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Implementing Antiretroviral Therapy in Rural Communities: The Lusikisiki Model of Decentralized HIV/AIDS Care

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Health worker shortages are a major bottleneck to scaling up antiretroviral therapy (ART), particularly in rural areas. In Lusikisiki, a rural area of South Africa with a population of 150,000 serviced by 1 hospital and 12 clinics, Médecins Sans Frontières has been supporting a program to deliver human immunodeficiency virus (HIV) services through decentralization to primary health care clinics, task shifting (including nurse-initiated as opposed to physician-initiated treatment), and community support. This approach has allowed for a rapid scale-up of treatment with satisfactory outcomes. Although the general approach in South Africa is to provide ART through hospitals—which seriously limits access for many people, if not the majority of people—1-year outcomes in Lusikisiki are comparable in the clinics and hospital. The greater proximity and acceptability of services at the clinic level has led to a faster enrollment of people into treatment and better retention of patients in treatment (2% vs. 19% lost to follow-up). In all, 2200 people were receiving ART in Lusikisiki in 2006, which represents 95% coverage. Maintaining quality and coverage will require increased resource input from the public sector and full acceptance of creative approaches to implementation, including task shifting and community involvement.

BACKGROUND

The chronic shortage of health care workers is recognized as one of the major bottlenecks to health care provision, and scaling up treatment is no exception [1]. The impact is most devastating in rural areas, where the human-resource crisis is most acute [2]. For the past 3 years, Médecins Sans Frontières (MSF) has been supporting a program to provide care and treatment for people with HIV/AIDS in the local service area of Lusikisiki, one of the poorest and most densely populated rural areas of South Africa.

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The Lusikisiki subdistrict comprises 150,000 inhabitants serviced by 1 hospital and 12 clinics. The HIV infection prevalence is high, with almost one-third (31%) of women who present at antenatal care clinics testing positive. A lack of staff within the health system is a major problem. With just 5 physicians per 100,000 people, Lusikisiki's physician-to-patient ratio is 14 times lower than the national average [3]. Approximately one-half of all nursing posts remain vacant. In addition, a chronic lack of auxiliary staff adds to nurses' workloads. In this article, we describe how the integration of HIV care and treatment into primary health care in Lusikisiki overcame some of the challenges of working in a resource-limited rural area, to achieve good treatment coverage and clinical outcomes [4].

APPROACHES TO SUPPORT CLINIC-BASED CARE

The World Health Organization promotes the role of primary health care and community-led care in the delivery of antiretroviral therapy (ART) in resource

limited settings [5]. In keeping with these principles, the delivery of HIV services in Lusikisiki was achieved through decentralization to primary health care, task shifting within services, and strong community support.

Decentralization and task shifting. The provision of treatment at the clinic level inevitably resulted in a significant increase in the number of service users within a system that was already chronically understaffed and poorly equipped. Although overall utilization of clinic services increased almost 2-fold since the start of the program (from 16,465 service users in April 2004 to 28,191 service users in April 2006), the number of professional nurses (30) did not increase. This near doubling of the workload would have been impossible to manage without task shifting.

With appropriate training, mentoring, and supervision, it was possible to delegate the running of the ART program to primary health care nurses and community health workers. Table 1 provides a description of some of the changes in the roles of clinic and support personnel in the Lusikisiki program. As much responsibility as possible was delegated to lower-level health care workers while ensuring that professional medical oversight was provided to maintain quality control.

Training and mentoring through mobile teams. All clinics received regular physician support via a mobile team visit to support the overall health services. In addition, these mobile teams provided training and mentoring of nurses in HIV management, including prevention of mother-to-child transmission, management of opportunistic infections, and ART. This was reinforced through on-the-job training, which also included patient management skills, such as examination, history taking, and counseling. Tuberculosis (TB) is the major cause of death among people with HIV/AIDS in South Africa; according to Statistics South Africa (the government statistical agency) [6], >50,000 people died of TB in 2001 alone. In the Lusikisiki program, 82.5% of patients with TB are found to be HIV positive; therefore, a particular emphasis was placed on developing a high suspicion for TB and making a clinical diagnosis when smear results are negative or extrapulmonary TB is present.

Table 1. Traditional roles of health staff in HIV/AIDS care, compared with roles of health staff in the Lusikisiki program.

Category	Traditional roles	Roles in the Lusikisiki program
Physicians	Conduct patient consultations: OIs, staging, ART initiation Visiting physician does not interact with clinic staff	Mobile visit: sees only problem cases Supervise clinics and mentor nurses and counselors Serve as part of a multidisciplinary team, including service users
Pharmacists	Manage drug supply Oversee prescriptions	Hospital pharmacist: provide mentoring to pharmacist assistants
Nurses	Support physician Conduct VCT Prepare individuals for ART Monitor ART recipients Collect data Manage drug supply Supervise community caregivers	Manage OIs Perform clinical staging Initiate and monitor ART Supervise clinic staff Manage drug supply Supervise adherence counselors
Adherence counselors	Not utilized	Prepare individuals for ART Empower ART recipients Run ART support groups Collect data (ART registers) Mentor community caregivers Trace individuals who default
Pharmacist's assistants	Not utilized or play a limited role (dispense drugs only under strict pharmacist supervision at the hospital)	Manage drug supply Dispense drugs Check adherence Identify individuals who default
Community caregivers	Promote health Directly observe treatment (including recall of individuals who default)	Run HIV support groups
Support groups, committees, activists, people with HIV/AIDS	Not utilized	Prepare individuals for and monitor adherence to ART Promote health in community Recall individuals who default React to bottlenecks Advocate for better service delivery

NOTE. ART, antiretroviral therapy; OI, opportunistic infection; VCT, voluntary counseling and testing.

Table 2. One-year outcomes at clinics and the hospital in Lusikisiki, South Africa.

Outcome	Patients at clinics		Patients at the hospital		
	No.	Percentage (95% CI)	No.	Percentage (95% CI)	*P*
Started ART	595	100.0	430	100.0	…
Continued to receive ART	482	81.0 (77.6–84.1)	289	67.2 (62.5–71.6)	<.001
Died	100	16.8 (13.9–20.1)	58	13.5 (10.4–17.1)	.147
Lost to follow-up	13	2.2 (1.2–3.7)	83	19.3 (15.7–23.4)	<.001
CD4 cell count at 12 months					
Determined	348	58.5 (54.4–62.5)	81	18.8 (15.3–22.9)	<.001
⩾200 cells/mm^3	303	87.1 (83.1–90.4)	61	14.2 (64.5–84.2)	.008
Viral load at 12 months					
Determined	296	49.7 (45.7–53.8)	41	9.5 (6.9–12.7)	<.001
<400 copies/mL	265	89.5 (85.5–92.8)	32	78.0 (62.4–89.4)	.033

NOTE. Sample includes all patients who enrolled between January 2004 and June 2005 to receive antiretroviral therapy (ART) and who had completed at least 12 months of treatment by July 2006.

Systems improvement and quality control were overseen by the mobile team (comprising 1 physician and 1 nurse), using a program-evaluation tool that looks at specific outcomes of the different components of HIV care on a quarterly basis. The whole clinic team was brought together to identify the strengths and weaknesses and to decide on priorities for the following quarter.

Creating new capacity. The role of adherence counselors extended far beyond counseling. With training and mentoring, these auxiliary/lay workers were able to support many of the key processes required to run a clinic-based HIV service, including service-user support, treatment preparedness, facilitation of support groups, and arrangement of follow-up visits, as well as teaching people receiving ART to package pillboxes, addressing problems in adherence, and collecting and collating statistics. High commitment was maintained by means of weekly meetings and workshops (and, it should be acknowledged, by the tenacious commitment of key individuals). Adherence counselors also worked with other community actors: volunteer workers (community caregivers), other support groups, adherence and clinic committees, and treatment activists. They also undertook all aspects of voluntary counseling and testing, with nurse supervision. Previously, this was solely the responsibility of the nurses, but, with this increased capacity, the number of people tested has increased >4-fold in the past 3 years (4874 tests performed in 2002 vs. 18,809 performed in 2005).

Engaging the community in HIV/AIDS care is a proven way to enhance program quality, in terms of clinical outcomes, adherence rates, and retention [7]. In Lusikisiki, the community interacted with HIV services in a number of ways. General support groups provided peer support for disclosure and testing and performed home visits when problems were identified. ART support groups prepared people for treatment, provided support for adherence and managing adverse effects, and traced and supported individuals who defaulted. A clinic committee represented service users in the case of complaints, advocated for better infrastructure and drug supply, and monitored HIV program and condom distribution in the community. An adherence committee followed up with nonadherent patients and served as arbitrator if a clinic team could not decide on the readiness of a person for ART. Finally, individual service users provided important support to other members of the community through learning about HIV and sharing their experiences.

Initially, some nurses doubted the capacity of community health workers, but their participation in clinical discussions and patient management was encouraged by the supervising physician. Eventually, nurses began to appreciate the benefits of having some of their workload shared by community health workers.

OUTCOMES OF INTEGRATING HIV SERVICES INTO CLINIC CARE

The approach taken in Lusikisiki has allowed for rapid scale-up of treatment coverage in a short time with good outcomes. A cohort analysis of people who have been receiving treatment for >12 months shows satisfactory immunological recovery and viral suppression (table 2). The data presented allow comparison of outcomes in the hospital and the clinics. Hospital-based ART is generally promoted in South Africa, as in many countries, with a progressive down-referral of patients to the clinics in some areas. Our aim was to show that satisfactory outcomes can be achieved when treatment is initiated at the clinic level. Routine program monitoring showed no difference between the sex ratio among patients attending the clinics and that among patients attending the hospital. The proportion of patients enrolling who had CD4 cell counts <50 cells/mm^3 was

19.2% (95% confidence interval [CI], 17.1%–21.3%) in the clinics and 26.3% (95% CI, 23.1%-29.0%) in the hospital ($P = .0002$). This indicates that the patients enrolling in the hospital had disease that was at a more advanced stage.

The greater proximity and acceptability of services at the clinic level has led to faster enrollment of people receiving treatment and better patient retention. Only 2% of people were lost to follow-up in the clinics, compared with 19% at the hospital. This higher dropout rate at the hospital may be explained by several factors: a higher early mortality, people having to travel farther, less preparation of ART recipients, and less-effective follow-up of individuals who default (adherence counselors are not employed at the hospital). There is no statistical difference between the recorded mortality rates in the hospital and the clinics; however, the percentage of individuals remaining in care was lower in the hospital (67%) than in the clinics (81%). Although the mortality rate among those lost to follow-up cannot be known, it is expected to be high.

Enrollment initially increased at a similar pace at the clinics and hospital. After 1 year, enrollment at the hospital reached a plateau and then began to decline, suggesting a saturation of services. In contrast, enrollment in the clinics continued to increase (figure 1). This is likely a result of clinics offering multiple service points and clinic services being integrated into general consultations.

By mid-2006, there were 2200 people receiving ART in Lusikisiki. According to modeling done for 2005, the program had achieved universal coverage for the subdistrict [4, 8]. At this level of coverage, people arriving at the clinics with HIV/AIDS were far less sick than previously noted. In the inception phases of the program, many people were very ill. This "catch-up of the backlog" is reflected in the statistics: in early 2004, 50% of service users at the hospital and 40% of those at clinics arrived with CD4 cell counts <50 cells/mm^3; by the end of 2005, the number of patients with CD4 cell counts <50 cells/mm^3 had decreased to 16% at both the hospital and clinics. Because people were arriving with a better immune status, clinical management was less time consuming, so that more patients could be seen.

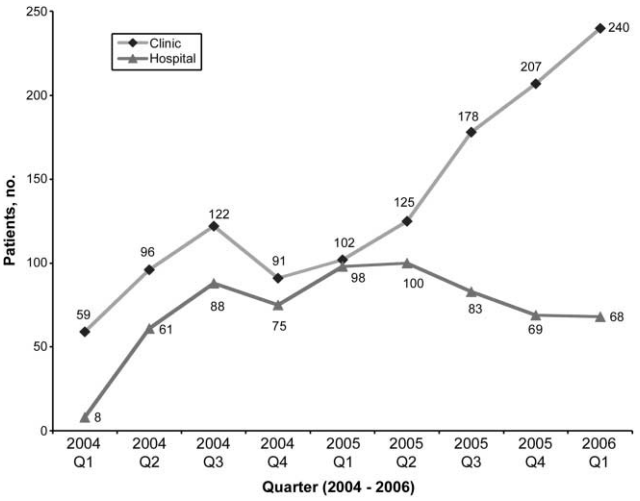

Figure 1. Enrollment into antiretroviral therapy (ART) programs at clinics, compared with the hospital. The graph shows the no. of patients newly enrolled into ART programs for each quarter (i.e., nos. are not cumulative).

CONCLUSIONS

The primary health care approach to providing HIV services in Lusikisiki had achieved nearly universal coverage within 2 years without compromising quality of care. Integration and task shifting helped to spread the workload among the staff, while decentralization helped to spread the load among different clinics. Outcome data show that treatment can be initiated at the clinic level with very satisfactory outcomes and that initiation at clinics allows for more rapid enrollment than does initiation done only at the hospital. Because clinics are part of the local community, they are more user friendly, so people seek treatment earlier and continue to receive treatment longer.

The shortage of nurses in rural areas is a critical issue. A number of potential ways to improve nurse recruitment and retention have emerged from the Lusikisiki experience. These include (1) ensuring an adequate budget for a full complement of clinic staff; (2) recruitment of adequate administrative staff (drivers, clerks, and pharmacist's assistants), to ensure that nurses' time is optimized toward direct patient care rather than being consumed by nonnursing tasks; (3) accreditation and increased remuneration of nurses trained and experienced in HIV care; (4) acknowledging the great disparity between nonurban settings by paying maximum rural allowances to staff working in the most challenging rural areas, like Lusikisiki; and (5) building and renovating nursing accommodations to meet acceptable standards.

The creation of new capacity has been an important aspect of increasing service efficiency and improving outcomes. In particular, the low rate (2%) of loss to follow-up in clinics can largely be attributed to the work of the adherence counselors. Although the critical role played by adherence counselors is recognized by clinic staff and service users, their function is not supported by Department of Health staffing structures; instead, they are employed by a local community-based organization.

Our experience shows that, far from being a detriment to health care services, as some have suggested [9], the provision of ART is having a positive effect on the general quality of primary health care. Improvements in drug supply, diagnostic services, monitoring, staff training, and infrastructural improvements all contribute to improving general primary health

care. The strong community ownership of and participation in health care delivery have also been major benefits in supporting the general quality of health services.

Nongovernmental organizations are a valuable source of technical and financial input, but perhaps their greatest contribution is their political freedom to promote innovation. The importance of MSF's role in Lusikisiki was not the provision of human and financial resources—which is a time-limited and unsustainable contribution—but, rather, the mobilization of expertise and fostering of partnerships to develop innovative approaches to delivering HIV services, to strengthen the system, and to enhance the quality of care. After a gradual handover of responsibilities and resources over a period of 18 months, MSF left Lusikisiki, in October 2006.

Some of the approaches utilized in the Lusikisiki program, such as nurse initiation of treatment, are hampered by a lack of clear policy guidance. Others, such as lay counselor testing, are inconsistent with current policy. However, in practice, these approaches are broadly recognized as an effective way to respond to the overwhelming need for comprehensive HIV care and treatment, including ART. Ensuring sustainability will require increased resource input from the public sector and full acceptance of the creative approaches to implementation, including task shifting and community involvement.

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