A Community-Based Approach to HIV Care in Rural Liberia:

Liberia's HIV Equity Initiative

A Report at 6 Months of Implementation

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National AIDS & STI Control Program
Ministry of Health and Social Welfare
Republic of Liberia

County Health Department
Grand Gedeh County
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Executive Summary

With the aim of achieving universal access to antiretroviral HIV treatment, in March 2007, the Liberian National AIDS & STI Control Program and Ministry of Health and Social Welfare, in partnership with Tiyatien Health, launched the HIV Equity Initiative – Liberia's first comprehensive, community-based antiretroviral treatment (ART) program – at Martha Tubman Memorial Hospital in Zwedru, Grand Gedeh County.

At Martha Tubman Hospital as at other treatment sites, the Liberian Ministry of Health has made a commitment to improving access to HIV care by providing all related medicines free-of-cost to HIV patients. The HIV Equity Initiative sought to demonstrate the impact of three unique program components on further eliminating barriers to adherence and access to ART. This involved training non-physician clinicians to prescribe and manage patients on ART; providing ART patients with comprehensive socioeconomic support including food packages and transportation stipends; and using a special type of community health worker, called "accompaniers", to provide directly observed therapy as well as moral and psychosocial support.

Through six months of implementation, the HEI has achieved impressive results, albeit on a small-scale among ART patients receiving all interventions outlined above. Over 62 patients were diagnosed with HIV and enrolled into long-term care and treatment provided by physician assistants and physicians. Among all HIV patients, 28 received ART. Mortality (6.3%) among 16 ART patients receiving comprehensive socioeconomic assistance as well as supervision and support by a HEI accompanier was low. Among these ART patients, average adherence to ART and attendance at monthly follow-up appointments was greater than 95% and no ART patient was lost to follow-up. Of note, mortality or default (50%) was higher among 12 ART patients not supervised by accompaniers and not receiving socioeconomic support.

We conclude that high quality HIV care can be achieved, at least on a small-scale, even in Liberia's most resource-constrained regions employing an integrated, comprehensive and community-based approach. Such approaches should be given greater consideration when designing treatment programs for HIV and other chronic diseases, including tuberculosis, in rural Liberia.

Background

Gaping voids of physical and human infrastructure have been cited as major barriers to the expansion of HIV services into resource-poor settings.[1] The problems caused by a dearth of infrastructure are heightened by the war-induced devastation and entrenched poverty that plague Liberia, one of the world's poorest nations. Until recently, these factors conspired to prevent antiretroviral treatment from reaching southeastern Liberia, the country's poorest and most heavily HIV-burdened region.[2]

Between September 2006 and February 2007, 67% (14/21) of AIDS patients presenting to Martha Tubman Memorial Hospital in Zwedru, a small town in southeastern Liberia, died in the absence of readily-available antiretroviral treatment.[3] Narratives from these patients revealed that structural barriers (e.g. out-of-pocket expenses, transportation costs, and user fees) prevented them from accessing antiretroviral treatment (ART) in Monrovia, where ART had already been available for six years.[4,5] In response to this evidence, in February 2007, Liberia's Coordinating Mechanism of the Global Fund for AIDS, Tuberculosis and Malaria (GFATM) authorized expansion of antiretroviral treatment to Tubman Hospital.[6]

The decision to rapidly expand HIV treatment was not made without reservation. In addition to the infrastructure concerns cited above, fears about potentially high rates of treatment default were raised. Indeed, adherence to long-term treatment had already proved challenging for national control of tuberculosis, another chronic infectious disease requiring a long-term, multi-drug regimen.

Recognizing the challenges of poor infrastructure and barriers to treatment adherence, the National AIDS Control Program, Tubman Hospital in partnership with a community-based organization, Tiyatien Health, launched Liberia's first comprehensive, community-based HIV treatment program – the HIV Equity Initiative. Inspired by the success of similar projects in rural Haiti and Rwanda, HEI sought to integrate HIV services within the context of primary healthcare while providing robust treatment adherence support. Here, in order to further inform the delivery of HIV care in rural Liberia, we report on preliminary results of the HIV Equity Initiative.

Program Description

From March 1, 2007 – August 31, 2007, under the HIV Equity Initiative (HEI), the Liberian National AIDS Control Program and Ministry of Health, in partnership with a community-based organization, Tiyatien Health, have been providing care to a growing cohort of over 60 HIV patients at Tubman Hospital. Most of the people served by HEI are poor subsistence farmers, nearly all of whom were displaced during 14 years of civil war. After living for years in refugee settlements across the border in Cote d'Ivoire, many have returned to find their farms spoiled and unemployment rates greater than 80%. HIV prevalence among pregnant women attending antenatal clinic is estimated at 9%.[2]

The HEI has learned how to provide high-quality HIV care to these patients based on their life experiences and the work of other agencies like Partners in Health.[7] The lessons learned from earlier

narratives of patients revealed that poverty-related factors such as lack of transportation, user fees, food insecurity, and indirect costs associated with time away from farming posed more significant barriers to adhering to long-term therapy than a patient's individual behavior.[4,5] HEI has thus put several critical components in place to reduce these barriers. The Liberian Ministry of Health has made a commitment to provide healthcare services for free at all public facilities. Thus, all care, including antiretroviral treatment (ART), laboratory services and inpatient hospitalizations, are provided entirely without cost, thereby eliminating a significant barrier for those seeking HIV testing and attending follow-up appointments.[8,9]

Second, HIV testing and treatment are integrated into primary healthcare services. Primary clinicians have been trained and protocols have been implemented by healthcare practitioners to conduct routine voluntary counseling and testing of patients presenting with tuberculosis and sexually transmitted infections, as well as those patients presenting to the maternal and child health clinic. This has been particularly important as most patients presenting to Tubman Hospital come only when they are ill rather than to seek HIV testing specifically. This strategy, also called "routine offer" testing has been generally accepted in various settings.[10,11] A follow-up clinic has been established to follow both HIV patients who are and are not yet eligible for antiretroviral treatment. Physicians *and* physician assistants have been trained through formal lectures and on-site mentoring provided by a NACP clinical mentor through its partnership with the Clinton Foundation HIV/AIDS Initiative. Training non-physicians in HIV management is well supported by the World Health Organization[12] and has been important for HEI as it has prevented treatment interruptions when the Hospital's only government-employed physician was absent. Additionally, it allows HEI to demonstrate the viability of expanding ART treatment to Liberia's outlying areas, where there are no physicians.

Third, the HEI has instituted a comprehensive package of interventions, centered on defraying out-of-pocket expenses for patients, to increase access to care and treatment adherence. Numerous studies document that transportation costs to and from clinic visits can deter adherence to ART and attendance at follow-up appointments.[13] HEI provides modest monthly transportation stipends ($5.00 per scheduled visit) to its ART patients, who often wait or walk for days to receive care, as they are often unable to afford transport in private vehicles. Similarly, studies have found that a lack of food is a cause of poor adherence to ART, and the subsequent provision of food has been shown to improve outcomes.[14,15] Families throughout the developing world spend greater than 50% of their household income on food, and income and food production decline when a household member has AIDS.[16,17] Therefore, in partnership with the World Food Program, HEI provides food packages (corn-soya blend, mineral oil, salt, sugar, and bulgar wheat) to malnourished HIV patients and their families.

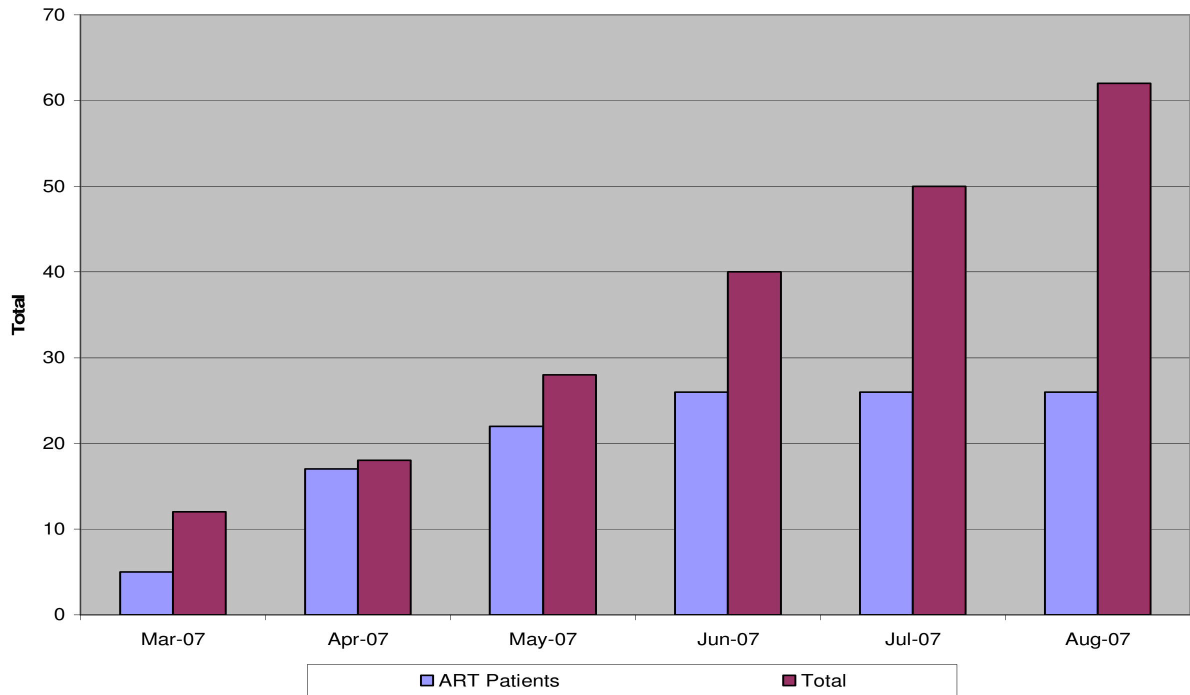
The fourth aspect and cornerstone of HEI's efforts to eliminate barriers to adherence and access to ART is its community health workers (or "accompaniers"). Trained based on Partners in Health's "accompagnateur" training curriculum, HEI's accompaniers provide directly-observed therapy of ART thrice-weekly while providing moral and psychosocial support in the patient's home. HEI's community health workers also monitor for signs of ART side effects or toxicity; collect information on living circumstances of patients; deliver medicines to patients in their homes; perform tracing if patients miss appointments; conduct active case finding; and serve as a link to the health center. In

HEI's program, accompaniers also strengthen primary healthcare activities by referring any sick individuals found in the community to the Hospital.

Results

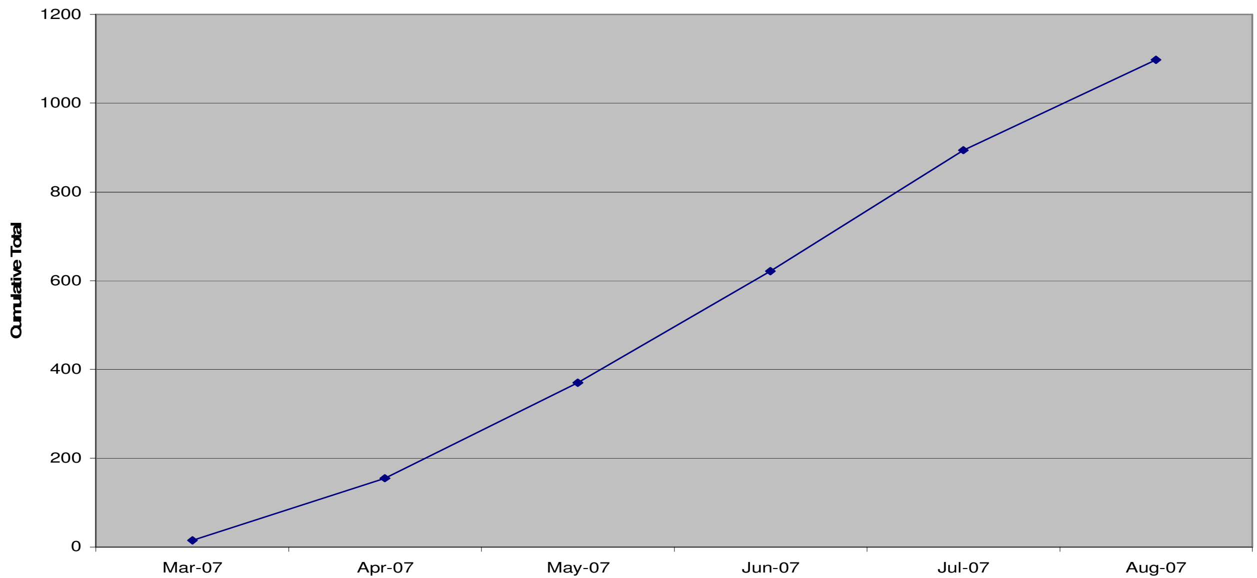
Total enrollment of HIV patients into HEI's program is described in figure 1. From March 1, 2007 through August 31, 2007, over 400 HIV tests were performed and 62 HIV patients were enrolled, including 28 who received ART.

Figure 1. HIV Patient Enrollment



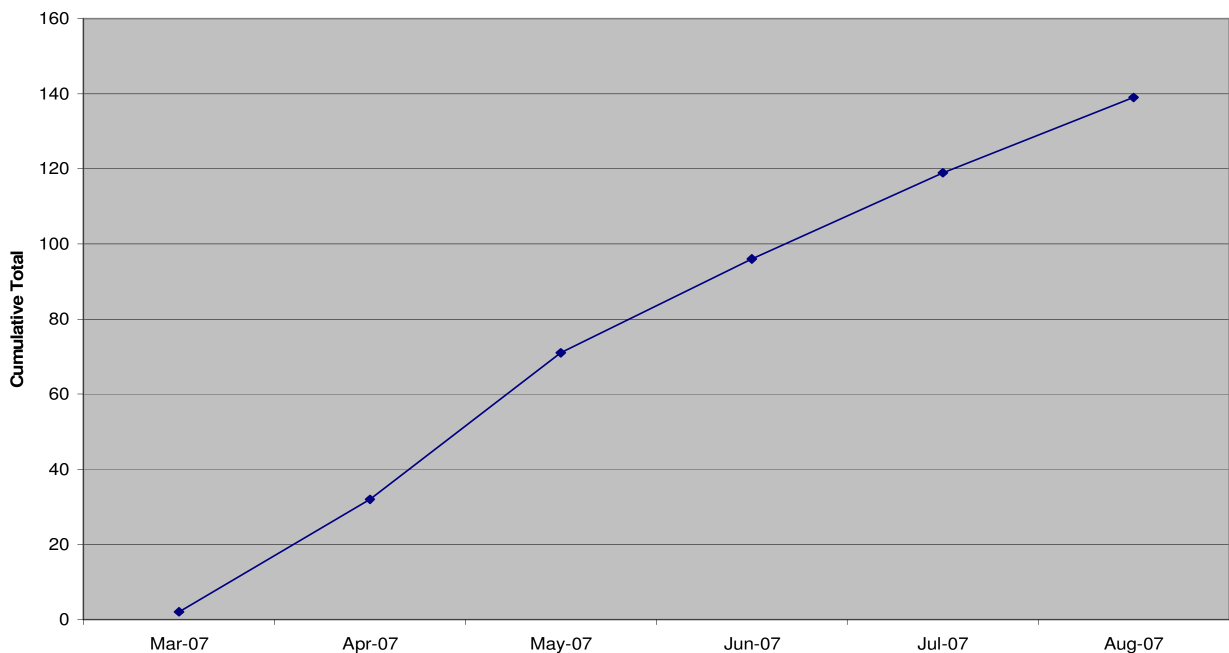
Mortality (6.3%) among 16 ART patients receiving comprehensive socioeconomic assistance as well as supervision and support by a HEI accompanier was low. Among these ART patients, average adherence to ART and attendance at monthly follow-up appointments was greater than 95% and no ART patient was lost to follow-up. Of note, mortality or default (50%) was higher among 12 ART patients not supervised by accompaniers and not receiving socioeconomic support.

Figute 2. CHW Home Visits to Conduct Directly Observed Therapy for ART



The HEI's community health workers made over 1000 home visits to provide directly-observed therapy, as shown in figure 2. Figures 4-7 and Box 1 respectively depict these activities in pictures and describe the therapeutic impact on one patient's life. Of note, figure 3 describes the impact of HEI's accompaniers' activities on primary health care. The HEI's community health workers referred nearly 150 individuals to Tubman Hospital for symptoms as varied as fever, cough and diarrhea. Some of these individuals were later diagnosed with and treated for severe illnesses such as anemia, tuberculosis and malaria.

Figure 3. Uptake of Primary Health Services by Individuals Referred From Communities by HEI Accompaniers



Discussion

This early analysis of a pilot project indicates that HIV treatment can be effectively delivered even in Liberia's most resource-constrained regions employing an integrated, community-based approach. Dramatic reductions in AIDS mortality and default rates have been made along with concurrent gains in treatment adherence.

To be sure, these findings are derived from a preliminary analysis, conducted only six months after program launch. Clear inferences linking specific community-based or clinic-based interventions to outcomes are impossible to ascertain. For instance, it is impossible to make any definitive conclusions concerning mortality differences among ART patients followed by an accompanier compared to those who were not. These groups of patients may differ in other aspects (e.g. ART patients followed by CHWs also tend to live closer to the hospital), which may influence outcomes.

But, this experience does demonstrate that high quality HIV care can be achieved, at least on a small-scale, in rural Liberia when patients receive integrated, community-based care along with socioeconomic support. Therefore, it is important to share and discuss these findings now as the implications therein may help inform scale-up of care in other parts of rural Liberia. HEI's experience has implications specifically for HIV care delivery and more generally for the provision of primary health care services in Liberia.

Figure 4. Training HEI accompaniers to provide directly observed ART.

Figure 5. HEI accompanier visits his patient to provide directly observed ART.

Figure 6. HEI's community health workers set to deliver food packages to their patients and families.

Implications for HIV Care in Rural Liberia

Lessons from HEI's experience should be considered in the context of a fledgling National AIDS Control Program. Over the last two years, public sector treatment has expanded from four to ten sites nationally. Many more Liberians are being enrolled into antiretroviral treatment than ever before. Large infusions of GFATM funds, including more than $30 million pledged to AIDS control over five years, have been a driving force. ART significantly prolongs survival and it is expected that this expansion will lead to greatly improved outcomes among people living with HIV. As the availability of free antiretroviral medicines expands, ensuring high treatment adherence, low default rates and good outcomes is critical.[18] Yet, based on many other countries' experience, this can be very challenging on a large scale. In a recent systematic review evaluating over 70,000 patients in African ART programs over 2 years, poor retention rates were observed.[19] These trends raise significant concern for Liberia's national AIDS control strategies.

Low treatment default rates, high rates of treatment adherence, and low mortality rates among ART patients are key indicators of a successful HIV treatment program. We have shown that the NACP can achieve these objectives by delivering HIV treatment through enlisting a cadre of community health workers as well as non-physician clinicians and providing supplementary socioeconomic support for its patients. Yet, among those who agree on the merits of the community-based approach some may question its feasibility as a model for treatment scale-up. It is too early yet to perform a costing exercise, but for now there seem to be several advantages of adopting a community-based model of HIV treatment.

First, since directly-observed ART leads to improved treatment adherence, it decreases the risk for virologic resistance, delaying conversion to expensive and complicated second-line ART regimens.[20] HEI achieved adherence rates greater than 95%, above the level at which risk of virologic resistance has been shown to increase. Second, HEI's community-based model can yield great return on investments already made and those that may arrive in support of AIDS control in Liberia. For instance, compared to baseline data, we found that reduction in AIDS mortality may be minimal when investments are made exclusively in antiretroviral medicines and free laboratory services. When community health workers and socioeconomic support are also provided, the data here suggest that a much greater reduction in AIDS mortality may be achieved. GFATM has already provided an unprecedented amount of funds towards AIDS control in Liberia. GFATM and other funding institutions are increasingly linking their support to performance evaluation. Simply enrolling greater numbers of people on ART is not sufficient. High-quality outcomes among these patients, too, must be shown at a satisfactory level if Liberia is to continue demonstrating it is a worthy recipient of major funding. We propose, as others already have, that an integrated, community-based HIV treatment model can deliver improved outcomes on a national scale.[20]

Implications for Strengthening Primary Healthcare in Rural Liberia

In Liberia, where fewer than three physicians exist per 100,000 people,[21] building human resources for health is a key priority. Well-trained, carefully supervised, and fairly compensated community health workers can help fill the human resource gap, and as HEI has shown, they are capable of

delivering complex health interventions. The work of HEI and some world-renowned agencies have demonstrated that community health workers can be given immense responsibility for conditions as complex and wide ranging as HIV/AIDS[7], neonatal mortality[22] and multi-drug resistant tuberculosis[23].

Box 1. Andrew's Story

Born into a family of hunters, Andrew never had enough money to attend school. In 1990, then 21 years-old, Andrew and his family fled to a refugee camp in Cote d'Ivoire after violence broke out in his village. Andrew and his wife, Martha, lost 2 of their 5 children to diarrhea during their 14 years in exile. Fifteen years later, after the war ended, Andrew returned to his village to rebuild. With Martha, Andrew organized a small home garden outside his thatched-roof shack and he tried hunting again. They found it difficult to manage to feed and send their children to school. Then, a year later, Andrew started coughing. The cough persisted for months and fevers followed. He lost over 20lbs and without access to a clinic, he and his wife sought out village church leaders for an explanation of his illness. Perplexed by Andrew's worsening condition, community leaders told him that his suffering was due to a curse inflicted upon him by Martha.

Fearing violent community retaliation, Martha fled the village with her children. Living alone, Andrew only grew sicker. Eventually, other relatives raised enough money to send him on a pick-up truck to our health center in Zwedru. There, Andrew was diagnosed with tuberculosis and AIDS by Tubman Hospital's staff. Upon hearing of his fatal illness, Andrew became dismayed: "I want to kill myself," he told his physician.

But one month after starting AIDS treatment his life began a transformation. With support from one of the HIV Equity Initiative's community health workers, Andrew took his medicine daily and gained 10lbs. The food and financial assistance he receives through the HEI has allowed him to save enough funds to start his own vending business. Andrew has become only the second member of his family to escape a life of hunting and subsistence farming.

And, there is more good news. Andrew will soon reunite with his family. Martha recently received news that Andrew's condition had improved. She is making travel preparations to join him. Andrew is anxious about revealing his AIDS diagnosis to his family, but is comforted by the presence of Cecelia, one of HEI's accompaniers. Cecelia stands by the family – ready to offer counseling and moral support.

With community health workers as the cornerstone, HIV treatment and associated "vertical" funding can be leveraged (or "horizontalized") for broader gains in primary healthcare.[24] Although tasked with the primary objective of improving outcomes among HIV patients, HEI's community health workers have already improved health generally in their communities. Within six months, they were able to refer nearly 150 sick individuals to the outpatient department at Tubman Hospital. We envision shifting other primary healthcare tasks, as outlined under Liberia's Basic Package of Health Services[25] to accompaniers, such as providing directly-observed therapy for patients with tuberculosis, mental illnesses, and those at risk of childhood mortality. This program is envisioned under a broader Rural Health Equity Initiative, to be spearheaded by the community-based organization, Tiyatien Health, and government health facilities in southeastern Liberia.

The Equity Imperative

In terms of equity, delivering HIV care in a community-based manner may be considered the highest standard of care.[24] The Ministry of Health's foremost policy imperative is the decentralization of health services.[25] We anticipate that HEI's community-based model can be widely deployed at the primary clinic level, where the greatest void of human resources currently exists. Indeed, as some other organizations have demonstrated, community-based HIV treatment can reduce health inequalities in resource-poor settings.[24]

Next Steps

The early results from HEI's work seem promising. With increased funding, HEI's operational partners would be better positioned to implement, evaluate and learn from the project's work over the long-term. Furthermore, there is an urgent need to recruit and train more accompaniers, enhance case detection at primary clinic sites in southeastern Liberia, and develop robust laboratory monitoring (e.g. CD4 counter) to follow its progress. The current partnership between a public health center and a community-based organization, Tiyatien Health, offers several avenues for funding. But, public investment is critical as the ultimate aim is to promote high quality care for patients with HIV and other diseases as a public good.

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References

1. Harries AD, Nyangulu DS, Hargreaves NJ, et al. Preventing antiretroviral anarchy in Africa. Lancet. 2001;358:410–414.
2. Results of Antenatal HIV Surveillance Survey. National AIDS & STI Control Program. 2007. Jan. Ministry of Health and Social Welfare: Monrovia.
3. Patient and laboratory records at Martha Tubman Memorial Hospital from September 1, 2006 through February 28, 2007.
4. Panjabi R, Westerhaus MJ, Mukherjee JS. Violence, Illness and the Narrative: Towards Breaking Vicious Social Cycles. Working Paper. Department of Social Medicine, University of North Carolina – Chapel Hill. In submission.
5. Panjabi R. (2007) Violence, Blame and the Chronicity of Suffering: A View from Rural Liberia. *Societies Without Borders*. (in press).
6. Minutes of the Liberia Coordinating Mechanism for the Global Fund for AIDS, Tuberculosis and Malaria. February 2, 2007. Ministry of Health and Social Welfare: Monrovia.
7. Farmer P, Leandre F, Mukherjee JS, et al. Community-based approaches to HIV treatment in resource-poor settings. Lancet 2001; 358: 404-09.
8. Russell S. The economic burden of illness for households in development countries: a review of the studies focusing on malaria, tuberculosis and HIV/AIDS. Am J Trop Med Hyg. 2004;71(Suppl 2):147–155.
9. Laniece I, Ciss M, Desclaux A, et al. Adherence to HAART and its principal determinants in a cohort of Senegalese adults. AIDS. 2003;17 (Suppl 3):S103–S108.
10. Centers for Disease Control. Introduction of routine HIV testing in prenatal care—Botswana, 2004. MMWR Morb Mort Wkly Rpt. 2004;53:1083–1086.
11. Westheimer EF, Urassa W, Msamanga G, et al. Acceptance of HIV testing among pregnant women in Dar-es-Salaam, Tanzania. J Acquir Immune Defic Syndr. 2004;37:1197–1205.
12. World Health Organization. Progress on Global Access to HIV Antiretroviral Therapy: An Update "3 by 5". Jun 2005; World Health Organization: Geneva.
13. Rowe KA, Makhubele B, Hargreaves JR, et al. Adherence to TB preventive therapy for HIV-positive patients in rural South Africa: implications for antiretroviral delivery in resource-poor settings? Int J Tuberc Lung Dis. 2005;9:263–269.
14. Ndekha MJ, Manary MJ, Ashorn P, et al. Home-based therapy with ready-to-use therapeutic food is of benefit to malnourished, HIV-infected Malawian children. Acta Paediatr. 2005;94:222–225.
15. Villamor E, Saathoff E, Manji K, et al. Vitamin supplements, socioeconomic status, and morbidity events as predictors of wasting in HIV-infected women from Tanzania. Am J Clin Nutr. 2005;82: 857–865.
16. Fawzi WW, Msamanga GI, Spiegelman D, et al. A randomized trial of multivitamin supplements and HIV disease progression and mortality. N Engl J Med. 2004;351:23–32.
17. Rutengwe RM. Identifying strategic interventions for improving household food and nutrition security in an urban informal settlement, South Africa. Asia Pac J Clin Nutr. 2004;13(Suppl):S169.
18. Personal communication with Dr. Khalipha Bility, Program Manager, National AIDS & STI Control Program, Ministry of Health and Social Welfare of Republic of Liberia: Monrovia.
19. Rosen S, Fox MP, Gill CJ. Patient retention in antiretroviral therapy programs in sub-Saharan Africa: A systematic review. PLoS Med 2007;4(10): e298. doi:10.1371/journal.pmed.0040298

20. Mukherjee JS, Ivers L, Leandre F, et al. Antiretroviral Therapy in Resource-Poor Settings: Decreasing Barriers to Access and Promoting Adherence. J Acquir Immune Defic Syndr 2006; 43:S123-S126.
21. World Health Organization. The world health report 2006: working together for health. 2006; World Health Organization: Geneva.
22. Bang AT, Bang RA, Reddy HM. Home-Based Neonatal Care: Summary and Applications of the Field Trial in Rural Gadchiroli, India (1993 to 2003). J Perinatol 2005; 25:S108–122.
23. Mitnick C, Bayona J, Palacios E, et al. Community-Based Therapy for Multidrug-Resistant Tuberculosis in Lima, Peru. NEJM. 2003; 348(2):119-128.
24. Farmer P. From "Marvelous Momentum" to Health Care for All: Success is Possible with the Right Programs. Foreign Affairs. 2006;Jul/Aug.
25. A Basic Package of Health and Social Welfare Services for Liberia. (2007) Ministry of Health and Social Welfare: Monrovia. (forthcoming).