

Bibliography on HIV/AIDS in Ethiopia and Ethiopians in the Diaspora: the 2007 Update, with an Emphasis on the ART Scale-Up

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Introduction

This is the sixth update of the bibliography on HIV/AIDS in Ethiopia and the Diaspora, the first one of which was published in this journal in 2003. The present update includes publications or presentations that appeared in 2007 and a few earlier works that were missed by the earlier updates.

This update again includes references to studies in all areas of HIV/AIDS research and relevant works on sexually transmitted infections (STIs) tuberculosis, and other co-infections in Ethiopia and Ethiopians in the Diaspora, as well as on sexual and contraceptive behavior, gender issues, and social and cultural attitudes, practices or conditions that affect HIV transmission. Also following the structure of the earlier updates, this issue presents all references under the following categories: 1) Earlier Bibliographies on HIV/AIDS and Related Social, Cultural and Economic Issues, 2) Basic Biomedical Research, 2) Epidemiological, Risk Factors, and Determinants Research, 3) Clinical Research, 4) Impact Research, 5) Intervention, 6) Monitoring and Evaluation, 7) Research on HIV/AIDS in Ethiopians in the Diaspora, with 8) Selected Websites Featuring HIV/AIDS in Ethiopia.

We used the same strategies as in the previous bibliographies to identify and catalog the references with the exception that we used the *List of Graduates 2006/2007* prepared by the Office of the Vice President for Graduate Studies and Research rather than the thesis lists prepared by individual departments. This permits an analysis of thesis subjects among the various University departments, a timely activity because of the rapidly increasing number of masters theses written in more academic departments, already reported in the 2006 Update. As in the previous bibliographies, we searched all 2007 references in the major databases, including MEDLINE, PsychINFO, Sociological Abstracts, and POPLINE using the key words "Ethiopia and HIV", "Ethiopia and AIDS", Ethiopia and reproductive health", and "Ethiopia and sexual behavior"

In addition to discussing all six areas of HIV/AIDS covered in previous Updates, this issue focuses on the anti-retroviral therapy (ART)-scale up, including voluntary counseling and testing (VCT), care and

support, as well as HIV prevention in Ethiopia. The ART scale-up began in 2003 and accelerated with the provision of free treatment in January 2005, the launching of the Strategic Plan for Intensifying Multi-Sectoral HIV/AIDS Response (2004-2008) along with a number of strategically important documents, and stepped up support by international partners. These developments have contributed to make ART a central strategy in HIV/AIDS control in Ethiopia. This Update is structured as follows: after a brief description of the various ART scale-up initiatives, including their objectives, achievements and challenges, the text discusses various ART and related interventions based on a review of the 2007 literature, followed by the categorized reference listing. In this Update, we refer to some of the major studies in the text to facilitate access to sources relevant to the ART scale-up. Combined number/letter references are used, with the letters denoting the seven reference sections (B=Basic Biomedical Research, C=Clinical Research, D=HIV/AIDS Research on Ethiopians in the Diaspora, E=Epidemiological, Risk Factors, and Determinants Research, IM=Impacts Research, I=Intervention Research, M=Monitoring and Evaluation Research) and the numbers corresponding to the numbered references in the bibliography. We adhered to the international system of using the family name of authors but it was not possible to verify the names of all Ethiopian authors due to the occasional use of first names instead following customary practice.

This Update includes 324 citations, 313 (96.7%) of which appeared in 2007; 168 (52.09%) are theses, 79 (24.4%) journal articles, 45 (13.9%) published and unpublished conference papers, 26 (8.0%) reports, and 6 (1.9%) books and United Nations newsletter articles. Of the theses, 104 (61.9%) were MA theses, 46 (27.4%) MPH theses, 16 (9.5%) MSc theses, and 2 doctoral dissertations. MA theses outnumbered, for the first time, MPH theses, reflecting continued increase in interest in HIV/AIDS research in the Social Science and Education Colleges and various Development Institutes. The smaller number of total citations in this update than in 2006 is largely due to the large number (140) of citations for conference papers presented at the 2006 International AIDS Conference in Toronto.

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Intervention: Major ART Scale-Up Initiatives

The period from 2003-2006: The evolving response to the HIV/AIDS epidemic in Ethiopia as a collective effort of the government, international donors, national and international non-governmental organizations, community-based organizations, faith-based organizations, the private sector, and associations of PLWHA and individuals has been described in detail up until 2005 (I:49). The government of Ethiopia started a fee-based ART initiative in 2003 towards controlling the HIV epidemic and mitigating its effects. The cost to clients-- between US\$289-346 per month--and even the subsequently reduced cost of \$28 per month were unaffordable to the great majority of HIV-infected people. Starting in early 2005, the government provided free ART to individuals who could obtain economic eligibility certificates from neighborhood *kebeles* at 56 hospital ART sites. This restriction, made necessary by shortages of ART, was eliminated later in 2005 as funding and technical assistance from the Global Fund to fight AIDS, Tuberculosis and Malaria, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), the Ethiopian Red Cross Society initiatives and several other sources became available. Ethiopia received from PEPFAR \$254.7 million between 2004 and 2006 and was approved for over \$400 million and 354 million for 2008 to support increasing access to prevention services, expanding entry points to ART, facilitating access to other forms of treatment and care, and improving patient support (I:93). Guided by the conceptual framework, implementation guidelines and targets set forth in the Ministry of Health's report Accelerating Access to HIV/AIDS Treatment in Ethiopia: Road Map for 2004-2006 was implemented. The second Road Map for Accelerated Access to HIV/AIDS Prevention, Care and Treatment in Ethiopia for 2007-2008/10 is being implemented. The National ART Strategic Communication Framework guided and supported the ART scale-up by identifying and advocating communication needs among all stakeholders and partners at all levels, from policy makers to community leaders and PLWHA associations. This included recommendations for greater community involvement and ownership of the program. It also emphasized the need for research activities on local and international ART uptake to help design, monitor and evaluate ART efforts and to address the issue of quality assurance in service delivery (I:10). Nevertheless, only 65% of the 100,000 PLWHA targeted by the Road Map for ART were receiving treatment. Reasons for this shortfall include inadequate treatment sites and health manpower, limited program and coordination capacity in pre-ART and ART, limited social mobilization for ART, especially among high-risk groups, lack of a pediatric focus as part of VCT and ART efforts, weak communication and implementation guidelines, and limited ownership by the supporting departments and institutes (I:91).

ART implementation and scale-up is being carried out as an integral part of the HIV continuum and not as a stand-alone service, with an emphasis on community participation to ensure continuum of care, universal coverage and sustainability. The implementation of the preventive, promotive and chronic care components of the comprehensive HIV intervention program is being facilitated by the decentralization of health governance to the *weredas* and *kebeles*, the development of the health extension program at household level, and the employment of counselors using the public health approach, described below. The Health Extension Program launched by the Ministry of Health in 2003 represents a community-based approach aimed at promoting a healthy environment and quality of patient care. Several independent performance reviews in 2005 reported modest improvements in most knowledge, attitudes (reduction in stigma and discrimination) and practices (condom distribution and use and increased demand for VCT), as well as the integration and expansion of VCT and the initiation of the prevention of mother-to-child transmission (PMTCT) program. Persisting challenges in 2006 that affected the implementation of the Strategic Plan (2004-2008) centered around the development of enough capacity to meet the rapid increase in demand for services (I:49). The public health approach was adopted and several initiatives were developed towards that objective.

The public health approach to ART service scale-up: In response to the shortcomings of the ART program up until 2006, specifically the insufficiency of treatment sites and personnel, the Ministry of Health launched in 2006 an intensive program of expanding the ART sites network in rural areas and of rapidly increasing the number of health staff by training and employing mid level health personnel. The public health approach to ART scale-up agreed on by WHO member states in 2006 towards the goal of universal access to comprehensive HIV/AIDS prevention programs, treatment, care and support by 2010 involves training and retaining adequate health manpower, development of standardized and simplified clinical tools, reference material and job aids, as well as task shifting. This includes shifting some of the less complicated tasks from highly qualified physicians to nurses and in turn from nurses to lower level nursing assistants and community health workers and counselors, as well as the development of standard, simplified guidelines and drug regimens. Ethiopia, along with 6 other African countries and Haiti, is implementing the task-shifting approach with considerable success (I:56, 145), as evidenced by the rapid ART scale-up discussed below. Task shifting was pioneered in Ethiopia in 2006 and involves capacity building of clinical nurses to prescribe first-line ARVs for stable patients and provide chronic HIV care, the use of trained non-health professional counselors. The revised ART Guidelines (I:99) are based on the public health approach to ART,

provide direction for program managers and service providers, and facilitate the planning and implementation of a safe and effective ART program. Such selective task shifting from physician/specialists to clinical nurses and non-health professional counselors will help free up physicians and specialists to concentrate on complex cases and to allow them to mentor nurses and others to assume more responsibilities in a systematic and sustainable manner. The expansion of the health extension program provides further resources complimenting these facility-based efforts with the planned training and assignment of two female health extension workers per health post in about 12,500 rural *kebeles* by 2008. By providing outreach services in their respective *kebeles* they are expected to advocate creating a healthy environment and healthful living and thus contribute to mitigating the impact of the disease (I:49).

The public health approach is being implemented and expanded together with the upgrading and decentralization of the health services in Ethiopia. The expansion and upgrading of health centers to serve as ART sites was facilitated when the 2004-2008 Strategic Plan assigned a larger role to the health sector when it delegated the Ministry of Health to spearhead the national leadership of national response to HIV/AIDS and the HAPCO (HIV/AIDS Prevention and Control Office) to coordination, resource mobilization, and monitoring/evaluation functions under the direction of the Ministry of Health. Coordination and integration of the ART program into the health care system will be essential to ensure continued service delivery, care and support.

The revised VCT Guidelines (I:96) consider the improved availability of ARVs and better treatment of opportunistic infections, which are important in expanding provider-initiated testing and counseling in health facilities thus increasing access. The new guidelines also reflect a major shift towards more diversified approaches that include, in addition to diagnostic and voluntary counseling and testing, expanded provider-initiated, couple, youth-friendly and home-based models. The counseling and testing activities of community counselors and other new cadres working within the framework of the public health approach, as well as infant diagnosis using virological tests (DNA-PCR) are also covered by these guidelines. We have not found reports on operational aspects or any difficulties encountered by individual ART facilities using the public health approach and expect these topics to be addressed by future research projects. The revised pediatric HIV/AIDS care and treatment (I:94), and management of opportunistic infections in adolescents and adults (I:95) guidelines supplement the above ART guidelines.

By upgrading health centers as a key entry point for HIV patients seeking care, the total number of sites in the

country providing free ART was increased from 32 (all of them hospitals) in early 2006 to 272 (154 health centers, including 4 NGO clinics, and 118 hospitals) by September 2007 (I:1). Moreover, the number of VCT sites was increased from 658 sites in 2005 to 1005 sites and of PMTCT sites from 32 to 408 during that period (8:I). By September 2007, 109,552 persons had started ART and 82,248 patients were alive and on ARVs (anti-retroviral drugs). During the two-year period from June 2005 to September 2007, the number of patients receiving chronic HIV/AIDS care increased from 13,329 to 187,770. Whereas 75% of all people 15 years and older who had ever started ART by early 2005 were males, 55.6% of them were females by September 2007. Similarly, the proportion of children in need of ART who started treatment increased from 1% to 5.1% and that of patients living outside of Addis Ababa also increased during that 32 month period, from 25% to 67% (I:22, 98). Decentralization of ART services to a larger number of health centers in the regions and large-scale in-service training for different cadres of health service workers were associated with this sharp increase in coverage. Decentralization is expected to increase access by taking services closer to rural areas and small towns, reduce transport and related costs to patients and families, and increase adherence and enrolment in care and ART services early in the course of the disease. The Ministry of Health uses the health network model in selecting new ART sites to facilitate linkages between services at hospital, health center and community levels.

Private sector and community responses: The Ministry of Health began in 2007 to facilitate the provision of free ART at 13 private hospitals, nearly all of them in Addis Ababa, and is planning to include private hospitals at the regional level to further improve access to ART services. Enlistment of private hospitals in the free ART rollout is also expected to increase the quality of services because they are better equipped than some regional public health centers (I:18). Studies are needed to show ART utilization and adherence patterns, quality of care, as well as patient profiles and service delivery of private ART sites. Another important event in the private sector in 2007 was the establishment of the National Network of Positive Women Ethiopians (NNPWE). The two basic goals of NNPWE are to 1) contribute to national and regional efforts to mitigate the effects of HIV/AIDS through greater involvement of women living with HIV/AIDS and their PLWHA associations in HIV/AIDS prevention/control, treatment, care, and support, and 2) build the capacity of PLWHA and their associations to deal with the impacts of HIV/AIDS and facilitate access to different services (I:103). A growing number of community-based organizations, including *Idirs*, Women's and Youth Associations, Anti-AIDS Clubs and Faith-Based Organizations have become involved in prevention, care and support activities (I:49, 93).

Millennium AIDS Campaign Ethiopia (MAC-E): The MAC-E Campaign was structured in three phases with the mandate to accelerate HIV/AIDS prevention, treatment, care and support services in terms of speed, volume and quality. It identified three major underlying and interlinked program gaps in the ART program during the 2003-2006 period: insufficient demand creation, HIV status awareness, and treatment seeking (I:97). During Phase I of the campaign (November 2006-January 2007), as a result of promoting increased demand and uptake through intensified social mobilization efforts and increasing capacity at VCT and ART entry points and services, 705,619 persons could be tested; this is more than double the target of 320,000 and eight times higher than the VCT uptake during the pre-campaign period. All regions except Addis Ababa surpassed their targets. Achievement of these unusually high rates within a 2-month period was associated with extensive social mobilization and providing 85% of the above 705,619 tests through an outreach program. Although only slightly over half of the target to start 20,000 people on ART was achieved, this was nevertheless a significant increase from the pre-intervention period. Although Phase I showed high demand for testing and treatment at the community level, several gaps were noted. They included weak TB/HIV collaboration, particularly recruitment from retrospective TB treatment cohorts and provider-initiated HIV counseling and testing (PIHCT), insufficient pre-ART linkage with ART, lack of focus on pediatric VCT and ART, and supply shortages, especially of drugs for other infections and STIs, as well as lack of human resources. These deficiencies were addressed in Phase II (I:97).

In Phase II (February – August 2007), 982,452 people of the 1.8 million target population (53%) were tested, 77% of the targeted 40,710 new patients were started on ART, and 57% of 97,234 patients targeted for chronic HIV/AIDS care were enrolled. The HIV positivity rate increased from 5.4% in Phase I to 7.3% in Phase II due to inclusion of a larger proportions of high-risk people in Phase II (97:I). During the first 3 months of the 12-months long Phase III, which extends from September 2007 to September 2008, 91.3% of the 750,000 target population were tested for HIV. Whereas a VCT uptake of over 100% was achieved in Dire Dawa (179%), Harari (171%), Tigray (125%), Oromia (113%), Somali (108%), Addis Ababa (94%), and 90% in Amhara, the performance in Gambela (35%), Afar (26%) and Benishangul (11%) Regions, and SNNPR (52%) was considered unsatisfactory during the first quarter of the third phase. Program managers concluded that linkage and referral have to be strengthened to improve this situation (I:92). Moreover, PMTCT uptake, which has traditionally been performing poorest, was unsatisfactory during Phase III. Between September and November 2007, only 8.3% of the target population of 6,410 pregnant women but 91.4% of the general target population were tested.

Program managers recommended that a combination of PMTCT-focused forums and special events be held at the national, regional, *wereda* and community levels, the availability, distribution, managerial responsibility and status of PMTCT combination therapy be improved, and the various approaches used in the PMTCT programs of the Regional HAPCOs and Health Bureaus be clearly defined. This last recommendation is particularly urgent since most regions failed to include PMTCT as a MAC-E Campaign target. Sustainability of social mobilization and sensitization, the primary strategy to increase access to care and treatment, could not be ascertained due to incomplete reporting during Phase III (I:88). Thus while 5,285 of the country's 6,392 *kebeles* conducted community conversations involving an estimated 5.6 million people in Phases I and II, only Amhara and Dire Dawa (1,844 *kebeles*) reported these social mobilization activities in Phase III. After implementation of MAC-E Phase III, all 11 administrative regions launched their own regional MAC-E plans but no information is available on their experiences.

Multisectoral Plan for Universal Access: Because the national AIDS response is one of the country's development priorities, the Ethiopian government developed the national Plan for Accelerated and Sustained Development to End Poverty (PASDEP), which includes a HIV/AIDS component that was adapted from the Ethiopian Strategic Plan for Intensifying Multisectoral HIV/AIDS Response 2004-2008 (SPM) (I:93). This 2007-2010 Plan is an outcome of the multisectoral efforts to meet the goals of PASDEP and the country joining the international commitment to move towards universal access to HIV prevention, treatment, care and support by 2010. This Plan, which will serve as the main implementation framework for Ethiopia's AIDS response until 2010, was developed in collaboration with government ministries, civil society and international partners. It was based on various national exercises, including the single point prevalence estimate, a costing of HIV/AIDS commodities, the National Social Mobilization Strategy, the Health Sector Road Map for Accelerated Access to HIV Prevention, Care and Treatment, and several international initiatives. According to the Single Point Prevalence Estimate by the Ministry of Health, 2.1% of the Ethiopian, 7.7% of the urban and 0.9% of the rural population were HIV-infected, with 258,260 persons, including 15,716 children, in need of ART in 2007 (E:66). The Plan also incorporates the results of the Ethiopia National Health Facility Survey 2005 on the operating capacity of health care facilities and the capacity of the health care infrastructure in Ethiopia to respond effectively to the HIV/AIDS epidemic within the framework of the national intervention strategies (I:59). The Multisectoral Plan's targets include: increasing condom use in the population from 10% in 2007 to 60% by 2010, increasing the proportion of people seeking treatment for STIs to

94%, 9.27 million people will be counseled and tested for HIV just in 2010, increasing the proportion of eligible people receiving ART from 32% in 2007 to 100% (or 397,000 clients) by 2010, increasing the proportion of HIV-positive pregnant women to 80%, 50% of PLWHA to receive care and support, to provide care and support (chronic care) to 43% of orphans and vulnerable children and 50% of the estimated 560,000 people living with HIV (PLHIV) by 2010, establishing HIV/AIDS information centers in all schools by 2010 and provide 100% access to primary health care services by 2008. Sixteen programs are being implemented to achieve universal access to HIV prevention, treatment, care and support, all of them summarized in the Multisectoral Plan(I:93).

Notwithstanding the major achievements made in ART scale-up between 2005 and 2007, the Multisectoral Plan identified five challenges its implementation faces to reach its objectives, all of which had been identified earlier in the ART rollout. They are 1) insufficient human resources, 2) weak health infrastructure, transportation and general systems, 3) inadequately coordinated and integrated efforts and activities of the various partners from the national to the facility level, low level of response of institutions, inadequate leadership at all levels, 4) low level of mainstreaming activities and efforts, and 5) inadequate translation of discussions from various advocacy works, community dialogues, and workplace interventions into feasible or realistic actions at grass root level as indicated by the absence of concrete action plans in most communities. Moreover, although the PASDEP and SPM plans emphasize the importance of a multisectoral approach as a major guiding principle of HIV/AIDS prevention and control (I:93), multi-sectoralism has been weak in Ethiopia in the past. This points out the need for operational health services and ART research on how to create an environment and mechanisms necessary to strengthen the multisectoral approach and optimize its effectiveness in HIV/AIDS prevention and control, from the central level down to the ART site and community levels.

Biomedical Research

Only 10 (3.1%) of the 324 references in this year's update were classified as dealing with basic biomedical questions. On a percentage basis, there has been a steady, approximately 33%, drop every year over the last three years in this category – 7.2% in the 2005 update and 4.8% in the 2006 update. The reduction is presumably due, at least in part, to the termination of the ENARP research program and an apparent dearth of strongly HIV or TB-related publications from the Armauer Hansen Research Institute (AHRI). There were two publications from ENARP and only one from AHRI in 2007. One of the ENARP papers involved comparative dried blood, plasma, and milk specimens for HIV burden assessments while the other was a more basic immunology study. The

AHRI publication concerned cutaneous leishmaniasis. One would hope that the human - scientists, technicians, maintenance workers, others - and equipment resources at both these institutions will not be allowed to wither away. The renovation and expansion of tuberculosis diagnostic and research capability at St. Peter's Hospital may also enable the recruitment of some of this human capital.

More encouraging was a publication (B:7) by Shiferaw *et al.* evaluating the microscopic observation drug susceptibility (MODS) assay for the detection of drug resistant *Mycobacterium tuberculosis*. The importance of this work cannot be understated. Drug resistant TB is an enormous problem but nearly all patients who are compliant with treatment and provided the appropriate drugs after correct diagnosis of their condition can be cured. Lack of drug susceptibility testing (DST) makes provision of the right drugs a matter of guesswork. Using the relatively inexpensive and low technology MODS test, it is possible to detect drug resistance within one to two weeks – instead of three weeks or more, with more laborious and less efficient effort, and to adjust the treatment regimen accordingly. While the authors correctly note that the assay was developed in Peru, the Peruvian researchers were aware of unpublished reports of the assay components used for research purposes with the BCG vaccine strain at AHRI in the 1980s just before the AIDS epidemic, and the accompanying TB problem, expanded in Ethiopia. This example reinforces the notion that basic research is vital for the eventual translation of findings and techniques to public health laboratories. DST capacity is also critical for the management of malaria, HIV, and other infectious diseases. Basic biomedical researchers can help to develop inexpensive and appropriate techniques as well as to evaluate new technologies before they are adopted in general practice.

Epidemiological, Risk Factors, and Determinants Research

One hundred of 324 (30.9%) references in this Update were classified in this category. Studies on knowledge, attitudes and practices in relation to HIV risk among students, unemployed youth, street children, commercial sex workers, and adult men and women, as well as research on sexual violence against women, children and domestic female workers predominated, as in previous years. Several studies focused on other problem areas covered in the past, including the impact of opportunistic infections in HIV/AIDS, determinants of reproductive health, the causes and health consequences of early marriage, and social ostracism associated with pregnancy-related fistula. Three studies involved molecular typing of HIV-1 and *Mycobacterium tuberculosis*, an area becoming increasingly relevant in the search for drug resistance with the continuing ART rollout. One of these studies reported was the first to report drug resistance in HIV-1 subtype C in

northwestern Ethiopia and recommended routine drug resistance monitoring (E:55). Evidence of drug resistance was also found in Ethiopian immigrants to Israel in 2007 (D:3), although it is not known if these mutations developed from use of antiretrovirals in Ethiopia or Israel. About another dozen issues that have not or only lightly been researched in the past were addressed in 2007. They included several studies examining the dynamics of the HIV epidemic from the continental (Africa) to the community levels (E:47, 61, 84, 87), noting continuing leveling off of prevalence rates. Using a the new laboratory-based BED HIV-1 incidence assay, the incidence of HIV infection among antenatal clients was estimated to have declined from 7.7% in 1995 to 2.0% in 2003, a trend following prevalence changes (E:93). Development projects subject to the influx of people from other areas were identified, as elsewhere in Africa, to be potentially vulnerable to the spread of HIV (E:2), pointing to the need for the parallel development of preventive and therapeutic programs. Another emerging factor in HIV transmission is men having sex with men, including sexual abuse of male children (E:50, 60, 80). Only two studies examined knowledge, attitudes, practices and behavior in relation to HIV risk in rural areas (E:100; I:101). The relatively faster spread of the HIV epidemic in rural than urban communities, where the great majority of the Ethiopian population resides and where HIV-related attitudinal and behavioral parameters have changed least, requires further studies in the more isolated parts of the country.

With the trend of HIV/AIDS interventions increasingly shifting from top-down to community and family approaches, three relevant attitudinal and behavioral issues need to be mentioned. First, studies of community attitudes towards HIV exposure of women and female genital cutting (E:20, 23) can indicate to what degree the public will support the control of practices jeopardizing female sexual rights and reproductive health. Second, the study of social relations, particularly the influence parents, peers, and school AIDS clubs on the sexual behavior of adolescents (E:8, 25; I:75), needs to be pursued for different social, ethnic and residential (urban/rural) groups in the search for more effective communication methods. Third, the problem of HIV stigma, the reduction of which is increasingly being considered central to effective programs in HIV/AIDS prevention, care and treatment in Africa, was addressed by only two studies (E:73, 86; M:18). There is a need for the development of measures that can capture the complexity of HIV stigma in a variety of contexts and ensure appropriate evaluation of stigma-reduction programs (M:18). Four studies dealt with the knowledge, attitudes and HIV risk of people with physical and sensory impairment (E:5, 33, 42, 63), another area which received little attention in the past.

Clinical Research

In this category, there are 19 references, or 5.9% of all references. This compares with 35 references (8.9%) and 21 references (13.7%) for this section in the 2006 and 2005 updates, respectively. Fourteen of the 2007 references were published in peer-reviewed journals and one was a letter to a journal in response to a peer-reviewed article.

Particularly noteworthy in this section was an investigation (C:1) of pneumocystis pneumonia (PCP) in HIV+ patients without TB or with atypical TB. Although PCP is thought to be rare in Africa compared to Europe or North America two decades ago, Aderaye *et al.* found that PCP accounted for nearly one-third of these cases. Importantly, increased use of PCP preventative therapy and/or HAART can prevent an epidemic of PCP in immunodeficient Ethiopian patients. PCP prophylaxis was an important intervention in reducing morbidity in HIV-infected patients in the northern hemisphere before the availability of HAART. Two conference presentations (C:6, 9) and one thesis (C:16) on the immune reconstitution inflammatory syndrome (IRIS) in patients receiving HAART are timely as drug treatment increases for patients in Ethiopia. Further investigation of this issue is certainly merited. Three studies (C:2, 10, 11) evaluated and compared manifestations of tuberculosis in HIV-infected and uninfected patients and another three studies (C:3, 13, 18) evaluated neurological manifestations in patients with HIV.

Increasingly, it is anticipated that clinical research will have an intervention orientation. In fact, intervention research, as indicated below, has more than tripled as a percentage of references from the update two years ago and now accounts for nearly half of the references in this update.

Impacts Research

Eleven of the references in this Update (3.4%) dealt with impacts of the HIV/AIDS epidemic in Ethiopia, about half the number in the 2006 Update. As in 2006, most studies focused on psychological impacts experienced by people living with HIV/AIDS (PLWHA) and orphans. New themes in the 2007 studies included socioeconomic and psychological impacts on women and on a teacher training institute in particular. Few studies have been carried out on impacts on social relations at the family and neighborhood levels among different social and cultural groups, which are relevant for developing communication and advocacy approaches by local communities. More studies are also needed on adaptive and coping economic behavior of rural households experiencing HIV/AIDS, where populations are least prepared to deal with the epidemic.

Intervention Research

The largest number of the 324 citations in this Update are, for the first time, in the Intervention category (n=158, 48.8%). This reflects the trend from biomedical and epidemiological to intervention studies that was also noted in the 2005 and 2006 updates. About two-thirds of both the MPH and MA/MSc theses in the Intervention category dealt with either VCT or ART issues and most of the others with care and support as well as reproductive health services and other HIV/AIDS prevention issues. Studies of the use of new intervention approaches and early results of several ART pilot programs at the community level carried out in 2007 provide valuable information on experiences gained and can help to guide the up-scaling of the national multi-sectoral HIV/AIDS program.

Anti-retroviral treatment (ART): Most studies dealing with issues related to ART focused on treatment accessibility and drug adherence. The first comprehensive longitudinal and multisectoral ART, care and support, a demonstration project in Ethiopia, managed by the Ministry of Health and two NGOs and involving the resources of a referral hospital and those of its community and local government in Addis Ababa, reported on the treatment of the first 3,765 AIDS patients. This project, considered to be a success, points out the need of such projects to establish strong relationships among partners, to integrate ART services within existing health care structures, to transfer some elements of medical care to local health centers, and to develop incentives to train and strengthen staff (I:80). A doctoral thesis reported that HAART decreased the prevalence and mortality in TB patients in a regional hospital in southern Ethiopia. This study concluded that treatment outcome may be further improved by counseling, testing and treating patients early in the disease process and making treatment available in less accessible rural areas (I:67, 68). Although radio and television messages promoting ART are potentially useful, especially in urban areas, they need to be more sensitively targeted at different social and cultural groups (I:158).

Although drug adherence levels in African countries have been relatively high compared to those reported from industrialized countries, considerable variations exist among countries, including Ethiopia, in regard to definitions of defaulting and systematic measurement of adherence of clinic populations (M:17). One study of drug adherence reported a considerable discrepancy between adherence (100%) and satisfaction with treatment (64%). Major factors in this relatively low patient satisfaction rate included distance to ART sites and long waiting lines, being away from home, use of holy water (*tsebel*), social stigma of using ARVs, and forgetting to use drugs (I:3). Several investigators reported geographical distance to be a major barrier to

the accessibility, utilization and adherence of ART. Studies of drug non-adherence at four regional and district hospitals identified distance between place of residence and ART site or pharmacy, in addition to the more widely reported personal, family and drug related factors as important (I:8, 120, 142). Similarly, a preliminary spatial study of the ART sites used by all clients in Ethiopia in December 2006 revealed a relationship between distance and utilization rates at the zonal and community levels, although these results need to be confirmed with current census population data and HIV prevalence data at the community level (I:73). However, geographical accessibility to treatment, an important factor in planning and implementation of HIV/AIDS programs, may not be a significant factor in all areas. For example, mathematical modeling to predict the impact of increasing the number of ART sites in South Africa found no linear relationship between treatment accessibility and catchment size of ART facilities and that substantially increasing a catchment area would increase accessibility by only a few percent (I:147). In addition to these and other "rational" factors, misinformation and traditional concepts of health and illness must also be considered in studies in drug adherence (I:16).

Social, economic, religious and legal challenges of the ART scale-up were addressed by several studies. Two sociological studies examined social, including religious, challenges PLWHA face in seeking ART, providing useful information for VCT counselors (I:62, 150,157). Common use of holy water was reported by two sociological studies, which reported that this practice may both jeopardize ART adherence and expose many users living around those springs to other health risks (IM:7; I:66). A preliminary report on the PEPFAR Faith-Based Initiative in collaboration with the Ethiopian Orthodox Church to support a comprehensive approach to AIDS care and ART by considering the use of holy water (I:44) indicates the need for culturally sensitive studies of this development. Results of a pilot project by a social services agency in Addis Ababa show that both drug adherence and treatment outcome were improved by providing benefits tailored to meet families' medical and material needs and by participation in peer support groups. This treatment and support model, involving weekly meetings to discuss the importance of adherence and side effects, daily availability of a nurse, and participation in peer support groups (I:143) is best suited for implementation in urban areas featuring these resources. Two other issues not previously dealt with concerned attitudes of health professionals towards providing VCT and ART services to clients and the need for legislation to fully protect the human rights of PLWHA, not only at the work place but also in other public settings and in the domestic sphere (I:74,130). The development of a scale for measuring attitudes of physicians and nurses towards PLWHA and the finding

that professionals with less education had more negative attitudes towards clients represents a first attempt to facilitate the gathering of objective information on a sensitive issue which has important implications for the delivery of quality care (M:15). The economic impact of HIV/AIDS on companies and their provision of ART is another understudied area. A 6-year longitudinal and multinational study of six Eastern and Southern African countries, including Ethiopia, concluded that increased labor costs due to HIV were less than 3% at 10 of the 12 companies surveyed and that whereas treatment of HIV-positive employees is cost-effective for many larger firms, smaller ones have less capacity and inclination to respond to workforce illness (I:114).

Voluntary counseling and testing (VCT) and provider-initiated HIV counseling and testing (PIHCT) services:

The topics of recent VCT and PIHCT studies showed greater diversification than in previous years. In addition to the accessibility and utilization of these services by the general client population at government facilities, several studies focused on pregnant women, couples, family planning clients, sexually abused children, physically handicapped persons, university students, STI and TB patients, military personnel, members of a PLWHA association, and government employees. While HIV awareness campaigns and increased accessibility to VCT services play a central role in early diagnosis and treatment of patients, other promising approaches, such as referral from dentists identifying clinical markers such as oral candidiasis also need to be considered (I:18). A thesis linking family planning service with VCT services from both client and provider perspectives provides valuable information on how to integrate these services for a client population that may be expected to increase in coming years (I:13). Another study of fertility decisions and the need for family planning among PLWHA also provides relevant information for family planners and HIV/AIDS counselors (I:88). A thesis with far-reaching implications for HIV treatment-seeking behavior among pregnant women found that women who had not been influenced by their male partners on HIV testing were 2.56 times more likely to accept HIV testing than those who were influenced by their partners (I:72). These findings reemphasize the need for further education efforts in family planning and primary health care providers in general. Problems arising out of couples using voluntary counseling testing services were pointed out by a study reporting that most respondents did not use these services because their partners already knew the HIV test results (I:38). Although this problem appears to be due primarily to the failure of VCT sites to record information for couples on an individual basis (mentioned below) it may also be due to confidentiality issues, as indicated by earlier low rates of instructing or training health staff in confidentiality and disclosure of HIV test results (I:59). A study on the relative accessibility of government and private counseling and

testing sites showed that antenatal clients of government health institutions had better access to services than women who did not use the government ANC services. This finding highlights the need for greater integration and collaboration between government and non-government health institutions mentioned above (I:116). Acceptability of PIHCT among patients with TB, STIs and other co-infections with HIV is another issue requiring further research. In a hospital in southern Ethiopia, HIV testing was not accepted by two-thirds of HIV-coinfected TB patients, due to a combination of client and program factors, such as prior HIV testing, self-perceived risk of HIV infection, and place of testing at considerable distance from place of residence (I:67, 68). A considerably higher acceptance rate of HIV counseling and testing (66.2%) could be achieved for TB patients in six health centers in Addis Ababa even though barriers to acceptability were similar (I:28).

Prevention: A wider range of primary and secondary HIV prevention issues was addressed by researchers in 2007 than in earlier years. Promising but relatively neglected approaches to HIV/AIDS prevention, care and support services, including involvement of youth and communities and to determine perceptions and service preferences, as well as peer counseling among youth were examined by several studies (I:11, 17, 69, 115, 149). Surveys among high school students in Addis Ababa revealed that the AIDS hotline telephone service was a more accessible and convenient source of information on HIV risk and reproductive health issues than information and counseling services available at health institutions (I:77). Another innovative approach to overcoming high HIV risk behavior of adolescents are the preventive, care and support activities provided by members of youth organizations sponsored by NGO, government and faith-based organizations (I:17). This study concluded that special training in conflict management and better support are needed to make youth voluntarism more effective.

In 2007, most PMTCT information appeared in governmental reports planning and implementing programs in this important but lagging and little researched area. Continued low coverage of PMTCT needs was indicated by a study showing that more than half of the HIV-positive women were missed by the PMTCT program during the first visit to antenatal clinics (ANC) (M:6). According to another study, reasons for women not participating in prevention of PMTCT follow-up counseling before starting ARV prophylaxis include lack of community leadership and lack of in-depth knowledge of gender relationships as major factors; a related problem is the failure to collect and analyze gender disaggregated data during the delivery of CVT services (I:23).

The reproductive and family planning situation in Ethiopia, characterized by very low contraceptive prevalence and a high unmet need for contraception which has hardly changed in recent years, remains a major challenge to HIV preventive programs. According to the report Trends in Demographic and Reproductive Health Indicators in Ethiopia (I:75), the median age of marriage and age at first birth for women aged 25-49 did not change in rural areas between 2000 and 2005. These and most other reproductive indices remained among the lowest in sub-Saharan Africa, requiring further research on socioeconomic underpinnings of early marriage and advocacy for education. Quality of family planning services in regard to limited choice of available methods, insufficient information to clients, inadequate community-based reproductive health service sites, and inadequate training of providers (I:71) also demand further research. One possible means of increasing community knowledge of and provision of reproductive health services is the use of community-based reproductive health agents (CBRHAs). A survey of CBRHAs revealed that personality traits and work experience were more strongly associated with their capacity to provide integrated services than demographic characteristics and that agents' gender and work-related characteristics were significantly associated with the number of clients they served (M:7). Such personal biases can perhaps be overcome by considering the reproductive health needs and preferences of clients in service delivery (I:36). One of the most extensive family planning programs integrated with behavior change communication approaches involved community-based contraception distribution, house-to-house individual education, peer education and formation of youth centers, establishment of AIDS clubs in school, and community advocacy through respected social, religious and cultural community leaders during a 9-year period. The program outcomes exceeded set targets in improving positive attitudes towards the use of contraceptives, increasing access to reproductive health care services, reducing risk behavior and stigma of HIV/AIDS and STIs and doubled the prevalence of family planning from 14.7% to 29.8%. A key to this success was the participatory involvement of the beneficiaries within the local cultural context (I:31). Although few studies have been undertaken on the possible integration of family planning and other reproductive health services with HIV/AIDS programs in Ethiopia, there is a growing interest in this strategy. The conceptual framework and opportunities for and challenges presented by an integration of reproductive health, family planning and HIV/AIDS programs formed the basis of an international conference in Addis Ababa. Rapidly growing evidence was presented indicating that this linkage may be an effective strategy for providing and expanding cost-effectively a wide range of services but additional research and pilot studies are required to develop and operationalize feasible programs in the

diverse sociocultural, health and provider environment (I:26, 32).

Several studies of fertility regulation practices and sexuality were carried out in 2007 among different ethnic groups. They may contribute to making family planning and other reproductive health programs culturally acceptable to local populations and stimulate research among other ethnic groups. A study of the role of traditional Borana institutions in reproductive health promotion, fertility regulation and HIV prevention, together with the book published in 2005 by Ibrahim Amae Elemo on these institutions (cited in the 2006 HIV/AIDS Update), constitutes a valuable source of information on these cultural practices of the Borana Oromo. An anthropological study among the Arsi Oromo identified elements of Oromo customary law and protective traditional values and behaviors surrounding sexual relations that may be incorporated into HIV/AIDS communication. This study also cautions against the uncritical implementation of Western-dominated and defined human rights principles, such as gender equality (I:109). Another anthropological study, on the reproductive success of polygamously and monogamously married men and women indicate that marriage practices benefit first-married polygamous wives more than second and third wives, or monogamous wives. Since these effects are also reflected in the relatively larger number of children and their better nutritional status of first married polygamous wives (E:43) this information may help community health services in providing effective reproductive and HIV preventive services to families with different family structures.

Care and support: A number of studies of patient care and support addressed the social, psychological and nutritional needs of PLWHA and the effectiveness and activities of organizations providing these services, including community-based and civil society organizations. Networking among providers of care and support services, an approach increasingly recognized as a means of exchanging information and experiences with meeting specific client needs and of learning about available services in different centers, was critically examined by one study (I:40). A study of the relationship between diet, food security and ART outcome reported that an improved diet in regard to acquisition of food aid, number of meals, and diversity of food was significantly positively correlated with functional improvement, increase in weight and CD4 count (I:117). These findings and another study reporting variable feeding options for HIV-positive infants (I:24) emphasize the need for qualitative and quantitative dietary studies among PLWHA and their families with different diets and the provision of food aid and income generating activities to determine and promote optimal diets for PLWHA of different ages as part of chronic AIDS care. The

publication by the Ministry of Agriculture and Rural Development in collaboration with FAO of a training manual for health workers involved with nutrition care for PLWHA constitutes a promising start in this direction (I:90). Several theses examined institutional and family settings and challenges in orphan care in Ethiopia, a largely neglected subject in the literature in the past. One study exploring the trade-offs and social dynamics of orphan care within extended families found rural-urban differences in the capacity to care for orphans and that there are multiple and reciprocal relationships in care-giving and care-receiving practices. The authors called for a contextual understanding of the orphan burden in the development of interventions that may consider care for four categories of extended families with different capabilities and resources (I:2). Two studies of the psychological impact of losing their parents and the role of civil society organizations in meeting the special needs of AIDS orphans indicate the severity of this problem and the need for appropriate care and supporting structures to mitigate these effects (IM:8; I:76).

Monitoring and Evaluation Research

Twenty references (6.2 %) were included in the Monitoring and Evaluation section, less than half of those in the 2006 Update. This decrease is due in part to the inclusion of a number of ART and VCT project evaluations in the Intervention section and the effect of the 2006 International AIDS conference. Examination of ART and VCT program monitoring and evaluation within the context of the ART scale-up facilitates a more comprehensive discussion of the continuum of activities and outcomes of these programs.

Monitoring and evaluation issues covered in earlier Updates include determinants of outcomes of HIV counseling, validation of lay diagnosis to determine TB/HIV-related mortality in Addis Ababa, and service delivery models for HIV counseling and testing. New areas considered by earlier studies reflect the rapid expansion of the various HIV/AIDS interventions, including assessment of ART monitoring, effects of scaling up ART on health care systems, treatment adherence monitoring and promotion policies in Ethiopia and East Africa countries, human rights protection during HIV testing in Ethiopia and east African countries, the use of antenatal clinic (ANC) surveillance data to evaluate PMCTC programs, the need to track expenditures of the increasing HIV/AIDS budget, development of different scales for measuring attitudes of health professionals and stigma, information management related vulnerable children vulnerable to HIV infection, and client-friendliness of model youth health centers. Some of these studies are discussed under the Intervention section. Clearly, the need for monitoring and evaluation research will increase in the future with the scale-up of ART and other interventions because of the increasing need for guiding, coordinating, modifying and streamlining ongoing projects and activities

according to targets, changing situations and challenges, lessons learned, and available resources.

Diaspora Research

Only five studies on HIV/AIDS were prepared in the Diaspora in 2007, largely due to the limited number of international conference on AIDS last year. The studies addressed issues surrounding disease impacts and drug resistance, the potential contribution of health professionals in the Diaspora to HIV/AIDS efforts in Ethiopia, and the lack of information on the impact of HIV/AIDS on the Ethiopian community in the USA. One study provides evidence of antiretroviral drug resistance among Ethiopian immigrants in Israel (D:3) and another one on the relationship between psychological distress, psychosocial variables, T lymphocyte counts and viral load (D:1). The finding of the latter study that HIV-positive women had more social support and better immunological and infection indicators than men and that the better indicators were related to shorter duration of HIV positivity since diagnosis, differential gender and infection-linked adherence and more social support has many implications for home-based care. The increasing involvement of Ethiopian Diaspora health professionals in the ART scale-up and related HIV/AIDS efforts in Ethiopia through Diaspora-based health associations (D:2) and the creation of new websites (listed below) informing on HIV/AIDS initiatives, programs and resources in Ethiopia and the Diaspora are positive developments that warrants further advocacy and support.

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Section 3. Epidemiological, Risk Factors, and Determinants Research

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Section 4. Clinical Research

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Section 5. Impacts Research

This section covers studies on the social, psychological, economic, and demographic impacts of HIV/AIDS on individuals, families, communities,

Section 6. Intervention Research

This section reports on research and programmatic activities that are aimed at treatment, care, and support of people

This section reports on research and programmatic activities that are aimed at infected and affected by HIV, including voluntary counseling and testing. This section also includes reports on prevention efforts and public policy measures targeted against HIV/AIDS.

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Section 7. Monitoring and Evaluation Research

This section covers studies that focus on HIV/AIDS related program or intervention monitoring and evaluation activities.

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- Section 8. HIV/AIDS Research on Ethiopians in the Diaspora**
- This section covers HIV/AIDS among Ethiopians and foreign residents of Ethiopian origin living outside of Ethiopia. It includes studies in all the above six major sections.
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- Section 9. Selected Websites Featuring HIV/AIDS in Ethiopia**
1. Addis Ababa HAPCO Website: <http://www.aahapco/org/>
 2. AIDS Portal: http://www.aidsportal.org/overlay_details.

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- aspx?nex=20&gclid=CO6um6LqzJECFSF41godlzvs2g
3. Center for International Health of the University of Bergen, Norway (also access to the Ethiopian Journal of Health Development): <http://www.cih.uib.no/journals/EJHD>
 4. Christian Relief and Development Association, Ethiopia: www/crdaethiopia.org
 5. Ethiopian AIDS Resource Center: <http://www/etharc/org>
 6. Family Health international: <http://www.fhi.org/en/CountrProfiles/Ethiopia+main+page.htm>
 7. HIV In Site at the University of California San Francisco's Center for HIV information: <http://hivinsite.ucsf.edu/global?page=cr09-35-00>
 8. Johns Hopkins University Center for Clinical Global Health Education: <http://ccghe/jhmi/edu/CCG/country/ethiop/>
 9. Network of Ethiopian Professionals in the Diaspora (NEPID): www.nepid.org/vacancies.htm
 10. People to people Organization: <http://peopletopeople.org/>; its Horn of Africa Journal of AIDS is available at: <http://peopletopeople.org/index.php?P=47>
 11. Save the Children: http://www.savethechildren.net/ethiopia/key_issues/abuse.html
 12. The International Training and Education Center on HIV (I-TECH): <http://www.go2itech.org/itech?page+co-03-00>
 13. United Nations Children's Fund (UNICEF): http://www.unicef.org/ethiopia/hiv_aids_464.html
 14. United Nation Development Programme (UNDP): <http://www.et.undp.org/hiv.htm>
 15. United Nation Educational Scientific and cultural Organization (UNESCO): http://hivaidsclearinghouse.unesco.org/ev_en.php?ID=2829+201&ID2=DO_TOPIC
 16. United Nation Joint Program on AIDS (UNAIDS): http://www.unaids.org/en/Regions_Countries/Countries/ethiopia/asp
 17. United Nations Centers for Disease Control and Prevention (CDC): <http://www.cdc.gov/nchstp/odgap/countries/ethiopia/htm>
 18. WHO E-Library: <http://www/who/int/hiv/topics/vct/elibrary/en/index.html>