

Systematic review on HIV situation, gaps and challenges in Addis Ababa, Ethiopia

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Research article

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Abstract

Background HIV prevalence in the Addis Ababa is still higher in key and priority populations. Therefore, this systematic review was carried out aiming in determining the prevalence of HIV, mortality rate by HIV/AIDS and predisposing risk factors, identification of hotspot areas, key and priority populations, availability and utilization of services, and challenges and gaps to be addressed for prevention and control of HIV epidemic in Addis Ababa. Methods The documents relevant to address the objectives were collected from online databases Google scholar and PubMed for published works. In addition, unpublished survey and surveillance reports, performance reports and project assessment findings, and mapping results were collected from partner organizations working on HIV/AIDS prevention and control. Results It appears that the HIV prevalence stabilizes, but varies along areas and socio-demographic groups. The most common hot spots in Addis Ababa are areas where bars, groceries, pensions, guest houses, hotels, brothels, massage houses, khat houses, shisha houses, night clubs, drinking establishments and tourist frequented settings are concentrated. The recognized key population (KP) is the female sex workers (FSWs). There is sexual mixing of key and priority populations (KPPs) with the general population. There are various behavioural, biological and socio-economic predisposing risk factors that drive HIV epidemic, and respective behavioural, biomedical and structural intervention measures are identified in the presence of gaps and challenges to address the problem. Conclusions HIV prevalence in Addis Ababa seems stabilized. However, it varies along different groups of the population. There are many behavioural, biological and socio-economic factors that predisposed to HIV/AIDS. Weak monitoring of the quality of interventions, limited linkage of positive clients, lost to follow up, financial shortage, limited man power and coordination, data quality and gaps in use of program data or research findings are some of the gaps and challenges. Therefore, prevention and control measures using behavioural, structural and biomedical interventions through filling of gaps and tackle challenges should be strengthened in order to prevent and control HIV/AIDS.

Introduction

According to HIV related estimates and projections for Ethiopia [1], there are 610,335 people living with HIV (PLHIV) with estimated adult HIV prevalence being 0.96%. The Ethiopian demographic and health survey (EDHS) 2016 report [2] shows Gambella region (4.8%) and Addis Ababa (3.4%) to have the highest HIV prevalence rates while Somali (<0.1%), and Southern Nations, Nationalities and peoples (SNNP, 0.4%) regional states have the lowest. The adult (15-59) HIV prevalence in Ethiopia is 0.9%, with varying burden by sex, age, and other demographic characteristics, across sub-regions and population groups. The urban HIV prevalence (2.9%) is seven times higher than the prevalence in rural settings (0.4%), women (1.2%) having twice higher HIV prevalence than men (0.6%) [2].

The Ethiopian population based HIV impact assessment (EPHIA) [3] showed that prevalence of HIV is 3.0% in urban settings [3]. This relatively high prevalence of HIV in Addis Ababa initiated us to look into the magnitude of the HIV prevalence, who and why they are affected, the availability and utilization of services for the most affected groups, and the gaps and challenges to address the problem. Therefore, this systematic review was carried out aiming in determining the prevalence of HIV, and mortality rate by AIDS (1), predisposing risk factors (2), identification of hotspot areas (3), key and priority populations (4), availability and utilization of services, and challenges and gaps to be addressed for prevention and control (5) of HIV epidemic in Addis Ababa.

Methods

The documents relevant to be reviewed to address Addis Ababa were collected from online databases google scholar and pubmed for published work starting 2010 using key words and phrases (HIV/AIDS prevalence in Addis Ababa; highly active antiretroviral therapy (HAART) use in Addis Ababa; antiretroviral therapy (ART) and resistance in Addis Ababa; HIV and behavioural, biological and socioeconomic predisposing factors in Addis Ababa; association of HIV with khat, alcohol and drug use in Addis Ababa; HIV and sexually transmitted infections in Addis Ababa; and prevention of mother to child transmission (PMTCT) in Addis Ababa). In addition to published works, unpublished survey and surveillance reports, performance reports and project assessment findings, and mapping results were collected from Federal Ministry of Health (FMOH), Ethiopian Public Institute (EPI), Ethiopian Public Health Association (EPHA), Organization for Social Services, Health and Development (OSSHD), Federal HIV/AIDS Prevention and Control Office (FHAPCO), Addis Ababa HIV/AIDS prevention and Control Office (AAHAPCO), Addis Ababa Health Bureau (AAHB), Population Services International/Ethiopia (PSI/E), American Centre for Disease Control and Prevention (CDC) and World Health Organization (WHO). A total of 241 documents were collected, among which only 109 of them were relevant and used for the quick review. The quick review form was developed to collect all necessary information of the source document with full citation, main findings and recommendations, and to match to specific objectives as indicated in the objective (Supplement 1, Supplement 2). After quick review, 41 documents with relevant information were selected and used. Quantitative data were collected from surveys and performance reports that are done along the years. Based on a closer and in-depth review of quantitative data, the raw information was categorized under exclusive thematic areas based on the specific objectives in order to make the data presentation easier. Furthermore, the quantitative methods were applied in synthesizing of secondary data and present it in table and graph form.

Results

HIV prevalences

Surveys and assessment conducted in Addis Ababa such as EDHS [2, 4, 5], and EPHIA assessment [3] showed that prevalence of HIV is 4.7%, 5.2%, 3.4% and 3.1%, respectively (Table 1). Around 104,851 PLHIV live in Addis Ababa contributing nearly to 17.7% of the PLHIV population in the country, while it contributes 3.5% to the total population of the country [1].

Table 1. HIV prevalence in Addis Ababa from EDHS and EPHIA [2, 3, 4, 5].

Studies	% HIV prevalence		
	Total	Women	Men
EDHS 2005	4.7	6.1	3.0
EDHS 2011	5.2	6.0	4.3
EDHS 2016	3.4	4.2	2.2
EPHIA 2017	3.1	-	-

Prevalences of HIV in Addis Ababa from Antenatal care (ANC) based surveillance of 2005-2014 are in a range of lowest in 2012 (4.4%) to the highest in 2005 (12.1%). The prevalence is relatively higher in 2014 (5.5%) than the prevalence in 2012 (4.4%). In addition, the prevalence from prevention of mother to child (PMTCT) surveillance report of 2016 (1.8%) is lower than the prevalence from ANC surveillance report of 2014 (Figure 1).

Figure 1. HIV prevalence in Addis Ababa, ANC 2005-2014 and PMTCT 2016 [6, 8, 9, 10].

Hotspot areas of HIV transmission

The most common hot spots in Addis Ababa are areas where bars, groceries, pensions, guest houses, hotels, brothels, massage houses, khat houses, shisha houses, night clubs, drinking establishments and tourist frequented settings are concentrated. Condominiums are also mentioned as hotspot areas because sex workers commonly rent condos and are becoming centre of sexual transactions. There are various behavioural, biological and socio-economic predisposing risk factors that drive the epidemic in these hotspot areas in particular and the general population in general [11, 22].

Factors involved in driving the epidemic

1. Behavioural factors

Low comprehensive knowledge about HIV/AIDS; alcohol and khat, shisha, substance abuse; gender based violence including rape; sex with multiple partners; practices of unsafe sex and inconsistent condom use; and dissatisfaction with sexual life in marriage are among major predisposing behavioural risk factors for the spread of HIV [11, 12, 13]. According to study conducted by OSSHD 72.5% of the intravenous drug users (IDUs) in Addis Ababa had the habit of reusing needle and syringe [14]. In addition, early sexual debut, peer influence of young girls to engage in transactional sex, virginity selling, unfaithfulness for marriage, and boyfriend/girlfriend sharing are identified as risk factors for HIV transmission [11, 12, 15]. In other studies, the percentage of men who had sex with non-marital, non-cohabiting partners is highest in Addis Ababa (26%) compared to national (16%). In Addis Ababa, the highest mean number of lifetime sexual partners reported by men is 5.2; and 72.4% of women and 41.8% men reported using condom during last sexual intercourse with non-regular partner [2].

2. Biological factors

Discordant couples have the highest risk of acquiring HIV. From the total HIV positive couples in Addis Ababa, 4.3% of them were found to be discordant [2]. The proportion of disclosure of HIV/AIDS diagnosis to HIV-infected children is low. Almost one in ten HIV exposed infants become HIV positive in Ethiopia. Two and four percent of the HIV exposed babies were HIV positive by 6 and 18 months, respectively [16]. There is low utilization of timely early infant diagnosis (EID) services. Being from the rural residence, home delivery, lack of understanding of the efficacy of ART, negative religious influences, and mixed infant feeding practices increased the risk of HIV transmission to children [17, 18].

3. Socio-economic factors

There are various socioeconomic factors contributing for high HIV epidemic in the City. High concentration of FSWs as means of livelihood; low socio-economic status; increasing sexual practices in massage houses; practice of intergenerational sex; high number of establishment like bars, hotels, restaurants, pastries, day and night clubs, brothels, pensions, local drink

houses, and guest houses; engagement of gate-keepers, brokers and hotel owners in facilitating young girls to have transactional sex; growing number of construction and industry sites leading to increasing daily laborers from all parts of the country; living in groups to share house rent; high presence of movie houses that show pornographies; virtual appointments for dating and sexual relation; presence of naked dancing and call girls service; serving of the cosmetic and cloth shops for drugs distribution; increasing number of migration and visitors; cultural change and moral deterioration are the socio-economoc predisposing risk factors. Similarly, absence of recreational centers for youth, divorce and widowhood are aggravating factors for the spread of HIV in the City [2, 11, 19].

Key and priority populations

MARPs Survey showed that the prevalence of HIV infection were 23% in self-identifying FSWs and 4.5% in truck drivers [20]; 4.2% in prison settings [21] and 5.7% HIV among mobile workers [22]. About 15.5% of drivers have misconceptions about HIV prevention methods [20]. According to recent estimates, there are about 200,000 FSWs in Ethiopia [23]. The majority of FSWs (57.5 %) are 24 years and younger, and about 14% are 19 years or younger [24]. MARPs study [20] also showed that the size of FSWs in Addis Ababa was estimated to be 10,267. HIV prevalence in FSWs is four times higher than the general population.

A total of 4,068 IDUs are estimated to be located in Addis Ababa [25]. The majority (72.5%) of the IDUs from Addis Ababa had the habit of reusing needle and syringe. Of the 177 Addis Ababa residents who claimed to have tested for HIV, 70 (39.5%) disclosed as HIV positive [14]. In addition, the prevalence of HIV among IDUs in Addis Ababa is 6%, and 40% of IDUs reported ever-sharing needles. Furthermore, among HIV-positive IDUs, 60% reported sharing a needle the last time they injected [25]. Male IDUs are higher in number than female users at a ratio of 9:1 and 3/4 of the IDUs were below the age of 35 years [14].

In Addis Ababa, following on identifying FSWs as KP, various priority populations were also identified. The priority populations (PPs) are divorced and widowed persons; HIV-negative

partners in discordant couples; long-distance truckers and taxi drivers and their assistants; paying clients and non-paying ('Balukas') of sex workers; individual engaged in transactional sex including sugar daddies and mummies, and waitresses; daily labourers in constructions and factories; IDUs; brokers, managers and workers in bars, groceries, pensions, guest houses, hotels, local drink houses, massage houses and shisha houses; and vulnerable adolescents and youth (immigrants from all parts of the country, migration returnees, house maids, street children, high education institution students and night school students) [11, 12, 23, 27].

HIV transmission interventions

1. Behavioral interventions

Behavioural change communication (BCC), conducting peer and outreach education sessions, transmitting messages using mini-media and mass-media, condom promotion, and life skill trainings are the common behavioural interventions. The national average performance of condom distribution to MARPs group is 43.9% of the plan while for Addis Ababa it was 28.9% of their plan that is far below the national average. Likewise, the proportion of condom distributed to MARPs is very low, only 18.4% of the total condom distributed in the city [29, 30, Figure 2].

Figure 2. Total condom distributed and condom distributed for MARPs from 2006-2010 EFY [29]. EFY= Ethiopian fiscal year.

2. Structural interventions

Structural interventions aiming to reduce vulnerability or ensuring service accessibility are being implemented including provision of economic strengthening, mapping and identification of hotspot areas and risky target groups, drop-in-centres (DICs), gender based violence and

referral linkage [29, 30]. Findings indicated that economic strengthening interventions are diminishing in scale (Figure 3).

Figure 3. Total number of individuals who were provided IGA training and start-up capital from 2006-2010 EFY; IGA = income generating activities [29]. EFY= Ethiopian fiscal year.

3. Biomedical interventions

Biomedical interventions services are distribution of condom, HIV testing, sexually transmitted infection (STI) screening and treatment, ART, PMTCT and family planning, and ART post-exposure prophylaxis. In addition, ART pre-exposure prophylaxis for FSWs and discordant couples is at piloting stage. More than 10% of the BCC beneficiaries/FSWs had never been tested for HIV [24]. Some parents are refusing to give consent for their children to access HIV testing services (HTS) and ART services [31].

Behavioral, socio-economic and biomedical factors contributed to discontinuation ART. Heavy pill burden, fear of stigma and discrimination, cost and access to transportation, medication side effects, economic problems in the household, long travel due to distance from ART clinics, long waiting times, alcohol drinking, smoking, being with baseline CD4 <200 cells/mm³, having mental illness, being bed ridden functional status, and dissatisfaction with healthcare services were risk factors for ART discontinuation. Males were reported to be most affected by discontinuation from being away from home [33, 34, 35]. More than 6% of HIV positive FSWs who started ART reported discontinuation of treatment for more than seven days in the three months prior to the assessment [24]. With the introduction of appointment spacing, some patients complain of lack of storage space for the six-month supply of ARTs, poor storage conditions for their medicines, and preference of frequent follow up. On the other hand, health workers are also concerned about adherence given the less frequent contact of PLHIV with the health services [36, 37].

The HIV care and treatment service coverage indicated ART coverage is 74.6%, and viral load testing coverage is about 60% with 87.5% viral suppression among those who received viral load testing [29]. The national average for the first, second and third 90's for urban Ethiopia is 72%, 71% and 70.1%, respectively. VLS among

15-64 years of age HIV-positives in urban areas is close to the target (70.1%) but varies by age, sex and region. VLS is distinctly lower at 48.2% in youth 15-24 compared to the adult above 25 years of age. The status of the three 90's for Addis Ababa is below the national urban average. Status of the three 90's in Addis Ababa for the age group 0-64 years is lower than the national average which is: 65.2 % for the 1st 90, 63.3 % for the 2nd 90 and 58.2% of all PLHIV had VLS with viral load level of <1000 copies/ml [3]. In Addis Ababa, the total number of clients on ART were 94,240 and 3,616 were newly enrolled during the reporting period. The retention at 12 months was 87% [29, Figure 4].

Figure 4. Number of individuals currently on ART (cumulative), 2006-2011 EFY [29]. EFY= Ethiopian fiscal year.

The Addis Ababa Mortality Surveillance Program using burial surveillance with verbal autopsy method [41] to identify AIDS and other causes of death showed that HIV/AIDS mortality is higher among females (12.1%) as compared to males (9.5%). Relatively, higher proportion of death due to HIV/AIDS (13.2%) was observed in the age group of 30-49 years [7]. In Addis Ababa from 2007-2010, an overall declining trends of AIDS related mortality was observed. However, starting 2010 onwards it seems stabilized (Figure 5).

Figure 5. Percentage of AIDS death in Addis Ababa from 2007-2011 [41].

Discussion

The current HIV program is applying targeted approaches so that both national and global targets are realized. In cognizant with that, Ethiopia has identified KPPs based on prevalence rate of specific groups and its respective context. The recognized KP group in Ethiopia is the FSWs. FSWs in Ethiopia are identified as KP in response to HIV epidemic as they are highly and consistently exposed to risky sexual practices which lead to HIV infection and transmission. Hence, evidence show that HIV prevalence among FSWs is the highest compared to other risk groups. The density of the FSWs population correlates closely with high PLHIV burden [12, 26, 27]. HIV transmission interventions include behavioural, biomedical and

structural components. The current strategic plan intends to achieve the three 90 targets by 2020 through targeted social mobilization and HIV testing, linkage to care, quality of HIV treatment, and virtual elimination of MTCT, envisioning ending AIDS by 2030 [28].

There is relative decline of HIV prevalence from 2005 and 2016 EDHS findings in the city. However, antenatal clinic (ANC) based surveillance 2014 (5.5%), and PMTCT 2016 (1.8%) HIV prevalence [6, 7] revealed that there is significant variation in reduction of HIV prevalence between the two study findings. Therefore, the comparison of the ANC and PMTCT surveillances findings needs cautious interpretation. There is need of implementing different behavioural, structural and biomedical transmission intervention measures on behavioural, biological and socio-economic factors that predisposed to HIV/AIDS in order to prevent and control rapid transmission. In connection to relatively better economic activities and social services, Addis Ababa attracts productive age groups from all over the country. Besides, the City serves as a gateway to the world. This also implies huge cultural exchange and dynamic and complex sexual behaviour, practices and networking catalysed by the presence of various types of sex workers [11]. There is sexual mixing of KPPs with the general population. The most affected populations are diluted by the general population. These serve as factors impacting the HIV transmission which call for a need to innovative HIV prevention and control strategies. Therefore, targeted activities need to be considered in designing strategies to promote testing and tracing HIV positives. Prevention and control measures should also be strengthened in the general population as well.

Combination ART achieves sustained HIV viral suppression and contributes to improvement in the quality of life, and reductions in mortality, progression to AIDS, opportunistic infections (OIs), hospitalization, and decreased HIV transmission to uninfected persons [32]. The stability of death by HIV/AIDS in Addis Ababa based on the studies [41] may be explained by better adherence follow-up and access for care and treatment.

Noncompliance to medical instruction and poor adherence fosters emergence of drug resistance. In addition, limited availability of laboratory services such as HIV RNA load and drug resistance testing and monitoring due to lack of experience of health professionals, and weak infrastructure and health care system contribute to

delay in diagnosis of treatment failure [38, 39]. The high rate of transmitted and preexisting drug resistance mutations in Ethiopian patients are identified [40]. The finding of HIV-positives with high viral load in some studies [3] alarms the presence of people with high viral load which increases the risk of HIV transmission in the community.

There are gaps and challenges of HIV/AIDS prevention and control in Addis Ababa. Some of the gaps and challenges are weak monitoring of the quality of interventions, limited linkage of positive clients, lost to follow up, long turnaround time of viral load (VL) and EID tests, limited index-case-testings, limited effort in preventing substance abuse, inconsistent supply of test kits and condom, financial shortage, limited man power and coordination, data quality problem, and gap in use of program data or research findings.

The limitations of this systematic review were the bad data quality in most works, and limitations of the secondary information due to their own inherent design and personal errors. Collection of secondary quantitative data was tried for many variables; however, interpretable data were found only for presented variables. In addition, due to many documents excluded, there may be a chance of missing relevant information to be analyzed.

Conclusions

Generally, even if the HIV prevalence is stabilized, the prevalence varies along different groups of the population within socio-demographic factors. There are many behavioural, biological and socio-economic factors that predisposed to HIV/AIDS. In addition, behavioural, structural and biomedical transmission intervention mechanisms are also affected by finance and lack of skilled man-power. Therefore, implementing targeted intervention focusing on primary prevention; update existing manuals and materials to address the current situations; ensuring availability of ARTs, test kits and condoms; broadcast key HIV messages on selected outlets; promote open discussion about sexual and reproductive health; strengthen targeted testing through index-case-testing, case-based-surveillance and social-network-strategy (SNS) to reach undiagnosed and new HIV infected people and linking them to care and treatment services; ensuring legal framework of governing massage houses, drug uses, shisha and khat houses, as well as illegal brokers are recommended in order to solve these

challenges and fill the gaps. If it is able to accomplish these activities with plan in collaboration with partners, there will be bright future prospect to accomplish the three 90's as planned.

Abbreviations

AAHAPCO = Addis Ababa HIV/AIDS Prevention and Control Office

AAHB = Addis Ababa Health Bureau

ANC = Antenatal clinic

ART = Antiretroviral therapy

BCC = Behavioural change communication

CBS = Case based surveillance

CDC = American Centre for Diseases Control and Prevention

CSA = Central Statistical Agency

DICs = drop-in-centres

EDHS = Ethiopian demographic and health survey

EFY = Ethiopian fiscal year

EID = Early infant diagnosis

EPHA = Ethiopian Public Health Association

EPHI = Ethiopian Public Health Institute

EPHIA = Ethiopian population based HIV impact assessment

FHAPCO = Federal HIV/AIDS Prevention and Control Office

FMOE = Federal Ministry of Education

FMOH = Federal Ministry of Health

FSWs = Female sex workers

HAART = Highly active antiretroviral therapy

HTS = HIV testing services

ICT = Index case testing

IDUs = Intravenous drug users

IGA = income generating activities

KP = Key population

KPP = Key and priority population

MARPs = Most at risk populations

MTCT = Mother-to-Child-Transmission

OIs = Opportunistic infections

OSSHD = Organization for Social Services, Health and Development

PEPFAR = President's Emergency Plan for AIDS Relief

PITC = Professional initiated testing and counseling

PLHIV = People Living With HIV

PMTCT = Prevention of Mother to Child transmission

PNS = Partner notification services

PP = Priority population

PPs = Priority populations

PSI/E = Population Services International, Ethiopia

SNNP = Sothern Nations, Nationalities and Peoples

SNS = Social networking strategy

STI = Sexually transmitted infections

UNODC = United Nations Office on Drug and Crime

VL = Viral load

VLS = Viral load suppression

WHO = World Health Organization

Declarations

Availability of data and materials

Not applicable

Competing interests

The author of this review article declared that no potential conflict of interest relevant to this review article.

Author's contributions

MA involved in the conceptualization, document collection, methodology, writing original draft, and editing of the draft to final manuscript.

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ETHICAL CONSIDERATION

Not applicable

Consent to publish

Not applicable

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Figures

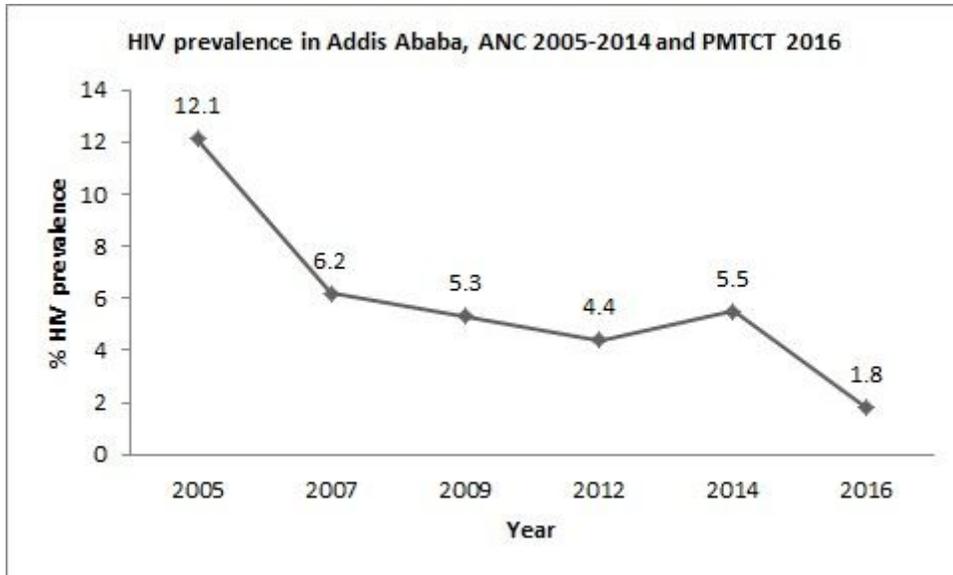


Figure 1

HIV prevalence in Addis Ababa, ANC 2005-2014 and PMTCT 2016 [6, 8, 9, 10].

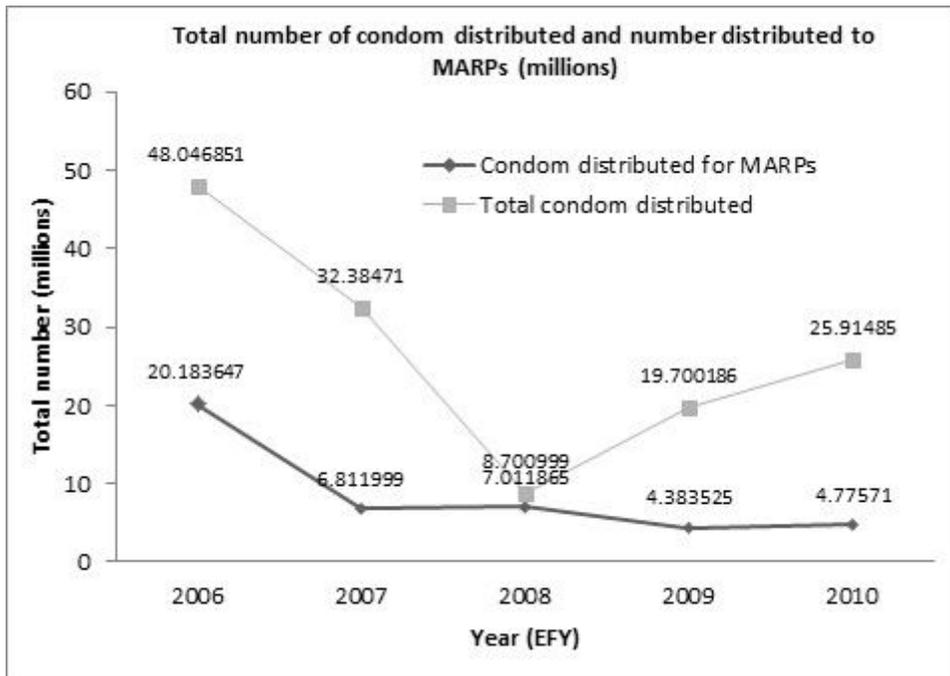


Figure 2

Total condom distributed and condom distributed for MARPs from 2006-2010 EFY [29]. EFY= Ethiopian fiscal year.

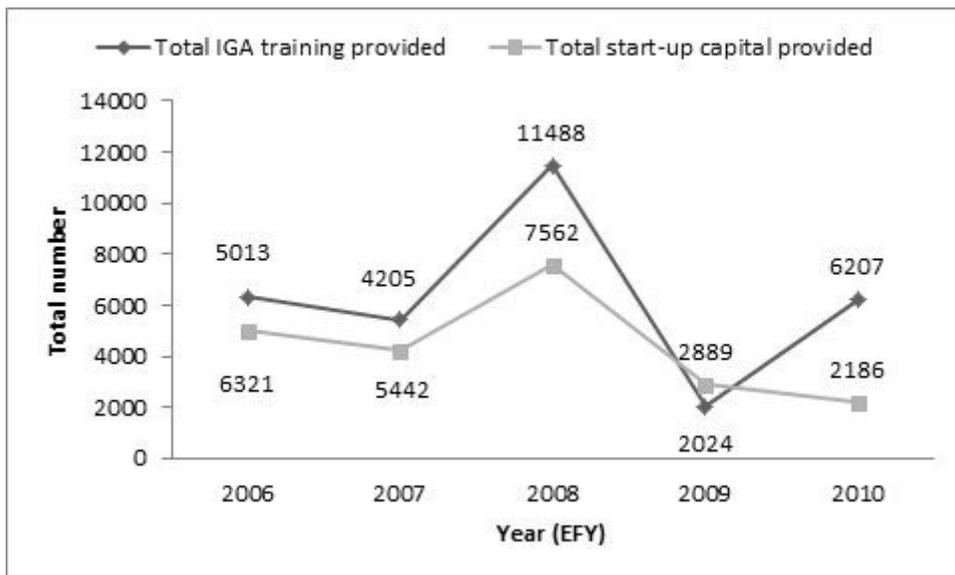


Figure 3

Total number of individuals who were provided IGA training and start-up capital from 2006-2010 EFY; IGA = income generating activities [29]. EFY= Ethiopian fiscal year.

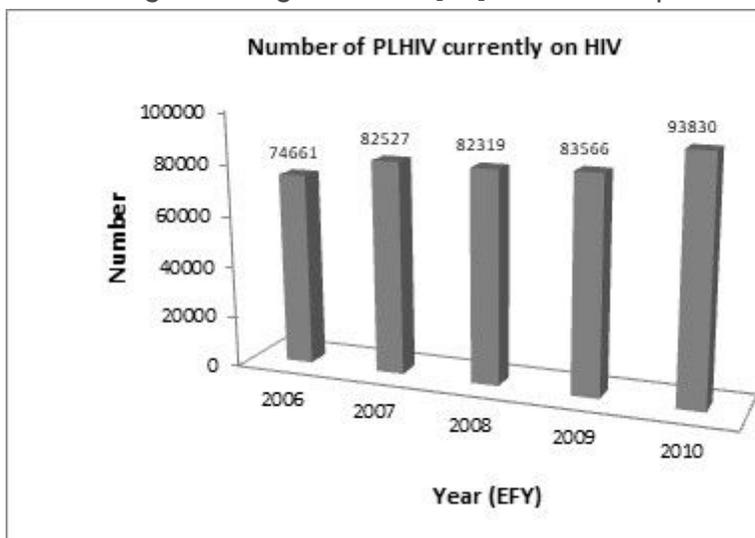


Figure 4

Number of individuals currently on ART (cumulative), 2006-2011 EFY [29]. EFY= Ethiopian fiscal year.

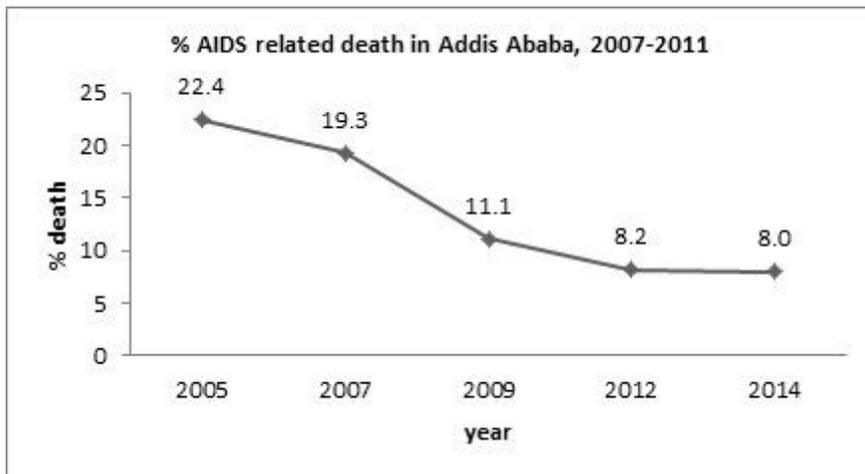


Figure 5

Percentage of AIDS death in Addis Ababa from 2007-2011 [41].

Supplementary Files

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