2000 and 20% among the same population in Bahirdar in 1999.

38 Armed Conflict, Humanitarian Crisis and the Spread of HIV Infection; An Analysis Of Experiences From the perspective of the war between Ethiopia and Eritrea: http://teweldebrhan.blogspot.com/2005/05/armed-conflict-humanitarian-crisis-and.html

39 Behre T, Gemechu H, de Waal A.; War and HIV prevalence: Evidence from Tigrai, Ethiopia.African Security Review.Volume 14 Number 3 2005.

40 Yigeremu, et al. HIV Prevalence in 72,000 urban and rural male army recruits, Ethiopia- AIDS 17: 1835-1840. 2003

More recent data from HTC done on the military/police across several regions in Tigrai reported that 3.4% of 294 armed forces were HIV infected[41]. Although the small sample size limits the generalisability of this study, HIV prevalence among military/police appears to be higher than the general population in Tigrai which according to DHS 2011 was estimated at 1.8%.

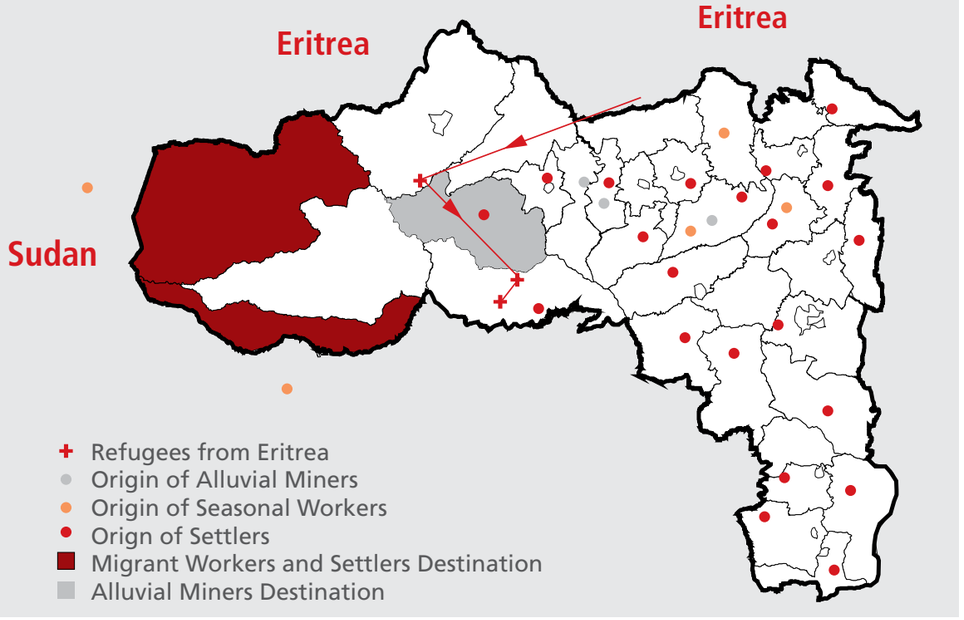
VCT data from the Seventh Mechanised Division of the army in Dansha found low HIV prevalence among the armed forced with 1.6% of 699 army personnel tested found to be HIV positive in 2010[42].

In summary the few seroprevalence studies conducted with the armed forces report varying HIV prevalence. Further studies are required to clarify whether HIV prevalence is indeed higher in this group compared to the general population, and whether it has also reflected the general decline in population prevalence seen in recent years.

2.3.6. Alluvial Miners

The formal mining industry in Ethiopia is in its embryonic stage and this review deals only with non-commercial or 'artisanal' alluvial mining that has been taking place in Tigrai for a long period of time. It takes place in various areas in the region including Laelai Adiabo, Mereb Lekhe, Were Lekhe and Kolla Tembien, as seen in **Figure 9**.

Figure 9: Map showing the distribution and origin of migrant workers, settlers and alluvial miners in Tigrai.



The vulnerability to HIV of these miners is thought to be related to the fact that most are temporary migrants who move between their home communities and the host communities where they engage in mining. The living conditions and high mobility of the miners may increase their risk of HIV and STI infection. However, at the moment there is no direct evidence of the prevalence of HIV in this population. An HIV prevalence and linked behavioural study is needed to provide information on the extent of the epidemic and associated risk factors.

2.3.7. Prisoners

Globally, prisoners are recognised to be at higher risk of HIV than the general population. Proximal factors that contribute to HIV transmission in prisons include overcrowding, high risk sexual behaviours and other risky behaviours including injection drug use and informal tattooing. But information on HIV prevalence in prison settings in Ethiopia is scant. The only published study accessed on HIV prevalence in a prison in Ethiopia was from 1991 where 450 inmates from a major prison in Dire Dawa, the second largest city of Ethiopia, had an HIV prevalence of 6.0%[43]. Prisons in Tigrai have their own clinics where inmates can access health services including HCT, counselling and treatment, and data was obtained on HIV tests conducted during the third quarter of 2011 from Mekelle Prison, as seen in **Table 9.** The service is given to both inmates and prison staff and the data provided in the table does not differentiate between the two, but it can be seen from the HCT and VCT data that the HIV prevalence among inmates and prison staff in Mekelle prison does not differ much from the general Tigrai population prevalence:

Table 9: HCT in Mekelle Prison (July to September, 2011. Prison Routine data)

	HCT Tested		Tested positive		% prevalence
	Male	Female	Male	Female	
VCT	69	8	1	0	1.3
PICT	125	2	4	0	3.1
HCT	194	10	5	0	2.4

2.3.8. Most-at-Risk Populations

In recent years, the focus of HIV prevention has shifted to those populations who are deemed most-at-risk (MARPs), because their sexual behaviour or lifestyle puts them at higher risk of coming into contact with HIV. Traditional MARPs includes sex workers, men who have sex with men (MSM), injecting drug users, among others, and in most communities that have been studied, the HIV prevalence among these groups (who are usually hard to reach) is many times greater than the general population HIV prevalence. Unfortunately, good recent data on these populations is also usually lacking, or data is just beginning to be gathered. These and other MARPs are included in the analysis below.

- **Sex workers -** In recent years a limited number of HIV prevalence studies among FSWs have been conducted in Tigrai, and these are summarised in **Table 10.** Data vary in quality but all point to a high prevalence. Data from the USAID Abt Associates report among various sub-populations for Tigrai from June-September 2011 found the overall HIV prevalence to be 10%. This study however is limited by the small sample size and the fact that the study population consisted of mobile VCT clients only.

41 Abt Associates PHSP. Unpublished data for Tigrai June-September 2011. (personal communication)

42 7th Mechanised Division, Dansha. 2010. Routine VCT data.

43 Kebede Y, Pickering J, McDonald JC, Wotton K, Zewde D;. HIV infection in an Ethiopian prison. Am J Public Health 1991;81(5):625-7.

Table 10: HIV Prevalence among sex workers in Ethiopia/Tigrai (various sources)

Year	Place	Prevalence %	Source
1988	Mekelle	24.1	Cited in Ethiopia: National AIDS Council Strategic Plan for 1991-1995, Amharic
1992	Mekelle	70.0	Statistics provided by regional authorities in Tigrai. Cited in UNAIDS/UNFPA (2000) Joint agency post conflict assessment for Ethiopia[45]
1992	Adigrat	70.0	Statistics provided by regional authorities in Tigrai. Cited in UNAIDS/UNFPA (2000) Joint agency post conflict assessment for Ethiopia[46]
2011	Dansha	17.9	Dansha Health Centre Records [47]
2011	Several locations in Tigrai (Adigrat, Adua, Alamata, Dansha, Enda Selase, Humera and Mekelle)	10.0	Abt Associates (USAID)[48]

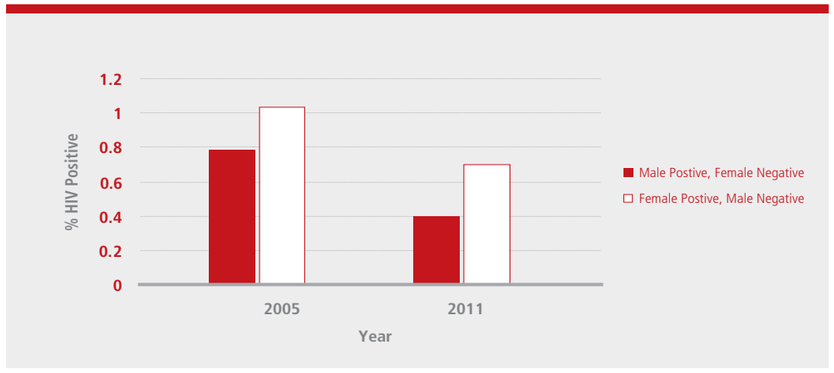
Source: as footnoted

- **MSM**: Very little is known about MSM in Tigrai or in Ethiopia as this group is largely unstudied.
- **IDU**: Similarly to MSM, this population has not been studied in Ethiopia or Tigrai but as seen in other countries this group may also be at high risk of HIV infection.

2.3.9. Discordant Couples

Based on prevalence data and total population, there are approximately 43,600 HIV-positive adults in Tigrai. The 2011 DHS suggested that in 65% of couples in which one partner is positive, the other is negative. Conservatively assuming that 75% of the HIV-positive adults are in couples (32,000 or 16,000 couples) and taking 65% of these, it would be safe to assume that there are possibly 10,000 discordant couples in Tigrai.

Figure 10: Distribution of HIV discordancy among couples in Ethiopia 2005 and 2011



Source: DHS 2005 and 2011

44 Controlling HIV/AIDS in Complex Emergencies and Post-conflict Situations: Follow-up to Security Council Resolution 1308. Joint Agency Post-conflict Assessment for Ethiopia. UNFPA/UNAIDS. 2000. data.unaids.org/topics/Security/ethiopia_en.doc

45 Ibid

46 Dansha Health Centre Records 2011. Data collected for this review.

47 Abt Associates PHSP. Unpublished data for Tigrai June-September 2011. (personal communication)

2.4. Incidence Modelling

A lack of data on key populations and their partners in Tigrai and in Ethiopia in general including population size estimates, HIV and STI prevalence and sexual behaviour (e.g. number of partners, frequency of unprotected sexual acts) meant it was not possible to run the MoT incidence model to estimate where new HIV infections would occur and the magnitude of incident infections within each risk group.

2.5. Factors influencing HIV Transmission in Tigrai

Further analysis of the 2005 and 2011 DHS data found there did not appear to be significant differences in sexual behaviour or risk factors for acquiring HIV between people living in Tigrai and those living in the rest of Ethiopia. Condom use at last sexual intercourse, number of partners in the past 12 months and HIV prevalence according to various demographic factors were comparable between Tigrai and the rest of Ethiopia (see **Appendix 2** for details). Male circumcision was also similar with a high prevalence in both Tigrai (96.2%) and nationally (92.2%)[48]. Self reported STIs and STI symptoms in 2011 were comparable in women from Tigrai and Ethiopia as a whole (4.0% vs. 3.4% respectively) but lower in men from Tigrai compared to the national average (1.3% vs. 2.3%). In terms of attitudes towards negotiating condom use 93.1% of men and 89.1% of women in Tigrai in 2011 believe a woman is justified in asking to use a condom if her husband has an STI (88.4% of men and 68.5% women nationally). However this was lower in women and men who had no education (56.4% and 81.2% nationally, no regional disaggregation)[49].

2.5.1. Knowledge Attitudes and Perceptions of HIV among the General Population

Data on HIV knowledge from the 2005 and 2011 DHS surveys are presented in **Table 11**, comparing the national average with the data from Tigrai. The table clearly shows that while levels of awareness about the existence of HIV are high across Ethiopia and Tigrai, levels of knowledge about how to prevent HIV transmission are much lower. There is considerable work to be done in order to educate the population about the basics of HIV/AIDS. However, it is notable that in every category, the level of knowledge in Tigrai was above the national average, and there was an improvement in every category between 2005 and 2011.

48 CSA; Demographic and Health Survey of Ethiopia.Measure; 2011.www.measuredhs.com

49 ibid

Table 11: A comparison of trends in HIV knowledge related variables in Ethiopia and Tigrai based on DHS done in 2005 and 2011.

Variable	DHS 2005 – Ethiopia	DHS 2005 – Tigrai	DHS 2011 – Ethiopia	DHS 2011 - Tigrai
Have heard of AIDS (females)	89.9% (14,070)	97.0% (919)	96.5% (16,515)	99.7% (1,104)
Have heard of AIDS (males)	96.5% (5,464)	99.7% (315)	98.8% (12,834)	99.8% (770)
HIV can be prevented by using condoms (females)	40.2% (14,070)	52.3% (919)	55.9% (16,515)	73.9% (1,104)
HIV can be prevented by using condoms (males)	64.3.% (5,464)	77.9% (315)	81.5% (12,834)	89.9% (770)
HIV can be prevented by limiting sexual intercourse to one uninfected partner (females)	62.5% (14,070)	72.1% (919)	64.6% (16,515)	81.6% (1,104)
HIV can be prevented by limiting sexual intercourse to one uninfected partner (males)	79.0% (5,464)	92.3% (315)	73.9% (12,834)	84.7% (770)
HIV can be prevented by using condoms and limiting sexual intercourse to one uninfected partner (females)	34.6% (14,070)	47.4% (919)	43.2% (16,515)	63.9% (1,104)
HIV can be prevented by using condoms and limiting sexual intercourse to one uninfected partner (males)	56.9% (5,464)	73.8% (315)	64.2% (12,834)	78.5% (770)

2.5.2. Sexual behaviour

There is a paucity of HIV-related behavioural studies in Ethiopia and in Tigrai. The 2008 World Bank report showed a strong association between regional differences in risky sexual behaviour and regional prevalence levels for the following sexual behaviours:

- Being sexually active among the never married
- Having risky sexual behaviour in the year preceding the survey
- High number of lifetime sexual partners (for males)
- Having sex with sex workers (for males)
- Sexual initiation before age 18 years

2.5.2.1. Sexual Behaviour in the General Population

Table 12 shows a number of factors that measure sexual behaviour, again comparing the 2005 and 2011 DHS results between Tigrai and the Ethiopian average. As can be seen, the number of current (in the past year) and lifetime partners is low for most of the Ethiopian population (compared to other countries in the region), and Tigraian women and men do not appear to be significantly different. However there is not sufficient data from Tigrai in the 2011 DHS to provide information on condom use at last sex (small sample size). The percentage of men aged 15-49 years in Tigrai reporting payment for sexual intercourse in the last 12 months in the 2005 and 2011 DHS has remained constant at 2% and 1.8% respectively which in both cases was higher than the national average. The DHS 2011 did not show a high use of alcohol and drugs in relation to sex in Tigrai (only 1.0% of women and 2.5% of men drank alcohol at last sexual intercourse and 0.3% of both men and women reported *khat* use). Alcohol use was comparable to the national average but *khat* use was lower in Tigrai.

Table 12: A comparison of trends in HIV behaviour-related variables in Ethiopia and Tigrai based on DHS done in 2005 and 2011.

Variable	DHS 2005 – Ethiopia	DHS 2005 – Tigrai	DHS 2011 – Ethiopia	DHS 2011 - Tigrai
Percentage of women who had 2+ partners in the past 12 months (all women)	0.1% (14,070)	0.0% (919)	0.4% (16,515)	0.9% (1,104)
Condom Use at last sexual intercourse for women who had 2+ partners in past 12 months	N/A	N/A	47.1% (62)	* (10)
Percentage of men who had 2+ partners in the past 12 months (all men aged 15-49)	2.4% (5,464)	2.3% (315)	3.5% (12,834)	1.7% (770)
Condom Use at last sexual intercourse for men aged 15-49 who had 2+ partners in past 12 months	N/A	N/A	15.5% (446)	N/A
Mean number of sexual partners in lifetime (among women who ever had sexual intercourse)	1.4 (5,106)	1.5 (347)	1.5 (12,311)	2.0 (829)
Mean number of sexual partners in lifetime (among men who ever had sexual intercourse)	3.0 (3,974)	2.7 (194)	2.9 (9,435)	3.5 (478)
Percentage of men aged 15-49 years reporting payment for sexual intercourse in the last 12 months	0.9% (5464)	2.0% (315)	1.1% (12,834)	1.8% (770)

Variations in the prevalence in sexual behaviours across the country may well account for the regional differences in HIV prevalence that are noted. However, there is still insufficient data to be able to determine at a much more local level, what the link is between behaviour and identified "hot spots" of HIV transmission.

2.5.2.2. Sexual Behaviour in Youth

A similar decrease in risky behaviour among youth was shown in the BSS surveys between 2002 and 2005 which reported having ever had sex declined significantly in both in-and out-of-school youth among boys and girls. The 2011 DHS estimated that 95% of never-married young women and 87% of never-married young men have never had sexual intercourse. This is similar to results in the 2005 DHS where 96% of never-married young women and 88% of never-married young men reported that they had never had sex. However, this does not quite tally with the same 2011 DHS data, wherein it was estimated that 11% of females and 1% of males first had sex before the age of 15 years and 39% and 1% respectively before the age of 18 years, unless this is an indicator of an early age of marriage of younger women. For youth aged 15-24 years in Ethiopia the data reveals that most first sexual encounters take place with a boyfriend or a girlfriend (61.4%). Nearly a quarter (21.8%) of students reported their first sexual encounter was with partner where the age difference was 5 year or more i.e. engaged in intergenerational sex.

A study of sexual behaviour of students from 5 universities including Mekelle university (where 44% of the students involved in the study were from), found the mean age of first sexual debut among for Mekelle university was 17.7 years for male students and 18.3 years for female students. The school year of first sexual debut for both male and females from Mekelle was primary school for 43 students (20.4%), secondary school for 133 (63%) and university for 35 (16.6%)[50]. This information shows that most first sexual encounters starts early during secondary education. As seen in **Table 13**, the rate of multiple partnerships i.e. having sex with more than one sexual partner in the last 12 months was high (41.3% in males and 38.5% in females) and condom use during last sexual encounter was relatively low (69.6% in males and 59.7% in females) among Mekelle university students[51].

Table 13: Percentage of male and female Mekelle university students engaging in various risky sexual behaviours

Risky sexual behaviour	Number Male (%)	Number Female (%)
Students who ever had sexual intercourse	282 (35.5)	96 (20.3)
Having more than one sexual partner	144 (52.8)	37 (38.5)
Sexual partnership with only one	129 (47.3)	59 (61.5)
Sexual partnership with only two	55 (20.2)	14 (14.6)
Sexual partnership with three or more	89 (32.6)	23 (24.0)
Having sex with more > 1 sexual partner last 12 month	33 (41.3)	15 (38.5)
Condom use in last sexual encounter	128 (69.6)	43 (59.7)

Source: see footnote 51

Finding from Focus Group Discussions (FGDs) and Key informant (KIs) interviews conducted for this study found that out-of-school youth, in particular the unemployed, are known to frequent places which put them at risk of having unsafe sex. These places include bars, ***khat*** houses, and porn film houses. The lack of youth recreation centres is an additional factor. Unemployed girls and school drop outs may start as waitresses, and some may transition to sex work through employment in restaurants and bars.

50 Tegabu D, Oljira L, Berhan Y, Tura G, Abraha A et al. Risky sexual behaviours and predisposing factors among Ethiopian university students. May 2011. Federal HAPCO

51 Ibid

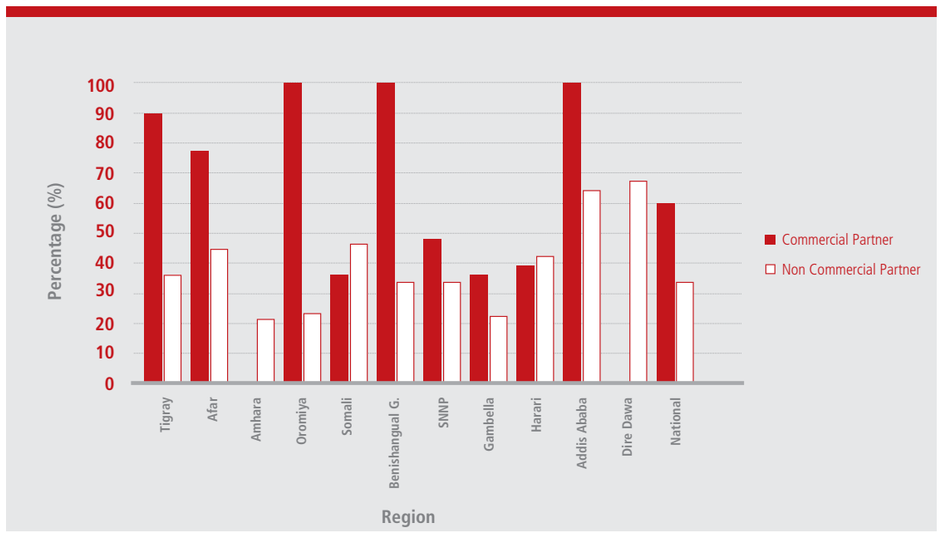
Findings from KIs and FGDs conducted for this study among in school youth/university students indicate that risky behaviour is fuelled by peer pressure, lack of oversight by friends and families, and inconsistent use of condoms. University students in particular indulge in unsafe sex by selecting hideouts or places where there is no electricity; interact with high school girls, and sex workers.

A number of risky-sexual behaviours were reported and described as follows:

- Female students who fail examinations or asked to resit examinations are at risk as many choose to stay and are employed in bars where they may become involved in sex work.
- High rates of alcohol and drug use place students at risk. Many students use Khat and alcohol for entertainment and to keep alert while studying (Khat) and may engage in risky sexual encounters following alcohol and Khat use.

The national 2005 Behavioural Surveillance Survey found that 43.1% of in-school youth reported ever using condom and 61.5% consistently used condoms in the previous year. A low proportion of in-school youth (5.4%) had commercial sex in the last 12 months in Tigrai. Of the youth who had had commercial sex in the last 12 months 68% used condoms consistently. The group were less likely to use a condom with non-commercial sex partners than with commercial sex partners (37% vs. 68%).

Figure 11: Consistent condom use with commercial and non-commercial sex partner among in-school youth.



Source: Ethiopia BSS 2005

The main reasons given for not using condoms among university students in Mekelle include trusting partners (18.3%), not comfortable with using condoms (12.3%) and partner objected to using condoms (10.8%)[52].

52 Tegabu D, Oljira L, Berhan Y, Tura G, Abraha A et al. Risky sexual behaviours and predisposing factors among Ethiopian university students. May 2011. Federal HAPCO

FGDs with youth who recently graduated conducted in this study showed that awareness and access to information on condoms is low. Moreover some students held negative perceptions about condoms such as not trusting them and finding condoms uncomfortable or reporting they reduce sexual pleasure.

2.5.2.3. Sexual Behaviour in Key Populations

Seasonal Migrant Workers / Settlers

The 2008 study by ILRI[53], which included the Alamata and Atsbi-Wemberta ***woredas*** of Tigrai examined the sources of risk of HIV infection in the rural areas, who was at risk, and to what extent AIDS already had an impact on rural communities and their livelihood systems. The study concluded that "the dominant factor (in HIV transmission) is the huge seasonal movement of people throughout rural Ethiopia", with a major bridging population being "seasonal migrants who seek alternative employment during the quiet months in farming, for example, working as casual labourers in commercial sesame farms in western Tigrai"[54].

FGDs conducted for this study with seasonal workers revealed that seasonal migrant workers tend to be young and highly mobile men often separated from the families for long periods of time. The young males frequent FSWs more often than married males, and many do not use condoms despite being aware of the risks of HIV. Reasons for not using condom include:

- Low awareness and knowledge regarding HIV prevention due to a lack of prevention programmes targeting seasonal workers
- Alcohol use
- Forgetting to bring condoms to bars, the perception it is the responsibility of FSWs to carry condoms
- Unwillingness to buy condoms or embarrassed to collect condoms from health centres
- The development of trust with FSWs

Long Distance Truck Drivers

Long distance truck drivers have long been recognised as a group at risk of HIV infection as a result of a number of behavioural and social factors including separation from spouses and families for long periods of time, alcohol use, and engagement in multiple concurrently partnerships including transactional or commercial partnerships. Data from the TransACTION baseline survey shows that of the 22.5% of truck drivers in Tigrai that had sex with a FSW in the past year, 73.5% had sex with 2 or more FSWs. The majority of truck drivers (89.4%) reported having a regular partner. Overall over a third (36.0%) of truck drivers reported having 2 or more partners in the previous 12 months55. High levels of consistent condom use among trucker drivers in Tigrai region with FSWs (94.1%) and casual partners (94.1%) was reported in the TransACTION baseline survey. However, consistent condom use was much lower with regular partners (46.7%) and when engaging in sex while drunk or on khat **(Table 14)**.[56]

53 Bishop-Sambrook C; Dynamics of the HIV/AIDS epidemic in value chain development in rural Ethiopia and responses through market-led agricultural initiatives; International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia 2008

54 Ibid

55 ibid

56 ibid

Table 14: Condom use amongst truck drivers by various partners, major towns in Tigrai

	%
Regular Partners	
% of truckers who used condom with all regular partners when high on *Khat* in past year, of those with a regular partner who was not a spouse	48.3
Casual Partners	
% of truckers who consistently used condoms when having sex while drunk with casual partners in past year	64.7
% of truckers who consistently used condoms with all casual partners when high on Khat in past year	41.2
Sex Workers	
% of truckers who consistently used condoms when having sex with sex workers while drunk in past year, of those who were clients of sex workers	2.9
% of truckers who consistently used condoms while having sex while high on Khat with sex workers in past year, of those who were clients of sex workers	29.4

Source: Transaction Baseline Study

Key informant interviews carried out for this study with truck drivers reported the following factors increased their vulnerability to HIV infection:

- Mobility: as a result of the long periods of separation from spouses associated with their work extra-marital sex as well as paid sex with FSW is common among truckers.
- Absence of any formal programme or services on HIV prevention.
- Heavy khat and alcohol use: is common among truck drivers as a result of loneliness, boredom and long working hours and is associated with engaging in high risk sexual encounters.
- Opportunity for paid sex: FSWs frequent the hotels that the truck drivers stay in. This provides the opportunity for engaging in transactional sex.
- Low use of condoms associated with alcohol use, FSW who are prepared to have sex without a condom for additional money, and the lack of free condoms.

Refugees

Refugees may have different sexual behaviours and a varying risk of HIV compared to the host population. Participants in the FGDs carried out for this study identified the following reasons why refugees are particularly vulnerable to HIV:

- There is gender asymmetry (more than 80% are males) and the shortage of females means that men tend to engage in sexual relationships with women from nearby communities. Multiple partnerships are apparently common.
- The refugees live a camp life with minimal employment opportunities, few recreation facilities and little hope for the future. Without a future to look forward to, people tend to discount the seriousness of acquiring HIV and instead engage in risky sexual behaviours for short term enjoyment[57].
- During their travel to and from the refugee camps, female refugees talked of experiencing gender based violence and being exposed to HIV infection.
- Within the refugee camps, some female refugees admitted that they engage in transactional sex because they need to earn money for their daily expenses. They reported this in a survey done by the women's association of the refugees, who then established income generating activities to stop the practice spreading.
- Overcrowded conditions, alcohol and substance use also contribute to unsafe sex with women and FSWs who stay around the refugee camps in so-called tea and coffee shops.

Armed Forces

A Public Health Masters dissertation[58] studied the sexual behaviour of Tigrai-based, married, military personnel in relation to length of stay away from their spouses. Among a sample of 686 military men, the researchers found that married military personnel who stayed away from their spouses were twice as likely to have extramarital sex including with FSW than those who stayed with their spouses. Condoms use among the armed forces in Tigrai is on the whole higher than other vulnerable groups. This may be due to the inclusion of HIV education and sensitisation activities as part of the training of soldiers. A study conducted on condom use by the Ethiopian army in the Zalambesa front in Tigrai reported that, of the 840 soldiers included in the study 99.9% had heard of male condoms; 95.9% said they could obtain condoms when needed; and of the 98.8% that ever had sexual intercourse 94.1% had ever used condoms. Of the total study population, 70% had sex with FSWs in the last 12 months and 54% had non regular or non paid sex in the last 12 months[59]. Similarly BSS 2005 found that a high proportion (59.2%) of sexually active ground force respondents (which include forces from Shire Front in Tigrai) had a commercial sex partner in the past year including 47.4% who had more than one commercial sex partner. Condom use with FSWs and non regular partners was high with 98.5% and 78.9% respectively reporting condom use during the most recent sexual encounter. Only a third of ground force respondents reporting having had sex without a condom in the past 12 months[60].

57 In August 2010 an out of camp scheme was introduced by the Ethiopian Federal Government which granted Eritrean refugees freedom of movement and resettlement outside of refugee camps

58 Wozam, T; Sexual Behaviour of married military personnel: Does duty location matter? A thesis to be submitted to the school of graduate studies of Addis Ababa University in partial fulfilment of the requirements for the Addis Ababa University School of graduate studies. April 2005.

59 Berhe; Assessment of Condom Use for HIV/AIDS Prevention Among the Ethiopian Army in Zalambesa Front, Tigrai Regional State. MPH thesis, Addis Ababa, Ethiopia.; 2005

60 HIV/AIDS Behavioral Surveillance Survey (BSS) Ethiopia 2005.

FGD conducted as part of this study with military personnel found the following factors relating to vulnerability to HIV infection:

- Camp life: Personnel are away from their spouses or girlfriends for prolonged periods. The longer the period of time the more vulnerable they are and the greater the potential to have extra-marital sex.
- Mobility: The participants reported that the army has no settled life.
- Engagement in transactional sex: Soldiers reported it was common to have paid sex with FSWs.
- Inconsistent condom use: Condoms are provided by the army but use is inconsistent particularly once trust has been established in a relationship even when this is with a FSW.
- Substance Use: Alcohol and khat use are blamed for making people more likely to engage in casual and unprotected sex.
- Inexperience The newly recruited, young and unmarried members are most vulnerable because of inexperience and less family responsibility.
- Complacency and low perception of risk: In some members of the military complacency is seen regarding risk of HIV infection and its consequence and has taken on a form of resistance to behaviour change. This view is not widespread but exists.
- Multiple partnerships with female domestic servants in the camps was also blamed as a source of transmission of the virus.

Alluvial Miners

What little information exists on the sexual behaviour of alluvial miners was gleaned from the FGDs conducted for this study. Almost all the participants in the FGDs reported not using condoms. The main reason cited was alcohol use and the associated behavioural disinhibition. The FGDs also highlighted other aspects that would increase miners' vulnerability to HIV acquisition:

- Little social cohesion and no parental oversight: as many of the miners are young men away from home, casual and transactional sex is easier to engage in than in the more restrictive home environments.
- Boredom, loneliness and frustration: After working long hours miners often frequent bars as there are very few alternative leisure options. They earn between 2,000 to 3,000 birr per month from the sale of gold which gives them sufficient cash to buy alcohol and sex if they wish.
- Poor living conditions: The miners live under temporary shelters. They spend time in the bars and taverns to escape the cold and wet conditions of their living quarters.

Prisoners

From the focus group discussions conducted with inmates in selected prison centres some important behavioural risk factors for HIV infection were identified. These include:

- Sharing Blades: Inmates in Alamata prison identified the lack of adequate and appropriate barber services in the prison as a risk factor for HIV infection. Concerns over hygiene and safety standards including the lack of sterilisation were cited. According to the discussants there is no safety box to dispose used sharps. As a result prisoners are at risk of injury with needles and sharps.
- Unsafe Tattooing practices: Tattooing is done manually using different sharps and needles. Some inmates in Alamata and Mekelle prison centres perform tattoos using the same equipment without proper sterilization.
- Overcrowding and MSM: It is difficult to determine to what extent MSM activities occur, as those involved risk punishment if exposed by fellow inmates. Consequently the majority of MSM activities remain unreported. Because sexual activities in prison are illegal and conjugal visits banned many prisons do not provide condoms for inmates. Overcrowding in prisons was mentioned as important factor for MSM including non-consensual sexual activities amongst the inmates. An Instance of individual paying inmates for sex was also reported.
- Condoms – are not available in prisons as sexual activity is not permitted

Sex workers

Sex workers have a higher risk of HIV infection and higher sexual risk behaviour than the general population as they have multiple concurrent partners, a higher frequency of unprotected sex and are at a higher risk of STIs. There have been very few studies in Ethiopia looking at sexual behaviour and risk behaviour in SWs, other than the collection of data on condom use. For example, **Table 15** shows reported condom use with clients in three studies – these are national results, but demonstrate the widely–seen phenomenon wherein sex workers will start to use condoms regularly with paying clients, but not so with non-paying partners – husbands and boyfriends. The study by DKT Ethiopia and HAPCO was a behavioural study of venue- based FSWs in 10 major towns in Ethiopia (but not Tigrai)[61].

Table 15: Condom use among female sex workers in Ethiopia by various sources

	BSS 2002	BSS 2005	DKT/HAPCO 2008
Consistent condom use last 7 days with paying clients	91.6%	98.3%	99.4%
Consistent condom use last 30 days with paying clients	90.8%	93.8%	86.2%
Consistent condom use last 12 months with non paying clients	70.5%	70.2%	56.3%

High rates of condom use were also reported in the TransACTION baseline survey of Most at Risk Populations in 12 towns in Ethiopia including Mekelle, Axum and Almata in Tigrai. In this study 97.9% of FSWs in Tigrai reported consistent condom use with all paying partners in the previous 7 days. Consistent condom use with non paying partners however was much lower at 66.6% as was sex following heavy alcohol use with paying clients in the previous 7 days (35.4%). The average number of clients reported by FSW in the past week was 2.8 and 16% reported having had an STI symptom in the previous month[62]

Similarly a baseline survey of FSWs in 5 major cities including Mekelle conducted in late 2008 reported high condom use with last commercial/non regular partners among FSWs in Mekelle (99.8%) but low condom use with most recent regular partners (31%). In addition FSWs in Mekelle were 82% less likely to consistently use condoms with regular partners compared to other locations (Addis Ababa, Bahir Dar, Adama and Hawassa). FSW in Mekelle reported having an average of 5.2 clients in the past week. Knowledge of HIV prevention among FSWs in Mekelle was high; 94.9% knew consistent and correct condom use protects from HIV infection, 98.8% were aware a person can become infected from unprotected sex and 80.8% knew having one uninfected faithful partner could protect them from infection[63]

FGDs conducted as part of this study found the clients of FSWs varied and included soldiers, daily labourers, truck drivers and migrant workers. FSWs reported some clients resisted condom use and used violence to force them not to use condoms. Women who do not identify themselves as SWs but engage in transactional sex such as women who work in bars and street girls were also highlighted as a key group vulnerable to HIV infection.

The TransACTION study of MARPs described above reported low rates of condom use among waitresses in Tigrai: 28.6% of waitresses reported consistent condom use with all regular partners that were not spouses and only 1 reported using a condom with the most recent casual partner from the 25 that had sex with a casual partner in the past year. Receipt of money or gifts from casual partners was uncommon with only 1 woman reporting this occurrence.[64] However these findings are limited by the small number of waitresses from Tigrai included in this study.v

61 DKT and FHAPCO. Study of condom use and behaviour among venue-based sex workers and their clients in major urban areas in Ethiopia, 2009.

62 Mekonnen, Y and Demissie, T.; Baseline survey of most at risk populations in 12 towns in Ethiopia. Transaction Programme, Save the Children USA; 2010. Disaggregated data for Tigrai were kindly provided by the TranAction team specifically for this study.

63 Girma W and Erulkar A. Commercial sex workers in five Ethiopian cities. A baseline survey for USAID targeted HIV prevention programme for most at risk populations. 2009

64 Mekonnen, Y and Demissie, T.; Baseline survey of most at risk populations in 12 towns in Ethiopia. Transaction Programme, Save the Children USA; 2010. Disaggregated data for Tigrai were kindly provided by the TranAction team specifically for this study.

No sexual behaviour data is available in Tigrai for:

- **MSMs**
- **IDUs**
- **Discordant couples –** the DHS 2011 shows that disclosure among couples (in general and not discordant only) in Tigrai is low with only 49.4% of women and 44.2% of men had been tested and shared their results with their partner. Nationally, disclosure varied with education and wealth quintile with a lower proportion of individuals with no education or from the lowest wealth quintile sharing their results with their partner. The same association may also be true in Tigrai. Similar low rates of disclosure are likely to apply to discordant couples and thereby increase the vulnerability of HIV negative individuals in discordant partnerships. More research is needed in this population that is potentially the source of a large proportion of new infections.

2.5.3. Violence and Traditional Practices

Female Genital Mutilation (FGM) is widely practiced in Ethiopia although Tigrai reports a lower prevalence. Data collected from 1011 female students on the prevalence of FGM based on self report and not a result of an examination found the prevalence was 30.9% in Tigrai (range 8.9% in Addis Ababa to 70% in Somali region). [65] As per DHS 2005, prevalence of female circumcision in Tigrai was 29.5%.

Ethiopian health officials fear that the use of un-sterilised instruments to perform these practices aggravates the HIV/AIDS epidemic as noted in the government's policy on HIV/AIDS.[66] It should be recognised that, **based on the few data available, researchers have not found an association between harmful traditional practices and HIV infection.**[67]

Male circumcision is another traditional practice that is widely practiced in Tigrai. The 2011 DHS reports that **96.5% of males in Tigrai are circumcised**, mostly in childhood, of which 75% of circumcisions are performed by local practitioners.[68] The lack of male circumcision has been found to be closely linked to HIV transmission and susceptibility to infection, but obviously it is not a factor that needs to be considered when understanding the transmission dynamics of HIV in Tigrai (or most of Ethiopia).

65 Gabrus L.; HIV/AIDS in Ethiopia, Country AIDS Policy Analysis Project, San Francisco: AIDS Policy Research Center, University of California; 2003

66 Government of Ethiopia; Policy on HIV/AIDS, Addis Ababa: GoE; 1998

67 Ibid

68 Ethiopia Demographic and Health Survey.2011

2.5.4. Gender, Women and Girls and HIV Risk and Vulnerability

The role of gender inequality and its impact on HIV/AIDS is widely recognised particularly in the African context. The gender inequality that prevails in both rural and urban communities in various forms (gender based violence, forced sex) has increased the vulnerability of girls and women to HIV/AIDS[69] and diminished their ability to protect themselves[70]

In Tigrai, women are equally represented in the national state parliament, and have access to free health services during pregnancy, childbirth and the first 42 days after delivery. There has also been relative success in reducing early marriage, female circumcision (prevalence in Tigrai in 2005 was the second lowest in Ethiopia after Gambella[71]), and achieving gender balance in primary and secondary schools (gender parity index of 1 for both primary school grade 1-8 and econdary school grades 9-10 in Tigrai in 2010.[72] [73]) However, there are indications that domestic violence is still widespread. According to DHS 2011 46.0% of men in Tigrai agree a husband is justified in beating his wife in one of 5 specified situations which include arguing with him, burning food, neglecting the children, going out without informing the husband and refusing sexual intercourse.

2.5.5. Structural Factors

As with other countries in the region and elsewhere in Ethiopia, structural factors such as poverty, infrastructural weakness, lack of human resource capacity and the lower status of women (including legal rights, illiteracy and fewer opportunities for livelihood) all contribute to increased vulnerabilities for HIV amongst the population.

However, there are specific structural factors in the state that may leave the population even more vulnerable to HIV. These include the facts that:

- Tigrai is a zone of conflict with displaced populations and the presence of military
- There is high movements of population, both for seasonal work and resettlement[74]
- The state is rapidly urbanising compared to other regions

69 Dunkle KL, Jewkes RK, Brown HC, Gray GE, McIntyre JA, Harlow SD. Gender-based violence, relationship power and risk of prevalent HIV infection among women attending antenatal clinics in Soweto, South Africa. Lancet 2004; 363:1415-1421.

70 WHO. Women and Health. Today's evidence tomorrow's agenda 2009.

71 Ethiopia Demographic and Health Survey.2005

72 Federal Republic of Ethiopia – MOE 2010. Education Statistics Annual Abstract. Chart 4.11 pg 28

73 Federal Republic of Ethiopia – MOE 2010. Education Statistics Annual Abstract. Table 4.19 pg 41

74 Bishop-Sambrook C; Dynamics of the HIV/AIDS epidemic in value chain development in rural Ethiopia and responses through market-led agricultural initiatives; International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia 2008

2.6. Summary

Based on the evidence presented in the preceding pages, some conclusions can be drawn about some the hypotheses put forward in Section 2.1.2:

Hypothesis 1. Over the last 10 years, the HIV prevalence has stabilized or declined in the major urban centres while increasing in the smaller towns.

Partly confirmed: Evidence from antenatal sentinel surveillance, routine antenatal data, PICT and HCT data all indicate that there is a declining HIV epidemic across urban sites in Tigrai. There is no direct data on HIV incidence trends over time but the strong declines in HIV prevalence is sufficient evidence. Contrary to what was postulated in the recent Synthesis Report for Ethiopia, there is no evidence that the epidemic is increasing in smaller towns in Tigrai.

Hypothesis 2. The rural epidemic is heterogeneous with most districts having a relatively low HIV prevalence but some areas demonstrating higher prevalence rates.

Partly confirmed: The prevalence of HIV in rural areas of Tigrai is consistently and substantially lower than in the urban areas, with three important exceptions. In areas where there are large numbers of seasonal workers, it does appear that the HIV prevalence is higher than in other rural areas. However, apart from the issue of seasonal workers and exceptions such as Degua Tembien and Raya Azebo (where HIV prevalence is greater than 3.5%), there is no empirical evidence that the prevalence is heterogeneous in rural areas.

Hypothesis 3. There may be a higher HIV prevalence in certain key population groups including sex workers, seasonal workers and settlers, alluvial miners, military/police, populations of humanitarian concern (refugees), prisoners, youth and in particular university students as well as other high risk youth, and discordant couples.

Confirmed: seasonal workers/settlers, sex workers, discordant couples

Partly confirmed: miners, military/police, university students (data only from FGDs)

Not confirmed: refugees, prisoners, truck drivers (partly due to limited data)

No data: MSMs, IDUs, certain youth (street children, OVCs)

3. Know Your HIV Response Synthesis

3.1. HIV/AIDS Policy and Laws

The Federal Democratic Republic of Ethiopia issued the first HIV/AIDS policy in 1998 and this still remains in use.[75] The policy addresses issues of prevention, treatment of patients, care and support, the support for orphans and vulnerable children (OVC), the protection of human rights of people living with HIV/AIDS (PLHIV) and coordination issues. The policy also covers the multisectoral nature of HIV prevention and calls for a harmonised approach by government and non-government organisations, the private sector and communities. There is also a provision for the promotion of research. Provision of free antiretroviral treatment (ART) was initially limited to those unable to pay. However since 2005, ART has been freely available for all eligible (CD4 <200). There are no regional HIV policies in Ethiopia and regions must therefore refer to the federal policy.

At the national level, there are anti-discrimination laws, regulations and provisions protecting the rights of people living with HIV in key areas. Mandatory HIV testing for employment is prohibited[76] and guidance by the Civil Service has been issued to protect people living with HIV from discrimination in the workplace[77]. Notwithstanding the federal laws which apply there are no laws or regulations in Tigrai that specifically protect or promote the human rights of people living with HIV**.** The region however has the earliest form of family law in Federal Ethiopia. As early as 1999, it enacted a law that made early marriage punishable and outlawed practices of arranged marriages by parents. The minimum age of marriage for both males and females was set at 18 years of age as of 2007[78]. The law brings forth a host of rights for young girls, a group vulnerable to HIV infection.

3.2. Strategic Planning

The Federal HAPCO developed the first Framework for the National Response to HIV/AIDS in Ethiopia (for 2000-2004) in 2000. A Strategic Plan for Intensifying Multi-Sectoral HIV/AIDS Response (for 2004 - 2008) followed in 2004 (SPMI) and in 2011 (SPMII for 2010/11-2014/15).

Annual plans (at federal and regional level) are prepared withv direct reference to the (current) SPMII strategic results, thematic areas[79] and objectives. The Tigrai-HAPCO (T-HAPCO) also developed regional strategic plans for 2004-2006 and for 2007- 2011. The T-HAPCO strategic plan of 2004-2006 focused on mainstreaming HIV/AIDS, community capacity building, strengthening partner forum, reduction of vulnerability to HIV/AIDS, effective resource utilization, access to health services, community empowerment, legal protection related to HIV/AIDS issues, and establishment of monitoring and evaluation for HIV/AIDS. The latest T-HAPCO strategic plan (2007-2011) covers condom promotion, VCT, PMTCT, IEC/BCC, STI management, blood safety, and universal precautions, support and care, capacity building, mainstreaming, legal issues, surveillance and ART.

75 FDRE; Policy on HIV/AIDS. Federal Democratic Republic of Ethiopia, August 1998

76 Labor Proclamation No. 262/2001 and 377/2003 Article 14.1 d

77 Report on progress towards implementation of the UN Declaration of Commitment on HIV/AIDS 2010. Federal Democratic Republic of Ethiopia, Federal HIV/AIDS Prevention and Control Office; 2010

78 Negarit Gazetta of the Tigrai National State Council. Proclamation 33/99 Family law of Tigrai. Tigrinya and Amharic; 1999

79 Creating Enabling Environment; Intensifying HIV Prevention; Increase Access to and Improve Quality of Chronic Care and Treatment; Strengthen Care and Support Services to Mitigate the Impact of HIV/AIDS; Strengthen Generation and Utilization of Strategic Information)

While the strategic plan for 2004-2006 focused on social issues and responses, the 2007-2011 plan concentrates more heavily on biomedical interventions. This may be been due to stronger influence by the Bureau of Health in the institutional structure in 2007 and also since social issues were mainstreamed to women, youth and social affairs sectors and therefore relevant strategies and activities were taken into account more in the sectoral plans than in the strategic plan developed by T-HAPCO.

A number of **national guidelines** relating to HIV prevention and treatment/care have been developed, including:

- Guidelines for peer education, life skills education, HIV/AIDS and reproductive health linkages
- Implementation guidelines for greater involvement of people living with HIV (GIPA)
- Guidelines for implementation of antiretroviral therapy in Ethiopia
- Guidelines for management of sexually transmitted infections using the syndromic approach
- Life skills education guidelines
- Guide to clinical nutrition care for children and adults with HIV
- Guidelines for partnership forums against HIV and AIDS
- Implementation guidelines for TB/HIV collaborative activities
- Guidelines for prevention of mother-to-child transmission of HIV
- Guidelines for VCT
- Guidelines for communication on HIV/AIDS
- Guidelines on community conversations

Most of these national guidelines are only available in English/Amharic. Only a few, such as the guidelines on community conversations, are translated into Tigrigna. In most cases, training was provided to health workers and programme implementers on how to use the guidelines. This contributed to training and retraining staff as well as shifting tasks traditionally done by doctors to middle and lower level health workers.

3.3. Institutional Response

Tigrai is one of nine member states of the Federation of Ethiopia, governed by an elected Parliament of 152 seats, a president who is at the same time the head of government and an independent judiciary. Regional government is composed of line ministries, known as bureaus (education, health, agriculture etc.) and a few autonomous agencies.

T-HAPCO was established by proclamation number 37/1999 (hereafter the law) in 1999, before the establishment of the Federal HIV/AIDS prevention and control office as an autonomous agency. The law also established a **Regional HIV/AIDS council** headed by the president of the Tigrai national state. Membership in the HIV regional council was inclusive[80] and the law made provisions for more organisations to be involved as members of the regional council on request.

80 The Regional HIV/AIDS Council includes heads of all 14 government bureaus, all resident NGOs working on the prevention and care of HIV/AIDS in Tigrai, leaders of the three major religious institutions (Ethiopian Orthodox Church, Tigrai Muslim Supreme Council and the AdigGrat Catholic Diocese), the three major civic societies (Women's Association of Tigrai (WAT), Youth Association of Tigrai (YAT), Farmer's Association of Tigrai), the association of PLHIV, the local radio station of Dimtsi Weyane Tigrai, and the two major local NGOs, Tigrai Development Association (TDA) and Relief Society of Tigrai (REST).

The council was due to meet twice a year[81] and had as its objectives:

- To make sustained effort to bring about behaviour change in the entire society of Tigrai;
- To protect the entire population from HIV infection, but with particular emphasis on the youth, to effectively implement national and regional policies and strategies to prevent HIV.[82]

The **HIV/AIDS Board** headed by the Tigrai Health Bureau was also established in 1999. The board members include bureau heads (Health, Education, Social affairs, Finance, Sports and Youth, Women affairs, Information from the government sectors); CEOs of the Women's Association of Tigrai (WAT), Youth Association of Tigrai (YAT), Ethiopian Red Cross Society (ERCS), Relief Society of Tigrai (REST) and Dimtsi Weyane Tigrai (Radio Station) from the private sector and civil society. The board was due to meet every three months. The law gave the following responsibilities to the regional board:

- Prepare plans of HIV prevention for approval by the regional HIV council
- Conduct research related to HIV prevention and control
- Assess and evaluate reports of T-HAPCO
- Find solutions to major challenges encountered by T-HAPCO
- Examine and approve plans and budgets prepared by T-HAPCO and present this for ratification by the regional HIV council
- Discuss and decide on issues raised by the head of T-HAPCO
- Monitor implementation of allocated resources to T-HAPCO[83]

Overall, provisions were not deemed empowering enough by board members. Their role was mainly advisory to T-HAPCO. The same structure existed all the way down to the district and sub district levels.

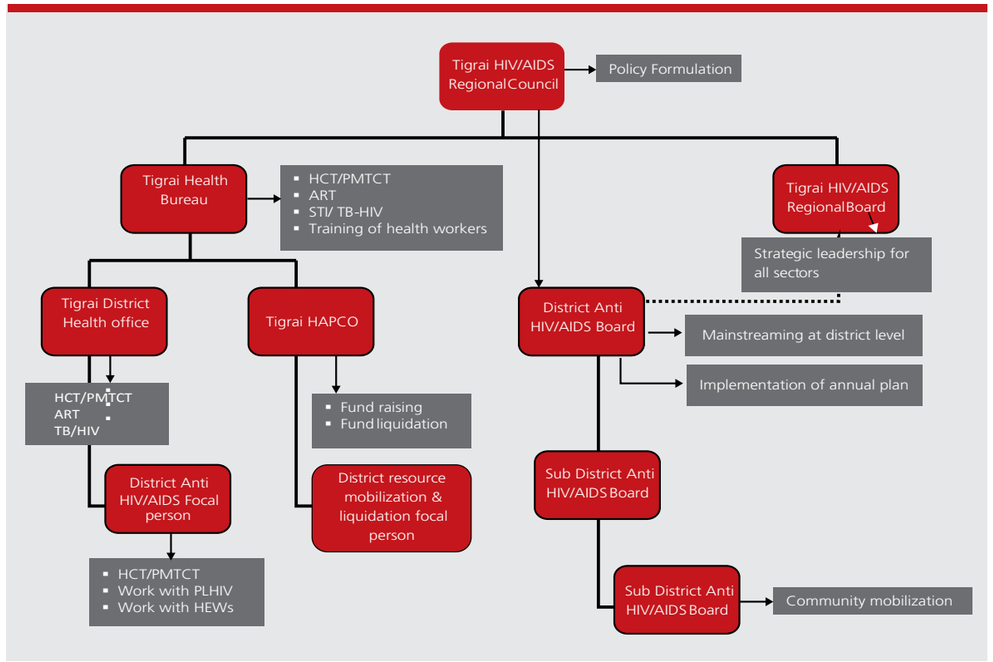
In 2007 when BPR was implemented, the Tigrai regional cabinet brought Tigrai HAPCO under the Tigrai Health Bureau. The Tigrai HAPCO was made accountable to the Tigrai Health Bureau and its responsibilities were transferred to the Health Bureau. However it retained its own seat as secretary in the Regional HIV/AIDS Board, as well as its own office and staff, including focal persons at the district level, although its budget was merged with that of the health bureau. Tigrai HAPCO continued to deal with all government sectors as before but its activities on HIV/AIDS impact mitigation (social support) were transferred to the Bureau of Social Affairs.

81 In practice these meetings have not occurred as often as planned.

82 The national state council of Tigrai; Proclamation 126/2007, the re-establishment of the Tigrai HIV/AIDS prevention and Control Office (T-HAPCO).Articles 5, 6, and 7. Tigrinya and Amharic Pp.3/4; 2007

83 ibid

Figure 12: HIV/AIDS governance and institutional mandates after amendment



Amendments and reorganizations were prompted by existing gaps in the HIV response, an indication of close follow up more than power struggles. Changes did not bring a paralysis in service delivery as reflected in the next chapters that show a constant expansion of HIV services.

The qualitative research carried out for this study included individual key informant interviews (KIs) with members of the HIV district boards, management committee of the district health office (DHO), health centre directors and focal persons on HIV at the district level. The aim was to explore if the changes in the institutional arrangements improved effectiveness in the response. The focus was on HIV Boards that include members from Tigrai Health Bureau, T-HAPCO and others. Findings include:

- Perceptions on the functioning of HIV district Boards: District HIV boards were not always active. Of the four boards for which members were interviewed (Tigrai has 46 district/ HIV Boards), only the board of Adua town claimed to have regular monthly meetings, with minutes and records. The other three boards were not meeting at all. Weakness in coordinating board members was also highlighted as an issue.
- Weak vertical linkages from regional to district levels: Coordination and linkage between bodies working at the district and regional level on the HIV/AIDS response was highlighted as an area of weakness.
- Involvement of PLHIV association in institutional arrangements: One of the permanent members of the regional Board of HIV/AIDS is the association of PLHIV. It has full voting status and has been involved in the HIV response throughout. The PLHIV association itself underwent several rounds of reorganisation to decentralise its structure. Currently it exists as an umbrella organisation at the regional level, named the Network of HIV Positives (NEP plus), a coalition of several local organisations of PLHIV associations.

3.4. Strategic Information

A number of different sources of strategic information on the HIV response in Ethiopia and to a lesser extent Tigrai are available. These are summarised in **Table 16** below. These are regular sources, in addition to specific studies such as the PMTCT baseline survey of 2004; the Dynamics of the HIV/AIDS Epidemics in Rural Ethiopia by Clare Bishop-Sambrook of 2008 that covered Alamata and Atsbi-Wemberta in Tigrai or evaluations such as the Tigrai HIV Mid-term Review by an independent team of 2008.

Table 16: Regular strategic information sources

Sources	Time period
Tigrai HAPCO monitoring and evaluation system reports	Quarterly
HMIS (HIV clinical data) reports	Quarterly/Monthly
Behavioural Surveillance Surveys (BSS)	2002 and 2005
Demographic Health Surveys (DHS)	2000, 2005 and 2011
EHNRI, ANC sentinel HIV Surveillance	Every two years (latest in 2009)
Population and Housing Census (CSA)	Every ten Years (latest in 2007)

3.4.1. The Routine Monitoring System

In alignment with the "Three Ones Principles" Ethiopia has one HIV national monitoring and evaluation system and one national plan (the most recent M&E plan covers 2010 to 2014). The Federal HAPCO monitoring system captures both biomedical as well as non-health routine programmatic data (on community mobilization, school HIV interventions, mainstreaming, condom promotion, care and support and behaviour change communication) using standard indicators. Joint Supportive Supervision and bi-annual Joint Reviews are additional mechanisms to assess progress in the implementation of the multi-sectoral HIV response.

The M&E system is decentralised down to the *Kebele* (village) level. The Regional HAPCO offices coordinate monitoring and evaluation of HIV programmes activities for their respective region, collating data from *Woreda* level quarterly reports and regional implementers. *Woredas* compile data from quarterly reports from *Kebeles* and implementers at *Woreda* level. *Kebeles* collect data directly from implementers. To improve standardisation in collection methods and quality of these data, Federal HAPCO is introducing a new Community Information System, piloted in 2011 (full scale implementation is planned for 2012).

Before 2010, clinical data in Tigrai were collected based on PEPFAR/I-TECH formats. In 2011, the Federal Health Management Information Systems (HMIS) was introduced.

3.4.2. BSS 2002 and BSS 2005

The Behavioural Surveillance Surveys of 2002 and 2005 included in-school and out-of-school youth, truck drivers, female sex workers (FSWs) and uniformed services. Rural migrant workers, miners and settlers were not included although rural to rural resettlement was a large policy effort in Ethiopia's food security. Moreover Tigrai has not been well covered in the BSS 2002 and 2005: BSS 2002 only included in school youth (ISY) while BSS 2005 included ISY, road construction workers and the military only. Other key high risk populations such as FSWs and transport workers were not sampled from Tigrai.

3.4.3. DHS 2000, 2005 and 2011

The Demographic and Health Survey (DHS) provides useful information on knowledge, behaviours and HIV prevalence in Ethiopia, disaggregated by region for most indicators.

Ethiopia has not undertaken either an AIDS Indicator Survey (AIS) (a standardised tool used to obtain indicators for monitoring national HIV/AIDS programmes) nor the Multiple Indicator Cluster Surveys (MICS), a survey developed by UNICEF to monitor programmes for children and women[84].

3.4.4. The National ANC Sentinel HIV Surveillance (2001-2009)

A HIV sentinel surveillance system among pregnant women was established in Ethiopia in 1989. The first three sites in Tigrai were included in 2001. These were Mekelle, Maichew and Adigrat, all located in urban areas of southern and eastern Tigrai. In 2002, Abi Adi from Central Tigrai was added to the urban sites. It was not until 2003 that the rural areas of Tigrai were included in the ANC sentinel surveillance. However the three areas that were added were in Atsbi, Edaga Arbi and Workamba, all located in eastern and central Tigrai. In 2005 Zana and Semema in the North west were added. The Western zone where seasonal workers are to be found (a group vulnerable to HIV infection) was not included. It was not until 2007 that one site from the west, namely Adi Goshu, was added.

In 2009, the number of sentinel sites in Ethiopia reached 73 rural and 41 urban of which 7 rural sites and 4 urban were in Tigrai.

3.5. Health System Strengthening

In the last several years the Federal Government of Ethiopia has undertaken a number of health system strengthening activities, including health facility expansion, training of health care professionals and the deployment of health extension workers. In 2007 funding was secured from donors to support health centre construction which was matched by 50% funding from regional governments. These health strengthening activities have supported the delivery of HIV services and programmes. In Tigrai the number of health facilities and health care workers has increased significantly from 39 in 2005 to 189 in 2010, mainly with support from the Global Fund Against AIDS, TB and Malaria (GFATM). The rural health infrastructure was also strengthened in this five year period. The number of health care workers has also increased as shown in **Table 17**:

84 World Food Programme; HIV/AIDS Analysis: Integrating HIV/AIDS analysis into food security and vulnerability analysis. Vulnerability analysis and Mapping Branch, Rome, Italy; 2008

Table 17: Health facility expansion before and after GFTAM support

Zone	Number of HCs 2005 (baseline)	Number of additional HCs by 2010	Staffing HOs, 2010	Staffing, Midwives, 2010 (newly posted)
Western	3	17	25	10
North Western	6	27	25	19
Central	9	38	47	47
Eastern	9	21	33	20
South Eastern	4	18	32	17
Southern	5	25	33	22
Mekelle City	3	4	10	4
Total	39	150	205	129

Source: Tigrai Health Bureau 2010 Profile

Figure 13 shows the distribution of ART and PMTCT sites in Tigrai. ART and PMTCT services are concentrated in the densely populated areas of the East, Southern Eastern and Southern part of the region.

Figure 13: ART, PMTCT and hospital facilities in Tigrai

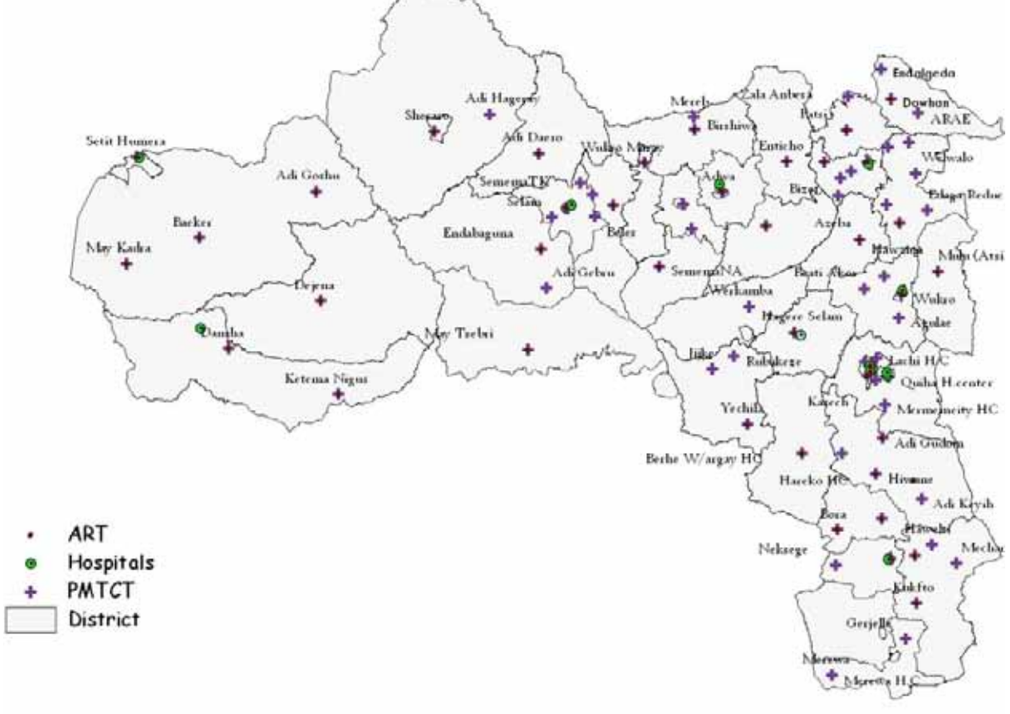


Figure 14: Health sector related human resources in Tigrai 2008-2010

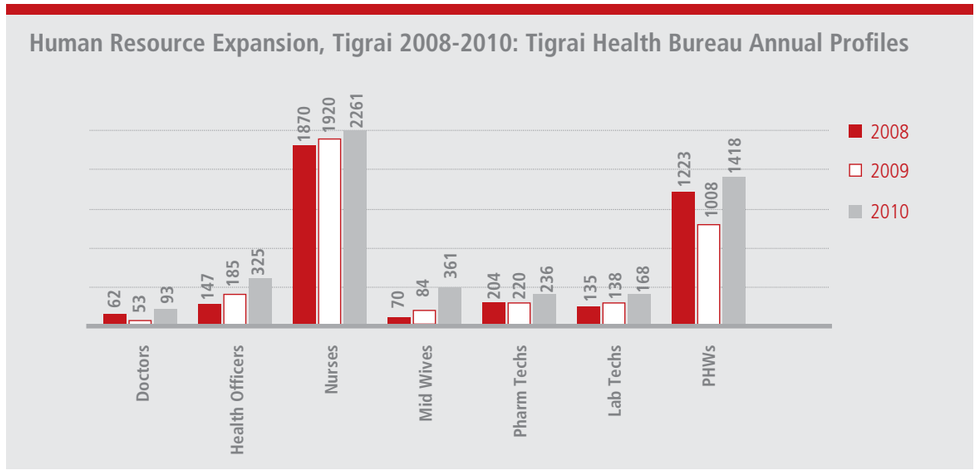
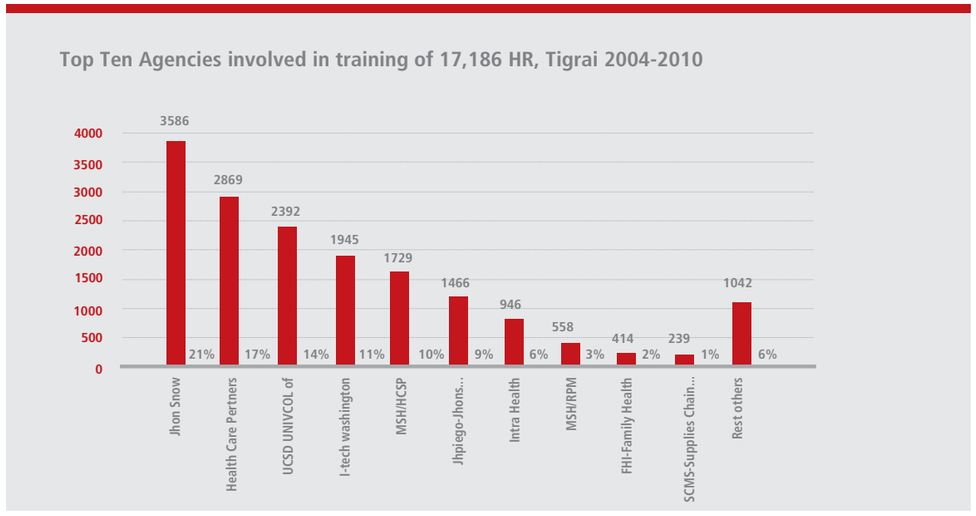


Figure 14 illustrates that the mainstay of the workforce in Tigrai are nurses and primary health care workers. Every health centre is staffed with a Health Officer (health workers with BSc degree in clinical medicine and public health). Health Officers in each health centre are supported by at least 5 nurses and 2 midwives, one or two laboratory technicians and one or two pharmacy technicians.

Human Resources/Capacity Building: In addition to health facility construction many international agencies have been involved in the training of health care professionals, lay health workers, mother mentors, managers, financiers, religious leaders and others on HIV prevention, patient care and patient treatment and management. **Figure 15** below shows the ten top agencies involved in the training of human resources in Tigrai from 2004 to 2010. At least 17,000 staff were trained during this period. The trainings reported may not be exhaustive, and trainees might have participated more than once, depending on the type of training. However, this provides a sense of the scale of the trainings and the consequent benefits for the health system.

Figure 15: Agencies involved in training in Tigrai 2004-2010



Source: JHPIEGO

Data were collected by JHPIEGO (an NGO affiliated with John Hopkins University) and the analysis conducted by the Tigrai MoT study team for this report. **Table 18** below shows the number of trainees per type of training related to HIV from 2006 to 2010. It is important to note the training activities reported here only include those provided to health care workers. Training conducted at the community level for mobilisation, awareness raising etc is not captured.

Table 18: Type of HIV training, Tigrai (2006-2010)

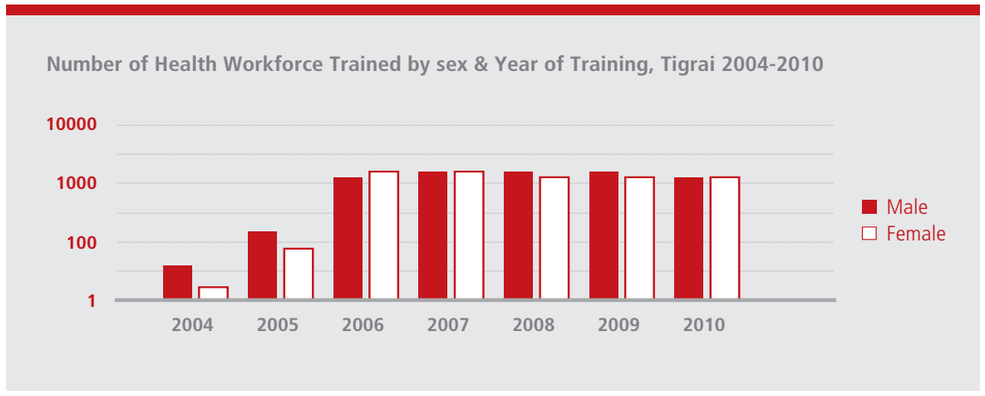
TYPE OF TRAINING	NUMBER of TRAINEES	PERCENT
Infection Prevention & Injection Safety	4,106	36
VCT/PICT	1,579	13.8
PMTCT	1,523	13
In School Youth	1,319	13
TB/HIV , STI Management	776	11.6
ART all types	738	6.5
Comprehensive HIV Training	616	5.4
Community Mobilization & IGA	616	5.4
Clinical Training	353	3.1
Laboratory Training	249	2.1
Drug &Therapeutic Committee	197	1.7
Home Based Care & Case Management [86]	33	0.3
TOTAL	11,367	100

Source: Personal communication, Belai Tesfahungen, WHO Focal Person in Tigrai85

85 These data are incomplete and do not capture the complete range of training that was offered

Training by gender: The number of females trained in the health workforce. **Figure 16** below show the disaggregation of health staff trained on HIV related issues by sex.

Figure 16: HIV Trainings. Tigrai 2004-2010. Sex disaggregation.



Source: Personal communication, Belai Tesfahungen, WHO Focal Person in Tigrai

Task Shifting: Originally, only senior health workers (doctors and specialists) were allowed to treat and manage patients. This approach limited patient management of HIV/AIDS to hospitals only. However the need to include health centres necessitated task shifting to train health officers, nurses and others in the management of patients. The Tigrai Health Bureau had three main partners in the Task Shifting process in relation to the HIV response: I-TECH on ART, IntraHealth on PMTCT and JHPIEGO on HIV prevention and MSH. The majority of the staff of the health bureau (other than administrative staff) underwent training of one nature or another.

3.6. HIV Prevention Programmes

3.6.1. HIV Counselling and Testing

According to records from the Tigrai Health Bureau and Tigrai HAPCO there was no meaningful voluntary counselling and testing before 2005. Testing was limited to urban areas such as Mekelle, the capital and surrounding towns and at hospital facilities. In 2006, there were 39 VCT sites, and only 40,000 people were tested in the entire region during that year.

Data for 2002/03 from Humera show that the number of people accessing VCT services was very low [86]. Over 14.5 months, only 803 consultations took place, including those referred by health workers. The main users were the military (29.5%), migrant workers (18.3%) and farmers (14.8%). Over 90% (725 of 803) of those tested had received results and 25.1% were HIV positive. A study by Brigg *et al* on the acceptability and use of VCT showed widespread fear, stigma and discriminatory attitudes[87]. FGDs conducted in this study in 2011 revealed a fear of testing due to discriminatory views towards PLHIV.

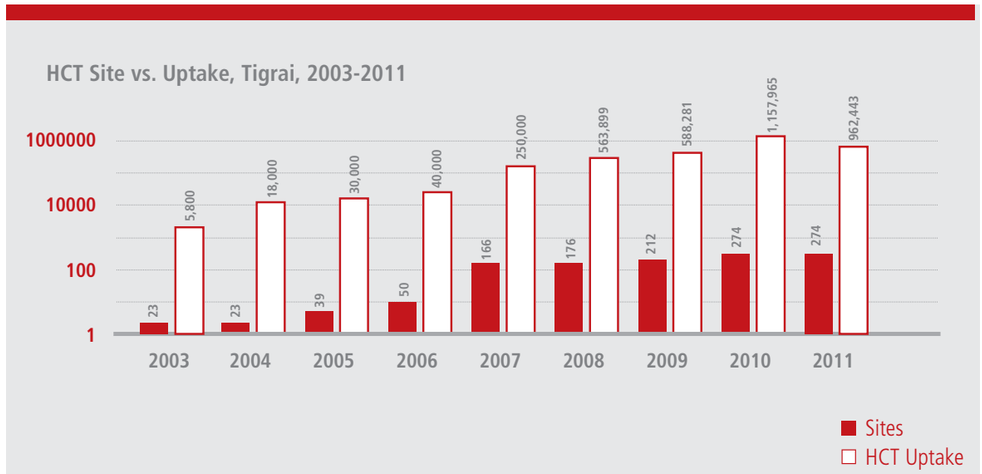
86 Brigg, R et al; Acceptability and Utilization of Services for voluntary counseling and testing and sexually transmitted infections in Kahsay Abera Hospital, Humera, Tigrai, Ethiopia. Ethiop. Med. J. 42; 2004

87 ibid

The Mid-Term Review of Tigrai HSDP III (2005-2010)[88] reported that the region carried out a number of large campaigns to encourage HIV testing. These consisted of community conversations, school health programmes and mobile VCT campaigns. Prior to 2006, VCT was performed in static health facilities i.e. hospitals and health centres only. A mobile VCT service was introduced to overcome the barriers to testing, including stigma associated with HIV testing sites. This involved conducting VCT in public areas and encouraging people to come forward for testing. This was first done in Aksum in 2007 during the festival of Hidar Tsion (where more than 100,000 people gather every year on the 28th November). The approach was successful; in a three day campaign, 903 people were tested, 600 of them youth from the town of Aksum. The pilot demonstrated that mobile VCT was more accessible than facility based VCT.

An incentive based approach was also used to improve uptake and offer of VCTs in Tigrai. Districts with the highest number of people tested were rewarded and best practices were shared. This approach contributed to increasing efforts in the offer of VCT and this in turn led to a rise in the number of people tested. As seen in **Figure 17**, the results show a steady increase in uptake of VCT in the region. PICT was initiated in late 2008, which contributed to doubling the uptake in one year alone:

Figure 17: HCT uptake and HCT site expansion per year, Tigrai 2003-2011



Source: Annual profiles of the Tigrai Health Bureau

The adult population of Tigrai (15+ years old) in 2011 was estimated to be 2,689,600[89] meaning that about half were tested for HIV every year since 2010 (altough the numbers reported in the figure refers to the number of tests and not number of people and this may include people who were tested more than once). Estimates from the recent 2011 DHS showed that in Tigrai, 55.5% of women aged 15-49 years had ever tested for HIV and received their results, with a further 4.9% ever being tested but not receiving their results. Just under half of men aged 15-49 years (49.1%) had ever tested for HIV and received their results, with a further 5.9% ever being tested but not receiving their results.

88 MTR HSDP III; Mid Term Review: Regional Report, Tigrai (EFY2003-2003) or 2005-2010 GC. The independent Review Team; 2008

89 EPP/Spectrum estimates. Global Annual Progress Report, Ethiopia 2012.

In the year preceding the survey, 35.3% of women and 29.7% of men had been tested for HIV and received their results, demonstrating a dramatic increase for both women and men from 2005 where only 1.9% of women and 2.5% of men in Tigrai had been tested and received their results.

The main challenges in VCT provision and uptake include:

- Constant shortages of reagents and test kits
- Low uptake of testing among partners of pregnant women who access testing through PMTCT
- Low rate of HIV status disclosure[90]
- Lack of follow up of individuals testing positive until 2008
- High counsellor turnover and cost of retraining staff
- Discouragement of the use of formal health care services including HIV testing services by traditional healers and individuals with traditional cultural beliefs

3.6.2. Condoms Promotion

Major stakeholders engaged in male condom distribution include, DKT Ethiopia (a social marketing NGO) and the military. DKT Ethiopia supplies condoms to the private sector, youth condom distributors, government institutions and non-government organisations. There are a number of condom outlets in the region. In addition to this, the Organisation for Social Support against AIDS (OSSA), in addition to other local and international NGOs and the Tigrai Health Bureau are responsible for distribution of condoms to health facilities for free. All health facilities are also condoms distribution points. Other outlets include pharmacies, kiosks, hotels and AIDS clubs.

Table 19: Distribution of male condoms, Tigrai vs. National 2003-2011

Year	DKT Ethiopia	Military [92]	Others	Total Tigrai	National
2003	3,700,000	n/a	n/a	3,700,000	n/a
2004	3,900,000	n/a	n/a	3,900,000	49 million
2005	5,000,000	n/a	n/a	5,000,000	47
2006	6,955,700	1,649,376	1,291,744	9,896,820	58
2007	6,409,956	288,000	n/a	6,697,956	78
2008	4,890,480	2,700,961	3,597,512	11,188,953	70
2009	9,115,967	3,233,092	43,857	12,392,916	97
2010	6,816,536	3,035,843	1,097,642	10,950,019	128
2011	5,132,461	889,920	n/a	6,022,702	n/a
Total	51,921,100	11,797,192	6,030,755	69,749,366	527 million

Source: DKT Ethiopia, T-HAPCO strategic plan for 2006-2011)[91]

90 The FGD carried out in this study in Humera reported some cases of PLHIV who run away as fugitives from their home of origin and begun to live in places like Humera due to fear of disclosure

91 MOND; Annual report on Condom use of Northern Command (personal communications); 2011

Although the data in **Table 19** is incomplete (and most likely an underestimation), it shows that condom distribution has increased over the years. It is notable that while the population of Tigrai accounts for only 6% of the population of Ethiopia, Tigrai accounts for 13% of condom distribution in the country. However when the number of condoms actually distributed is compared to the number planned it is apparent that supply is not meeting the need. Between 2010 and 2011 Tigrai had planned to distribute more than 23 million condoms[92,93].

Female condoms are not widespread in Tigrai. Disaggregated data by type of condom were not available for the region.

3.6.3. Prevention of Mother to Child Transmission (PMTCT)

The first national guideline for PMTCT was issued in 2001 and revised in 2007[94]. In Tigrai, implementation of the PMTCT programme did not start until 2002. Government supported PMTCT services started in Mekelle, AdiGrat and St Mary's hospital in Aksum. In 2005 the Tigrai Health Bureau had 9 PMTCT sites which grew to 44 by 2007 (**Table 20**). By 2009, it was 109; and in 2011 it reached 186 sites. PMTCT consisted of promotion campaigns, VCT for all pregnant women at first ANC visit and single dose nevirapine until 2007 when guidelines were changed to dual therapy. New WHO guidelines, Option A (WHO 2010) were adopted in 2011 and were being implemented at the time of this study.

Table 20: PMTCT programme, Tigrai (2005-2011)

Year	2005	2006	2007	2008	2009	2010	2011
PMTCT Sites	9	10	44	54	109	140	186
Expected number of pregnant women	n/a	n/a	165,269	169,401	173,636	177,977	182,426
Pregnant women with at least one ANC visit	n/a	n/a	48,985	80,804	93,012	133,980	n/a
Pregnant women tested for HIV at ANC	4,493	12,185	24611	48798	41,661	94295	100,293
Pregnant women tested HIV positive	305	632	633	1,092	1,253	1,306	1,062
Pregnant women receiving ARV prophylaxis	n/a	n/a	302	517	619	626	866
Infants receiving ARV prophylaxis	n/a	n/a	280	447	484	352	n/a

Source: Tigrai Health Bureau and Tigrai HAPCO

Based on Spectrum/EPP draft estimates (April 2012) for Tigrai the estimated number of pregnant women in need of PMTCT were 3,700 in 2011. Since only 866 received PMTCT, coverage was as low as 24%. However the 866 who received PMTCT do not include pregnant women on ART for their own health which could be as many 300 which would translate to a slight increase in coverage. HIV transmission rate through PMTCT was estimated at 20% at the end of breastfeeding at the national level in 2012.

92 Multi-sectoral HIV/AIDS Response Monitoring and Evaluation Report. Federal HAPCO.July 2010-2011

93 Condom distribution targets calculated as follows: (adult population 15-49 yrs/2) X 40% X 100 condoms per year

94 MOH and NACS;.National Guideline on the PMTCT of HIV in Ethiopia, Addis Ababa, Ethiopia; 2001.

In addition to the Government of Tigrai's efforts in PMTCT, two non-government organisations have supported PMTCT in Tigrai in partnership with the Tigrai Health Bureau:

- **Medicins Du Monde (MDM**) introduced PMTCT in Mekelle hospital in 2005. By 2009, at least 50% of HIV positive pregnant women in Mekelle hospital were enrolled in PMTCT, 80% had hospital deliveries and 96% of mothers and infants received prophylactic ART. All counsellors at Mekelle hospital were trained on PMTCT, ART was continuously available throughout the programme and all women received counselling on safe infant feeding practices. Medicins Du Monde handed over PMTCT activities to the local health authorities in 2009.
- **Hareg/Intrahealth** – The Hareg Project provided PMTCT services in Aksum Hospital and Wuqro Marai, a town 15 kms northwest of Aksum. Hareg was later replaced by IntraHealth, an organisation working to strengthen PMTCT services in 45 health centres.[95] The Hareg Project conducted BCC activities which included the use of community action facilitators (individuals responsible for running coffee ceremonies, community conversation and household visits) and HEWs to increase the demand for PMTCT services. Mother support groups (MSG), responsible for providing psychosocial support to HIV positive mothers were also established. Success in implementing the MSGs led to the establishment of a technical working group to facilitate MSG replication in other facilities.[96]

As seen in **Table 20**, PMTCT uptake by mothers who attended ANC showed a steady increase rising from 4,493 in 2005 to over 100,000 in 2011 as a result of the site expansion. The number of pregnant women receiving ART prophylaxis also increased steadily over the years. Key elements that were identified that contributed to the increased uptake in PMTCT include:

- Introduction of legalisation which made antenatal care, delivery and postnatal care free at all levels of the health system[97]
- The use of Health Extension Workers, trained in safe delivery and, in promotion of PMTCT
- The training of midwives and health officers to staff health centres
- The availability of at least one ambulance per district, aimed at supporting expectant mothers as a priority since 2009
- Community conversation and dialogue which encouraged pregnant women to come forward for testing
- Increased social mobilization efforts promoting HCT during the Ethiopian Millennium HIV campaign in 2008

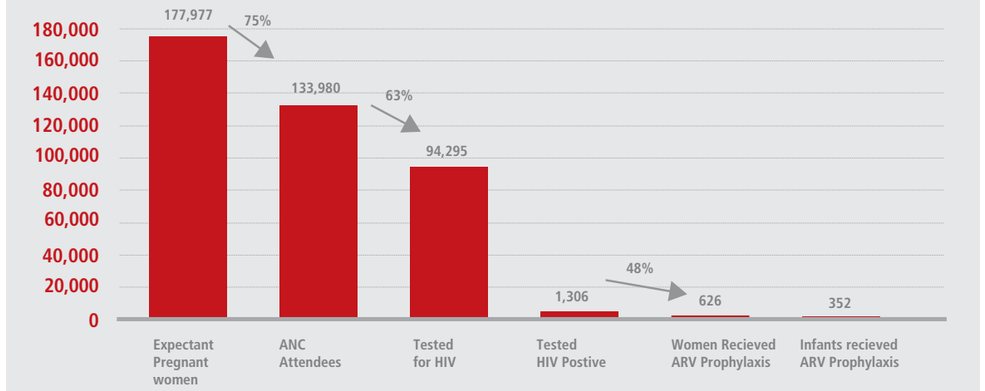
95 USAID; Comprehensive MCH/PMTCT Project, 2007-2009. Final Report; 2009

96 USAID; Comprehensive Maternal and Child Health/Prevention of Mother-to-Child Transmission Project, 2007-2009: Executive Summary; 2009

97 NegaritGazetta (175/2010).Proclamation to amend law 103/2006 on health service provision, leadership and administration. Article 16, sub article 1, translated to English for this report, 2011 Tigrinya and Amharic

Despite the increase in the uptake of PMTCT services, coverage remains low and a number of missed opportunities for PMTCT are seen, as shown in Figure 18. Progressive loss of pregnant women is seen at every step of the PMTCT cascade, beginning with non-attendance at ANCs. Antenatal attendance in Tigrai and in Ethiopia is much lower than other sub Saharan African countries. In Tigrai 75% of expected pregnant women reported at least one ANC visit in 2010 (see Table 20). However, not all health facilities that provide ANCs actually provide PMTCT services and among those that do, service delivery failures as well as patient related factors result in limited uptake of antenatal testing, receipt of results and receipt of ARV prophylaxis. In 2010, 37% of pregnant women attending ANCs were not tested for HIV and 52% of identified HIV positive pregnant women did not receive ARV prophylaxis **(Figure 18)**. In fact, many HIV positive pregnant women do not deliver at health facilities. These significant losses substantially reduce the effectiveness of PMTCT programmes and require follow up.

Figure 18: Prevention of mother to child HIV transmission services in Tigrai in 2010



Source: Tigrai Health Bureau and Tigrai HAPCO

The DHS 2011 reports even lower coverage of PMTCT in Tigrai with only 29.3% of pregnant women reporting receipt of HIV counselling during antenatal care and 43.9% who were tested and received their results. Only a little over a quarter of pregnant women (27.0%) received HIV counselling, an HIV test and their results during ANC.

Another key PMTCT challenge is the unwillingness of male partners of pregnant women to be tested. Moreover, there are still low levels of understanding and knowledge of mother to child transmission, as shown in **Table 21**:

Table 21: Knowledge of mothers on MTCT, Tigrai 2000-2009, various sources (N in brackets)

Knowledge of MoT & PMTCT	DHS 2000[99]	PMTCT survey 2004[100]	DHS 2005	DHS 2011[101]	EHNRI 2008[102]	Tigrai HH Survey 2009[103]
% women 15-49 yrs who heard of HIV/AIDS	91.3 (969)	99.0 (149)	97.0 (919)	99.7 (1,101)	93.7 (756)	95.0 (1860)
% women 15-49 yrs who knew MTCT occurs during pregnancy	28.6 (969)	8.0 (149)	NA	NA	NA	33.1 (1860)
% women 15-49 yrs who knew MTCT occurs during delivery	11.2 (969)	NA	NA	NA	NA	33.0 (1860)
% women 15-49 yrs who knew MTCT occurs through breastfeeding	55.1 (969)	NA	77.0 (448)	86.9 (959)	NA	53.2 (1860)

Source: as footnoted

3.6.4. Communication for Social and Behavioural Change

Behavioural and social change communication programmes implemented in Tigrai include:

- **Radio stations and newspapers:** The regional government has made use of two popular media outlets - a radio station known as Dimtsi Weyane Tigrai and a newspaper named Weyin - for HIV related behaviour change communication (BCC). Both media outlets communicate in Tigrigna and are accepted by the local population as they were developed and supported by them.

Both are members of the HIV regional board and have benefited from the resources mobilised for HIV related BCC activities. The 2007-2011 strategic plan of Tigrai HAPCO[103] reported that between 2004 and 2006, 174 hours of HIV related messages were transmitted through Dimtsi Weyane Tigrai in Tigrinya. This translates to 58hours per year or 4.8 hours per month. The newspaper Weyin ran a regularly weekly column entitled **"**let us listen, learn and live" which was serialized for a number of years and aimed at raising awareness and bringing about behavioural change.

98 CSA; Demographic and Health Survey of Ethiopia.Measure; 2000;.www.measuredhs.com

99 The Hareg Project; Baseline Survey on PMTCT in Ethiopia, AED LINKAGES, USAID; 2004

100 CSA; Demographic and Health Survey of Ethiopia.Measure; 2011 .www.measuredhs.com

101 EHNRI; Impact Evaluation of Ethiopia's National Response to HIV/AIDS, Tuberculosis, and Malaria. FMOH/EHNRI, Addis Ababa, Ethiopia.; 2008

102 THB/IFHP/L10K;.Tigrai Household Survey Report. USAID, Pathfinder, JSI (sponsored); 2009

103 T-HAPCO;. Strategic plan for 2007-2011 Tigrinya; 2008

Other local newspapers which featured HIV related BCC messages include: the Bell 'DEWEL', by Tigrai HAPCO, and the widely distributed Shield (WALTA) with 6,000 copies distributed quarterly. Fana Wegi is a health education newsletter that was produced by MSF Holland. It mainly focused on leishmaniasis and HIV co-infection in Kafta Humera and was only available in English. "Ideas for Health" (SINKI TIINA) another newsletter published MSF Belgium in English aimed at raising awareness of HIV and STDs. It was short lived and disappeared when the agency phased out its activities in 2004.

- **HIV printed materials**: Fliers with HIV related BCC messaged have been produced and distributed in Tigrai. In 2002 alone, 100,000 fliers were distributed while, in 2005/2006, 75,000 fliers were distributed according to the strategic plan of T-HAPCO[104].
- **Community Conversations (CC):** is an Ethiopian innovation on HIV social mobilization. CC is a process whereby members of the community come together, hold discussions on their concerns and by using own values and capacity reach shared solutions for change and implement accordingly. With the help of a trained facilitator, groups of about 20 people sit and discuss issues such as VCT, PMTCT and condom use. At the end of the cycle (about twenty sessions), they develop an action plan to address HIV needs. In 2007, Tigrai had 151 permanent sites for community conversation. In 2010, this reached to over 600 sites. The population reached in 2005 through 14,851 community conversation sessions of HIV prevention was estimated to be 900,000 (number of CC sessions i.e. 14,851 multiplied by 60 which is the maximum number of participants). In 2011 Federal HAPCO reported that all of the 734 Kebeles had a CC programme in place and 191 had developed an action plan[105]. In addition nearly half of all schools were implementing community conversations among students and staff (1,302 schools). The DHS 2011 shows that 50.6% of women and 55.7% of men in Tigrai had heard of the community conversation programme (compared to 30.8% and 51.9% nationally), demonstrating the high levels of awareness achieved by the programme.
- **The Health extension workers (HEWs) programme:** Currently there are 1,440 (1,220 rural) HEWs in Tigrai[106]. These are females trained for one year who work on health promotion. Their primary aim is to conduct health education including HIV prevention and promote healthy behaviours at the household level. HEWs are deployed at the health post level and cover 90% of health posts in rural areas and around 70% in urban areas. HEWs play a key role in community mobilization for the prevention HIV. The sub-district of Mahbere Weyni, which achieved 100% uptake of HIV testing of adults aged 15 years and above is one example of the impact HEWs have had on HIV prevention.
- **The role of PLHIV in community mobilization:** Currently there is an association of PLHIV in every major town in Tigrai. There are no rural associations as such but instead branches in smaller towns. There are 38 associations of PLHIV in total in Tigrai with a membership that is about 30% male and 70% female. NEP+ (Timret) is the regional and federal umbrella for these associations. 33 associations are legally registered and five are in the process of being registered. With support from regional HAPCO as well as other partners, the PLHIV community has been participating in VCT sensitization and PMTCT promotion using various forums and health service delivery outlets. The PLHIV associations are also involved in campaigning against stigma and discrimination and carry out IEC activities.

104 Ibid. p.13

105 Federal HAPCO; Multi-sectoral HIV/AIDS Response Montioring and Evaluation Report 2003 EFY (July 2010- June 2011).

106 Tigrai Health Bureau 2011 data.

FGDs conducted for this study with members of PLHIV associations highlighted the following:

- PLHIV associations are now independently carrying out health education and BCC activities having initially received support from T-HAPCO and other partners
- PLHIV associations contribute to awareness creation by sharing experiences and disseminating information on a range of issues including PMTCT, VCT, treatment adherence and care and support for PLHIV
- Perceived stigma and discrimination by PLHIV associations members is decreasing: "Now we are treated the same as the youth and women associations, nothing more nothing less" (FGD with PLHIV males, Setit Humera, 2011)".

3.6.5. Prevention Programmes in the Workplace

Implementing HIV mainstreaming workplace programmes is one of the key activities of T-HAPCO. Every sector bureau nominates one focal person on HIV prevention who will form a team of volunteers who in turn sensitise and organise their office into an AIDS club and possibly contribute funds to support orphans. In 2011, 1,041 government organisations in Tigrai had established an AIDS Fund, 1,518 had a focal person for HIV prevention and 1,273 had an HIV Plan. Among NGOs and associations, 309 had established an AIDS fund, 478 allocated up to 2% of their budget to HIV and 441 had an HIV plan[107]. Data for the private sector was not available possibly because there are few mainstreaming activities taking place.

In 2008, an MA thesis[108] reviewed HIV/AIDS workplace interventions in Mekelle's trade industry sector for small and micro-enterprises. Five FGDs and 28 individual interviews from a population of 145 members across 14 Business Cluster Networks were conducted. The study found all members (100%) had heard of HIV/AIDS. Their source of information however was not their workplace but rather radio and television. The study concluded that direct services such as IEC, VCT were not in place. PLHIV were not involved in the workplace programmes and gender issues were not sufficiently addressed.

3.6.6. Risk Reduction Programmes for Youth

The following activities for youth (both in-school and out-of school youth) have been conducted Tigrai:

- Income generating activities (IGA): With Funding from GFATM 974 youth (ISY and OSY) were supported to begin IGA activities.
- Youth friendly VCT services: VCT in 9 major cities targeting youth has been established.
- AIDS information Centres: for 9 major cities were established.
- Condom distribution: With support from GFATM over 500,000 condoms were purchased and distributed to districts to be distributed for free to in-and-out of school youth. A further 4 million condoms were distributed through social marketing and for free with support from the district advisory committees of 9 major cities.

107 Federal HAPCO;. Multi-sectoral HIV/AIDS Response Monitoring and Evaluation Report 2003 EFY (july 2010-June 2011)

108 Genet Arefe; Cluster approach & small enterprise support strategy and HIV/AIDS study in Tigrai region, Ethiopia. MA thesis on management of development, University of Larestein, The Netherlands; 2008.

3.6.6.1. School Programmes:

The HIV/AIDS council in Tigrai has formed AIDS clubs in each school consisting of school directors, teachers and students. The purpose of the clubs was to raise awareness and serve as a forum for learning and promote knowledge and understanding of HIV/AIDS. A manual on HIV prevention was prepared in Tigrinya in the same year for school directors. School directors were also given training on HIV prevention as part of their annual review meeting. Best practices were drawn from the experience of the primary school of Dugum which achieved a testing rate of 100% i.e. all students were tested. Dugum primary school became a model school mainly through the efforts of the school director in engaging students and teachers and introducing a HIV health education programme.

Education materials on HIV prevention were prepared in Tigrinya for both primary (grade 1-6) and post primary schools (grade 7 and above) and distributed as part of the curricula. The regional HIV Board also assigned 70 nurses to all high schools. One of the main aims of this programme was to promote HIV prevention in schools. The school health programme was successful and approved as a permanent programme. However, district Health Bureaus failed to sustain the school health programme by pooling staff to serve as clinical nurses in the health centres.

Evaluation studies of HIV education programmes in Tigrai are lacking. The limited evidence available indicates that while awareness of HIV/AIDS is high, comprehensive knowledge is low and misconception on HIV transmission is common.

Two studies assessing HIV awareness and knowledge of transmission among primary and secondary students in Tigrai in 2007/08 were identified. The first, a study of 388 students from all primary schools in Aksum attending grades 1 to 8, found that awareness of HIV through AIDS clubs was high (100%) but comprehensive knowledge was much lower. Only 61.3% were aware of all modes of transmission and just over a half (57.2%) knew of HIV prevention methods. A significant proportion held various misconceptions regarding HIV transmission (33% believed transmission could occur via a mosquito bite and 26.5% through coughing) indicating the need for more comprehensive HIV/AIDS education programmes[109].
The second study, a MA thesis on knowledge of modes of HIV transmission among 624 female students attending grade 9 to 12 in Maichew, Tigrai, also found that while knowledge of sexual transmission was high (94.6%) knowledge of other modes of transmission was much lower. Only 40.4% were aware vertical transmission could occur during pregnancy and 35.6% through breast feeding[110]. The authors recommended provision of additional financial and technical support for anti HIV/AIDS clubs to strengthen their ability to impart knowledge of HIV transmission and prevention.

109 Tewelde Y; Assesment of HIV/AIDS related knowledge and its influencing factors among late window of hope population in Aksum town, Tigrai, MPH thesis, Gonder University, Ethiopia; 2007

110 NegussieAhmedin ;. Correlates of premarital sexual practice among high school female adolescents in Maichew Towm, Southern Tigrai. Ma thesis, School of Graduate Studies, Addis Ababa; 2008

3.6.6.2. Out of School Youth

Prevention programmes established for out of school youth (OSY) include anti AIDS clubs and peer education programmes through which youth educators are trained to conduct BCC activities. In addition a number of organisations in Mekelle are involved in providing youth friendly services to both in and out of school. These include health centres which train young people on condom use, youth associations which mobilise and raise awareness, FM Mekelle which runs a HIV education programme for youth and a number of civil society and non-government organisations that run anti AIDS clubs, promote VCT and distribute condoms.

In collaboration with the government, NGOs and the Tigrai YAT a number of prevention programmes have been established for out of school youth (OSY) in the last five years. These include the following[111]:

- Anti AIDS clubs: 496 anti AIDS clubs targeting out of school youth have been established. In 230 of these clubs 100% of the members have received HCT and 450,000 community members have been reached by the clubs through HIV edutainment activities such as dramas and role plays.
- Community conversations: were done in construction sites along the road from Adigrat to Adua together with the Ethiopian Road Authority between 2007 and 2010. These covered 7 districts and 27 sub districts. On average between 50 to 60 youth participated each CC session. Similar activities were conducted on the road construction site from Adua to Shire-Adi Goshu and Humera to Lugdi on the Sudanese border. The YAT in collaboration with CCRDA carried out CCs fortnightly in Mekelle and Southern zone covering 6 districts (47 sub districts) and in collaboration with UNICEF also carried out CCs in 200 sites across 14 districts. GFATM supported CCs in all districts.
- IEC/BCC activities: a range of IEC/BCC activities have been conducted at various forums for 900,000 OSY. The YAT in collaboration with Save the Children USA established a HIV/AIDS Advisory Committee targeting IEC/BCC activities at MARPS namely FSWs, Long distance drivers and daily labourers most of who are OSY.
- Saving schemes: YAT and Save the Children USA have also established 61 saving associations to date with an initial capital of Birr 1,339,402 for MARPS.
- Programmes specifically for MARPS: The Tigrai Youth Association is implementing a USAID funded programme (TransACTION) providing prevention care and support services for at risk populations many of whom are youth. Activities include peer education, condom distribution, IGA, care and support services for PLHIV and training[112]

111 Youth Association of Tigrai (YAT) Summary Report on HIV/AIDS Prevention Activities 2007-2012. Mekelle; 2012.

112 Data provided by Tigrai Youth Association. March 2011. TransACTION

3.6.6.3. University Students

While HIV programmes targeting school age children have been developed and implemented, interventions focusing on university students are less developed in Tigrai[113]. However, Mekelle University in recent years has established the following programmes to serve the HIV/AIDS-related needs of both faculty and students:

- HIV prevention programmes which include:
  - Peer education (Peer network, support and mentorship), life skills school community conversations, condom promotion and distribution
  - Youth dialogue
- HIV/AIDS treatment programmes:
  - VCT, PITC
  - ART
- HIV/AIDS care and support services
  - Financial support - AIDS fund on the way to be started
  - Psycho-social support
  - Health service

These interventions have received technical support from both the Regional Health and Education Bureaus, as well as local CSOs and NGOs such as the Mahibera fana PLHIV association, the Tigrai civic society association, the Mums for Mums CSO, and the Tigrai branches of both OSSA and Family Guidance Association of Ethiopia (FGAE).

As well, the University has been involved in other HIV related issues such as the development of an HIV/AIDS policy, an HIV/AIDS workplace policy, HIV/AIDS strategic planning, allocating budgets and a focal person for this work, and establishing an AIDS Resource Centre.

Stakeholders and donor organisations involved in support of HIV/AIDS interventions in the university include: CDC/PEPFAR (care, STI clinic); ITECH (care, continuous medical education); DKT (condom promotion and utilization); UNFPA through OSSA (GBV and SRH services); IFHP and FGAE.

In collaboration with Pathfinder International Ethiopia, youth friendly centres were established in the three campuses of Mekelle University and two other districts of Tigrai. These include health centres which train young people on condom use and raise awareness of HIV prevention.

113 Data for Mekelle university only available as information on HIV programmes for university students in Tigrai has not been complied (more than 2/3 of university students in Tigrai are at Mekelle University)

3.6.7. Risk Reduction for Vulnerable and Key Populations

3.6.7.1. Seasonal Migrant Workers / Settlers

Few HIV services or programmes targeting seasonal farm workers have been developed. Medicins sans Frontiers (MSF) Holland has been involved in delivering health services in Kafta Humera, an area in Tigrai where seasonal migrant workers are highly concentrated. MSF Holland's HIV related activities included free ART provision (introduced in 2004[114] as the first programme of its kind in Ethiopia[115]), treatment of HIV-leishmaniasis co-infection and VCT. In 2005 (the year the most recent data is available) 359 migrant workers were receiving ART. MSF-Holland was also involved in supporting health facilities in providing syndromic management of STIs. The programme however mainly focused on treatment. Moreover it centred on visceral leishmaniasis not HIV/AIDS as such. FGDs with seasonal farm workers carried out for this study revealed that HIV prevention for seasonal workers was lacking. The limited BCC activities that were done were conducted in Amharic and not in Tigrigna and therefore not widely understood. At the time of field work, distribution of fliers to control diarrhoeal diseases and malaria was ongoing but nothing was observed on HIV prevention.

3.6.7.2. Long Distance Truck Drivers

The TransACTION programme is providing HIV/STI prevention, care and support services for high risk populations, including long distance trucker drivers working along transportation corridors in Tigrai. The results of the Transaction study mentioned above in 2010 suggest that truck drivers are accessing HIV testing services with 69.5% of truckers reporting having ever had an HIV test. A third were tested in the last 6 months. The low rate of treatment seeking (only 50% of truckers reported seeking STI treatment) and knowledge of STI treatment sites demonstrate the need for BCC activities to promote care seeking behaviour and knowledge of STI treatment services.

Key informant interviews conducted as part of this study with truckers revealed that a comprehensive and consistent package of HIV services was not provided for this group: HIV prevention targeting truck drivers was inadequate and limited to bill boards with HIV prevention messages. The need for mobile services including mobile VCT due to the mobility of truck drivers was also highlighted. Mobile services were initially provided by some development agencies such as OSSA and Africa Services in Tigrai however these initiatives were limited and not sustained.

3.6.7.3. Refugees

The Federal government of Ethiopia has an office for refugee affairs - the Administration for Refugee and Returnees Affairs (ARRA) - which works closely with United Nations High Commission for Refugees (UNHCR). Other NGOs involved in refugee well-being include the International Rescue Committee (IRC) and International Organisation for Migration (IOM). The IOM focuses on finding a 'third country' of final destination for refugees unable to return home and the UNHCR has a focus on the health and well being of refugees in the host country.

114 FanaWegi Newsletter of MSF-Holland Vol.1 issue.1

115 THB; HIV/AIDS best practice. Tigrai Health Bureau with publication cost covered by I-TECH Ethiopia. Table 8, P.17; 2007

FGDs and field assessments conducted for this study established that the following HIV programmes and services for refugee populations in Mai Ayni and Shimelba camps were available:

- IEC/BCC: IEC and BCC activities are carried out by the International Red Cross. BCC activities include community conversations and AIDS clubs. The limited quality and impact of BCC activities in bringing about behavioural change was highlighted as an issue.
- Reproductive health: Reproductive services including family planning, prevention of female genital mutilation and safe abortion are available.
- Condom distribution: Both male and female condoms are available and distributed at various sites within camps. Condom distribution in Mai Ayni camp was estimated at 10,000 condoms per month.
- HIV testing services: HCT is available daily free of charge within camps and a PMTCT programme offering antenatal testing was recently established.
- Health care access, ART and support services: medical cases are referred to the Administration of Refugees and Returnees Affairs (ARRA) led health centres and Shire (Sihul) hospital. An ART programme was established in the Shimelba camp and serves both the refugee and host community. STI and TB treatment services are available in the camps. HIV home based and palliative care programmes have been established. A PLHIV association was established in Shimelba. It distributes supplies to PLHIV, carries out BCC activities, conducts HCT and advocates for HIV services for the camp.
- HIV/AIDS impact mitigation programmes: in Mai Ayni there is an IGA project for female refugees provided through the Women's Refugee Association and supported by UNHCR and ARRA.
- Sexual and GBV: secure accommodation for women at risk of GBV was provided by the ARRA in 2009 in Shimelba and Mai Ayni.

3.6.7.4. Armed Forces

The armed forces in Tigrai have received considerable HIV interventions. HIV programmes and services targeting the military include the following:

- IEC/BCC: The military published a series of peer education pamphlets which included basic information on HIV and prevention and were widely available. AIDS clubs were established as forums for discussing and sharing information on HIV issues and services. In North-Central command (based in Shire) behavioural change with regard to HIV has been mainstreamed and incorporated as one of the core values of the command unit.
- Condom distribution: The military provide condoms to troops for free. Distribution has been supported by promotion activities such as poster campaigns and the IEC/BCC activities described above to generate and sustain demand for condoms.
- HCT: The military has a voluntary testing programme which provides testing services for soldiers every three months. Published data on uptake of testing among the armed forces however is limited. One MSc thesis on VCT uptake among 917 army troops stationed in Zalambessa, Tigrai found that in 2006 only 47% (430) of soldiers had received VCT with 39% citing a lack of nearby testing services as the reason for not undergoing VCT[116].
- ART/STI services: HIV and STI treatment services for military personnel are provided by military hospitals.

3.6.7.5. Alluvial Miners

The limited information available from the FGDs conducted in the study suggest there is a lack of comprehensive HIV prevention and treatment programmes targeting alluvial miners. HCT, STI treatment and ART services targeting miners were not available. The distribution of condoms to sites accessible to miners was inadequate and infrequent. Moreover, alluvial miners had to travel to major towns to access ART and STI treatment and diagnosis relied on individual initiative.

3.6.7.6. Prisoners

Field assessments and FGDs with prison inmates and staff found the following HIV services for prisoners are available:

- IEC/BCC: AIDS clubs have been established and are open to both inmates and prison staff. PLHIV are also members of the clubs and share their knowledge and experience with members. A peer education programme with regular formal education and discussion sessions is also in place providing inmates with information about HIV transmission and prevention. New inmates are provided with HIV information on HIV prevention and HIV risk factors in prisons on arrival.
- HCT: regular testing of inmates is conducted through established VCT and PITC programmes. Every three months a VCT campaign is run and inmates are encouraged to test. VCT is also available to prison staff and relatives and friends of prisoners.
- HIV treatment and care: ART services are available for prisoners in health centres located near prisons and priority in accessing health care is given to HIV positive inmates. Funding for treatment care programmes however is limited and care and support services such as nutritional support are not provided. Condoms are not available for prison populations.

3.6.7.7. Female Sex Workers (FSWs) and their Clients

No size estimation or census has ever been carried out in Tigrai on FSWs, consequently information required for planning and targeting HIV services for this group is lacking. Current behavioural data are limited to a few areas such as Mekelle, Alamata, Axum and Maichew. Data from the TransACTION study of high risk groups in these four towns suggest some FSWs were able to access HIV testing services: 61.6% of FSWs in Tigrai (along transport corridors) reported having had an HIV test in the previous 3 months and 94.4% were aware of where HCT was available. Access to outreach support services for FSW in this study was low with only 20.0% reporting contact with an outreach worker in the previous 6 months[117].

The six FDGs carried out for this study in all major towns in Tigrai (rural areas were not assessed since sex work tends to take on more the form of transactional sex and is more hidden) further confirmed that FSWs have access to some HIV services and programmes, both for HIV prevention, treatment and impact mitigation (IGAs). FDGs included sex workers and members of the Women's Association of Tigrai. However the FDGs suggest that services are not regular nor a full package offered consistently or available everywhere. The limited services available include condom distribution and IEC promoting VCT, PMTCT, condom use and ART. Economic support in the form of start-up capital for small business enterprises was also available but too small scale to have a significant impact.

116 Aytensfisu Y. ; Assessment of the Utilization and Determinants of Vountary Counselling and Testing in the Armed Forces of Ethiopia. Msc thesis on Publich Health, Addis Ababa University.; 2006

117 Mekonnen, Y and Demissie, T.; Baseline survey of most at risk populations in 12 towns in Ethiopia. Transaction Programme, Save the Children USA.; 2010

In Alamata (a town located in the southern zone), the USAID funded TransACTION project for most at risk populations (MARPS) led by Save the Children USA/Addis Mela peer education and treatment is operating a programme for FSWs that includes: regular coffee ceremony to discuss issues related to HIV prevention; peer education programme; free STI and HIV testing and treatment and a saving scheme.

Analysis of the limited existing literature found there was some provision of HIV services (mostly income generation activities) for FSWs and their clients but these were inadequate and mostly centred around income-generating activities, i.e. not addressing the health issues of sex work but rather trying to "rehabilitate" sex workers. For example, in 2009, 4,587,377 birr (about 270,000 USD) from the T-HAPCO HIV prevention budget was disbursed to the Women's Association of Tigrai and Women's Affairs Bureau for 'provision of skill training and start up capital for women, particularly FSWs and HIV positive women to be engaged in IGA[118]. In addition to IGA, the budget accounted for IEC, PMTCT and condom distribution. Between 2010 and 2011 2,821 FSWs and low income women in Tigrai received income generation training (out of a planned 3,358) and 2,113 received start up capital for income generation activities[119]. No evaluations have been carried out to measure the effectiveness of these interventions.

Clients of FSWs vary from place to place; data on the client group of FSWs in Tigrai are not available. Some of the population groups analysed below, namely the seasonal migrant workers, truckers, and the soldiers were identified as clients of FSWs during the FGDs.

3.6.7.8. Men who have Sex with Men (MSM)

There are no HIV programmes aimed at MSM. No published or grey literature on MSM could be found.

3.6.7.9. IDUs

The magnitude of the problem is not known and there are no programmes aimed at this group.

3.6.7.10. Discordant Couples

There are no HIV programmes in Tigrai aimed at discordant couples.

3.6.7.11. Women and Girls

Some of the key activities addressing gender disparities in Tigrai include: [120]

- Advocacy promoting the empowerment of women and creating an enabling environment to build their skills and thereby reduce risks
- Promotion and expansion of reproductive health services in rural areas
- Enabling the participation of women in all interventions, including HIV prevention, home based care and support services
- Advocacy, to raise awareness of vulnerability and promote risk reduction programmes against gender based sexual violence
- Combating early marriage and other harmful traditional practices

118 T-HAPCO,; Annual Plan of the Tigrai HIV Board. Statement of expenditure. SOE-002/2002; 2009

119 Ibid

120 FAPCO ; Ethiopian Strategic plan for Intensifying multi-sectoral HIV/AIDS response (2004-2008), Addis Ababa, Ethiopia. http://www.etharc.org/arvinfo/HIVstrategicplan.pdf; 2004

3.6.8. The Role of Civil Society Organisations (CSOs) in HIV Prevention

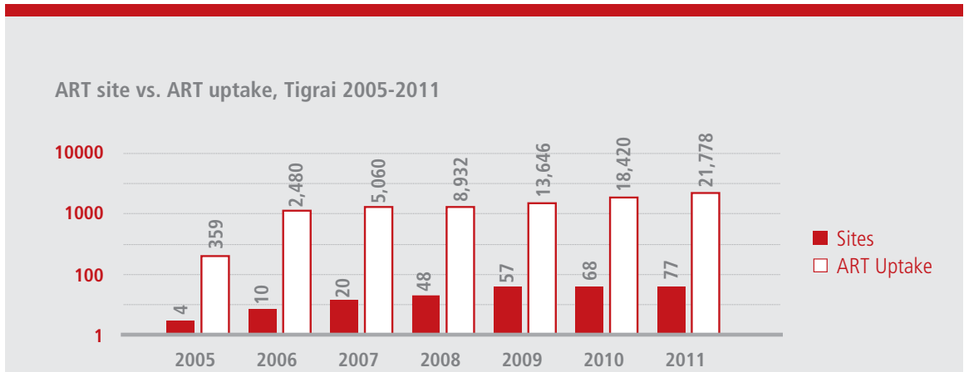
The role of community-based organisations (CBOs) as vehicles for HIV education and prevention interventions has been demonstrated in many locations. UNAIDS recently commissioned a review and assessment of CBOs in Northwest Tigrai[121]. Data on CBOs was difficult to access, but the study found that out of 51 identified CSOs, only 16 were directly involved in fighting the spread of HIV/AIDS and its impacts. The rest were engaged in various awareness programmes which were judged to be inconsistent in quality and usefulness. It was noted that the limited range, size and "competence" of many of the organisations surveyed reflected the more general problem of weak CBOs/CSOs in Ethiopia.

Building the capacity of the CBO sector would be an opportunity to improve HIV education and prevention efforts, especially in some of rural areas in Tigrai that are showing higher prevalence or rapidly expanding. The assessment recommended building up the capacity of CSOs in governance, local resource mobilization, networking and joint planning in order for them to "better implement behavioural change, communication and other efforts".[122]

3.7. HIV Treatment and Care Programmes

Free ART provision began in Tigrai in 2004 in Setit Humera, at Kahsai Abera Hospital by MSF Holland. The free ART programme was launched by the federal government in late 2005. Since the introduction of free provision of ART by the government, the number of sites offering ART and people on treatment has risen rapidly (**figure 19**). Sex disaggregated data on ART is not consistently available in Tigrai.

Figure 19: ART site expansion versus ART Uptake, Tigrai 2005-2011



Source: Annual profiles of the Tigrai Health Bureau

According to 2011 EPP/Spectrum draft estimates there are 57,000 HIV positive people in Tigrai. About 30,000 were estimated in need of ART (at CD4<200) and corresponding coverage was estimated at 70%. Coverage would be lower if WHO 2010 guidelines were in use i.e. CD4 threshold for initiation of ART of 350. However coverage estimates are for all patients including children. Assuming Tigrai follows the national trend for paediatric treatment coverage, coverage is below 20% for children.

121 UNAIDS, HAPCO; Situation assessment on the Contribution of CSOs in HIV/AIDs prevention, care and support program, in Tigray Region with due emphasis to the North Western Zone; 2011

122 ibid

ART service use: Of the total number of patients who have ever started ART (25,138), 73% were currently on ARV in 2010 (see table 22). Ten percent dropped out of treatment, 1.5% were lost to follow up and 16% transferred out without referral to another health centre. By mid 2011, 21,788 patients were receiving ART, 73% of those who had ever started ART and 41% of those who had enrolled for treatment[123].

Table 22: ART performance of all hospitals HCs, Tigrai 2008-2010[124]

Year	Ever started ART	Currently on ART	Drop out	LTF	Dead	TO	TI
2008	12,122	8,932	1,519	382	1,077	1,487	1,246
2009	18,452	13,646	2,197	382	2,197	2,899	2,546
2010	25,138	18,420	2,567	387	3,011	4,032	3,375

LTF=lost to follow up TO= transferred out TI=transferred in

The Mid-Term Review of the Tigrai Health Sector Development Plan (HSDP) III (2005-2010)[125] which reviewed ART programme performance found the following:

- The rate of loss to follow up, transfers or death was over 25%. This is high when compared to other regions
- Four out of 12 hospitals in the region were not yet fully equipped to provide ART mainly due to shortage of laboratory equipment
- Paediatric ART is only available in hospitals and not health centres
- Supportive supervision and monitoring of health centres with ART service is weak[126]
- Poor linkage between the hospitals, health centres and community. Weak performance of patient tracing mechanism for patients lost to follow up
- Lack of appropriate IEC materials for treatment and care, i.e. especially in local language

In later years, improvements were seen in tracing patients lost to follow up, linkages between health centres and hospitals and supplies of test kits and reagents.

According to key informant interviews with senior THB staff conducted as part of this study the ART programme strengthened the health system in many ways:

- A number of hospitals were equipped with CD4 machines, haematology and chemistry machines raising the quality of diagnosis of not only HIV/AIDS related diseases but also other illnesses
- The knowledge, skills and standard procedures of health workers improved in the area of infection prevention, universal precautions and data management and use
- The relationship between hospitals and health centres was strengthened. As a result of the introduction of transfer outs and transfer ins, hospitals became referral facilities for health centres because the latter did not have CD4 machines or capacity for dried blood tests

123 Federal HAPCO. Multi-sectoral HIV/AIDS Response Monitoring and Evaluation Report 2003 EFY (July 2010-June 2011)

124 THB ART Report2007-2010.

125 MTR HSDP III ; Mid Term Review: Regional Report, Tigrai (EFY2003-2003) or 2005-2010 GC. The independent Review Team; 2008

126 The situation here may have recently changed as there are now mentors for supervision in place

Further challenges on ART identified during informal meetings with PLHIVs are:

- A lack of good nutritional support to boost the effectiveness of ART
- Religious leaders opposing treatment.

3.8. TB HIV Co-Infection Treatment Programmes

TB HIV co-infection programmes have been established in Tigrai. Provider initiated counselling and testing services screen for HIV in TB patients and TB in PLHIV. Isoniazid preventive treatment and cotrimoxazole prophylaxis is provided to PLHIV and ART to TB patients with HIV co-infection.

Data on TB and HIV treatment services is shown in **Table 23**. All HIV positive individuals seen at HIV clinics were screened for TB in 2009/2010 but only 56% of TB patients were counselled for HIV testing and 50% were tested.

Table 23: TB and HIV treatment, Tigrai 2009/2010[127]

TB clinic									
No. of TB Cases	No. TB Pts Counselled for HIV	No. of TB Pts Tested For HIV	% of TB Pts Tested For HIV	No. of TB Pts tested HIV positive	% of TB Pts Co-infected with HIV	No. of HIV positive TB Pts started CPT	% HIV + TB Pts on CPT	No. of HIV + TB Pts started ART	% HIV + TB Pts on ART
10,812	6,034	5,415	50	734	14	480	65	306	42
HIV Clinics									
No. of Clients HIV Counselled & Tested*	No, of clients tested HIV +	% of HIV+ among Tested Clients	No. HIV+ Clients Screened for TB	% HIV+ Clients Screened for TB	No. HIV + clients diagnosed active TB	% of HIV+ Clients diagnosed active TB	No. of clients free from TB	No. of HIV+ clients without active TB on IPT	% of HIV+ Clients on IPT
279774	4560	2	4560	100	528	12	7009	18	0.3

IPT=Isoniazid Preventive Therapy
CPT=Co-trimoxazole Preventive Therapy
**Data from HIV clinics only whereas HCT data includes data from both static health facilities and mobile testing sites.*

127 Tsige Mariam Teklu; Report on TB /HIV treatment in Tigrai, Tigrai Health Bureau; 2011

3.9. Syndromic Management of STIs

STI prevention, treatment and control is recognised as a key strategy for HIV prevention in the national HIV/AIDS policy. The policy highlights STI prevention through counselling and education, improving the quality of STI services and promoting treatment guidelines. Diagnosis and treatment of STIs through syndromic management is recommended and emphasis is given to STI prevention and treatment for vulnerable groups. In Tigrai the government response has mainly focused on training for syndromic STI management and neglected drug supply management. However according to key informant interviews with senior THB staff stockout of drugs for treating STIs are frequent.

MSF Belgium was involved in supporting syndromic management of STIs in 6 health centres and 5 clinics (Mekelle, Adigrat, Alamata, Indaselase Shire, and Mai Chew. The NGO also supported STI prevention and education, running workshops for FSWs and PLHIVs. A key Informant from Mekelle health centre reported that although MSF-Belgium phased out its activities in 2004, the health centre continues to provide STI services. However, STI treatment is not provided for free and this may have a negative effect on access.

Few studies on the use of STI services in Tigrai have been conducted. One study by Brigg ***et al***[128] reported that during two months in 2004 in Kahsay Abera Hospital, Humera 90 patients were treated for STIs: very low rates of partner notification and patient follow up were reported 11% and 4% respectively. The study also found that patients went to pharmacies, drug stores or traditional healers first and health services second. This was due to concerns of confidentially as the hospital records patient names and fear of partner notification.

3.10. Summary

In recent years Tigrai has benefited from the expansion of HIV services including a significant increase in the number of PMTCT, ART and VCT sites as well as general health system strengthening which has supported the HIV response. As a result HIV testing and treatment has increased however coverage particularly in relation to PMTCT remains low.

Programmes for vulnerable or most at risk groups exist but are limited and do not offer a complete package of interventions that cover prevention, testing, STI treatment and ART. Moreover certain vulnerable populations such as migrant workers and truck drivers are largely overlooked with few prevention or testing programmes targeting these groups. In addition there are no programmes for discordant couples, MSM or IDUs and very little is known about these populations and their risk profile.

Condom distribution is an important component of HIV prevention. Despite a significant increase in condom distribution over the years coverage remains low. Moreover very little is known about actual condom use.

There is a lack of strategic information on the coverage and quality of HIV services. There are gaps in relation to the evaluation of programmes and in particular their impact as well as data on the size of populations to adequately assess coverage.

128 Brigg, R et al; Acceptability and Utilization of Services for Voluntary Counselling and Testing and Sexually Transmitted Infections in Kahsay Abera Hospital Humera, Tigrai, Ethiopia. Ethiop.Med.J.42 Pp.173-177; 2004

4. Resources for HIV Prevention

4.1. National Spending

A National Health Accounts survey for 2007/8 was issued by the FMOH in 2010[129]. Key findings are summarised below.

In the year 2007/8, Ethiopia spent USD 248,000,100 on HIV, which corresponds to 20% of the national health expenditure. This was the largest amount spent on a single disease. The per capita expenditure was calculated as USD 3.27. The per capita expenditure relative to the population of PLHIV was USD 180 per annum.

PLHIV contributed USD 8,808,189 or USD 32 per capita, which amounts to 3.5% of the total spending. A breakdown of the out-of-pocket spending by PLHIV showed that 70% was spent on outpatient care and 29% on inpatient care. Spending by PLHIV amounts to four times the national per capita spending for health.

The sources of funding were from donors (84%), government (11%), PLHIV (4%) and other private sources including local NGOs and private for profit organisations (1%). Financial management was under the FMOH and member state health authorities (RHBs) in 48% of the cases only. Donors managed 40%.

The greatest share of HIV expenditure was on preventive programmes and public health services130 (65.5%) followed by treatment services (17%). Approximately 5% (USD 12,620,200) of total HIV/AIDS spending was used for IEC/BCC activities. Management took 4%, while the remaining was spent on ancillary services. ART received USD 17,332,300, almost all (99%) coming from external sources.

Donor dependence was not limited to ART only, but also to IEC/BCC, where external sources contributed 97%. For the latter, international agencies (bilateral and multilateral donors and international NGOs) managed 56% of funds, national NGOs managed 37%, while the federal/state governments managed only 7%.

4.2. Overall Funding and Spending on HIV/AIDS Prevention in Tigrai (2003-2010)

The NHA 2007/8 findings summarised above are not disaggregated by region and no other HIV spending assessment is available for the country/regions. Given the time and resource limits of this study, we were only able to access T-HAPCO financial data for HIV (presented below), that do not provide the full picture of HIV financial resources for the region. T-HAPCO data, for example, include some of the Global Funds resources (the ones managed by T-HAPCO that exclude ARV) but exclude PEPFAR and other partners whose support to the region is not channelled through RHAPCO.

129 FMOH; Ethiopia's Fourth National Health Accounts, 2007/2008. Health Care Financing Team, Policy, Planning and Finance General Directorate. Addis Ababa. Chapter 5; 2010

130 This includes public health programmes that are not disaggregated by type as not all financing sources could provide expenditures disaggregated by type of HIV/AIDS function

For RHAPCO data reported below, the major source on the origin, distribution and utilization of Tigrai HAPCO funds is an MSc dissertation[131] and other official reports/sources[132].

Table 24 below shows partial expenditure on HIV/AIDS in Tigrai – the amounts exclude PEPFAR funds for which data disaggregated by region are not available.

Direct spending by partners, in particular PEPFAR and the organisations funded by PEPFAR such as I-TECH, MSH, IntraHealth could not be accessed fully. Partners fund care, training of health workers including short courses abroad for doctors and specialists, data clerks and health information management, renovation and maintenance of facilities and others. These expenses are not accessible.

Table 24: HIV Expenditure by functions, by Tigrai HAPCO 2004-2010 in USD (official yearly exchange rates used to convert ETB to USD)[133]

Year	Annual exp.	Prevention	%	Treatment*	%	Care & Support	%	Programme Support **	%
2004	2,239,683	1,774,013	79	149,160	7	166,273	7	150,237	7
2005	1,713,705	878,468	51	128,956	8	152,174	9	554,108	32
2006	2,153,266	1,327,361	62	559,504	26	266,401	12	118,738	6
2007	2,269,610	1,263,628	56	409,477	18	482,342	21	0	0
2008	1,426,739	1,002,062	70	106,952	7	317,725	22	0	0
2009	3,982,603	3,124,449	78	140,936	4	683,430	17	31,448	1
2010	4,971,409	4,372,946	88	0	0	598,463	12	0	0
Total	**18,757,014**	**13,742,925**	**76**	**1,494,985**	**7**	**2,666,808**	**14**	**854,530**	**4**

***Excludes ART expenditure**
**** Includes review meetings, joint supervision, salaries of HIV focal persons etc.**

Three-quarters of the Tigrai HAPCO funds were used for prevention. The lowest expenditure on prevention (51%) was in 2005 and the highest (88%) in 2010. However, funds allocated for construction of preventive health structures such as PMTCT and VCT centres in 2009 and 2010 and the construction of Primary Health Care Units (Health Centres) inflate expenditure on prevention.

The second biggest expenditure is care and support (14%) which included cash support to PLHIV and orphan support ranging from income generating activities to daily living expenses of patients.

In **Table 24** ART expenditure was not included in the column for treatment. Therefore, the 7% expenditure under treatment is the one incurred on STI, opportunistic infections, skin lesions and expenses that are not covered by the free ART programme. Figures for treatment with ARV were not accessible at the regional level.

131 Belai Hailu;, Fund Management and its utilization in Tigrai HAPCO. MSc in accounting and Finance, Addis Ababa University, Faculty of Business and economics.; 2008

132 Tigrai HAPCO 2003 (1995 EFY) Annual report: Budgeting Pp.29-37 Audit report:Finance & its utilization, P. 38; Tigrai HAPCO 2004 (1996 EFY) Annual report:Budgeting Pp.6-20 Budget utilization & settlement Pp. 35-38, Audit report P. 39; Tigrai HAPCO 2006 (1998 EFY) Annual report: Budget released from Federal HAPCO to Tigrai HAPCO P. 14 Audit report P. 27; Tigrai HAPCO 2007 (1999 EFY) Annual report:Budget disbursed to T-HAPCO from different donors (F-HAPCO),Pp.23-31 Audit report P.31. Budget disbursed from F-HAPCO and other donors to T-HAPCO disbursed and upgraded Pp.27-30; Tigrai HAPCO 2008 (2000 EFY) Annual report: Budget disbursed from FHAPCO to T-HAPCO liquidated and unliquidated. P.18,Audit report; Tigrai HAPCO 2009 (2001 EFY) Annual report:Budget released from F-HAPCO to T-HAPCO, Budget released to districts and sectors, P. 5, Budget utilization and liquidation Pp. 14/15; Tigrai HAPCO, 2010 Statement of Expenditure: Summary by objectives. Round four Year Four.

133 http://data.worldbank.org/indicator/PA.NUS.FCRF?page=1

Table 25 shows the funds disbursed by FHAPCO to T-HAPCO and the original sources of these funds. A shift in the main source of funding from the World Bank (WB) to the Global Fund for AIDS, TB and Malaria (GF) occurred between 2002 and 2010.

Table 25: Budget Disbursed From Federal HAPCO to Tigrai HAPCO (2003-2010) in USD (official yearly exchange rates used to convert ETB to USD)[134]

Year	Disbursed from FHAPCO to THAPCO	Disbursed from THAPCO to Beneficiaries	Expenditure	Sources of Fund
2002	1,477,768	n/a	363,287	WB, UNICEF, Irish Aid
2003	1,052,083	758,970	549,216	World Bank, UNICEF, Irish aid
2004	1,435,636	1,055,989	1,055,989	World Bank, UNICEF, Irish Aid
2005	2,256,422	2,298,375	2,298,375	World Bank, UNICEF, Global Fund
2006	1,932,869	1,905,501	221,280	World Bank, UNDP, UNICEF Global Fund, IRISH AID
2007		1,577,047	117,988	World bank, UNDP, UNICEF Global Fund, ACTION AID
2008	1,695,115	3,308,402	3,308,402	Global Fund, WORLD BANK, UNDAF
2009	4,279,479	3,308,402	2,066,779	Global Fund, World Bank, UNDAF
2010	3,190,923		3,564,985	Global Fund, UNDAF, World Bank
Total	**21,787,801**	**18,542,380**	**13,546,300**	**73.7% accounted for**

A number of audit reports were examined to assess HIV expenditure in Tigrai. The main audit findings are summarised in **Table 26** below. Timely liquidation which implies timely use of funds, poor bank reconciliation, and incomplete ledgers-were recurring problems. These problems occurred mainly due to low levels of knowledge and skills in accounting. The audits did not find any major irregularity related to misuse of funds.

134 http://data.worldbank.org/indicator/PA.NUS.FCRF?page=1

Table 26: Beneficiaries and Audit Reports: Tigrai HIV Prevention Response (official yearly exchange rates used to convert ETB to USD)[135]

Year	Amount in USD	Source	Beneficiaries	Audit report – performance results
2003	378,708 272,059 108,203	WB, UNICEF WB, UNICEF Irish Aid	CSOs, local NGOs, Media 48 districts Eastern & Southern Zonal administration	**Federal Auditor General** 6 districts and 5 private sector organisations audited **Result: good performance,** only 2 districts used 15% instead of 5% for overhead cost
2004	295,599 183,902 439,859 136,629	WB, UNICEF WB Irish Aid WB , UNICEF Irish Aid	11 CSOs FBOs, PLHIV association, Mums for MUMs, Media Direct to sub districts 11 regional and district sectors Zonal administration	**Federal Auditor General** 6 districts & 4 non-governmental organisations audited **Result: acceptable** Limitations: - Weak timely liquidation - Poor bank reconciliation in a few districts - Youth association had incomplete ledger
2005	256,126 535,088 653,630 74,517	GF round 2 yr 1 GF round 4 yr 1 WB Irish Aid	19 government & non-government offices T HAPCO & NW Zonal admin Government sectors, districts & sub districts Southern & Eastern Zonal Admin	**National Audit Corporation** **Result: satisfactory** Limitations were: - Sectors had large amounts of money not liquidated - Bureau for finance was not receiving timely financial reports
2006	550,641 1,371,237	WB,UNDP, UNICEF GFATM, Irish Aid	22 Government & non-government sectors, Regional Bureaus, PLHIV Associations, Local NGOs, FBOs, Media	**National Audit Corporation** **Result: satisfactory** Commentary: better results compared to other member states in Ethiopia
2007	626,900 171,127 356,099 16,544 25,893 79,353 155,209 115,760 7,977 5,598 22,175	GFATM GFATM GFATM GFATM GFATM GFATM WB UNICEF UNDP WFP Action Aid	7 government offices 34 districts,11 towns,11 hospitals 9 non-government associations FBOs Media Women & Youth associations 12 government,5 FBOs, 2 NGOs, 2 Media 3 government 2 CSOs. 3 NGOs, 3 Media Youth & Farmer's association Mums for Mums, OSSA, SGAT3 districts , SGAT	**National Audit Corporation Result: satisfactory** Corrective measures recommended on Media (Weyin Newspaper and Dimtsi Weyane Tigrai)

CSO= Civil Society Organisation FBO=Faith Based Organisation WB=World Bank GFATM=Global Fund for AIDS, TB & Malaria

135 Ibid

Table 26 above demonstrates the variety of sources and the highly diverse nature of beneficiaries. Government offices (other than T-HAPCO) had access to resources mainly for mainstreaming HIV prevention in their work places. Districts accessed resources mainly for health education purposes. Civil society organisations, particularly youth and women associations accessed resources in order to strengthen their core activities.

4.3. Main Sources of Funding for HIV/AIDS in Tigrai

- **The World Bank** HIV funded programme known as EMSAP (Ethiopia Multi-Sectoral AIDS Programme) started in 2003/04. The programme placed much emphasis on developing and expanding local responses to the epidemic. Just under half of the programme's budget was channelled through the district*s* directly to community organisations at the sub district (Kebele) level and NGOs. One third of the budget was used to support multi-sectoral activities in scaling up and mainstreaming HIV.[136]
- **Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM)**: started in 2005, the GFATM was a key partner in health centres construction. In two years (2009-2010) Tigrai was able to construct 160 health centres and about half of the financial resources for the construction and 100% for equipment came from the GF. This enabled Tigrai to increase service coverage to nearly 100% in the rural areas by 2010[137].
- **PEPFAR:** PEPFAR resources are run by its own locally registered NGOs and US based universities. In Tigrai these were organisations such as **I-TECH** based in Washington University. Their focus was treatment. **MSH** is another PEPFAR funded partner involved in Care and Support and replaced the earlier Family Health International (FHI). **FHI** pioneered the expansion of both HCT and ART. **IntraHealth,** replaced the Hareg Project which introduced PMTCT in Tigrai together with Medicins Du Monde.
- **United Nations Agencies: UNICEF** was involved mainly in promoting the PHC programme (Health Extension Programme). **WFP and UNFPA** also provided funds for HIV/AIDS in Tigrai.
- Other major international NGOs involved in the response were **MSF-Holland** who introduced free ART in Humera, Tigrai; **MSF Belgium** who supported syndromic management of STIs (IEC, trainings, drugs, medicines)[138] and **Medicins du Monde** who established PMTCT in Mekelle Hospital and health centre.

Accurate assessment of resource allocation for HIV in Tigrai was difficult as data on funding by PEPFAR, a main funder of HIV services was not available by region.

136 Bishop-Sambrook C; Dynamics of the HIV/AIDS epidemic in value chain development in rural Ethiopia and responses through market-led agricultural initiatives; International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia 2008

137 THB (2010) Profile of the Tigrai Health Bureau

138 MSF Belgium (2005) Handover Report, THB Archives, Unpublished.

5. Linking the Response to the Epidemic

The preceding pages have described what is currently known about the HIV epidemic in Tigrai, both its epidemiology and the response, in the hope of understanding the transmission dynamics – where most of the new cases are occurring – and then linking this information to the information available on the response to the epidemic: whether the resources available are being directed most appropriately.

What is evident is there is not enough data available on Ethiopia in general, and on Tigrai in particular, to attempt the sort of in-depth that would be able to precisely describe the current drivers of the epidemic, nor the details of the response. This is particularly true for those populations who are considered to be at particularly high-risk: the so-called MARPs populations, as well as discordant couples.

However, what data does exist is gathered in these pages, and it does provide the opportunity to summarise the situation and to make some general observations on the status of the epidemic in Tigrai and the response, and thus to indicate some areas where an imbalance or disjuncture is occurring between the apparent epidemic and the response.

Data Sources

In terms of the data sources that were available, it should be noted that:

- The national Behavioural Surveillance Surveys of 2002 and 2005 included in-school and out-of-school youth, truck drivers, female sex workers (FSWs) and uniformed services. Rural migrant workers, miners and settlers were not included.
- The National DHS (2000, 2005 and 2011) is potentially the most reliable source of population-based information about HIV.
- While an HIV sentinel surveillance system among pregnant women was established in Ethiopia in 1989, the first three sites in Tigrai were not included until 2001, and were all urban. It was not until 2003 that the rural areas of Tigrai were included in the ANC sentinel surveillance. However the three areas that were added were in Atsbi, Edaga Arbi and Workamba, all located in eastern and central Tigrai. The Western zone where seasonal workers are found (a group vulnerable to HIV infection) was not included until 2007 when one site from the west, namely Adi Goshu, was added.

Basic facts of the epidemiology of HIV/AIDS in Tigrai

The basic facts of the epidemiology of HIV/AIDS in Tigrai are:

- The most recent ANC surveillance data (2009) states that the HIV prevalence in Tigrai is 2.2% (5.0% urban and 1.3% rural). The 2011 DHS, on the other hand, estimates overall HIV adult prevalence (15-49 years) to be 1.8% (1.9% women and 1.0% men).
- There are indications of a decrease in the overall prevalence in Tigrai over the past seven years in both the male and female populations. Based on ANC surveillance, the prevalence of HIV among pregnant women 'fell' from 7.3% in 2000 to 3.5% in 2005 and further decreased to 2.2% in 2009. This may be partly due to an increased proportion of rural surveillance sites, because comparison of the 2005 and 2011 DHS estimates shows that over the last 6 years, HIV prevalence has not changed among women and men. However the ANC surveillance data shows HIV prevalence among 15-24 year olds has decreased in both urban and rural areas, a proxy indicator of incidence.
- The Federal HAPCO (FHAPCO) estimated that there were about 56,900 PLHIV in Tigrai in 2012: 43,600 adults more than 15 years old (the total adult population is 2,689,600) and 13,300 children (0-14 years old) (EPP/Spectrum projection 2012). This is a marked decrease from the 89,887 PLHIV estimated to be in Tigrai in 2010. There are 3,500 pregnant women in need of PMTCT (2012). If we take the national current HIV estimated MTC transmission rate at 20% at the end of breastfeeding period in 2012, this might result in as many as 700 new infections in newborns for this cohort alone.
- There is no indication that there is a rising prevalence in small towns or emerging cities. HIV prevalence is higher in major urban areas when compared to the 'emerging' towns and much lower in rural areas.
- HIV prevalence is consistently low and does not vary greatly across ***rural*** districts (i.e. between 0 and 1%), with the exception of those mentioned below.
- HIV prevalence in Tigrai varies widely across zones from 0.4% (Central zone) to 2.2% (Western) (ANC, 2010) and the possible reasons for this include:
  - Low prevalence in the North Western and Central zones because these areas are less urbanized and constitute the rural hinterland of Tigrai.
  - Higher prevalence in:
    - Western zone (Humera District) - seasonal workers and commercial farms.
    - Southern zone (Raya Azebo) - a "growth corridor" with a booming economy, commercial farms and fast developing towns, highly urbanized, an entry and exit point for trade.

When looking at HIV prevalence by district (ANC, 2010), we notice that HIV prevalence is higher in:

- Urban centres – Mekelle, Almata, Korem, Setit Humera
- DeguaTembien: no obvious reason for its higher prevalence other than its proximity to Mekelle - possibly a 'hide out' from Mekelle for people to avoid stigma or a place of religious pilgrimage (Edna Aba Hadera)
- Districts around the main highway road from Alamata to Adigrat and EndaSelase Shire.

The following is known about the prevalence in certain sub-populations considered to be vulnerable or at risk:

- **Young women -** The 2005 DHS estimated the HIV prevalence among 15-24 year old women in Tigrai to be 3.0% and among men of the same age to be 1.1%, and both HCT and PICT data from 2010 confirmed a prevalence in young women twice that in young men. This has been ascribed to the tendency for girls to have sexual debut at an earlier age than boys (DHS 2011 39% of females and 13% of males first had sex below the age of 18 years), or the

tendency for girls to have older partners (DHS 2011 - 21% of women aged 15-19 who had intercourse in the past 12 months had sex with a man 10 years or older compared with less than 1% of men reporting sex with a women 10 year or older). The DHS 2005 results are based on national averages and are not Tigrai-specific. However, the 2011 DHS estimated the prevalence of HIV among women and men aged 15-24 years in Tigrai to be almost equal: 0.6% and 0.7% respectively. The sample size for this result is small, but if this is a true change in the sex ratio of HIV, it would bear investigating. As with the rest of Ethiopia, in Tigrai sexually active, never-married women were at much higher risk of being HIV positive (2.8%) than never-married men (1.6%) (DHS 2011). There is no data in Tigrai on prevalence in specific sub-population youth groups that may be at higher risk for HIV, namely university students, OVCs and street children.

- **Seasonal workers/ settlers –** limited data from several HCT testing sites in areas where seasonal migrant workers and settlers are present found HIV prevalence ranging from 0.5% to 8.2% (2008-2010). HIV prevalence based on ANC 2010 data in the districts where there are seasonal workers/settlers, is higher than the general population at 2.2%.
- Despite the assumption of vulnerabilities or behaviours that would place them at higher risk, HIV prevalence seems to be low in other potential high-risk groups, not being appreciably different from the general population prevalence (although sample sizes are small): **truck drivers** (0.4%) and **refugees** (0.5%).
- **Military/police –** higher prevalence (3.4%) but a small sample group (294).
- **Sex workers -** Data vary in quality but all point to a high prevalence, ranging in recent studies from 10% to 20%, which is much less than what was reported twenty years ago, but which is still several times higher than the overall population prevalence.
- High-risk groups for which essentially no prevalence data exists includes: **miners, MSM and IDUs.**

The following is known about the drivers of the epidemic in Tigrai, based on the perceived drivers of the epidemic in Ethiopia as a whole:

- Low levels of comprehensive knowledge about HIV/AIDS: levels of knowledge about how to prevent HIV transmission are relatively low in Ethiopia in comparison to most sub-Saharan countries. However, it is notable that in the DHS 2011, in every category testing HIV knowledge, the level of knowledge in Tigrai was above the national average, and there was an improvement in every category between 2005 and 2011.
- Sexual behaviour patterns and trends among the general population: The number of current and lifetime partners is low for most of the Ethiopian population (compared to other countries in the region), and Tigraian women and men do not appear to be significantly different. Tigraian men and women seem to display risky sexual behaviours above the national average – twice as many Tigraian women had multiple sexual partners (although for the men it was only half the national average) and the mean number of lifetime partners was greater than the national average for both men and women. However, neither of these was found to be statistically significant. There is not sufficient data from Tigrai in the 2011 DHS to provide information on multiple partnerships, condom use at last sex, etc. (small sample size)

- The percentage of men aged 15-49 years in Tigrai reporting payment for sexual intercourse in the last 12 months in the 2005 and 2011 DHS has remained constant at 2% and 1.8% respectively which in both cases was similar to the national average, and low in comparison to other countries.
- HIV Transmission risk in marriage – **discordant couples:** No information is available on the possible numbers of discordant couples in Tigrai, but a rough estimation suggests that there may be 10,000 discordant couples in Tigrai. It appears that no programmes are being specifically implemented to address this important group (The 2008 Ethiopian Synthesis Report suggested that transmission in this group was an important source of new infections, especially in urban areas). Disclosure among couples (in general and not discordant couples only) in Tigrai is low with only 49.4% of women and 44.2% of men of those tested shared their results with their partner. Similar low rates of disclosure are likely to apply to discordant couples and thereby increase the vulnerability of HIV negative individuals in discordant partnerships.
- **University students** may be at risk: There are few behavioural studies amongst Tigraian youth, save for a study in university students where the mean age of first sexual debut for males is 17.7 years and for females 18.3 years: 20% of sexually-active young males and females commenced sexual activity in primary school, and another 60% in secondary school. The prevalence of multiple partnerships in this group was high (41.3% in males and 38.5% in females) and condom use during last sexual encounter was relatively low (69.6% in males and 59.7% in females).
- **Sex workers** are still at risk: There has been no survey, size estimation or recent HIV prevalence study among sex workers in Tigrai. Evidence indicates that sex workers are increasingly using condoms regularly with paying clients, but not so with non-paying partners – husbands and boyfriends. Sex worker clients such as truck drivers are also reporting increasing rates of consistent condom use with sex workers and casual partners (>90%) but similarly lower levels with regular partners.
- There is hardly any data on transactional sex taking place among women who are not self-declared sex workers (waitresses, students, domestic workers, etc.)
- Presence of sexually transmitted infections (STIs): Limited data on STI rates in Tigrai (self reported STIs and symptoms from DHS 2011 available only; 4.0% women and 1.3% men).
- Alcohol and drug use: Some focus groups from this study report increased risky sexual behaviour (not using condoms, multiple concurrent partnerships, etc) when under the influence of alcohol and drugs. However, DHS 2011 does not show a high prevalence in the general population of use of alcohol and drugs in relation to sex in Tigrai.

However, this analysis revealed the paucity of published socio-cultural research in Tigrai. More data on other potentially high-risk and vulnerable populations are needed, in particular for: seasonal workers/settlers, miners, sex worker census, university students and other high-risk youth (street children and OVC), IDU and MSM. Data are lacking to measure accurately the recent spread of HIV in these groups and their role in the further spread of HIV to the general population. Data that is needed includes everything from basic population size estimates to more detailed information about knowledge and attitudes towards HIV/AIDS and most importantly, information about sexual behaviour. In groups such as injection drug users IDUs) and men who have sex with men (MSM), almost no data exists. These are critical gaps in attempting to understand the current transmission dynamics.

A further issue is that surveillance of both the epidemiology and the response depends on nationally-generated systems (ANC, DHS, etc.) and there are no mechanisms for initiating surveillance or behavioural studies for populations of interest at the regional level.

The Response to HIV in Tigrai

Given the above, the following can be noted about the response to HIV in Tigrai:

- The most recent T-HAPCO strategic plan (2007-2011) covers condom promotion, VCT, PMTCT, IEC/BCC, STI management, blood safety, and universal precautions, support and care, capacity building, mainstreaming, legal issues, surveillance and ART.
- Although Ethiopia has produced a number of guidelines to lead programme development and implementation, most of these national guidelines are only available in English. Only a few, such as the guidelines on community conversations, are translated into Tigrigna.
- The high level of awareness of HIV in Tigrai could be ascribed to the various and active channels through which IEC is directed, including widespread use of radio and other media, community conversations, HIV awareness programmes in both the schools and the workplace, the formation of PLHIV organisations, and the widespread deployment of health extension workers.
- In recent years Tigrai has benefited from the expansion of HIV services including a significant increase in the number of PMTCT, ART and VCT sites as well as general health system strengthening which has support the HIV response. As a result HIV testing and treatment has increased however coverage particularly in relation to PMTCT remains low.

ART and PMTCT services are concentrated in the densely populated areas of the East, Southern Eastern and Southern part of the region: A fewer number of ART, PMTCT and hospital facilities are in West Tigrai, where there is a higher HIV prevalence. The Western zone is least served in terms of HIV services programmes but is most vulnerable due to its high population of migrant workers and settlers, remoteness, and possibly as a result of being in a border area. Most programmes are piloted and preferentially introduced in urban areas

The following can be noted regarding specific programmes:

- 2011 DHS showed that in Tigrai, 55.5% of women aged 15-49 years had ever tested for HIV and received their results, with a further 4.9% ever being tested but not receiving their results. Just under half a men aged 15-49 years (49.1%) had ever tested for HIV and received their results, with a further 5.9% ever being tested but not receiving their results.
- While the population of Tigrai accounts for only 6% of the population of Ethiopia, Tigrai accounts for 13% of condom distribution in the country. Despite a significant increase in condom distribution over the years coverage still remains less than optimal.
- Since the introduction of free provision of ART by the government in 2005, the number of sites offering ART and people on treatment has risen rapidly. By mid 2011, 21,788 patients were receiving ART, 73% of those who had ever started ART and 41% of those who had enrolled for treatment.
- In 2009/10 all HIV positive individuals seen at HIV clinics were screened for TB but only 56% of TB patients were counselled for HIV testing and 50% were tested.
- Despite the increase in the uptake of PMTCT services, coverage remains low. Of those women who do enrol significant losses to follow-up substantially reduce the effectiveness of PMTCT programmes.
- There is an association of PLHIV in every major town in Tigrai. There are no rural associations as such but instead branches in smaller towns. There are 38 associations of PLHIV in total in Tigrai (with about 30% male and 70% females members), which might represent more than 50% of the estimated 43,000 adult PLHIV in Tigrai.
- In 2011, 1,041 government organisations in Tigrai had established an AIDS Fund, 1,518 had a focal person for HIV prevention and 1,273 had an HIV Plan. However, the study found that not all of these entities were well-functioning.
- There is a lack of strategic information on the coverage and quality of HIV services. There are gaps in relation to the evaluation of programmes and in particular their impact as well as data on the size of key populations to adequately assess coverage.

The following points can be made about programmes for specific populations:

- **Sex workers**: As noted, no size estimation has ever been carried out in Tigrai on FSWs, consequently information required for planning and targeting HIV services for this group is lacking. Current behavioural data are limited to a few urban areas. Some limited HIV services available (condom distribution, IEC promoting VCT, PMTCT, condom use and ART) but mainly focusing on IGA (which has yet to be demonstrated to have any lasting impact on HIV prevention). What data is available shows very low contact with outreach service and a low level of knowledge of STIs. Services are not regular, nor is a full package offered consistently or available everywhere.
- **Youth:** there are services for in-school youth, and to a lesser extent for out of school youth and university students.
- **Seasonal workers and settlers:** what HIV programmes exist focus on treatment and neglect HIV prevention.
- **Miners:** there is a lack of comprehensive HIV prevention and treatment programmes targeting alluvial miners.
- **Refugees:** programmes and services are relatively adequate.
- **Truck drivers:** comprehensive and consistent package of HIV prevention is lacking.
- **Prisoners:** minimum services are available including BCC, HCT, STI, ART referral services but data to evaluate the extent of access is lacking. Condoms are not available for prisoners.
- **Armed and uniformed services:** Programme seems to be adequate.
- **MSMs, IDUs and discordant couples**: – there are no programmes aimed at these populations.

Resource allocation

Regarding the allocation of resources, a National AIDS Spending Assessment (NASA) has not been done in Ethiopia. A National Health Accounting (NHA) with HIV sub-accounts was done 2007-08 but not disaggregated by region. Data available for this study was from T-HAPCO that do not provide the full picture of HIV resources for the region. Available T-HAPCO data includes some GFATM resources (but only the proportion of resources managed by T-HAPCO), but does not include resources from PEPFAR and other partners whose support for the region goes through other channels. A large proportion of the Global Fund grant was mainly targeted for management and infrastructure (construction of PMTCT, VCT centres and Primary Health Care Centres).

It is already clear that the Tigrai HIV budget is not proportionately distributed amongst those geographical areas, such as the Western Zone, where the prevalence is highest (although they may be the less populated areas of the state). From the preceding pages, it should also be clear that resources are also not being directed towards prevention programmes in those populations who have a higher prevalence, such as sex workers and seasonal workers/settlers. While there are adequate programmes being implemented for high-risk groups such as the military or refugees, programmes are inadequate or non-existent for other high-risk groups such as discordant couples, truck drivers, miners, high-risk youth, MSM and IDUs.

Conclusions and hypothesis

To reiterate the conclusions about the three hypotheses that guided this study:

Hypothesis 1. Over the last 10 years, the HIV prevalence has stabilized or declined in the major urban centres while increasing in the smaller towns.

Partly confirmed: Evidence from antenatal sentinel surveillance, routine antenatal data, PICT and HCT data all indicate that there is a declining HIV epidemic across urban sites in Tigrai. There is no direct data on HIV incidence trends over time but the strong declines in HIV prevalence is sufficient evidence. Contrary to what was postulated in the recent Synthesis Report for Ethiopia, there is no evidence that the epidemic is increasing in smaller towns in Tigrai.

Hypothesis 2. The rural epidemic is heterogeneous with most districts having a relatively low HIV prevalence but some areas demonstrating higher prevalence rates.

Partly confirmed: The prevalence of HIV in rural areas of Tigrai is consistently and substantially lower than in the urban areas, with three important exceptions. In areas where there are large numbers of seasonal workers, it does appear that the HIV prevalence is higher than in other rural areas. However, apart from the issue of seasonal workers and exceptions such as Degua Tembien and Raya Azebo (where HIV prevalence is greater than 3.5%), there is no empirical evidence that the prevalence is heterogeneous in rural areas.

Hypothesis 3. There may be a higher HIV prevalence in certain key population groups including sex workers, seasonal workers and settlers, alluvial miners, military/police, populations of humanitarian concern (refugees), prisoners, youth and in particular university students as well as other high risk youth, and discordant couples.

Confirmed: seasonal workers/settlers, sex workers, discordant couples.

Partly confirmed: miners, military/police, university students (data only from FGDs).

Not confirmed: refugees and prisoners, truck drivers (partly due to limited data).

No data: MSMs, IDUs and certain youth (street children and OVCs).

Table 27: Summary of HIV prevalence, population size, risk behaviours, HIV response and recommendations for key population groups

Population group	HIV Prevalence	Number at risk	Risk Behaviours/ vulnerability	Response	Recommendation
Sex workers	**10%** (VCT data small sample, 2011)	**9,000** CSWs (Based on FSW prevalence of 0.7% x female population of Tigrai)	High condom use with clients but lower with alcohol and drug use; low with non paying partners	Some limited HIV services available (condom distribution, IEC promoting VCT, PMTCT, condom use and ART) but mainly focusing on IGA	• Carry out a sex workers census and provide a consistent package of comprehensive services targeted at FSWs (outreach services, BCC, peer education, HCT, STIs services, condoms, ART)
IDUs	?	?	?	None	• Introduce small-scale prevalence and behavioural studies and conduct formative research
MSM	?	?	?	None	• Introduce small-scale prevalence and behavioural studies and conduct formative research
Discordant couples	N/A	**10,000** (Based on 65% discordancy from DHS 2011 & 43,600 adults living with HIV in Tigrai (EPP/Spectrum estimates) & assuming 75% of these are in couples)	Low condom use	No specific HIV programmes	• Develop targeted services for discordant couples within the health system, including those focusing on positive prevention, positive living & family planning

139 Vandepitte J, Lyerla R, Dallabetta G, Crabbe F, Along M, Buve A. Estimates of the number of female sex workers in different regions of the world. Sexually Transmitted Infections 2006; 82(Suppl III):iii18–iii25. doi: 10.1136/sti.2006.020081

Population group	HIV Prevalence	Number at risk	Risk Behaviours/ vulnerability	Response	Recommendation
Seasonal workers	**2.2%** (ANC 2010)[140] **0.5%-8.2%** HCT data 2008-2010)	**200,000** in Kafta Humera -varies by year (Livelihood Profile 2007)	Alcohol use; low condom use; interaction with FSWs	The few HIV programmes that exist focus on treatment and neglect HIV prevention	• Design programmes & services targeting seasonal workers & conduct research on prevalence & behaviours
Settlers	**2.2%** (ANC 2010)[141] **0.5%-8.2%** (HCT data 2008-2010)	**150,000** (Profile of THB, 2010)	Alcohol use; low condom use; interaction with FSWs	The few HIV programmes that exist focus on treatment and neglect HIV prevention	• Design programmes & services targeting settlers & conduct research on prevalence & behaviours
Miners	?	**30,000-40,000** (FGDs with miners)	Spend time in bars; interaction with FSWs; very low condom use	Lack of comprehensive HIV prevention and treatment programmes targeting alluvial miners	• Design programmes & services targeting miners & conduct research on prevalence & behaviours
Long distance truck drivers	**0.4%** (VCT data small sample, 2011)	?	Interaction with FSWs; multiple partnerships; inconsistent condom use with regular partners or with alcohol or khat use	Programmes limited to IEC/BCC e.g. billboards. Comprehensive and consistent package of HIV prevention, treatment programmes is lacking	• Implement mobile VCT, condom distribution & BCC programmes

140 Not sub population data. Prevalence based on ANC clinic data in areas where seasonal workers and settlers are found

141 Ibid

Population group	HIV Prevalence	Number at risk	Risk Behaviours/ vulnerability	Response	Recommendation
Refugees	**0.5%** (HCT 2009-2010)	**39,495** in Adi-Harish, My-Ayni and Shimelba camps (UNHCR January 2012 data)	Transactional sex; overcrowding; alcohol and substance abuse	Adequate HIV programmes covering IEC/ BCC, condom distribution, HCT, treatment, reproductive health and impact mitigation (IGA)	None
Youth male	**0.6%** (15-24 yrs, DHS 2011, Tigrai, small sample size)	**420,124** (15-24 yrs, 2007 census)	Inconsistent condom use	Some HIV programmes in place including IEC/BCC e.g. AIDS clubs, youth friendly health centres, education programmes, condom distribution, AIDS information centres but need strengthening	• Increased package of interventions specifically aimed at in & out of school youth & university students, focusing on improving knowledge & condom use. Identify the higher-risk youth populations (e.g. street children, OVCs)
Youth female	**0.7%** (15-24 yrs, DHS 2011, Tigrai, small sample size)	**438,566** (15-24 yrs, 2007 census)	Earlier age of sexual debt, older partners, lower condom use than males	Some HIV programmes in place including IEC/BCC e.g. AIDS clubs, youth friendly health centres, education programmes, condom distribution, AIDS information centres but need strengthening	•Increased package of interventions specifically aimed at in & out of school youth & university students, focusing on improving knowledge & condom use. Identify the higher-risk youth populations (e.g. street children, OVCs). Implement sexual & reproductive services for adolescent girls

Population group	HIV Prevalence	Number at risk	Risk Behaviours/ vulnerability	Response	Recommendation
Youth sub populations					
University students	?	**25,000-30,000** (KI with university staff)	Multiple partners; inconsistent condom use; alcohol and khat use	HIV programmes including peer education, community conversation, life skill training, condom promotion and distribution, HCT, treatment and care services available but need strengthening and expansion	• Introduce small-scale prevalence and behavioural studies for this group • Increased package of interventions focusing on improving knowledge & condom use
In school youth	?	**98,438** (Tigrai regional state Education bureau, education statistics abstract 2008/2009)	Multiple partners; inconsistent condom use	HIV programmes including IEC/BCC e.g. AIDS clubs and HIV education programmes	• Increased package of interventions focusing on improving knowledge & condom use
Out of school youth	?	**21,200** (Population aged 15-19 yrs from 2007 census [119,643] - in school youth population[98,438])	Inconsistent condom use; transactional sex	Adequate HIV programmes including IEC/BCC e.g. AIDS clubs, community conversations, condom distribution,VCT, saving schemes and IGA	• Increased package of interventions focussing on improving knowledge & condom use
Street children	?	?	Some may have been infected as newborns (MTCT)	N/A	• Introduce small-scale prevalence and behavioural studies

Population group	HIV Prevalence	Number at risk	Risk Behaviours/ vulnerability	Response	Recommendation
OVCs	?	**80,000** orphans due to AIDS (draft EPP/Spectrum 2012 estimates) and up to **200,000** OVCs	Some may have been infected as newborns (MTCT)	Programmes limited to IGA	• Introduce small-scale prevalence and behavioural studies
Military/ Police	**3.4%** (VCT data small sample, 2011)	**Armed forces: 52,000-60,0000** (KI with military personnel) **Police:** **10,000-12,000** (KI with Civil Service Commission of Tigrai)	Interaction with FSWs; multiple partners; inconsistent condom use associated with substance abuse	Adequate HIV programmes for military covering IEC/BCC, condom distribution, HCT, and treatment	None
Prisoners	**1.3%-3.1%** prisoners & prison staff (HCT, VCT, PICT data Jun-Sep 2011)	**6,000** (KI with prison staff)	Sharing blades & needles; unsafe tattooing practices; overcrowding, MSM activities; no condoms available	Minimum HIV services covering IEC/BCC, HCT, treatment and care but no condom provision	• Raise current programme to the level of the minimum package of services for prisoners including HIV information, peer based education, condoms, HCT, STI prevention

Key

Cells highlighted in green indicate where there is strong, reliable evidence

Cells highlighted in orange indicate where there is medium strength evidence

Cells highlighted in red indicate where there is weak evidence e.g. single source, small sample size, non "research data"

6. Conclusions and Recommendations

This report has demonstrated that while a large number of programmes have been implemented in Tigrai, both by government and civil society, to address issues of HIV surveillance, testing, prevention, treatment, care and impact mitigation, there are still gaps in each of these programmes, hampered in most cases by a lack of up-to-date and reliable data, not only on the size of the various populations at risk but also on the results of those programmes that have been implemented. The following conclusions and recommendations highlight those areas of greatest concern, with suggestions on strategies or initiatives that can be taken to address the issues.

1. **There is not comprehensive strategic information on key populations** of potential concern for the region. Disaggregated coverage data for HIV prevention that is not clinical is not readily available.

Recommendation:

- Introduce small-scale prevalence and behavioural studies on key populations, starting with seasonal workers/settlers, miners, sex worker census, university students and other high-risk youth, progressing to formative research on MSMs and IDUs.
- Analysis of routine data on testing, treatment, care, etc. should be collected and reported disaggregated by sex and age.

2. Report has shown that **variation of HIV prevalence is at the zonal and district levels**. No evidence that programme planning is done on the basis of geographical considerations (HIV needs).

Recommendation:

- Programme planning at zonal/district level should factor in differences in HIV prevalence in addition to population size
- Conduct a study in DeguaTembien to determine factors accounting for the unexplained higher prevalence
- While HIV programmes should be focused on urban areas, programming should not neglect those rural areas that are of higher prevalence, or where location (such as proximity to transport corridors or high-risk populations) place the local population at risk.

3. **There are few programmes in operation that address the needs and issues of high-risk groups.**

Recommendation:

- While research is needed to estimate the size and HIV prevalence of these high-risk groups, programmes should be started while research is ongoing on the assumption that there is a need
- Implement the minimum package of services for high-risk populations [142]
- Establish systematic surveillance of HIV prevalence for all high risk groups

142 HIV Prevention Package, MARPS and vulnerable groups, FHAPCO, FMOH, September 2011, Addis Ababa

4. **Programmes that do address issues in key populations need to be strengthened and expanded.**

Recommendation

- Youth: Increased package of interventions specifically aimed at in & out of school youth & university students, focussing on improving knowledge & condom use; identify the higher-risk youth populations (e.g. street children, OVCs). Implement sexual & reproductive services for adolescent girls.
- Seasonal workers/ settlers: current care and treatment programmes need to be expanded to include prevention interventions.
- Miners: develop programmes & services targeting miners & conduct research on prevalence & behaviours.
- Truck drivers: mobile VCT, distribution of condoms & BCC programmes for this group are needed.
- Prisoners: Raise current programme to the level of the minimum package of services for prisoners including HIV information, peer based education, condoms, HCT, STI prevention
- Sex workers: carry out a sex workers census and provide a consistent package of comprehensive services targeedt at FSWs (outreach services, BCC, peer education, HCT, STIs services, condoms, ART).

5. **Discordant couples are a high-risk population that need increased attention.**

Recommendation:

- Develop targeted services for discordant couples within the health system, including those focusing on positive prevention. Programmes beyond clinical services and impact mitigation are required, including positive living with HIV, safe sex, family planning.

6. **Enrolment and follow-up in the PMTCT programme is inadequate.**

Recommendation:

- The PMTCT programme needs to be strengthened, to ensure that a higher proportion of pregnant women who visit the ANC are tested and are followed up to delivery and the breastfeeding period, and that they and their newborns receive appropriate services.

7. **There is a lack of knowledge at the regional level on how overall funds are allocated to different services and locations, the source of the funding, or the accounting of expenditures.**

Recommendation:

- Surveys of expenditures carried out at the national level should be disaggregated by regions. Partners should be accountable for reporting on funding at the regional level so that this can be included during regional programme planning.

Appendix 1:

Composition of Technical Reference Group

Name	Organisation
Abadi Luel	I-TECH
Abdelwasie Ahmed	NSLAM (Nursalem)
Ablelom Kahsay	Tigrai Health Bureau
Abraha W.Michael	Mekelle University
Afewerki Kahsay	TIGRAI HEALTH BUREAU
Abraham Kahsay	ITECH
Alem Desta	Mekelle University
Asefa Hagos	TIGRAI HEALTH BUREAU
Ashenafi Asmelash	Mums for mums
Assefa Haddis	BOLSA(Social Affair)
Atakilit Halefom	ISS
Atsebeha Berhe	REST
Atsbeha Gebrekidan	TIGRAI HEALTH BUREAU
Atsede Abraha	EFFORT-TRR
Belay Tesfahunegn	WHO
Brhane Girmay	TIGRAI HEALTH BUREAU
Enun Kassa	ACSOT
Estifanos Gebremeskel	Mekelle University, Bioinformatics
Ezedin Adem	Mekelle University
Fantaw Bihonegn	Tigrai Health Bureau
Gebremedhin Kinfu	Tigrai Health Bureau
Gebretsadik kahsay	BANR
Genet Arefe	Tigrai HAPCO
Goitom Gebremedhin	Tigrai HAPCO
Hailu Tsegay	Mekelle University

Name	Organisation
Kahsay Tesfalidet	TDVA(Tigrai Disabled Veterans Association)
Kellali Tsegay	IFHP
Kibreab Assayehegn	Women Affairs
Kidanemariam Alemseged	IFHP(PATH FINDER)
Mokenen Gebremedhin	Messebo Cement Factory
Moges Belay	Mekelle university
Musie Araya	Tigrai Health Bureau
Muauz Kebede	Tigrai Health Bureau
Nuru Seid	OSSA
Samual Zemariam	Tigrai HAPCO
Sedi Salh	Tigrai Health Bureau
Sertse Mebrahtu	PRISON
Solomon Gebremariam	Mekelle university
Solomon Hailu	HAPCO
Solomon Mersa	Tigrai Health Bureau
S/R Guay Weldegebreal	My Garment
S/R Etay Yemane	TRANS
Tiquidem Asberom	BOYSA (Youth Affairs)
Tesfay Belay	Tigrai Health Bureau
Tsegazab Kahsu	MSH
Tsigmariam Teklu	Tigrai Health Bureau
Weldegebreal Niguse	Youth Association
Yaynishet Gerbreyohannes	Inter Health
Yohannes Chekol	HAB
Yohannes	I-TECH
Yrgalem Kahsay	Human to Human
Yrgalem Almsegede	Tigrai Health Bureau
Zemikeal Gebremedhin	ACOT

Appendix 2:

Reanalysis of the 2005 and 2011 Demographic and Health Survey in Ethiopia

Purpose

The most recent DHS survey in Ethiopia was conducted in 2011 with the previous survey conducted in 2005. The DHS is useful for the following 2 purposes:

- To identify the patterns of distribution of HIV by age, gender and various sexual behaviours and so may be useful to identify risk factors for being HIV positive.
- We can compare results for Tigrai with the results from the rest of Ethiopia to determine whether the Tigrai region is systematically different. If not, then conclusions drawn from the national level DHS survey are likely to be applicable to Tigrai.

Methodology for DHS Analysis

The 2005 and 2011 Ethiopia Demographic and Health Surveys (EDHS) are nationally representative surveys of 14,070 women aged 15-49 and 6,033 men aged 15-59 and 16,515 women aged 15-49 and 14,110 men aged 15-59 respectively. The 2005 and 2011 EDHS database were downloaded from the Measure website and included datasets for females, males, HIV and couples. The HIV dataset was merged with the datasets for females, males and couples and analysed.

The 2005 and 2011 EDHS were designed to provide estimates for Ethiopia as a whole as well as the different geographical areas. Datasets were weighted using the sample weight and analysis was conducted. In the 2005 and 2011 EDHS, percentages based on 25-49 unweighted cases are shown in parenthesis and percentages based on fewer than 25 unweighted cases are suppressed. This is to ensure statistical reliability. Tables show the weighted frequencies and weighted percentages.

HIV prevalence is shown by demographic characteristics and sexual behaviours. Data by HIV prevalence by gender for Tigrai and Ethiopia as a whole is provided in the tables.

Sexual Behaviours

Frequency of various sexual behaviours for females for Ethiopia excluding Tigrai

Table A1: Frequency of various sexual behaviours for females for Ethiopia excluding Tigrai

	2005 DHS		2011 DHS	
	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent
Condom Use at last sexual intercourse				
Yes	43	1.0	177	1.8
No	4 016	98.8	9788	98.2
Condom Use at last sexual intercourse for participants who had 2+ partners in past 12 months[#]				
Yes	1	24.7	20	(38.4)
No	9	75.3	32	(61.6)
Number of partners in last 12 months				
0	3836	48.6	5426	35.2
1	4052	51.3	9914	64.3
2+	10	0.1	52	0.3
Number of higher risk partners in last 12 months[##]				
0	7761	98.3	15014	97.4
1	135	1.7	351	2.3
2+	2	*	27	(0.2)
Number of lifetime partners				
1	3 479	72.7	8409	73.0
2	916	19.2	2198	19.1
>2	364	7.5	875	7.6

[#] Filtered on 2 or more sexual partners in the last 12 months
[##] Number of partners excluding husband/wife/cohabiting partner

Frequency of various sexual behaviours for Ethiopia excluding Tigrai for males

Table A2: Frequency of various sexual behaviours for Ethiopia excluding Tigrai for males

	2005 DHS		2011 DHS	
	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent
Condom Use at last sexual intercourse				
Yes	1 37	4.7	507	7.1
No	2 794	95.2	6591	92.8
Condom Use at last sexual intercourse for participants who had 2+ partners in past 12 months[#]				
Yes	110	8.5	62	14.4
No	10	91.5	370	85.6
Condom Use at paid sexual intercourse				
Yes	27	64.7	42	(49.1)
No	14	35.3	42	(49.4)
Number of partners in last 12 months				
0	2 208	42.9	4944	41.1
1	2813	54.7	6667	55.4
2+	121	2.3	432	3.6
Number of higher risk partners in last 12 months[##]				
0	4897	95.2	11380	94.5
1	225	4.4	579	4.8
2+	20	0.4	85	0.7
Number of lifetime partners				
1	1 513	46.5	4071	52.8
2	730	22.4	1720	22.3
>2	982	30.2	1920	24.9

[#] Filtered on 2 or more sexual partners in the last 12 months
[##] Number of partners excluding husband/wife/cohabiting partner

Frequency of various sexual behaviours for Tigrai for females

Table A3: Frequency of various sexual behaviours for Tigrai for females

	2005 DHS		2011 DHS	
	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent
Condom Use at last sexual intercourse				
Yes	2	*	25	(3.7)
No	288	99.2	654	96.3
Condom Use at last sexual intercourse for participants who had 2+ partners in past 12 months[#]				
Yes	-	-	9	*
No	-	-	1	*
Number of partners in last 12 months				
0	257	46.9	425	38.5
1	290	53.1	669	60.6
2+	-	-	10	*
Number of higher risk partners in last 12 months[##]				
0	529	96.8	1050	95.1
1	17	(3.2)	44	(4.0)
2+	-	-	10	*
Number of lifetime partners				
1	225	64.6	547	65.6
2	92	26.5	205	24.6
>2	30	8.6	78	9.3

[#] Filtered on 2 or more sexual partners in the last 12 months
[##] Number of partners excluding husband/wife/cohabiting partner

Frequency of various sexual behaviours for Tigrai for males

Table A4: Frequency of various sexual behaviours for Tigrai for males

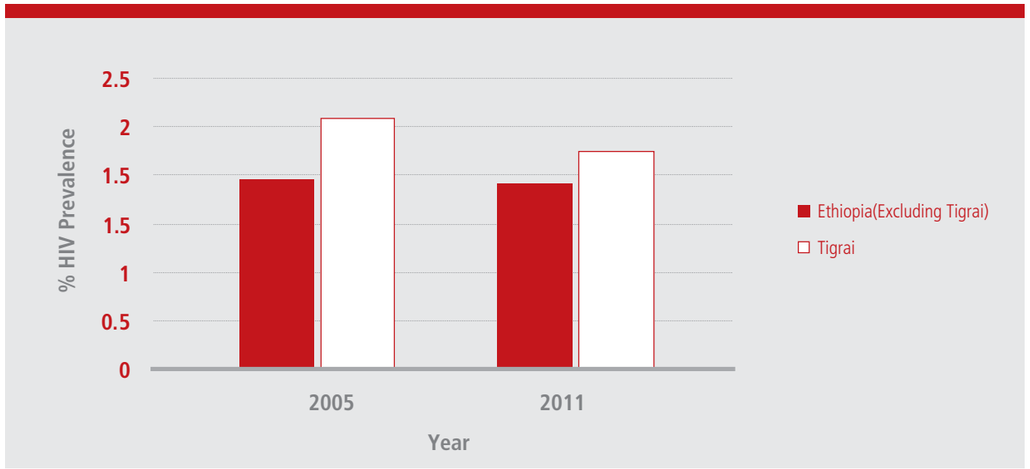
	2005 DHS		2011 DHS	
	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent
Condom Use at last sexual intercourse				
Yes	16	*	49	(10.9)
No	171	91.4	398	89.1
Condom Use at last sexual intercourse for participants who had 2+ partners in past 12 months#				
Yes	1	*	7	*
No	8	*	6	*
Condom Use at paid sexual intercourse				
Yes	3	*	2	*
No	4	*	0	*
Number of partners in last 12 months				
0	128	40.6	322	42.0
1	179	56.8	433	56.4
2+	8	*	13	*
Number of higher risk partners in last 12 months##				
0	285	90.5	699	90.9
1	26	(8.3)	60	7.8
2+	4	*	9	*
Number of lifetime partners				
1	129	46.8	233	48.7
2	49	(16.7)	93	19.5
>2	94	36.5	152	31.7

Filtered on 2 or more sexual partners in the last 12 months
Number of partners excluding husband/wife/cohabiting partner

HIV prevalence results

Comparison of overall HIV Prevalence for Ethiopia (excl Tigrai) and Tigrai, 2005 and 2011 DHS

Figure 20: Comparison of overall HIV Prevalence for Ethiopia (excl Tigrai) and Tigrai, 2005 and 2011 DHS



The overall HIV prevalence for Ethiopia (excluding Tigrai) has remained constant from the 2005 DHS 1.4% (CI 1.1-1.7) compared to the 2011 DHS 1.4% (CI 1.2-1.7). The overall HIV prevalence rate for Tigrai has decreased from 2.1% (1.2-3.7) to 1.8% (1.4-2.4) in 2011.

HIV Prevalence by gender and age group for Ethiopia (excluding Tigrai)

Table A5: HIV Prevalence by gender and age group for Ethiopia (excluding Tigrai)

	2005 DHS Female		2011 DHS Female		2005 DHS Male		2011 DHS Male	
	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent
Age								
15-19	1291	0.7	3318	0.2	1 111	0.1	2734	0.0
20-24	957	1.4	2441	0.9	868	0.2	2136	0.1
25-29	943	1.9	2640	2.9	602	0.6	2151	1.0
30-34	689	1.6	1705	3.7	634	1.9	1386	0.9
35-39	606	4.8	1586	2.9	548	1.7	1551	3.0
40-44	453	3.0	1025	1.9	409	3.0	1018	2.1
45-49	410	0.9	998	1.9	358	0.0	853	1.3
50-54	-	-	-	-	267	0.5	630	1.3
55-59	-	-	-	-	189	0.0	536	0.0

HIV Prevalence by gender and age group for Tigrai

Table A6: HIV Prevalence by gender and age group for Tigrai

	2005 DHS Female		2011 DHS Female		2005 DHS Male		2011 DHS Male	
	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent
Age								
15-19	106	1.1	266	0.6	64	0.0	198	0.0
20-24	68	6.0	178	0.8	61	2.3	144	1.8
25-29	61	5.6	148	4.1	38	2.0	111	0.0
30-34	45	0.0	104	4.4	30	(2.6)	92	2.7
35-39	44	0.0	127	4.4	33	3.8	81	2.1
40-44	34	3.5	85	2.1	29	(0.0)	76	2.1
45-49	29	(0.0)	73	1.3	18	(0.0)	54	2.1
50-54	-	-	-	-	26	(5.0)	47	0.0
55-59	-	-	-	-	19	(3.8)	43	0.0

The small sample sizes make comparisons difficult but there are no significant differences between HIV prevalence in Ethiopia and Tigrai. Also, the pattern of HIV peaking in younger women and older men is seen in 2005 in both Ethiopia and Tigrai but only in Ethiopia in 2011. In Tigrai in 2011 HIV prevalence peaks in females aged 30-39 years and males aged 30-34 years.

HIV prevalence by demographic factors for females aged 15-49 years in Ethiopia excluding Tigrai

Table A7: HIV prevalence by demographic factors for females aged 15-49 years in Ethiopia excluding Tigrai

	2005 DHS		2011 DHS	
	Weighted Frequency	HIV+ Weighted Percent	Weighted Frequency	Weighted Percent
Residence				
Urban	897	7.8	3247	5.3
Rural	4 452	0.6	10466	0.8
Marital Status				
Never married	1 357	0.7	3693	0.5
Ever had sexual intercourse	87	9.5	295	3.1
Never had sexual intercourse	1 270	0.1	3397	0.3
Married/living together	3 442	1.5	8635	1.6
Widow	379	8.5	427	12.2
Divorced or separated	171	5.8	959	4.8
Type of Union				
In polygynous union	446	1.5	963	1.8
Not in polygynous union	2 966	1.4	7629	1.5
Not currently in union	1 907	2.5	5079	2.3
Education				
None	3 511	1.1	6990	1.3
Primary	1 257	2.4	5242	2.1
Secondary	518	5.6	890	4.6
Higher	63	1.2	591	1.6
Occupation				
Not working	3 504	1.5	5925	1.3
prof., tech., manag.	53	1.5	239	1.7
clerical	16	(5.2)	175	3.7
Sales	609	4.7	2510	2.5
agric-employee	961	0.6	3469	0.6
Services	1	*	129	6.3
Skilled manual	128	3.1	1049	6.0
unskilled manual	56	5.8	121	2.1

HIV prevalence by demographic factors for males aged 15-49 years in Ethiopia excluding Tigrai

Table A8: HIV prevalence by demographic factors for males aged 15-49 years in Ethiopia excluding Tigrai

	2005 DHS		2011 DHS	
	Weighted Frequency	HIV+ Weighted Percent	Weighted Frequency	Weighted Percent
Residence				
Urban	636	2.4	2639	3.0
Rural	3 985	0.7	9187	0.4
Marital Status				
Never married	1 957	0.3	5060	0.2
Ever had sexual intercourse	306	0.8	915	0.9
Never had sexual intercourse	1 651	0.2	4145	0.0
Married/living together	2 441	1.3	6444	1.3
Widow	117	1.8	29	14.0
Divorced or separated	16	*	292	5.4
Type of Union				
In polygynous union	150	1.3	337	1.3
Not in polygynous union	2 408	1.3	6087	1.3
Not currently in union	2 090	0.5	5382	0.6
Education				
None	186	0.7	3481	0.8
Primary	1 818	0.5	6325	0.8
Secondary	813	2.1	1207	2.2
Higher	93	1.9	812	1.2
Occupation				
Not working	579	0.0	828	0.1
prof., tech., manag.	88	2.1	448	2.2
clerical	5	*	146	1.8
sales	255	2.9	1013	2.7
agric-employee	3 354	0.7	8183	0.3
services	7	*	147	5.4
Skilled manual	120	7.1	794	4.7
unskilled manual	93	0.8	167	2.4

HIV prevalence by demographic factors for females aged 15-49 in Tigrai

Table A9: HIV prevalence by demographic factors for females aged 15-49 in Tigrai

	2005 DHS		2011 DHS	
	Weighted Frequency	HIV+ Weighted Percent	Weighted Frequency	Weighted Percent
Residence				
Urban	83	7.4	265	4.2
Rural	304	1.2	717	1.5
Marital Status				
Never married	92	0.6	264	0.8
Ever had sexual intercourse	5	*	19	(2.8)
Never had sexual intercourse	86	0.0	246	0.6
Married/living together	243	3.1	548	1.2
Widow	17	*	43	(10.8)
Divorced or separated	35	3.4	127	6.5
Type of Union				
In polygynous union	9	*	4	*
Not in polygynous union	228	3.0	538	1.1
Not currently in union	144	1.6	434	3.5
Education				
None	235	0.6	484	1.7
Primary	91	3.3	377	3.2
Secondary	50	11.0	90	1.8
Higher	11	*	31	(0.0)
Occupation				
Not working	220	3.0	243	2.2
prof., tech., manag.	7	*	11	*
clerical	5	*	7	*
sales	23	(14.0)	165	2.2
agric-employee	102	0.0	438	1.4
services	-	-	26	(3.9)
Skilled manual	7	*	61	8.9
unskilled manual	23	(0.0)	15	*

HIV prevalence by demographic factors for males aged 15-49 in Tigrai

Table A10: HIV prevalence by demographic factors for males aged 15-49 in Tigrai

	DHS 2005		DHS 2011	
	Weighted Frequency	HIV+ Weighted Percent	Weighted Frequency	Weighted Percent
Residence				
Urban	48	2.7	184	1.5
Rural	225	1.3	571	1.2
Marital Status				
Never married	127	0.6	357	0.5
Ever had sexual intercourse	24	(3.2)	77	1.6
Never had sexual intercourse	103	0.0	280	0.2
Married/living together	142	2.3	368	1.2
Widow	4	*	7	*
Divorced or separated	-	-	24	(9.1)
Type of Union				
In polygynous union	2	*	2	*
Not in polygynous union	140	2.4	366	1.2
Not currently in union	131	0.7	387	1.3
Education				
None	114	1.5	230	1.3
Primary	94	2.2	389	1.7
Secondary	58	1.0	72	0.0
Higher	8	*	64	0.0
Occupation				
Not working	38	(0.0)	27	(0.0)
prof., tech., manag.	8	*	36	1.4
clerical	-	-	6	*
sales	18	*	57	0.0
agric-employee	184	1.6	527	1.4
services	1	*	11	*
Skilled manual	10	*	69	2.2
unskilled manual	23	(0.0)	17	*

HIV prevalence was higher in urban areas in comparison to rural areas in Ethiopia and in Tigrai. Prevalence was also higher among those whose spouse has died or who have divorced across the country.

HIV Prevalence by sexual behaviour

HIV prevalence for females among those who have ever had sex for Ethiopia excluding Tigrai

Table A11: HIV prevalence for females among those who have ever had sex for Ethiopia excluding Tigrai

	2005 DHS		2011 DHS	
	Weighted Frequency	HIV+ Weighted Percent	Weighted Frequency	HIV+ Weighted Percent
Age				
15-24	1 053	1.9	5759	0.5
15-49	4 058	2.3	13713	1.8
Condom use at last sexual intercourse in past 12 months				
Yes	38	23.3	154	17.7
No	3 433	1.5	8755	1.4
Condom Use at last sexual intercourse for participants who had 2+ partners in past 12 months#				
Yes	1	65.6*	19	(42.2)
No	5	1.6*	30	(13.8)
Number of partners in last 12 months				
0	586	5.7	1345	6.7
1	3 469	1.7	8862	1.6
2+	6	*	49	24.8
Number of higher risk partners in last 12 months##				
0	3 943	2.1	9922	2.2
1	117	9.5	309	5.3
2+	4	*	25	(36.6)
Number of lifetime partners				
1	2 954	1.3	7521	1.3
2	784	4.9	1956	5.1
>2	313	5.1	771	5.3

Filtered on 2 or more sexual partners in the last 12 months
Number of partners excluding husband/wife/cohabiting partner

HIV prevalence for males among those who have ever had sex for Ethiopia excluding Tigrai

Table A12: HIV prevalence for males among those who have ever had sex for Ethiopia excluding Tigrai

	2005 DHS		2011 DHS	
	Weighted Frequency	HIV+ Weighted Percent	Weighted Frequency	HIV+ Weighted Percent
Age				
15-24	452	0.1	4869	0.1
15-49	2 697	1.3	11826	1.0
Condom use at last sexual intercourse in past 12 months				
Yes	105	1.8	477	5.4
No	2 514	1.2	6541	1.1
Condom Use at last sexual intercourse for participants who had 2+ partners in past 12 months[#]				
Yes	6	1.7*	58	0.9
No	98	3.8	360	2.1
Paid for sexual intercourse in last 12 months used condom				
Yes	13	(1.9)	41	*
No	26	(0.0)	38	(8.2)
Number of partners in last 12 months				
0	250	2.2	605	2.6
1	2515	1.2	6601	1.3
2	105	3.8	418	1.9
Number of higher risk partners in last 12 months[##]				
0	2 667	1.3	7000	1.5
1	187	1.3	545	2.3
2+	11	(0.4)	80	0.0
Number of lifetime partners				
1	1 342	0.7	4039	0.1
2	651	1.7	1669	2.3
>2	861	1.6	1902	3.5

[#] Filtered on 2 or more sexual partners in the last 12 months
[##] Number of partners excluding husband/wife/cohabiting partner

HIV prevalence for females among those who have ever had sex in Tigrai

Table A13: HIV prevalence for females among those who have ever had sex in Tigrai

	DHS 2005		DHS 2011	
	Weighted Frequency	HIV+ Weighted Percent	Weighted Frequency	HIV+ Weighted Percent
Age				
15-24	89	5.9	445	0.6
15-49	301	3.3	982	2.2
Condom use at last sexual intercourse				
Yes	2	*	20	(13.9)
No	248	3.5	580	1.3
Condom Use at last sexual intercourse for participants who had 2+ partners in past 12 months[#]				
Yes	-	-	7	*
No	-	-	1	*
Number of partners in last 12 months				
0	50	2.4	136	7.2
1	250	3.5	593	1.7
2	-	-	7	*
Number of higher risk partners in last 12 months[##]				
0	285	3.0	689	2.4
1	15	9.2	40	8.0
2+	-	-	7	*
Number of lifetime partners				
1	194	3.2	481	0.9
2	79	2.5	183	5.1
>2	25	6.6	70	8.8

[#] Filtered on 2 or more sexual partners in the last 12 months
[##] Number of partners excluding husband/wife/cohabiting partner

HIV prevalence for males among those who have ever had sex in Tigrai

Table A14: HIV prevalence for males among those who have ever had sex in Tigrai

	DHS 2005		DHS 2011	
	Weighted Frequency	HIV+ Weighted Percent	Weighted Frequency	HIV+ Weighted Percent
Age				
15-24	27	(0.4)	342	0.7
15-49	166	1.4	755	1.3
Condom use at last sexual intercourse				
Yes	12	*	47	3.9
No	145	2.9	388	1.1
Condom Use at last sexual intercourse for participants who had 2+ partners in past 12 months[#]				
Yes	1	*	6	*
No	7	*	6	*
Paid for sexual intercourse in last 12 months used condom				
Yes	2	*	2	*
No	2	*	-	-
Number of partners in last 12 months				
0	9	*	40	(6.8)
1	150	2.4	423	1.4
2	8	*	12	0.0
Number of higher risk partners in last 12 months[##]				
0	144	2.0	407	1.6
1	19	*	59	4.0
2	4	*	8	*
Number of lifetime partners				
1	77	0.0	228	0.0
2	28	(4.2)	88	3.5
>2	59	5.2	149	2.9

[#] Filtered on 2 or more sexual partners in the last 12 months
[##] Number of partners excluding husband/wife/cohabiting partner

Condom use back in 2005 was remarkably low in Ethiopia including Tigrai. HIV prevalence patterns by sexual behaviour were similar in Ethiopia and Tigrai with women and men reporting more than one lifetime sexual partner or more than one partner in the last 12 months being at substantially higher risk of being HIV positive.

Distribution of HIV discordancy among couples for Ethiopia excluding Tigrai

Table A15: Distribution of HIV discordancy among couples for Ethiopia excluding Tigrai

	2005 DHS		2011 DHS	
	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent
Male positive and female negative	16	0.6	26	0.4
Female positive and male negative	25	1.0	39	0.6

Distribution of HIV discordancy among couples in Tigrai.

Table A16: Distribution of HIV discordancy among couples in Tigrai.

	2005 DHS		2011 DHS	
	Weighted Frequency	Weighted Percent	Weighted Frequency	Weighted Percent
Male positive and female negative	5	3.3	1	0.3
Female positive and male negative	2	1.6	2	0.7

The numbers of discordant couples are too small to be able to determine if there are differences between Tigrai and the rest of Ethiopia.

Conclusions

This reanalysis shows that there do not appear to be significant differences in sexual behaviour or risk factors for acquiring HIV between people living in Tigrai and those living in the rest of Ethiopia. This means that conclusions and recommendations of the DHS that pertain to Ethiopia are likely to be relevant to Tigrai too.

Appendix 3:

Detailed Tables of Routine Antenatal HIV Data

Table A17: HIV prevalence levels among antenatal clinic attendees per facility for 2008-2010.

Note: The HCs below are all the ones with PMTCT services available (about half of existing HCs) – they include all public and some private (mainly in Mekelle).

Location of Facility	Percent ANC HIV Positive	Percent ANC HIV Positive	Number ANC tested	Percent ANC HIV Positive
	2008	2009	2010	2010
Municipal cities				
Hospitals on main road (in municipal cities)				
Mekelle Hospital	26.9%	18.5%	550	6.5%
Quiha Hospital	4.7%	7.2%	543	3.1%
Adigrat Hospital	8.8%	3.4%	388	3.9%
Adwa Hospital	3.6%	2.4%	1 468	2.1%
St Mary Aksum Hospital	4.0%	2.3%	900	1.4%
Sihul Hospital Endaselassie	15%	6.8%	227	1.3%
Lemlem Karl Maichew Hospital	5.9%	4.6%	706	5.1%
Wukro Hospital	6.6%	4.8%	591	4.1%
Alamata Hospital	23%	11.9%	506	7.3%
Health Centres on main road (in municipal cities)				
Mekelle HC	3.2%	5.2%	2 325	4.2%
Semien HC	4.8%	2.9%	805	3.1%
Quiha HC	7.7%	4.1%	98	2.0%
Kassech HC	4.5%	2.8%	577	3.5%
Aynalem HC			67	0%
FGAE (NGO/ not public)			121	13.2%
Adi Ha HC			37	0%
Adigrat HC	4.4%	2.7%	1 605	3.1%
Adwa HC	3.8%	3.1%	1 567	1.5%
Aksum HC	2.6%	0.9%	1 074	0.4%
Millennium HC Aksum		3.9%	174	0.6%
Endaselassie MCH (NGO/ not public)		4.1%	1 889	2.2%
Endaselassie HC	3.5%	3.4%	2 109	2.0%
Maichew HC	2%	4.2%	599	1.5%
Semere Meles			10	0%
Wukro HC		2.8%	478	1.3%
Alamata HC	7.3%	5.4%	856	7.4%
Korem HC	3.7%	4.5%	755	4.6%

Location of Facility	Percent ANC HIV Positive	Percent ANC HIV Positive	Number ANC tested	Percent ANC HIV Positive
	2008	2009	2010	2010
Hospitals off the main road (in municipal towns)				
Abi Adi HC	1%	0.5%	921	1.1%
Health Centres off the main road (in municipal towns)				
Abi Adi Hospital	5.8%	1.3%	222	1.8%
Health centres in (municipal) border town off the main road Border town is only if the site is near another country: Eritrea or the Sudan				
Sheraro HC	15%	3.1%	843	2.6%
Hospitals in Border towns (municipal) on the Main Road AND with Seasonal workers and settlers				
Kahsai Abera Humera Hospital	8.8%	7.0%	670	4.6%
Health centres in Border towns (municipal) on the Main Road AND with Seasonal workers and settlers				
Humera HC	4.5%	2.3%	244	2.0%
Emerging Towns				
Health centres off the main road in emerging towns				
Atsibi HC	1.4%	3.1%	2 368	1.7%
Mohoni HC	6.4%	6.7%	1 631	5.2%
Hagere Selam HC	4.1%	2.8%	1 023	3.8%
Endaba Guna HC	0.6%	0.8%	484	1.2%
Hawzien	1.3%	1.6%	2 695	0.7%
Mahber Dego HC		0%	1 019	0%
Samre HC	0.3%	0.1%	2 197	0.4%
Naedier Adiet (Semema Adiet)	0%	1%	1 344	0.3%
Bora HC			52	0%
Edaga Aribi HC			1 669	0.1%
Semema (Tahtay Koraro) HC	0.3%	0.3%	882	0.1%
Chercher HC			20	0%
Ketema Ngus HC			755	1.5%
Adi Daero HC	1.7%	1.8%	1 717	0.5%
Adihageray		3.1%	927	1.6%
Health centres on Main Road in emerging towns				
Adi Shihu (Alajae) HC	3.2%	1.4%	1 056	1.2%
Agulae HC			339	2.7%
Selekleka (M. Zana) HC		3.2%	2 800	0.4%
Wurkro Maray HC	1.8%	0.1%	2 029	0.5%
Edaga Hamus HC		1.5%	815	0.9%
Freweini HC	2.5%	2.0%	865	2.0%
Enticho HC	2.5%	2.1%	2 954	0.8%
Adigudem HC	3.5%	2.2%	3 194	1.3%
Fatsi (Gulomekada) HC	2.5%	0.5%	827	1.6%
Hiwane HC			95	0%
Betmara HC			62	1.6%

Location of Facility	Percent ANC HIV Positive	Percent ANC HIV Positive	Number ANC tested	Percent ANC HIV Positive
	2008	2009	2010	2010
Timuga HC			254	0%
Health centres on the main road (in emerging towns) with resettles/seasonal workers (all categories apply)				
Dansha HC		-	473	3.0%
Baeker HC		2.6%	153	3.9%
Hospitals on the main road (in emerging towns) with resettles/seasonal workers (all categories apply)				
Dansha Hospital	3.2%	3.4%	557	2.0%
Health centres in emerging towns off the main road on the border with Resettlement/Seasonal Workers				
Mai Kadra		6.9%	816	6.6%
Adi Goshu HC		2.1%	436	1.6%
Health centres in Emerging towns on the border off the main road				
Dowhan HC	0%	4.0%	169	0.6%
Alluvial Miners off the main road				
Kisad Gaba			90	0%
Mai Hanse			288	0.7%

Location of Facility	Percent ANC HIV Positive	Percent ANC HIV Positive	Number ANC tested	Percent ANC HIV Positive
	2008	2009	2010	2010
Rural districts (outside the emerging *towns*)				
Health centres off the main road (in "village settlements" – not recognised by the urban development bureau as emerging towns)				
Hawelti HC			20	0%
Birshiwa HC		0%	780	0.6%
Mechare HC			26	7.7%
Merewa HC			98	0%
Selen Wuha HC			200	0.5%
Selewa HC			81	1.2%
Teka HC			24	0%
Welwalo HC			194	0%
Baeti Akor HC			198	0.5%
Tsgereda HC			186	0%
Yechila HC	1.8%	1.1%	1 855	0.3%
Gerjelle HC			187	0.5%
Abraha Atsbeha HC			110	0%
Adi Grat Kerse BerKelbisea HC			82	0%
Adi Gebru HC			162	0%
Alitena HC			9	0%
Edaga Hibret HC			25	0%
Endalgeda HC			49	0%
Mai Dumu HC			1 113	0%
Kukufto HC			11	9%
Edaga Robue HC			236	0.4%
Biera			132	0.8%
Health centres on the main road (in villages along the main road)				
Negash HC			89	2.2%
Dinglet HC			189	0%
Refugees/on main road				
Mai Tsebri	0.8%	0.5%	7 148	0.3%

Appendix 4:

ANC Routine Clinic Data 2009

Table A18: HIV prevalence among antenatal clinic attendees by urban districts, 2009

District (municipal towns)	Total ANC Tested N	Total ANC +ve N	HIV Prevalence (%)
Abi Adi Town	921	10	1.1
Adigrat Town	1993	65	3.3
Adwa Town	2156	42	1.9
Alamata Town	1362	100	7.3
Axum Town	2148	18	0.8
Endaslassie Town	4235	88	2.1
Korem Town	755	35	4.6
Maichew Town	1315	45	3.4
Mekelle Zone	5123	213	4.2
Setit Humera Town	863	32	3.7
Sheraro Town	843	22	2.6
Wukro Town	1069	30	2.8
Total	22 783	700	3.1

Table A19: HIV prevalence among antenatal clinic attendees by rural district

District	Total ANC Tested	Total ANC +ve	HIV Prevalence (%)
Adwa Rural	1567	8	0.5
Ahferom	2954	23	0.8
Alaje	1275	15	1.2
Alamata Rural	2500	39	1.6
Asgede Tsimbila	1049	8	0.8
Atsibi Wenberta	2368	40	1.7
Dogua Tembien	1023	39	3.8
Endamohoni	144	0	0.0
Enderta	498	4	0.8
Erob	227	1	0.4
Ganta Afeshum	1377	1	0.1
Gulo Mekdada	827	13	1.6
Hawzien	2695	19	0.7
Hintalo Wajarat	3289	41	1.2
Kafta Humera	1679	72	4.3
Kilte Awlaelo	1042	14	1.3
Kolla Tembien	2033	10	0.5
Laelay Adiabo	1717	9	0.5
Laelay Maichew	1019	0	0.0
Medebay Zana	2800	10	0.4
Mereb Leke	660	3	0.5
Naedier Adiet	1344	4	0.3
Ofla	2536	11	0.4
Raya Azebo	1708	87	5.1
Saesie Tsaeda Emba	2513	26	1.0
Samre Saharti	2197	9	0.4
Tahtay Adiabo	704	14	2.0
Tahtay Koraro	1995	1	0.1
Tahtay Maichew	2029	11	0.5
Tanqua Abegelle	1855	6	0.3
Tsegede	1785	36	2.0
Tselemti	7148	25	0.3
Welkait	1396	5	0.4
Werie Leke	1669	2	0.1
Total	61622	606	1.0

Appendix 5:

List of organisations providing HIV Programmes and Services in Tigrai [142]

Organization	Location of activity	Reported Prevention Activity
Tigrai Health Bureau	All over Tigrai	IEC/BCC through HEP, VCT, PMTCT, condom distribution though HCs, Some STI treatment and TB-HIV prevention
Tigrai HAPCO	All over Tigrai	CC through, IEC materials production, sponsors of local newspapers, radio stations, organizes AIDS resource centres,
Addis Mela-SCF USA	Mekelle, Alamata Setit Humera	Peer education on HIV, IEC/BCC, condom distribution with truckers, FSWs
Africa Services Foundation	Mekelle	Mobile HCT
Association of Brotherhood of Humans (mahber Hiwnet dekiseb)	Mekelle, Alamata	IEC/BCC, Street Children
Bureau of youth and Sports	All over Tigrai	HCT campaign, establishing youth friendly centres, use of sport events to carry out IEC and VCT
Bureau of Education Tigrai	All schools	IEC/BCC through AIDS clubs in schools
Bureau of Labour and Social Affairs	All over Tigrai	IEC/BCC, work place intervention
Bureau of Women's Affairs	At district level (46)	Focused IEC on women to mitigate HTP , support girls' clubs at schools in life skills training against gender based violence, reduce early marriage, reduce school drop outs
CIDA – Canadian International Development Agency	Maichew	ISY-OSY-2010
CHAI-Clinton Health Access Initiative	Mekelle, Atsbi, Samre, Adi Gudom, Mehoni	Paediatric HIV prevention, IEC/BCC, PMTCT, VCT, safe delivery (SBA)
DKT Ethiopia	Mekelle, Adua, Setit Humera	Social marketing of Condom
Dombosco Schools	Mekelle, Wukro Adua	IEC/BCC
ERCS-Ethiopian Red Cross Society	Mekelle, Aksum	HIV Screening for blood transfusion
Ethiopian Orthodox Church, Tigrai Hagere Sibket	All over Tigrai	IEC/BCC
Ethiopian Muslim Supreme Council-Tigrai Branch	All over Tigrai	IEC/BCC
Ethiopian Catholic Church-Adigrat Dioceses	Adigrat, Mekelle, Enda Selase Shire	IEC/BCC
Farmers Association of Tigrai	All over Tigrai	IEC/BCC
FGAE Tigrai branch -Family Guidance association of Tigrai	Mekelle and Aksum	VCT, PMTCT, IEC/BCC
Intra Health-USAID	46 districts	PMTCT
I-TECH -CDC	Hospitals of Tigrai	ART
IFHP-Pathfinder International	All over Tigrai	IEC/BCC
IPAS Ethiopia	All over Tigrai	IEC/ BCC, safe abortion care
MOND Northern and NW command (Defence)	Mekelle, Edaga Hamus, Dohan, Dansha	IEC/BCC, condom distribution, HCT
MUMs for MUMs	Mekelle, Adua, Maichew, Alamata	Home Based Care, training of FSWs in income generating skills, street children
MSH USAID	All over Tigrai	Community Conversation, HCT
MSF Holland	Kafta Humera, Setit humera, Tsegede	HCT in Humera, prevention of HIV Kalazar co-infection phases out in 2009
MSF Belgium	Mekelle, Adigrat, Alamata	STI treatment, focused on FSWs, phased out in 2004
OSSA-Organization for Social Support against AIDS	Mekelle, Maichew, Humera Adua	HCT, training on HIV prevention,
REST-Relief Society of Tigrai	All over Tigrai	IEC/BCC, PMTCT, distribution of IEC materials for HEWs and CHWs
SGT-NetPlus, PLHIV Association	All over Tigrai	IEC/BCC
TDA-Tigrai Development Association	All over Tigrai	IEC in TDA supported 12 libraries in 12 towns, support for TDA supported schools, Use of circus Tigrai show for HIV prevention
TDVA-Tigrai Disabled Veterans Association	All over Tigrai	IEC/BCC for its members
UNICEF-Ethiopia	All over Tigrai	Contribution to HIV prevention focusing in children
WAT-Women's Association of Tigrai	All over Tigrai	IGA for FSWs ,promotion of PMTCT through Development Army, support girls in school and out of school
WHO - World Health Organization, Ethiopia	Mekelle	Technical and financial support to THB
YAT-Youth Association of Tigrai	All over Tigrai	IEC/BCC on OSY, condom distribution, HCT campaigns

142 This is not an exhaustive list of organisation providing HIV services in Tigrai but rather a compilation of those indentified during the course of this study.

Appendix 6:

Ethical Clearance

ብሂራዊ ክልላዊ መ□ግስቲ ትግራይ
ቢሮ ሓለዋ ጥዕና

The Government of the National Regional State of Tigray, Bureau of Health

7TH AUGUST 2011
Mekelle, Tigrai, Ethiopia
Ref...513/228/2011

ETHICAL CLEARANCE

The ethical clearance committee of the Tigrai Health Bureau here with confirms that the study objectives, methods and approaches on MOT (Modes of HIV Transmission and prevention Response) in Tigrai do not have any conflict of interest be it from the point of view of the team of assessors, the programme implementors or partners who fund the research.

The main objectives are wholly aimed of improving the fight against HIV/AIDS and improviong the social economic impact of the epidemic and the protection of human right issues of the infected and affected populations of Tigrai.

Moreover, the study was undertaken after the request of the Regional HIV/AIDS council, the regional HIV/AIDS Board and the Tigrai Health Bureau/THAPCO, who will be actively involved throughout the study period.

Hagos Godefay
Acting Head, Tigrai health Bureau

7 ☎ 034-4-40-02-22 / 034-4-40-95-01 / 034-4-41-00-99 / 034-4-41-01-00 / 034-4-41-01-01 / 034-4-41-01-02 / 034-4-41-01-03 Fax 251-4-40-88-30 / 251-4-40-28-11 E-mail tigrayhealth@telecom.net.et Mekelle, Tigray, Ethiopia

Appendix 7:

References

Aklilu M, Messele T, Tsegaye A, Biru T, Mariam DH, Van Bethem B, Coutinho R, Rinke de Wit T, Fontanet A; Factors associated with HIV-1 infection among sex workers of Addis Ababa, Ethiopia; AIDS 2001, 15:87-96.

Alliance of Civil Society Organisation of Tigrai. Situation assessment on the contribution of CSOs in HIV/AIDS prevention, care and support programmes, in Tigray Region with due emphasis to the North Western Zone. October 2011.

Armed Conflict, Humanitarian Crisis and the Spread of HIV Infection; An Analysis Of Experiences From the perspective of the war between Ethiopia and Eritrea:

http://teweldebrhan.blogspot.com/2005/05/armed-conflict-humanitarian-crisis-and.html

Assefa A, Rahlenbeck S, Molla K, Alemu S; Seroprevalence of HIV-1 and syphilis antibodies in blood donors in Gondar, Ethiopia, 1989-1993. Journal of Acquired Immune Deficiency Syndromes, 1994, 7(12):1282-1285.

Aytensfisu Y. ; Assessment of the Utilization and Determinants of Vountary Counselling and Testing in the Armed Forces of Ethiopia. Msc thesis on Public Health, Addis Ababa University.; 2006

Berhe T, Gemechu H, de Waal A.; War and HIV prevalence: Evidence from Tigrai, Ethiopia.African Security Review.Volume 14 Number 3 2005.

Berhe T; Assessment of Condom Use for HIV/AIDS Prevention Among the Ethiopian Army in Zalambesa Front, Tigrai Regional State. MPH thesis, Addis Ababa, Ethiopia.; 2005

Belai Hailu;, Fund Management and its utilization in Tigrai HAPCO. MSc in accounting and Finance, Addis Ababa University, Faculty of Business and economics.; 2008

Bishop-Sambrook C; Dynamics of the HIV/AIDS epidemic in value chain development in rural Ethiopia and responses through market-led agricultural initiatives; International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia 2008

Brigg, R et al; Acceptability and Utilization of Services for voluntary counseling and testing and sexually transmitted infections in Kahsay Abera Hospital, Humera, Tigrai, Ethiopia. Ethiop. Med. J. 42; 2004

Controlling HIV/AIDS in Complex Emergencies and Post-conflict Situations: Follow-up to Security Council Resolution 1308. Joint Agency Post-conflict Assessment for Ethiopia. UNFPA/UNAIDS. 2000. data.unaids.org/topics/Security/ethiopia_en.doc

CSA; Demographic and Health Survey of Ethiopia.Measure; 2000; www.measuredhs.com

CSA/ ORC Macro: Ethiopia Demographic and Health Survey (2005), August 2006

CSA; Demographic and Health Survey of Ethiopia.Measure; 2011www.measuredhs.com

DKT and FHAPCO. Study of condom use and behaviour among venue-based sex workers and their clients in major urban areas in Ethiopia, 2009.

Dunkle KL, Jewkes RK, Brown HC, Gray GE, McIntyre JA, Harlow SD. Gender-based violence, relationship power and risk of prevalent HIV infection among women attending antenatal clinics in Soweto, South Africa. Lancet 2004; 363:1415-1421.

EPP/Spectrum estimates. Global Annual Progress Report, Ethiopia 2012.

Ethiopia Global AIDS Progress Report, 2012. 23 April 2012

Ethiopian Health and Nutrition Research Institute (EHNRI); Report on the 2009 Round Antenatal Care Sentinel HIV Surveillance in Ethiopia; 2011.

EHNRI; Impact Evaluation of Ethiopia's National Response to HIV/AIDS, Tuberculosis, and Malaria. FMOH/EHNRI, Addis Ababa, Ethiopia.; 2008

Ethiopia HIV/AIDS Prevention & Control Office (HAPCO) and Global HIV/AIDS Monitoring and Evaluation Team (GAMET). HIV/AIDS in Ethiopia – An epidemiological synthesis. The Global HIV/AIDS Program. The World Bank April 2008.

Ethiopia HIV/AIDS Prevention & Control Office (HAPCO); HIV/AIDS Behavioral Surveillance Survey (BSS) Ethiopia 2005.

Ethiopia HIV/AIDS Prevention & Control Office (HAPCO; Ethiopian Strategic plan for Intensifying multi-sectoral HIV/AIDS response (2004-2008), Addis Ababa, Ethiopia. http://www.etharc.org/arvinfo/HIVstrategicplan.pdf; 2004

Ethiopia HIV/AIDS Prevention & Control Office (HAPCO); Multi-sectoral HIV/AIDS Response Montioring and Evaluation Report 2003 EFY (July 2010- June 2011).

Gabrus L.; HIV/AIDS in Ethiopia, Country AIDS Policy Analysis Project, San Francisco: AIDS Policy Research Center, University of California; 2003

Genet Arefe; Cluster approach & small enterprise support strategy and HIV/AIDS study in Tigrai region, Ethiopia. MA thesis on management of development, University of Larestein, The Netherlands; 2008.

Girma W and Erulkar A. Commercial sex workers in five Ethiopian cities. A baseline survey for USAID targeted HIV prevention programme for most at risk populations. 2009

Government of Ethiopia; Policy on HIV/AIDS, Addis Ababa: GoE; 1998

Kebede Y, Pickering J, McDonald JC, Wotton K, Zewde D;. HIV infection in an Ethiopian prison. Am J Public Health 1991;81(5):625-7.

Kidan KG, Fantahun M and Azeze B; Seroprevalence of Human Immunodeficiency Virus Infection and its association with Syphilis seropositivity among antenatal clinic attenders at Debretabor rural Hospital, Ethiopia; East African Medical Journal, 1995, 72(9):579-583.

Lester FT, Ayehunie S, Zewdie D.; Acquired immunodeficiency syndrome: seven cases in an Addis Ababa hospital; Ethiop Med J. 1988; 26(3):139-45

Livelihood Profile (2007) Humera sesame and sorghum livelihood zone, Tigrai, Ethiopia.

Mehret M, Khodakevich L, Shanko B, Ayohunie S, Gizaw G, Shanko B, et al; HIV-1 Infection and related risk factors among female sex workers in urban areas of Ethiopia; Ethiopian J Health Dev.1990a; 4:163-170.

Mehret M, Khodakevich L, Shanko B, Ayohunie S, Gizaw G, Shanko B, et al; HIV-1 infection among employees of the Ethiopian Freight Transport Corporation; Ethiopian J Health Dev. 1990b; 4:177-182.

Mekonnen Y, Sanders E., Messele T, Wolday D, Dorigo-Zestma W, Schaap A, Mekonnen W, Meless H, Mihret W, Fontanet A, Coutinho RA, Dukers NH; Prevalence and incidence of, and risk factors for HIV-1 infection among factory workers in Ethiopia 1997-2001; J Health Popul Nutr 2005; 23(4):358-368

Mekonnen, Y and Demissie, T.; Baseline survey of most at risk populations in 12 towns in Ethiopia. Transaction Programme, Save the Children USA; 2010. Disaggregated data for Tigrai were kindly provided by the TranAction team specifically for this study.

Mishra, V., Rathavuth, H., & Pav G.; Evaluating HIV Seroprevalence Estimates from Ethiopia: Further Analysis of the 2005 Ethiopia Demographic and Health Survey. Calverton, Maryland, USA: Macro International Inc.; 2008

Mitike, G & Tamiru, M; The drivers of HIV/AIDS Epidemic and response in Ethiopia. Federal HIV/AIDS prevention and control office. 2008

MOH; AIDS in Ethiopia; First Edition. 1996

MOH; Ethiopia's Fourth National Health Accounts, 2007/2008. Health Care Financing Team, Policy, Planning and Finance General Directorate. Addis Ababa. Chapter 5; 2010

Negussie Ahmedin ;. Correlates of premarital sexual practice among high school female adolescents in Maichew Towm, Southern Tigrai. Ma thesis, School of Graduate Studies, Addis Ababa; 2008

Tegabu D, Oljira L, Berhan Y, Tura G, Abraha A et al. Risky sexual behaviours and predisposing factors among Ethiopian university students. May 2011. Federal HAPCO.

Tewelde Y; Assessment of HIV/AIDS related knowledge and its influencing factors among late window of hope population in Aksum town, Tigrai, MPH thesis, Gonder University, Ethiopia; 2007

Tsige Mariam Teklu; Report on TB /HIV treatment in Tigrai, Tigrai Health Bureau; 2011

Vandepitte J, Lyerla R, Dallabetta G, Crabbe F, Along M, Buve A. Estimates of the number of female sex workers in different regions of the world. Sexually Transmitted Infections 2006; 82(Suppl III):iii18–iii25. doi: 10.1136/sti.2006.020081

WHO. Women and Health. Today's evidence tomorrow's agenda 2009.

World Food Programme; HIV/AIDS Analysis: Integrating HIV/AIDS analysis into food security and vulnerability analysis. Vulnerability analysis and Mapping Branch, Rome, Italy; 2008

Yigeremu, et al. HIV Prevalence in 72,000 urban and rural male army recruits, Ethiopia- AIDS 17: 1835-1840. 2003