Bibliography on HIV/AIDS in Ethiopia and Ethiopians in the Diaspora: The 2010 Update

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Introduction
This is the eighth update of the bibliography on HIV/AIDS in Ethiopia, which has been published annually since 2003. All the seven previous issues included published and unpublished research on HIV/AIDS and related health conditions and issues, including other sexually transmitted infections, tuberculosis, and socioeconomic, behavioral and policy as well as risk behavior, gender-based violence, family planning, and relevant health policy and interventions. This update extends the bibliography to cover references not listed in previous updates, both publications and presentations that appeared in 2010 and those that were missed by earlier updates. Following the format of the 2009 Update, this issue presents new references under the same eight main headings, as follows: earlier bibliographies on HIV/AIDS and related health and socioeconomic issues, basic biomedical research, epidemiological, social, and behavioral research, treatment, care and clinical research, prevention research, health services and health policy research, health informatics, monitoring, and evaluation research, and HIV/AIDS research on Ethiopians in the diaspora. Similarly, Section 1 lists earlier bibliographies on topics related to HIV/AIDS in Ethiopia and Section 10 lists of selected websites. The text preceding the reference listing not only highlights representative studies in their respective categories, but also addresses issues and questions that continue to emerge as part of the changing HIV epidemic and expanding interventions. In this update we are giving particular attention to the up scaling of antiretroviral treatment, ART in the country and the expansion and reorganizing of the antiretroviral (ART) delivery services and related issues. In this issue, we are cross-referencing some references in different sections to provide more comprehensive coverage of the epidemiological, treatment, care, prevention and health informatics issues addressed in the same publications.

We used the same methods as in the previous updates to identify and catalog the references. Thus, all new references appearing in 2010 were searched in major databases, including PubMed/MEDLINE, CINAHL, Social Work Abstracts, Sociological Collection, EconLit and POPLINE using the key words “Ethiopia and HIV”, “Ethiopia and AIDS”, “Ethiopia and reproductive health”, “Ethiopia and sexual behavior” and, to identify publications on Ethiopian immigrants in Israel, “Ethiopia and Israel”. Second, journals that were not indexed by these database systems, such as the Ethiopian Journal of Health Development and the Ethiopian Journal of Health Sciences, were manually reviewed for relevant abstracts. In this update, we have included abstracts from major national and international conferences on public health, including the 1) Annual 2010 Conference of the Ethiopian Public Health Association, 2) 2010 International AIDS Conference, Vienna, 3) International Conference on Global Health and the CROI, APHA and AEA conferences. Additional online searches were made on websites of major national and regional HIV/AIDS resource centers, such as http://www.etharc.org, and international organizations (e.g. http://www.unaids.com). Lastly, we again included graduate theses and dissertations prepared in different departments of Addis Ababa University.

This update includes 391 citations, somewhat increased compared to the 2009 update; 143 are articles, 133 conference or workshop presentations, 92 master’s theses or doctoral dissertations, 22 unpublished reports by the Federal Ministry of Health, World Health Organization, UNAIDS, or other international or national nongovernment organizations, and 1 is a book [by OSSREA].

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Figure 1: Presentations at the International Conference on AIDS (A) and Publications cited in PubMed (B) concerning Ethiopia and HIV or AIDS. The increase in presentations in recent years now seems to be followed by an increase in material becoming full-length manuscripts. The highest number of presentations (137) was in Toronto in 2006; conferences located in Bangkok, Mexico City, and Vienna all had ~90 presentations*.


Figure 2: In 2009, there was a large increase in the number of publications concerning HIV, AIDS, and/or tuberculosis and Ethiopia. Again, only 2 publications concerned schistosomiasis and there was a slight decrease in papers concerning malaria, from 36 to 33.

Basic Biomedical Research
There was a modest increase compared to last year in the number (24) and also the percentage (6.1%) of basic laboratory-based biomedical research studies in this update. Of these, 19 (79.2%) were published articles, 3 (12.5%) were master’s theses, and 2 (8.3%) were conference abstracts. Among the topics covered in these studies were those related to drug resistance in either tuberculosis or HIV. While multi-drug resistant (MDR) TB remained low in new Addis Ababa patients tested in 2006 (Agonafir et al. (2010), MDR-TB in retreated patients had nearly tripled to 71% compared to the report by Wolde Meskel et al. Ethiop. Med J. 46:219-225 (2008) in patients tested in 2002. Testing patients in Gondar, however, Mekonen et al. (19) found no MDR-TB in frozen patient samples. Only the abstract of this paper was available and the time frame could not be determined. These studies all used classical drug
susceptibility culture testing (DST) methods. Abebe et al. (1) reviewed new molecular methods for DST. These methods have been deployed at St. Peter’s TB Hospital and more timely reports could be useful in evaluating the course of the TB epidemic. Eight papers concerned the diagnosis by various methods of human and bovine TB. The latter has yet to be reported in HIV-infected Ethiopians, although the potential would seem to be great. Two papers concerned another opportunistic pathogen of HIV patients, Leishmania donovani. It is to be hoped that the abstract and thesis on ART virological failures will soon be developed into full manuscripts.

Finally, we also would urge the Ethiopian Medical Journal find the means to publish their articles online to ensure greater information access and cost savings. Many libraries no longer have non-electronic journal subscriptions.

**Epidemiological, Behavioral, Socioeconomic and Cultural Research**

In this update, we slightly modified the heading of this section to give due attention to socioeconomic factors, particularly poverty as a driving force of the HIV epidemic in Ethiopia, particularly among commercial sex workers and street children. With 80 (20.5%) of all 391 references, this section continues to be the largest, although it has become relatively smaller compared to the three Intervention categories (Treatment, Care and Clinical, Prevention, and Health Services and Health Policy Research), each of which contains more references this year than last, particularly the Health Services section. This shift indicates a strong response of the research community to the research needs created by the rapid expansion of the health resources as part of the rapid antiretroviral treatment (ART) program. As in previous updates, the most frequently researched issues in the Epidemiological, Behavioral, Socioeconomic and Cultural Research section in 2010 were the prevalence and distribution of HIV, TB and other co-infections, individual and inter-personal risk behavior, socioeconomic, cultural, psychological and structural determinants of risk behavior and HIV/AIDS. We are therefore; describing here mainly issues that remain either understudied or were not addressed in earlier updates. A study of the link between HIV risk, pregnancy risk perception and use of condoms among adolescents provides relevant and scarce information for health education programs targeting youth (43). Of the many studies that continued to focus on high-risk females and youth, three studies reported on sexual relations between girls and older men, a subject addressed by numerous studies in other sub-Saharan African countries and a risk factor contributing to generally higher HIV prevalence in young females (28). Research showing an association between lower virginity values among female university students with high value given to boy/girl friend relationships can guide health education messages on the consequences of liberalization of sex (11). A new aspect of sexuality in youths was examined by Magadi (54), whose analysis of Demographic and Health Survey (DHS) data for Ethiopia and another 19 sub-Saharan countries revealed that orphans and adolescents in households with HIV-infected adults initiated sexual activities earlier and were more likely to be infected with HIV.

Other new and understudied issues include the relationship between climate change, migration and HIV infection (14), which may have predictive value in analyzing the heterogeneous distribution and apparent diffusion of HIV in the rural Ethiopian population; predisposing factors for sexual violence against females among prisoners (58); high prevalence of oral sex (9.2%) and anal sex (4.3%) among university students (12) and sexual abuse of male street children (69). A comparison of extensive studies on another harmful traditional practice-female genital mutilation- shows that its prevalence decreased from 61% in 1997 to 46% in 2007 in all regions except Afar and Somali, where infibulations continues to be widely practiced (48).

Persistence of high levels of HIV-related stigma was indicated by a survey of teachers in government and private schools in Addis Ababa shows that most teachers did not intent to teach about HIV/AIDS in the future (47). Useful information on issues surrounding discriminative inheritance and property activities impacting on HIV-affected women is presented in an abstract which also provides a website interested women in 12 East African nations, including Ethiopia, can consult (52).

Several studies focused on pregnancy outcomes, the dilemma mothers face in regard to whether they should breast-feed, and continuing challenges of meeting patients’ needs in perinatal programs. Eshete and Wassie (34), examining the multi-factorial nature of pregnancy outcomes, concluded that infection with HIV, refusal to be HIV-tested, malaria infection and having a husband who is a driver, illiteracy of the mother, and rural residence were significantly associated with low birth weight. A study of the risk perception and practice of breast feeding by HIV-infected mothers (49) points out the conflict facing mothers in deciding whether or not to breast feed in light of the possibility of HIV transmission and stigma attached to avoiding breast feeding. High contraception needs expressed by many VCT attendees (25) emphasize the persisting need for the integration of maternal and HIV prevention programs.

**Impacts Research**

Twenty-two references were included in the Impacts Section, slightly fewer than in the 2009 update. Most studies examined the impacts of HIV/AIDS on orphans and vulnerable children (OVC) (3,6,10,11,12,17,21), fertility desire and decision making of PLWHA (7,13,14,20), and psychological and quality of life impacts (2,4,5,9,10). The socioeconomic status and functions of orphans and vulnerable children (OVC) in the family setting was discussed by two studies. Whereas
one study argued that OVC are basically a burden to families affected by HIV/AIDS (6), another study considered them to be essential for the coping of such families (3). Several studies reported on mental disorders among TB/HIV co-infected orphans (9), general well-being and educational achievement (10, 11), as well as the heavy work loads many OVC carry (21). Two studies examined experiences with and modeling of re-integrating OVC into society (12, 17). Further research will be required to comprehensively assess the socioeconomic functions, assets and liabilities of HIV-infected and affected OVC in the household setting to provide information on their specific needs and the needs of the guardians for further community-based and external support. Among the studies on psychological and quality of life impacts of HIV in the general population, only the one by Abera (4) considered stage of infection; hospital patients with mean CD4 counts above 200 cells/mm³ had better social functioning and mental health and those adhering to ART had higher quality of life scores overall. The finding by Deribew (9) that TB/HIV co-infected individuals had significantly higher risk of common mental disorders has implications for the development of socioeconomic livelihood support programs. All five studies on fertility desire were prepared as Master’s theses (7, 8, 13, 14, 20). Additional research on fertility desire and family planning decisions by PLWHA is urgently needed because of their impact on future epidemiological, demographic and social characteristics of Ethiopia. Studies considering the perception and functional role of HIV symptoms in the decision of individuals and families whether or not to have children, shown by other researchers to be a major factor, will be particularly needed. The other impacts of HIV and TB-maternal and neonatal mortality (1,16,18), armed conflict (15), and drought (19), although examined in studies presented in earlier updates, are inadequately understood and also warrant further research.

Health Services and Health Policy Research

We identified 75 (19.2%) references as studies dealing with health services and health policies, representing twice as many as in last year’s update, apparently due to the increasing need to inform and evaluate the rapidly expanding ART program for the achievement of optimum outcomes. Tesfaye et al. (69) described the structural development of the early phase of the program and Assefa et al. (4-7) summarized recent accomplishments. Among the issues that have received increasing attention by researchers during the last five years are the development of human health resources and task shifting with the objective of scaling up the capacity of the health services to meet the rapidly increasing demands for counseling, testing and treatment services towards the goal of achieving universal access to these services (6,7,70). Interview surveys with providers and AIDS patients and review of records in 23 health center and 32 hospital ART service centers in all regions revealed that in spite of the 10-fold increase of HIV testing between 2005 and 2008, only 61% of the positive patients were linked to chronic care immediately after being tested and that attrition increased from 18% in 2005 to 26% in 2008. The main factors in poor linkage and retention were fear of stigma, transport cost, feeling healthy and using traditional medicines, with food insecurity also contributing low retention (7). Further studies will be required to evaluate the out-transfer of AIDS patients from hospitals to health centers nearer their homes for chronic care as part of ART scale-up to guide activities and programs aiming at improving treatment outcomes and patient retention. Although task shifting from higher qualified to lower qualified health workers has been described in literature covered by recent HIV/AIDS Updates, there is still lack of information on the link between task shifting, ART outcomes and patient retention, considered to be one of the most critical issues for the long-term success ART program (6).

Several studies provide evidence that the Ethiopian Health Extension Program, which is the cornerstone of both the provision of primary health care in rural areas and also the increasingly employed task shifting strategy in the delivery of HIV/AIDS services from scarce medical doctors to community-based health workers, is effective. An evaluation of the contribution of community health workers in Ethiopia, Malawi, Namibia and Nigeria showed that they can contribute effectively and inexpensively to deliver HIV/AIDS services in rural and underserved communities if the necessary working environment can be created (13). Moreover, better antenatal care use and a higher rate of postnatal visits were achieved in communities with high rates of visits by health extension workers (32), and the Ethiopian Society for Obstetricians and Gynecologists, in close partnership with the Ministry of Health, is planning to develop community-based maternal and neonatal health by promoting awareness of obstetrics/gynecology problems and care, self-care, health seeking behavior, and strengthening access to mother and neonatal services (69). The cost-effectiveness of community health workers has been documented. One study calculated the cost of successfully treating each smear-positive TB patients to be only 37% of such treatment by general health workers (15). Moreover, health extension workers were similarly functional and competent in antenatal and postnatal care provided in one health post, although they lacked in delivery, newborn care and technical skills (22). These achievements need to be replicated in other communities to provide more evidence that the health extension program is off to a promising start and to alleviate doubts about its effectiveness expressed by one investigator (38). The general consensus of these and other investigators is that greater attention needs to be given to training and in-service refresher courses, supervision and timely supply of medical equipment and supplies to further increase the functionality and competence of extension community health workers.
REPEATED (See earlier Paragraph) There is a need to improve the management of health information in health posts to increase the efficiency of the health extension program as indicated by a survey of 60 health posts in Tigray Region (63). Four Ministry of Health publications presenting guidelines for a framework for linking health provider-initiated counseling and testing (PICT) (52) and health training packages for HCT (43,44) and the TB, malaria and HIV control program (53) are essential for ART scale-up implementation. Addisse et al. (2) described the progress made by 35 community service organizations toward developing and implementing a HIV and AIDS workplace policy. Another publication bearing on HIV/AIDS policy suggested the incorporation of community-based care into the national continuum of care package (42).

The mobilization, functionality and impact of other community-based health resources, both health workers employed by the health services and volunteers, is described in this update by more studies than before. Of the former, peer educators were found to be an essential component of prevention programs among mobile migrant populations (No. 54 in Prevention Section), case managers or “expert patients” effective promoters of ART adherence (nos. 4 and 28 in Treatment Section), and dispensers of contraceptive pills and condoms in VCT sessions (25). These authors proposed that community counselors also be employed to administer injectable contraceptives as in many other developing countries to increase the effectiveness of integrated family planning/VCT services. Para-social workers are underdeveloped health resource for the care of HIV-orphans and vulnerable children in sub-Saharan Africa. Strengthening of the social workforce is acutely needed in Ethiopia with its large orphan population. A collaborative training program of para-social workers between Ethiopian, Tanzanian and Nigerian universities also promises to generate south-to-south technical assistance (9, 37). Five studies reported that the participation of volunteer groups strengthened different HIV/AIDS programs. One study found youth groups to be effective empowerment and advocacy groups which had gained a voice at decision making (nos. 9 and 48 in Prevention Section) and another one described the role of mother support groups in promoting ARV prophylaxis and facility-based deliveries among mothers (No. 27 in Treatment Section). Support given by the Ethiopian Orthodox Church to guardians of orphans and vulnerable children (No. 18, Treatment Section, No. 58 in Prevention Section) and the challenges faced and burden carried by families and other relatives and friends of AIDS patients on chronic care (No. 37, Treatment Section) are promising, but understudied approaches to providing care. Four studies of the impact of malnutrition and socioeconomic status on PLWHA, in addition to those in the Prevention Section, reflect the concern over the impact of persisting food insecurity on voluntary care givers. Weiss et al (No. 62, Treatment Section) estimated that nutritional needs of PLWHA with symptoms being at least twice as high as of PLWHA without symptoms due to their weakened immune system. Maes (39) questioned the sustainability of health care voluntarism in view of the deepening food and financial crisis in Ethiopia and other poor countries and the assumption that local communities are a major source of “untapped moral and social energy”. Although community extension workers and several other types of community health workers are being paid in Ethiopia, more research is required on the various issues surrounding the demands placed on and the capacity of volunteers working in community-, organization- family-based anti-AIDS activities and projects to evaluate the sustainability of voluntarism.

Several studies examined the contribution of traditional burial societies (iddirs) to HIV/AIDS programs. These community-based organizations are increasingly functioning also as indigenous health insurance providers, helping to provide low-cost and effective home and community-based chronic care for HIV/AIDS patients and their families (57, 73, 75). The generally high demand for iddir membership, team spirit and their capacity to be self-supporting financially make iddirs sustainable, a critical quality of community organizations (12, 57). One pilot program showed that palliative care can reduce stigma and discrimination, increase acceptance and use of VCT, improve PLWHA well-being, improve household economic conditions of beneficiaries, and increase community support of iddirs (73). Evaluation of that iddir-supported palliative care program, which is linked to local health facilities in 14 major cities, shows that it reduced stigma and discrimination of PLWHA and vulnerable children, increased use of VCT for HIV, improved the well-being of PLWHA, improved the economic stability of affected families and orphans, and increased community support for iddirs (73).

The rapid expansion of the ART delivery system in Ethiopia has been a remarkable achievement considering the logistic challenges and infrastructure problems. By March 2010, the latest month covered by the Ministry of Health’s monthly HIV Care and ART Updates, 183,254 AIDS patients were receiving ART from 535 treatment sites (54), a 9-fold increase since February 2006, a few months after free treatment was provided and when the Ministry of Health first issued monthly reports on ART uptake nation-wide. The success of the program is also revealed by the enrollment in the ART program of a socio-economically representative segment of the population, including many poor people (26). On the provider side, however, persistence of high attrition of health workers in regional communities points out the need for greater support of health personnel working in rural areas (28). Additional forces in health manpower attrition, including the pull of the private sector and of international HIV/AIDS partners, are examined by

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several studies in the Health Informatics, Monitoring and Evaluation Section. Further studies are needed on health manpower attrition in the public health sector to identify deficiencies in manpower development, with the objective of strengthening human health resources in the regions, particularly rural areas. Another persisting impediment to health services development and accessibility of ART and TB services is the cost to users accessing these services. Costs ranging from 33-40% of annual household income were reported for pre-treatment and treatment of HIV and TB, with even higher costs for treatment of TB (72). Another study estimated the costs to patients and their escorts to be seven times higher than the cost incurred to the public health system (46). The authors of these two studies suggested possible cost-cutting measures through early diagnosis of HIV through a more effective referral system and efficient screening of suspects, and the provision of free diagnostic services, alternative care providers.

Prevention Research
Although there is some overlap between some prevention, treatment and health services issues, particularly in the integration of prevention of mother-to-child transmission (PMTCT), family planning and ART programs, and the involvement of patient and facility factors in adherence and patient retention, research cited in this section is of a predominantly preventive nature. Of the 72 references included in this section, more than a quarter dealt with young people and gender issues (20 references), prevention of mother-to-child transmission (PMTCT) HIV prevention (11 references), counseling and testing (10 references), and condom use and social marketing (9 references). Three studies summarized recent achievements by youth-led advocacy and empowerment groups in supporting HIV prevention for youth (9, 48, 62), one study each reported favorable attitudes and increasing demand for STI health services by rural youth (53) and university students (60), and another on the development of a program for the enhancement of reproductive health and rights for female university students (65). Similarly, girls’ and anti AIDS clubs were reported to improve communication on sexuality among high school students and with parents (57). A survey of youth behavior and socioeconomic characteristics bearing on HIV and STI risk among 10,080 adolescent boys and girls in seven regions concluded that few young people had received information on sexual or reproductive health or puberty from parent, their school and the health services, boys in particular obtaining information from friends; the many young people living away from parents should have better access to health services, social networks and safety nets; programs should provide skills to young men on how to prevent violence in marriage and place greater emphasis on marital transmission of HIV; youth centers should be staffed equitably by males and females to encourage more females to participate in more sex-specific programs; and the potential of religious institutions for implementing youth educational and development activities should be explored (28). The UNESCO publication International Technical Guidance on Sexuality, which provides advice for developers and implementers of school-based sexuality education programs, has been introduced in some Ethiopian schools as a resource for sexuality education and HIV prevention, but research is required on the development of partnerships between stakeholders at the school and community levels (4). It has also become evident that the design, implementation and evaluation of behavioral and socioeconomic interventions among youth will have to be more rigorous and include HIV testing of study populations. A review of 1,200 studies on HIV prevention among youth in sub-Saharan Africa, including Ethiopia, concluded that the great majority of interventions remain weak, largely because of the failure to include biological markers necessary for the evaluation of programs (27).

Three studies referenced in this update presented encouraging evidence that gender equity for HIV prevention and violence may be achieved in different urban populations through community-based communication activities and if inequitable gender norms can be changed towards greater male involvement in programs (43,46,61). Similarly, a PMTCT pilot project showed that male participation can be significantly increased by challenging traditional social norms and by making health services more welcoming to men (37). In another pilot intervention, Asefa and Mitike (6) noted facility-based deficiencies in the low quality of PMTCT. A well designed PMTCT project addressing some of these and other problems resulted in more HIV-positive women delivering in hospitals and having their CD4 counts tested, as well as in larger percentages of male partners tested for HIV (4). A city-wide review of health records in Addis Ababa revealed that although the proportion of partners tested for HIV decreased between 2004 and 2009 and of young children on ART (nevirapine) in 2007 had decreased by nearly half by 2009 (zidovudine), the infection rate among all ANC attendants decreased from 10.5% in 2004 to 4.6% in 2009, reflecting the larger number of women being tested (51). Further studies will be required to inform in the scaling up of the PMTCT programs in smaller regional and district towns and rural areas, which depress MTCT rates in Ethiopia to one of the lowest world-wide.

According to the 2010 UNAIDS Report (59), condom use among males was still less than 10% and near zero among women in Ethiopia in 2009, among the lowest rates in sub-Saharan Africa (UNAIDS 2010). National PMTCT coverage in 2010 was estimated below 20% and ANC coverage less than 30% (59). Four studies provided encouraging information about increasing accessibility, effectiveness and patient satisfaction with ANC/PMTCT services in different health facilities and programs (5, 6, 21.13, 21, No. 41 in Health Services Section). One study
described a novel approach (apparently the first time to be used in Ethiopia) to distributing condoms at gas stations, where housemaids and other females lacking direct access to health facilities can obtain them (5). Two other publications reported that intended and actual condom use by low-illiterate rural females were strongly related to psychosocial factors, including self-efficacy (14,15), indicating the need for stepped-up health promotion and counseling activities in rural areas, in addition to increasing the accessibility of condoms.

Ten studies reported on the development and impact of health promotion, communication and VCT programs. They included studies of the behavioral changes achieved with effective HIV prevention messages among illiterate rural women (12), modeling of intended use of VCT among school teachers (59), the lower use of mobile VCT services, but higher HIV prevalence among tested women than men (42), high disclosure rates of positive HIV status by female ART patients to partners (30), HIV risk reduction with a prevention education program involving drama, role play and drawings to break community silence about HIV/AIDS and stimulate discussions (64), and assessment of the extent, barriers, and improvements in communication on sexual and reproductive health issues among parents and their children (19,31). Encouraging results of pilot projects in stigma reductions were reported by Desta and McCrossan (26,43) who used a participatory-based intervention and the latter community conversations, a participatory strategy sensitizing communities to and empowering communities to reduce risk behavior which was first introduced in Ethiopia about 10 years ago (71). Morrone et al. (54) informed on a peer education method using trans-cultural mediators among Somali pastoral nomadic populations in Ethiopia, Somalia and other African countries.

Six studies focused on HIV/AIDS prevention among high-risk and hard-to-reach groups. Two studies examined HIV prevention options and economic support for commercial sex workers (49, 17); Tadele (65) addressed safety concerns and practices of men having sex with men. Desta (26) reported the low knowledge, high HIV denial rates and resistance to using condoms, and low use of prevention services among Afar pastoralists. Any progress in HIV/AIDS reduction among these and other pastoralists demands the development of culturally appropriate interventions (26, 54). Although health workers are usually not included among high-risk HIV groups, two studies on their occupational exposure are cited here since they indicate the need for stepping up preventive measures among this group. A retrospective study of HIV exposure by health personnel in health facilities revealed that even though 68.5% of them had been exposed in the past, only 18.4% used post-exposure prophylaxis due to lack of information, fear of stigma and discrimination, lack of understanding the need for and support in reporting (No. 58, Treatment Section).

Another study found similar exposure rates and that nearly half of the health workers reported unsatisfactory supply of infection prevention materials, and a similar proportion had unfavorable attitudes toward standard precautions such as recapping needles, indicating the need for strengthening supervision and training (No. 61, Health Services Section).

Increasing attention is given by researchers to the potential of and need for improved nutrition in ameliorating HIV infection. Besides general nutrition, adequate intake of vitamin A is receiving increasing attention by researchers as an HIV suppressant. One study reported lower serum protein, albumin and serum vitamin A serum levels in HIV-infected than non-infected women pregnant and non-pregnant women (No. 59, Epidemiology Section). Production and consumption of vegetables which contain high levels of vitamin A was encouraged by two studies (1, 2). The high prevalence of food insecurity among PLWHA (69, No. 62, Epidemiology Section) is a stark reminder of the impediments in ART adherence and outcome. Another urgent, but understudied approach to improving general health levels in populations at risk of HIV infection and reducing the risk of co-infections in HIV-infected persons involves the integration of water, sanitation and hygiene into HIV/AIDS programs (10).

Four studies dealt with positive and negative impacts of traditional surgical procedures. Gebremedhin (33), reviewing 18 Demographic and Health Surveys in sub-Saharan Africa, including Ethiopia, found a strong association between male non-circumcision and HIV-risk. WHO and UNAIDS have developed a manual and training package for safe male circumcision and an African NGO has been training clinicians in Ethiopia and five East African countries (7). Two studies provided new information on harmful traditional practices, one showing a statistically significant association between surgical procedures in the oropharyngeal area and HIV infection (52). The other study used community conversation and dialogue to promote the abandonment of female genital mutilation/cutting (FGM/C) among different ethnic groups. This latter study provided information for better understanding of the process of behavioral change within communities and the interaction and contribution of different local and outside actors (24). These insights can facilitate the scaling up of strategies to encourage abandonment of FGM/C and should be followed up with evidence-based studies.

**Treatment, Care, and Clinical Research**

Sixty-one of the 358 (17%) references in this update were classified in this category. Researchers again addressed a wide range of clinical and non-clinical issues in the provision of treatment and care of patients with AIDS and related diseases, adherence and treatment outcome. Most studies dealt with treatment outcome, survival and mortality, mostly of AIDS patients, but also TB/HIV and
**HIV/Leishmania donovani** double infections and TB (3,5-7,9,14,16,31,33,36,47,48,52,53,56,57) and adherence to treatment (4,13,21-24,32,46,59-61). Although the incidence of death of persons on ART is not well documented in Ethiopia and other African countries, the peaking of mortality among patients newly enrolled in treatment programs, their overall beneficial impacts and major determinants of mortality, such as low CD4 counts, nutritional status, having advanced disease, WHO stage IV, and poor adherence to ART, have been reported by many studies. Some of the studies in this update identified new and understudied factors in ART-related mortality. Of the two studies comparing ART outcomes between hospital and health centers, one reported no differences in mortality and loss to follow-up (3) and the other found significantly better outcomes at health centers (9). These findings indicate that the rapid ART scale-up nation-wide has not compromised the quality of treatment at health centers, which are serving increasing numbers of PLWHA. Another study found age group above 45 years and drug regimen 1b ( stavudine, lamivudine and nevirapine) to be significant predictors of mortality from AIDS (6). An 8-year retrospective study of successfully treated tuberculosis patients associated older age, sex (males) and non-farmers with higher mortality (16). Shaweno (52,53) and Getahun (25,26) examined treatment outcome of tuberculosis patients on DOTS, the former reporting the synergistic impact of HIV/TB on mortality. The beneficial influence of HIV/AIDS testing on treatment-seeking behavior of tuberculosis patients (8) adds to the importance of testing centers in stemming the epidemic. Poor tuberculosis treatment outcomes in a health center in southern Ethiopia were attributed to the lack of focused measures (48) and major deficiencies of TB treatment in six TB clinics in Afar Region were associated with deficient staffing, supervision, laboratory supplies and patient-provider relations (29), all problems which have been reported from other pastoralist areas in Ethiopia.

The 2010 WHO treatment guidelines, which recommend earlier initiation of ART, at a CD4 count of <350 cells/mm (rather than the old standard of CD4 <200 cells/mm), increases the number of Ethiopians medically eligible for antiretroviral therapy by about 30% (No. 70, Prevention Section). They will need to be considered in the planning and management of individual ART delivery centers and ART outcomes, utilization and coverage. The resulting further increase in the number of PLWHA who will be put on ART and the possibility of transmitted drug resistance point out the need for stepped up surveillance to maintain high drug efficacy. The rapid increase in ART had not revealed transmitted drug resistance above the 5% WHO threshold level in newly infected individuals in Addis Ababa in 2008, referred in our 2009 HIV/AIDS Update. However, there is mounting evidence that drug resistance is gradually developing in Africa (65), following the trend in the industrialized countries.

Although high adherence rates in ART have been reported from most hospitals studied (28), loss to follow-up continues to be of concern in health facilities, reflecting limited capacity and quality of some health services and levels of stigma towards PLWHA. A 6-year HIV cohort study reported that a quarter of all patients were lost to follow-up before starting ART, particularly those presenting with less advanced disease stage and living in rural areas, that PLWHA increasingly reported earlier, and that the mortality rate of those who did start treatment declined over time (36,47). In addition to the previously reported patient- and facility-related factors in losses to follow-up, level of readiness for ART, which is associated with level of apprehension and hopelessness, was reported to be a strong predictor of adherence to ART (61). While one study found access to ART to alleviate stigma among PLWHA (55), another study reported that some HIV-infected persons missed taking ARTs because of self-perceived stigma, contributing to the high non-adherence rate in that health facility (22). The finding of a study that defaulting from ART was significantly associated with lack of knowledge about the consequences of discontinuing treatment, doubts about and loss of interest in ART and use of alternative medicine indicate the need for continued counseling during chronic treatment (23). The fact that all patients missing doses in a hospital population were due to either forgetfulness, lack of food, being too busy, transportation problems and being away from home (46) indicate the precarious living conditions of this population. Addressing the issue of possible over-reporting adherence by self-reporting, one study concluded that adherence measurement may be standardized by using existing routine patient data (No. 8, Health Informatics Section) and another study developed a Bayesian Network model to predict adherence trends in the affected population (No. 26, Health Informatics Section). Several studies reported the beneficial role of facilitators of ART adherence, including the utilization of case workers (4, 32) and parents influencing their HIV-positive children. Particularly promising is the utilization of case workers or ‘expert patients’, who were accredited in one intervention trial with increased ART uptake and adherence, and reduced loss to follow-up (4). Another study reported the beneficial effect of palliative care on ART adherence (20), Talman et al. (56) found that children had higher ART default rates than adults and that most losses to follow-up were due to administrative errors (duplicate charts, incorrect address, etc.), death and changing place of residence, indicating the need for improved documentation and collaboration with community-based organizations. Information on referred patients for use by destination facilities appears to be similarly deficient, as indicated by a study of TB screening and referral linkage among HIV patients attending central and regional hospitals (35), requiring further studies of patient referral practices.

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Six studies focused on issues related to chronic care and support of orphans and vulnerable children (18), the training and use of para-social workers to assist and support vulnerable children and families (No. 37, Health Services Section), the challenges faced by the many poor care givers serving terminally ill patients (37), the development of urban gardens to help HIV-infected females on ART cope socioeconomically (49), improving the nutritional status of infected mothers (62) and the use of holy water (13), which not only has spiritual benefits for terminally ill patients, but may also constitute a risk factor by delaying antiretroviral treatment. Other six studies examined treatment effectiveness and clinical and immunological parameters of HIV, TB and HIV/Leishmania donovani co-infections (31, 33, 52, 53, and 64). Several studies dealt with psychosocial problems of PLWHA on ART experience, particularly the prevalence and causes of mental disorders (39, also No. 9 in the Impacts Section) and their quality of life (6, 14). PMTCT using antiretroviral prophylaxis for infants (49), and clinical aspects and risk factors, particularly malnutrition in mothers and children (57, 62). Mental health, quality of life and nutritional issues remain understudied in view of the prevalence and magnitude of these problems among HIV-infected and affected persons in Ethiopia.

One issue which has been of considerable concern since the scale-up of ART world-wide, the impact of treatment and improvement in health on the sexual behavior of PLWHA on treatment, has received little attention in Ethiopia so far. Longitudinal studies in several other sub-Saharan countries showed that their risk behavior does not significantly increase during the course of treatment and even decreased in one study. While these findings alleviate concerns about the continuation of high-risk sexual activities by patients on ART, additional longitudinal studies are needed to examine this relationship in the Ethiopian context. A retrospective study of this issue in Ethiopia in 2010 found that a large proportion (37%) of 1,781 AIDS patients on ART engaged in risky sex during the period three month prior to the study (17).

Health Informatics, Monitoring and Evaluation Research
In this update, 34 (8.7%) covered a growing diversity of health information and/or monitoring and evaluation issues. Most studies dealt with the introduction of new information technology, teaching methods and mainstreaming programs (3, 8, 12, 21, 23, 24, 28, 29, 33, 35). A community score card process was implemented which facilitates and measures accountability of all organizations providing HIV/AIDS related social services and promotes discussions of challenges and opportunities with multiple stakeholders (3). Development of HIV/AIDS prevention messages for illiterate rural women (no. 14 in the Prevention Section), the issuance of revised provider-initiated testing and counseling guidelines for HIV/AIDS service centers (nos. 50, 51 in the Health Services Section) and implementation on a strategic framework for linkages and referral HCT and chronic HIV services (nos. 40, 41 in the Health Services Section), as well as the use of routine data to measure ART adherence (8) all can contribute to render prevention, treatment and care services more effective. The development and implementation of an innovative information technology which significantly reduces data transfer and report processing time (28), integrated programming (29) and video conference-based distant learning between institutions in Ethiopia and other countries (25) promise to have applications beyond HIV/AIDS programs.

The rapid scale-up of ART services in Ethiopia was discussed by several publications in addition to those listed in the Health Services, Prevention, and Treatment Section. They focused on patterns and impacts of HIV/AIDS service utilization and scaling up of services (16, 20, 23, 27, 31, 36, 37). A particularly relevant study analyzed the impact of the response of Ethiopia and four other African countries to the HIV epidemic over the last 25 years using micro-simulation and DHS data; the results provide decision makers with quantitative information on the long-term impact of their investment and thus to build their case for the continuation of HIV/AIDS funding (20). One study evaluated the potentially negative impact of the rapid up-scaling of the national ART program on human resources (staff number and composition, in-service training, supervision, time allocation, and motivation), service delivery and medical products for other priority health care services. Results from interviews with health workers in 57 primary care facilities in four regions revealed improved services in nearly all categories (No. 10 in Health Services Section). An evaluation of PEPFAR’s (President’s Emergency Plan for AIDS Relief) impact on major health parameters in Ethiopia and other sub-Saharan countries showed that while the under-5 mortality rates decreased significantly in PEPFAR focused countries, no significant changes were recorded in the malaria-related death rate, TB mortality rate, and infant immunization rates (27). These results point to the need for further strengthening of the HIV/TB/malaria initiatives and integration of HIV/AIDS-related activities into primary health care. A cost analysis of the PEPFAR-funded orphan and vulnerable children programs in Ethiopia shows that costs per child decrease with the scaling up of programs (32). Further research is required to comprehensively evaluate the effectiveness and quality of institutionalized orphan care, which has been associated with various management problems in several other sub-Saharan countries. But the absence of a national human resources policy for the health policy may hamper the performance of international aid agencies. One study pointed out the need for better coordination of multiple donor preferences and capacity building of local organizations receiving funds from the Global Fund (No. 31, Health Services Section).

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Relatively few studies examined in 2010 the effectiveness and quality of programs (5, 17, 18, 30, 32). A review of all ANC records in Addis Ababa revealed that while VCT increased sharply and HIV prevalence decreased more than half among attendees and from 14.3% to 8.2% among their exposed infants between 2004 and 2009, PMTCT service utilization remained below 45% and VCT among partners decreased from 6.1% to 5.3%. These data and the fact that PMTCT service utilization rates are significantly lower in smaller towns and rural areas (No. 48, Health Services Section), represent a major challenge for achieving the country’s goal of a “HIV-free generation by 2020” (23). One study evaluated the potentially negative impact of the rapid up scaling of the national ART Program on human resources (staff number and composition, in-service training, supervision, time allocation, and motivation), service delivery and medical products for other priority health care services. Results from interviews with health workers in 57 primary care facilities in four regions revealed improved services in nearly all categories (No. 10, Health Services Section).

**Diaspora Research**

Following the pattern of research listed in the Diaspora Research section in earlier updates, most of the 13 references included here pertain to clinical and epidemiological research. Seven studies focused on tuberculosis (1, 3-7, 11, 12), one each on HIV/TB and HIV/Leishmania donovani co-infections (4, 7,) and two on HIV/AIDS (2, 9). Stigma and breastfeeding (10, 13) and epidemiological differences between native-born African-Americans and African immigrants (8) were addressed by the remaining studies.

**Section 1. Earlier Bibliographies on HIV/AIDS and Related Health and Socio-Economic Issues**


**Section 2. Basic Biomedical Research**

This section covers laboratory-based biomedical research, including studies on HIV structure, replication, and host immune responses; co-infection with other agents; development and testing of laboratory procedures; and other related laboratory studies.

5. Ameni G, Aseffa A, Hewinson G, Vordermeier M. Comparison of different testing schemes to increase the detection *Mycobacterium bovis* infection in...


Section 3. Epidemiological, Behavioral, and Socioeconomic Research

This section includes studies on the epidemiology of HIV and other opportunistic infections, AIDS and related diseases, and risk and protective behaviors. It also covers research on the biological, psychosocial, socioeconomic, cultural, structural, and other contextual determinants of HIV transmission and prevention.


3. Abegaz WM. Challenges of female students and their vulnerability to HIV/AIDS in Dessie town

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private TVETs [MOL thesis]. Azusa Pacific University; 2006.
10. Alemu T, Tadesse H, Kebede D. Explorative assessment of factors predisposing to homosexuality and subsequent HIV infection among orphans and vulnerable children living on the streets of Dilla Town, southern Ethiopia. 21st Annual Conference of the Ethiopian Public Health Association; 2010; Mekele, Ethiopia. Abstract No. 8.


35. Eticha BT. Syphilis prevalence among patients who visit the ART and VCT centers of St. Paul’s Hospital, Addis Ababa [MSc thesis]. Institute of Pathobiology: Addis Ababa University; 2010.


42. Gubena FW. Seroprevalence of toxoplasmosis and immune profile of HIV infected and non-infected subjects in Bahir Dar [MSc thesis]. School of Public Health: Addis Ababa University; 2010.

43. Haile Mariam TA. Exploring the link between HIV and pregnancy risk perception and contraceptive use among youth in Debre Berhan District [MPH thesis]. School of Public Health: Addis Ababa University; 2010.


45. Kebebew T. Stigmatizing and discriminatory attitude towards PLHIV among high school students. 18th International AIDS Conference; 2010; Vienna. Abstract THPE0930.


52. Lukera M, White S. Inheritance Legal Network in Eastern and Southern Africa: Responding to HIV/AIDS and discriminatory application of inheritance laws through collaborative exchange of knowledge, information and expertise. 18th International AIDS Conference; 2010; Vienna. Abstract THPE0933.


54. Magadi M. A cross-national analysis of the association between HIV/AIDS and adolescent sexual and reproductive health in Sub-Saharan Africa. 18th International AIDS Conference; 2010; Vienna. Abstract TUPE0249.


66. Tadesse S. Harmful traditional practices affecting the lives of young girls and pre-disposing factor to becoming infected with HIV/AIDS: The case of Borena Zone, Oromiya Region of Ethiopia. 18th International AIDS Conference; 2010; Vienna. Abstract TUPE0658.


68. Tefera G. "Unrecognized victims": Sexual abuse against male street children in Merkato area, Addis Ababa. 18th International AIDS Conference; 2010; Vienna. Abstract TUPE0531.


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Section 4. Impacts Research

This section includes studies on the characteristics and clinical course of HIV infection and opportunistic infections, treatment to AIDS and opportunistic infections, effects and outcomes associated with treatment, clinical and non-clinical care and supportive services provided to people living with HIV/AIDS.


Section 5. Health Services and Health Policy Research

This section includes reports on research and programmatic activities that are aimed at expanding and improving the healthcare system, including such issues as expansion of services for people living with HIV/AIDS, health resource economics and management, healthcare staff training, and national as well as international health resource economics and management, healthcare expansion of services for people living with HIV/AIDS, women, children, and other vulnerable groups.

1. Abebo TA. Assessment of sexual practice and reproductive health needs of people living with HIV/AIDS who are on ART at three selected hospitals and health centers in Addis Ababa [MPH thesis]. School of Public Health: Addis Ababa University; 2010.


7. Assefa Y, Van Damme W, Mariam DH, Koos H. Toward universal access to HIV counseling and testing and antiretroviral treatment in Ethiopia: looking beyond HIV testing and ART initiation. AIDS Patient Care STDs. 2010;24:521-525.


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64. Sanders R, Mekonnen Y. Equity and access to ART in Ethiopia. 18th International AIDS Conference; 2010; Vienna. Abstract TUPE0981.


68. Tamiru M, J. H. Hospital bed occupancy and HIV/AIDS in three major public hospitals of Addis

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Section 6. Prevention Research

This section includes reports on research and programmatic activities that are aimed at provision of prevention services targeted against HIV/AIDS and related opportunistic infections. Included in this section are studies on information and behavioral change communication, provision of voluntary testing and counseling and mother-to-child transmission prevention services, community mobilization, and other efforts against HIV/AIDS.


6. Ashengo T, Curran K, Mulwanda J, Chinkoyo E. Surgical time and number of procedures conducted during training varies by type of adult MC procedure. 18th International AIDS Conference; 2010; Vienna. Abstract MOPE0344.


22. CDC. Global reproductive health: Modeling and reinforcement to combat HIV/AIDS (MARCH). Atlanta: Centers for Disease Control and Prevention, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion; 2008 July 29.


29. Ferede TN. Assessment of the contraceptive prevalence and determinant factors among currently married women in reproductive age (15-49) group in Derashe Special Woreda, SNNPR, Ethiopia [MPH thesis]. School of Public Health: Addis Ababa University; 2010.


34. Gebreselassie S. The protective effect of male circumcision from HIV infection and sexually transmitted diseases: evidence from 18 demographic and health surveys in Sub-Saharan Africa. 18th International AIDS Conference; 2010; Vienna. Abstract MOPE0328.


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36. Gerbi EA. Assessment of willingness to accept provider initiated HIV counseling and testing among tuberculosis and non-tuberculosis is Shashemene Town, West Arsi Zone [MPH thesis]. School of Public Health: Addis Ababa University; 2010.


42. Mansfield C-S, Teshome Y. On the gender differentiated use of mobile VCT services in Ethiopia. 18th International AIDS Conference; 2010; Vienna. Abstract CDD0989.

43. McCrossan G, Sinkineh L. Using a social capita behaviour model to reduce stigma and increase HIV testing: Insights from Concern Worldwide Ethiopia. 18th International AIDS Conference; 2010; Vienna. Abstract MOPE0636.


58. Oloo J, Ababeye B. Role of religious leaders in enhancing sustainability of OVC care and support programs. 18th International AIDS Conference; 2010; Vienna. Abstract CDE1186.

63. Shewakena Z. Seeking alternative income earning mechanism for HBC graduated PLWHs’ to ensure food security at their household level in Kirkos area, Addis Ababa City. 18th International AIDS Conference; 2010; Vienna. Abstract CDE1320.
64. Simpson-Hebert M. "We stop AIDS" prevention education curriculum brings behavior change in East Africa. 18th International AIDS Conference; 2010; Vienna. Abstract MOPE0610.

Section 7. Treatment, Care, Clinical Research

This section includes studies on the characteristics and clinical course of HIV infection and opportunistic infections, treatment to AIDS and opportunistic infections, effects and outcomes associated with treatment, clinical and non-clinical care and supportive services provided to people living with HIV/AIDS.


18. Desta H. Sustaining OVC care and support by empowering OVC guardians and the community through a faith-based initiative. 18th International AIDS Conference; 2010; Vienna. Abstract WEPE0802.


20. Goga T. The impact of palliative care on ART adherence at Dilla, Hawassa and Soddo Medan ACTS project sites, SNNPR, Ethiopia. 18th International AIDS Conference; 2010; Vienna. Abstract CDE1096.


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46. Moshago AE. Adherence to antiretroviral therapy among patients at Dilla Hospital, Southern Ethiopia. 18th International AIDS Conference; 2010; Vienna. Abstract CDB0204.


49. Russell N, Green C, Yimam M. Urban Gardens Program (UGP) for AIDS affected women and OVC links Ethiopia’s health and agricultural strategies for a cohesive approach to urban gardening and empowers local project champions in shift toward sustainability. 18th International AIDS Conference; 2010; Vienna. Abstract THP0875.


52. Shaweno D. Clinical presentation and treatment outcome of TB among HIV positive patients on short course DOTs in Hawassa Health Center: A retrospective cohort study [MPH thesis]. School of Public Health: Addis Ababa University; 2010.

53. Shaweno D, Worku A. Clinical presentation and treatment outcome of tuberculosis among HIV positive TB patients on DOTs in Hawassa Health Center: A retrospective study. 21st Annual Public Health Conference of the Ethiopian Public Health Association; 2010; Mekele, Ethiopia. Abstract No. 44.


Section 8. Health Informatics, Monitoring, and Evaluation Research

This section includes studies on the characteristics and clinical course of HIV infection and opportunistic infections, treatment to AIDS and opportunistic infections, effects and outcomes associated with treatment, clinical and non-clinical care and supportive services provided to people living with HIV/AIDS.


12. Fideno BB. Assessment of the status of HIV/AIDS mainstreaming at the government sectors in Ethiopia J Health Dev 2011;25(1)
Addis Ababa and factors affecting the implementation [MPH thesis]. School of Public Health: Addis Ababa University; 2010.


35. Thomas DY. Cookies and cakes: Clinical mentoring designs and approaches for ART scale
Section 9. Diaspora Research
This section includes studies on the characteristics and clinical course of HIV infection and opportunistic infections, treatment to AIDS and opportunistic infections, effects and outcomes associated with treatment, clinical and non-clinical care and supportive services provided to people living with HIV/AIDS.


Section 10. Selected Websites Featuring HIV/AIDS in Ethiopia

2. Center for International Health of the University of Bergen, Norway (also access to the Ethiopian Journal of Health Development): http://ejhd.uib.no/


4. Ethiopian AIDS Resources Center: http://www.etharc.org


7. People to People Organization: http://www.peoplepeople.org/

8. Save the Children: http://www.savethechildren.net/ethiopia/


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15. University of California, San Francisco HIV InSite: http://hivinsite.ucsf.edu/global?page=cr09-et-00
17. The International Technical Training and Education Center on HIV (I-TECH) of the University of Washington: http://www.go2itech.org/itech?page=co-03-00
18. The International Center for AIDS Care and Treatment Programs (ICAP) at Columbia University’s Mailman School of Public Health: http://www.columbia-icap.org/wherewework/ethiopia/index.html