

# Scaling-up HIV treatment programmes in resource-limited settings: the rural Haiti experience

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**Objective:** To scale-up a successful HIV/AIDS treatment project and provide comprehensive care to an entire Département du Centre (population 550 000) in rural Haiti, thereby demonstrating that community-based treatment of HIV is feasible and highly effective in resource-limited settings, and serving as a successful model for others to replicate.

**Participants:** In the Département du Centre of rural Haiti comprehensive HIV and tuberculosis treatment is provided free of charge to anyone who presents for care. All those who meet clinical enrolment criteria are treated with highly active antiretroviral therapy (HAART).

**Intervention:** HAART was provided in the context of a comprehensive programme of HIV, tuberculosis (TB), sexually transmitted disease (STD) of the project, treatment and prevention, and women's health services at four sites in the first year. At each site, the medical facility was renovated, additional staff were hired as needed, and a network of *accompagnateurs* (community health workers) was established throughout the surrounding villages to serve as a link with the community, and to provide directly observed treatment (DOT).

**Results:** In the first year of programme scale-up, over 8000 patients were followed for HIV, and over 1050 were treated with DOT HAART. Adherence to HAART was very high, and clinical outcomes were excellent: all patients responded with weight gain and improved functional capacity, and fewer than 5% required medication changes due to side effects. Viral load was tested among a subset of patients showing that 86% had undetectable viral loads.

**Conclusion:** Community-based care of AIDS has been highly effective in rural Haiti. With more international financial support for HIV/AIDS treatment in resource-limited settings, there should be no barriers to access to life-saving HAART for those who need it most.

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*AIDS* 2004, **18** (suppl 3):S21–S25

**Keywords:** AIDS, antiretroviral therapy, community-based care, community health workers, directly observed therapy, Haiti, tuberculosis, HIV, poverty

## Introduction

Forty-two million individuals worldwide are living with HIV, yet fewer than 5% have access to the life-saving antiretroviral medications considered the standard of care in the world's industrialized nations. In Africa, the most affected continent, it is estimated that

fewer than 1% of those infected are receiving combination antiretroviral therapy. Three years ago, the United Nations convened a 'special session' on AIDS: plans were made to strengthen HIV prevention and risk reduction, and to stave off death among those already infected. In September 2003, the leaders of the World Health Organization (WHO), the Joint United Nations

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DOI: 10.1097/01.aids.0000131308.62828.45

Programme on HIV/AIDS (UNAIDS), and the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) joined together to declare the lack of access to antiretroviral medications a “global health emergency”. In response, the “Treat 3 Million by 2005” initiative was launched. In order to meet this goal, however, it will be essential to accelerate the current pace of enrolment. Expanding access to antiretroviral treatment and care in resource-limited settings, and linking improved care to prevention, is one of the most urgent global priorities for policymakers and government officials.

In 1998, Partners In Health and its Haitian sister organization Zanmi Lasante, both non-profit organizations affiliated with Harvard Medical School, began providing highly active antiretroviral therapy (HAART) to a small number of patients in rural Haiti living with advanced HIV disease. With funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), this pilot project is now being scaled-up to provide comprehensive HIV/tuberculosis care to Haiti's entire *Département du Centre* (population 550 000). Each patient on HAART receives daily home visits from a community health worker, called an *accompagnateur*, who provides directly observed treatment (DOT). In the first year of programme scale-up, over 8000 patients were followed for HIV, and over 1050 were treated with DOT HAART. Clinical outcomes have been excellent: all patients have responded with weight gain, and fewer than 5% required medication changes due to side effects or toxicity. Among a subset of patients for whom viral load was tested, 86% had suppressed viral loads.

This successful initiative has served as a model programme for other resource-limited countries, demonstrating that adherence to HAART can be exceptionally high if care is community-based and *accompagnateurs* are able to assist their neighbours with adherence to therapy. Adjuvant social services have also been central to the success of this programme, as are efforts to strengthen the weak public health infrastructure of Haiti.

## Programme history

Haiti is the poorest country in the western hemisphere and one of the poorest in the world, ranking 150th out of the 175 countries listed in the United Nations Development Programme Human Development Index [1]. Decades of political instability and an economic crisis have further contributed to increasing poverty and deteriorating health and social infrastructures. Not coincidentally, Haiti is saddled with the worst AIDS epidemic outside of Africa. The epidemic is general-

ized, with approximately equal numbers of men and women infected [2,3]. With an adult prevalence of 6.1%, HIV/AIDS has now surpassed tuberculosis as the leading cause of death among young adults nationwide, [4] and is the major contributor to the declining life expectancy in Haiti, which is 50.36 years for men and 52.92 for women [5].

Partners In Health and Zanmi Lasante have a long history of providing HIV and tuberculosis care through the Clinique Bon Sauveur, in the village of Cange, a squatter settlement in rural Haiti. In 1988, these organizations launched an effective, DOT programme for tuberculosis by building an extensive network of *accompagnateurs* who provided the essential link between the patients (dispersed throughout mountainous central Haiti and living in rural villages) and the clinic-hospital complex in Cange [6].

The first case of AIDS in central Haiti was documented in 1986. Since that time, voluntary counseling and testing (VCT) has been offered free of charge at the Clinique Bon Sauveur, and is closely linked with prevention activities such as condom promotion and culturally appropriate HIV education. These efforts have been described elsewhere [7]. In 1995, the clinic became the first in Haiti to offer zidovudine free of charge to all HIV-positive pregnant women in order to decrease the rate of mother-to-child transmission of HIV. This dramatically enhanced the uptake of VCT among pregnant women (from 30% to nearly 100%) and substantially lowered the rate of vertical transmission of HIV.

However, the effects of these comprehensive prevention programmes were limited, because most HIV transmission occurred in Port-au-Prince, as young adults migrated from the rural areas to the capital in search of work [8]. Many returned to their homes in central Haiti sick with advanced HIV disease; a survey of inpatients in 1995 revealed that approximately 40% of adults admitted to the Clinique Bon Sauveur were infected with HIV. In 1998-1999, as the number of deaths continued to rise, Partners In Health/Zanmi Lasante launched a programme to offer HAART to the sickest patients – those who no longer responded to treatment of tuberculosis and other opportunistic infections. The goals of the ‘HIV Equity Initiative’ were to replicate the methods of the successful DOT programme already in place for the management of tuberculosis, to train *accompagnateurs* to administer HAART, and to demonstrate that high adherence to HAART regimens could be attained in resource-limited settings.

The clinical benefits of DOT HAART were rapidly apparent, as evidenced by a recent review [9] comparing the outcomes of the first 100 patients who received

HAART based on the clinical criteria of advanced disease (usually bed-bound) (group A) and two other groups, each with 100 HIV-positive patients in whom HAART was deferred because they were either deemed less sick (group B) or because they lived too far away from the clinic to arrange for the services of an *accompagnateur* (group C). As illustrated in Table 1, the HAART patients had superior clinical outcomes, even though they were much sicker at the time they started treatment.

## Expansion project overview

In March 2003, Haiti received the first disbursement of a 5-year, US\$67 million grant from the GFATM in order to develop a country-wide programme for HIV VCT, the prevention of mother-to-child transmission, treatment of opportunistic infections, and diagnosis and treatment of tuberculosis. A portion of these funds was given to Partners In Health/Zanmi Lasante to scale-up the HIV pilot project started in Cange, in the process also supporting three other related efforts: improved casefinding and treatment of tuberculosis, which affected as many as half of all HIV-infected patients; improved diagnosis and treatment of sexually transmitted diseases (STD); and improved prenatal care and women's health (requisite for prevention of mother-to-child transmission of HIV). These 'three pillars' of primary care, when linked to the fourth pillar of integrated HIV prevention and care, are the basis of the expansion currently under way in Haiti's Département du Centre.

In the first year, in concert with the Haitian Ministry of Health, the comprehensive four-pillar programme was launched at four sites: Boucan Carré, Lascahobas, Belladère, and Thomonde. An additional six sites will be added over the next 4 years. In addition to HIV, tuberculosis, sexually transmitted diseases (STD), and women's health services, which are provided free of

charge, general medical care was provided at a nominal cost (the fee set by the Ministry of Health) to all patients who presented for care. As in Cange, a network of *accompagnateurs* was established throughout the villages surrounding each site. Patients with clinical evidence or risk factors for HIV, tuberculosis, and other illnesses were referred to the medical facilities, each of which had undergone extensive renovation: within the first 3 months, each site had a functioning pharmacy, laboratory, space for clinical examination, and generator-powered electrical supply. With the assistance of the Ministry of Health of Haiti, additional healthcare staff (physicians, nurses, pharmacists, administrators, etc.) were hired as needed so that each site was able to provide general medical, paediatric, and obstetric care.

With these expanded services, the number of ambulatory visits increased approximately 10-fold at each site within 3 months of expansion. All pregnant patients, and all patients with clinical symptoms, signs, or risk factors for HIV, were offered VCT. In the first year of the expansion, the Clinique Bon Sauveur and the four expansion sites followed over 8000 HIV-positive patients, and 1050 were started on DOT HAART on the basis of laboratory and clinical criteria. Over time, the rate of VCT uptake is increasing; this network of facilities expects to treat far more patients with HAART during year two of scale-up.

## Adherence support strategies

The *accompagnateurs* are the structural backbone of the programmes at the Clinique Bon Sauveur and at all of the expansion sites. They are highly respected in their home communities, and serve as the essential link between the villages and the clinic. Each time a patient from the catchment area is diagnosed with active tuberculosis or advanced HIV disease requiring HAART, an *accompagnateur* is either selected from the

**Table 1. Comparison of outcomes between patients on highly active antiretroviral therapy and two other groups.**

Outcome	Group A	Groups B and C
Number of patients	100	200 (100 in B, 100 in C)
Mortality at end of study period	0	43 (14 in B, 29 in C)
Tuberculosis incidence	2/100	21/100 (data available only for B)
Number of opportunistic infections during study period	0.24	3.3
Average weight change	10.3 kg weight gain	6.0 kg weight loss
Number of days hospitalized during study period	0	23.4

Group A: First 100 patients to take directly observed treatment (DOT) with highly active antiretroviral therapy (HAART) from a community health worker.

Group B: 100 patients diagnosed at the same time as group A, but deemed not sick enough for HAART (received prophylaxis for opportunistic infections and all medications except HAART).

Group C: 100 patients diagnosed at the same time as groups A and B, but living outside the area served by community health workers (therefore not qualifying for DOT HAART).

current staff or hired from the community at the patient's request. All *accompagnateurs* are trained concerning the importance of confidentiality and emotional support for the patients. They also receive training regarding the clinical presentation and management of HIV and tuberculosis, including the proper use of medications and their side-effects. During the daily visits, the *accompagnateurs* observe the patients taking their medications, and they then either leave the second dose of medication or return later to deliver that dose as well.

Social support is also provided by the clinic staff. New patients undergo a detailed social assessment to address potential barriers to medication adherence or robust response to therapy; malnutrition is a ranking problem in central Haiti. A social worker also visits each patient at home, to analyse the household's financial situation and social support network. In addition, the clinic staff, including physicians and nurses, regularly make home visits to provide emotional support and ensure that the patients are thriving in all aspects of life. A management plan is elaborated on the basis of these assessments.

## Programme structure

At each site, HAART is provided in the context of a comprehensive programme of HIV, tuberculosis, and STD care based on four pillars established by Partners In Health/Zanmi Lasante. The first pillar, as noted, is integrated HIV prevention and care [10]. HIV prevention is emphasized at every site and includes community events, discussions and lectures at churches and schools, and ongoing teaching by multiple healthcare providers in group and individual settings in the clinic. These programmes include sexual education and condom distribution. In addition, the *accompagnateurs* educate their fellow villagers and refer those with risk factors or clinical signs of HIV to the clinic for testing. VCT is offered to all patients who have tuberculosis, an STD, or any other risk factor or clinical sign of HIV. Patients who test HIV-negative are instructed about high-risk behaviours to avoid. Those diagnosed with HIV undergo in-depth counselling, including emotional support and education about methods to prevent HIV transmission. All HIV-positive patients are followed with monthly clinic visits to allow for ongoing social support, early diagnosis and treatment of opportunistic infections, and for those on HAART, evaluation for side-effects, toxicity, and adherence to medical therapy.

The second pillar is women's health and prenatal care, including the prevention of mother-to-child transmission of HIV disease. Prenatal testing is recommended for all pregnant women, and those who are HIV-

positive receive extensive counselling along with monthly follow-up visits with a physician for ongoing evaluation. A nurse will make a home visit before delivery to evaluate the patient's socioeconomic situation and water supply. Antiretroviral therapy, either with zidovudine alone or with HAART, is started at variable points during pregnancy. Late presenters are treated with nevirapine. The babies of HIV-positive mothers are treated with a week of zidovudine, and formula feeding is recommended and provided free of charge. A sanitation engineer works with the Partners In Health/Zanmi Lasante team in order to improve access to clean water in the sites served by the expansion projects.

The third pillar is effective tuberculosis diagnosis and treatment. The tuberculosis programme is similar to (and was in fact the precursor to) that for HIV, with community-wide prevention and educational activities, active case finding, and DOT. Social support is central to the high cure rates documented since 1988.

The fourth pillar is STD treatment. All patients with risk factors or symptoms of STD are offered HIV testing in addition to STD testing and treatment [11] (see Fig. 1).

## Selection for treatment

Between 1998 and 2002, those HIV-infected patients who received HAART were selected on the basis of clinical guidelines suggesting severe immunosuppression. At that time there was no alternative, as the program had limited laboratory facilities that were capable of only the most basic functions, including the following tests: hematocrit, white blood cell count and differential, liver function tests, and rapid HIV tests. Lacking the capacity for CD4 count, the team selected the sickest patients for initiation of HAART based on clinical staging of immune suppression, a syndromic approach. Clinical criteria for HAART enrolment included conditions such as recurrent opportunistic infections that did not improve with antibacterial or antifungal agents, chronic enteropathy with wasting, otherwise unexplained significant weight loss, severe

- Voluntary counselling and testing
- Prevention of mother-to-child transmission
- Sexual education and distribution of condoms
- Treatment of all sexually transmitted diseases
- Safe blood transfusion
- Monitoring and surveillance
- Treatment of opportunistic infections, including tuberculosis
- Antiretroviral therapy

**Fig. 1. Integrated approach to HIV/AIDS.**

neurological complications related to HIV, and severe anaemia, leucopenia, or thrombocytopenia [12]. Although partners in Health/Zanmi Lasante's small pilot programme was started well before others, such recommendations were in accordance with the 2002 WHO recommendations for scaling-up access to antiretroviral therapy in resource-limited settings, which state that HIV-positive patients with clinical AIDS are appropriate candidates for treatment even when CD4 cell counts are not available. Patients with active HIV-associated tuberculosis were typically treated for tuberculosis alone, as most improved dramatically with such therapy. A reassessment of these patients has been conducted monthly, and many are now receiving HAART, though they were usually able to wait a few years before requiring antiretroviral therapy [13].

In late 2002, with the help of the Division of AIDS at Harvard Medical School, the Clinique Bon Sauveur acquired a flow cytometer, thus enabling the on-site measurement of CD4 cell counts. In April 2003, a second flow cytometer was obtained for the Lascahobas site. Enrolment on HAART is now based on a combination of clinical and immunological criteria. All patients from the catchment area with a CD4 cell count less than 200 cells/mm<sup>3</sup> or clinical AIDS are immediately offered DOT HAART. Those with HIV and tuberculosis are now treated with concurrent HAART and antituberculosis medication if they are deemed to be at risk, by WHO criteria, of clinical decline over the next 6 months. HAART is deferred in those patients with higher CD4 cell counts (over 350 cells/mm<sup>3</sup>) who are clinically stable, but patients with CD4 cell counts between 200 and 350 cells/mm<sup>3</sup> who have signs and symptoms of advanced HIV disease are also offered DOT HAART.

In conclusion, community-based care of AIDS has been highly effective in rural Haiti. Due to the powerful linkage between prevention and treatment, medical staff at the Clinique Bon Sauveur and the four expansion sites have seen an enormous increase in demand for voluntary counselling and testing since HAART was introduced. The 'Lazarus effect', as it is known, has led to an equally dramatic decrease in AIDS-related stigma, thus encouraging more individuals to undergo HIV testing. With the majority of these patients now testing negative, healthcare workers can use this opportunity to educate them about high risk behaviours to avoid. HIV-positive patients are encouraged to avoid risky behaviour; they also hold an important role in the program's AIDS prevention activities [15].

Adherence to HAART has been very high, and as a result, all patients have responded with weight gain and improved functional capacity [10]. Fewer than 5% of patients have required treatment changes as a result of

side-effects. In a subset of DOT HAART patients in whom a viral load test was performed, 86% had no virus detected in peripheral blood. With more international financial support for HIV/AIDS treatment in resource-limited settings, there should be no barriers to access to life-saving HAART for those who need it most. Improving AIDS care will also dramatically strengthen HIV prevention efforts.

*Sponsorship: This study was supported by the Global Fund To Fight AIDS, Tuberculosis and Malaria.*

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