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Scaling up HIV testing and counselling towards universal access: what works in resource-limited settings?

By Carole Leach-Lemens, John Owuor

Introduction

Achieving universal access to treatment, prevention and care implies attaining universal knowledge of HIV status.¹ This will depend on the health system's capacity to identify those who are HIV-positive, notably at an early stage of infection, and link the newly diagnosed to effective treatment and care.²

The World Health Organization (WHO) estimates an additional 5 million are currently in need of treatment. By 2015 the number in need of treatment is anticipated to rise to 22 million.

Of those in need of treatment approximately 70% live in sub-Saharan Africa where an estimated 80% are unaware of their status, and nearly 90% are unaware of their partner's status.^{3, 4, 5}

Yet testing and counselling is recognised as a pivotal entry point for the prevention, treatment and care of HIV.⁶ The goal of testing and counselling is to know your status and do something meaningful with the information.⁷

During his time at the US Centers for Disease Control in Kenya and latterly at the World Health Organization, Dr Kevin M De Cock was a strong advocate of the need to step up HIV testing. In an article published in *The Lancet* in 2003 he argued: "A public health goal should be for every African adult and adolescent to know his or her HIV status, and to be retested in case of potential exposure."⁸

Knowledge of HIV status has been linked to a reduction in high-risk behaviours and increased condom use, most notably among HIV-positive individuals and within serodiscordant partnerships.^{9, 10} However, it is important not to overstate the prevention benefit. Some studies have found a greater increase in condom use by people who test positive for HIV than for those who test negative.¹¹ Evidence nevertheless suggests that those who test negative are more likely to go for repeat testing and counselling¹² indicating perhaps a greater willingness to access health services.

However, evidence as to which sorts of testing interventions are most likely to result in sustained behaviour change is still preliminary, and more evidence is clearly needed.

Follow-up and retention in care are no less critical than behaviour change as outcomes of testing and counselling for those who are diagnosed HIV-positive.

Over the period of 2004 to 2008 testing rates have steadily increased. In 15 PEPFAR focus low- and middle-income countries over 55 million testing and counselling sessions have been provided and over 155,000 individuals have been trained in testing and counselling.¹³ These numbers do not reveal numbers of infections averted, numbers linked to and retained in care, nor the quality of counselling provided, despite the fact that 5% of PEPFAR's budget across the 15 focus countries is being spent on testing and counselling.¹⁴

While there is evidence of a massive scale-up of testing and counselling in resource-limited settings, diagnosis continues to

occur late in the course of HIV disease and the number who test regularly in high-prevalence countries remains low.

A recent study by Michael April and colleagues examined trends in testing rates and outcomes from 2001 to 2006 in a small South African community with an estimated prevalence rate of 23%. They found that testing rates among those not previously identified as HIV-positive increased significantly, from 4% in 2001 to 20% in 2006. The greatest increase was among pregnant women following the start of provider-initiated antenatal testing in 2002.

Moreover, while testing yield remained high in the South African study cited above, patients were not identified any earlier in the course of HIV disease. This led the authors to conclude that "further expansion of testing - combined with effective programmes for linking sero-positive clients to care, monitoring and treatment, once eligible - remains an important public health goal."¹⁵

The need for expanded testing in resource-limited settings, notably in sub-Saharan Africa, has also been widely reported elsewhere.^{16, 17}

But, as Dr Francois Venter, head of the South African HIV Clinicians' Society said at the HIV Implementers' Meeting in Namibia in June 2009, "HIV testing is not the endpoint - it's entry to care, we do not have good care systems for taking people - who are healthy and do not need antiretroviral therapy - on and for retaining them in care."¹⁸ This remains arguably the greatest challenge for any testing programme.

This article reviews recent developments in expanding the opportunities for HIV testing and counselling. A future edition of HATIP will review strategies for retaining individuals in care after an HIV diagnosis and ensuring rapid initiation of antiretroviral treatment in those who need it.

How can the uptake of testing be improved?

To date, no single strategy has proved to be equally effective in all settings. Since HIV testing and counselling began in 1985, the dominant testing intervention has been client-initiated where an individual seeks a test from an established testing centre offering pre- and post-test counselling in order to know his/her HIV status. This approach has not yielded the desired degree of uptake leading to a shift in approach in recent years.

Different approaches, reflecting the different socioeconomic and political structures, have been used to encourage HIV testing uptake, with mixed results.^{19, 20}

In response to requests for guidance on provider-initiated HIV testing and counselling in health facilities WHO released guidelines in May 2007 in support of expanded HIV testing worldwide. Provider-initiated testing is to be offered routinely to all adults accessing health care facilities in high prevalence settings (where antenatal prevalence is greater than 1%). All clients are to be tested for HIV unless they specifically choose not to (opt out). In addition it is advised that adults at high risk with a negative test result be retested every 6-12 months.²¹

Examples of provider-initiated testing include routine testing in all medical facilities, the provision of HIV testing within maternal-child health programmes, and the offer of testing to the families of people receiving antiretroviral treatment, either at the clinic or at home.

Provision of routine provider-initiated testing and counselling (PITC) is not without criticism. People may feel unable to opt out because they fear disapproval of health workers. They may not be given sufficient information on their right to opt out and may avoid health services.

Botswana was the first country in sub-Saharan Africa to introduce PITC in 2004. Acceptance of PITC is high. A total of 514,020 people have been tested over the period 2004-August 2007, the majority have been females (close to 70%) and prevalence among those tested has declined from 41.9% in 2004 to 22.3% in 2007. The percentage of women delivering in hospital who were tested during pregnancy or postpartum has steadily increased from 49% in 2002 to 79% with the introduction of PITC in 2004 to 97% at the end of 2006. Rapid tests were widely available in antenatal clinics in 2005. PITC has improved the linkage to prevention, treatment and care and contributed to the reduction of stigma and discrimination. The introduction of a cadre of lay counsellors has been accepted and increased testing and counselling significantly, in particular in antenatal care clinics (prevention of mother-to-child transmission). Challenges remain and include consulting clinicians being unable to conduct testing due to work overload, a lack of training, attitude as well as space constraints. The availability of PITC has been inconsistent and inadequate in health facilities. Supportive supervision to ensure quality, in particular for lay counsellors, is wanting.²²

Challenges for the successful implementation of PITC include informed consent, sufficient numbers of trained counsellors, an adequate supply of test kits and appropriate referrals to treatment and care.²³

Technological advances and policy changes have also made it possible to move testing from the traditional hospital or clinic-based settings to community-based models. Examples of innovative models include door-to-door and home-based counselling and testing, mobile testing vans and workplace programmes, often backed up by community mobilisation drives designed to raise awareness of HIV testing and treatment opportunities.

Integration of testing into other services

The World Health Organization recommends HIV testing and counselling to be a part of the routine package of screening tests during pregnancy and delivery yet **40% of women in high-prevalence countries of southern Africa are still not being offered an HIV test during pregnancy.**²⁴

For women and their infants to be able to benefit from antiretroviral treatment, HIV testing for women during pregnancy is essential.

In addition infant diagnosis in resource-limited settings is challenging. Diagnosis most often depends on the use of specialised equipment and highly trained personnel to be able to detect HIV DNA up until the age of 18 months when HIV antibodies can be detected. Scarcity of healthcare personnel makes this difficult. In an effort to improve the rates of early infant diagnosis (EID) many countries are now using dried blood spots (DBS) that give reliable results, do not require specialised training and can be used in even the most remote areas.²⁵ However, routine testing of infants born to HIV-positive mothers does not happen. Effective linkage of PMTCT to child health services would help contribute to better treatment and care of infected children.²⁶ A [recent report](#) found that HIV testing at infant immunisation clinics in South Africa is both feasible and acceptable. Most mothers agreed to HIV testing and 7% of the infants of mothers who reported that they were HIV-negative were, in fact, infected.²⁷

PMTCT services within health facilities in most low- and middle-income countries primarily focus on pregnant women and “reducing the risk of transmission during pregnancy and delivery”. Or, in other words, Prong 3 of the four-pronged approach the United

Nations recommends for comprehensive prevention of mother-to-child transmission, which comprises:

- Prong 1: Primary prevention of HIV infection among women
- Prong 2: Prevention of unintended pregnancies among women living with HIV
- Prong 3: Prevention of HIV transmission from women living with HIV to their children and
- Prong 4: Provision of care, treatment and support to mothers living with HIV, their children and families.²⁸

The International Center for AIDS Care and Treatment Programs (ICAP) in Ethiopia provides an example of the successful integration of routine opt-out provider-initiated HIV counselling and testing, incorporating a four-pronged approach, at family planning clinics.

Healthcare workers within family planning clinics were trained in provider-initiated counselling and testing. A confidential space for counselling was made available. Appropriate forms and registers were developed. Point-of-service HIV testing with same-hour results began. On-site mentorship and supportive supervision is provided by ICAP clinical advisers on a regular basis.

For the one year period (December 2007-December 2008) routine opt-out provider-initiated HIV testing and counselling was successfully started at the family planning units of 40 ICAP supported facilities in Ethiopia.

Out of a total of 23,514 family planning clients of unknown HIV status offered an HIV test using the opt-out approach, 63% (14,719) accepted. Of those who accepted 1.9% (274) tested positive and were then referred to the HIV care/ART clinic. Those women who tested negative were counselled on HIV prevention.

This example demonstrates the feasibility and acceptability of family planning clinics being used as an entry point to PMTCT care and treatment by providing PITC services during routine appointments. And, importantly, it means HIV-positive women can be identified in the family planning clinic enabling them to access care and treatment early as well as be in a position to make an informed choice in regard to having more children.²⁹

Studies in Kenya show that encouraging partner PITC and attendance at antenatal clinics could help reduce the risk of vertical transmission and infant mortality. Adam Aluiso and colleagues presented a study at the 5th IAS Conference on HIV Pathogenesis, Treatment and Prevention in July 2009, showing that the one-year-old children of women whose partners had attended the clinics had an HIV free survival rate 60% higher than those whose partners did not attend.³⁰ An earlier study by Carey Farquhar and colleagues of women attending an antenatal clinic in Nairobi also demonstrated the positive effect of partner involvement and couples counselling on uptake of interventions to prevent vertical and sexual HIV transmission.³¹

Approximately 80% of antenatal clinics in Kenya offer PMTCT services, but uptake of testing and counselling is less than 50%. The government is considering incentives including waiving maternity fees for couples who attend PMTCT sessions together to increase male participation.³²

The high prevalence of HIV among TB patients supports the increasing integration and success of PITC into TB programmes. TB was almost under control in Kenya in the 1980s however a dramatic rise occurred in the 1990s coinciding with the concurrent epidemic of HIV. Kenya, now ranked as a high TB burden country, initiated TB-HIV collaborative activities in 2004, of which PITC is one of the principle activities. Studies in Kenya provide evidence that routine provision of onsite PITC for those suspected of having TB as well as those confirmed with TB increases uptake of HIV testing, reduces

stigma associated with HIV testing and allows for targeted testing and counselling and treatment in consideration of the special needs of those co-infected with TB/HIV.^{33, 34}

Nevertheless recent WHO data show that the integration of HIV testing into TB programmes has proved challenging. In 2007, for example, WHO's [Global tuberculosis control report](#) shows that only 37% of notified TB cases in sub-Saharan Africa were tested for HIV in 2007.

Innovative strategies

Couples counselling and testing

has been shown to increase behaviour change among couples in some settings, and is now seen as a high priority in many African countries with mature epidemics, where a high proportion of HIV transmissions are estimated to be taking place within stable partnerships, either due to infection acquired prior to the current partnership, or due to a concurrent sexual partnership.^{35, 36}

Couples counselling and testing involves counsellor-assisted mutual disclosure. The counselling provided is based on the results of both partners. Reduction in incidence in discordant couples has been reported.³⁷ According to Elizabeth Marum of the CDC's Global AIDS Program, it's estimated that 35 to 75% of heterosexual transmissions could be prevented with couples counselling and testing. Expansion of couples testing to non-cohabiting couples has been proposed as the logical next step in promoting awareness of serostatus within couples.³⁸

An initiative supported by the US President's Emergency Plan for AIDS Relief (PEPFAR) HIV counselling and testing technical working group with the Zambia Emory HIV research group (ZEHR) and in collaboration with several African countries, to provide south-to-south technical assistance and training for expansion of couples HIV counselling and testing has begun.³⁹

Door-to-door or home-based counselling and testing: examples from Uganda

Door-to-door or home-based testing has been piloted in Uganda and is being rolled out to other countries. It is proving to be a viable option supplementing traditional client-initiated testing and counselling in some settings, in particular in communities with high HIV prevalence and low knowledge of HIV status.

Two Ugandan studies reported on at the Sixteenth Conference on Retroviruses and Opportunistic Infections (CROI 2009) illustrate this.^{40, 41}

The first, in south-eastern Uganda, compared the ability of home-based to clinic-based antiretroviral treatment programmes to encourage testing and counselling among household members of those receiving treatment.

Patients who received their antiretroviral therapy from the clinics were given vouchers to give to their household members for free testing and counselling. Household members of those who received their medications at home were offered home-based counselling and rapid testing.

Of the 7184 eligible household members recruited, 67% were in the home-based arm. 89% of household members who were available during home visits accepted the offer of counselling and testing. Household members in the home-based arm were more likely to take an HIV test than those in the clinic arm ($p = 0.001$). Moreover, home-based testing and counselling diagnosed 56% of all HIV-positive diagnoses compared to 27% in the clinic arm.

The authors noted that fewer young male household members had been recruited, possibly because they were away at work during home visits. They proposed increased outreach work to target this population and recommended expansion of home-based testing and counselling together with increased efforts to identify and address those issues that prevent people from accessing counselling and testing services.

The second study, from 2005-2007 in Bushenyi district, examined the outcomes of door-to-door testing and counselling using district-wide surveys one month prior to and one month after completion of the PITC intervention. Survey respondents were aged 18 to 49 and questions included HIV testing history, HIV risk behaviours and HIV-related stigma.

Testing uptake increased from 20% at baseline to 63% at completion ($p < 0.01$). An overall increase from 72 to 81% ($p = 0.04$) was reported in status disclosures. However for positive disclosures the increase was not significant. ($p = 0.20$)

The study revealed improvements in measures of stigma. For example, people were more ($p = 0.01$) willing to buy vegetables from an HIV-positive shopkeeper and felt that a person who discloses his/her HIV-positive status to their spouse is deserving of more respect.

While no real change in overall condom use (16% at base line compared to 14% at follow-up) was observed, there was a highly significant increase in condom use by HIV-positive men from 6% at baseline compared to 55% at follow-up ($p = 0.02$).

The authors note, door-to-door testing has increased uptake, eased disclosure, improved condom use among HIV-positive men and reduced HIV-related stigma.

Studies overall indicate acceptance of door-to-door or home-based testing is high, ranging from approximately 85% to 95%. It ensures privacy and minimises any inconveniences, for example, transportation issues and child care, as well as reducing perceived stigma.⁴²

High acceptance of repeat population-based PITC in rural Malawi

In settings or groups with high HIV incidence and prevalence, it is important to find ways to facilitate regular HIV testing, to ensure that individuals have up-to-date knowledge of their HIV status.

But establishing a culture of repeat testing is not easy, especially given the need for the over-stretched health system to reach those who have never tested at all.

The Malawi Longitudinal Study of Families and Health (MLSFH) was undertaken to examine the acceptability of repeat PITC in a rural area.

In 2004 91% (2983) of individuals offered an HIV test agreed to provide samples for HIV testing. The blood samples were collected by trained nurses using oral swabs and sent to the project's laboratory where enzyme-linked immunosorbent assays (ELISA) and confirmatory Western blot tests were done.

Participants received test results (within two to four months) and post-test counselling through mobile testing and counselling clinics (tents) set up an average distance of about two kilometres from the participants' homes.

A small random lottery was run to determine whether a monetary incentive would motivate participants to come back for their test results. Given that the majority of people within this region subsist on less than one US dollar a day, it was not surprising that most participants with lucky numbers for a financial reward of the equivalent of US\$1 returned for their test results.

In 2006 repeat tests were offered using rapid tests (parallel Determine™ and UniGold tests) in the participants' homes, with no

monetary incentive. The participants had a choice between receiving same-day test results at their homes or later at a mobile clinic. The majority chose to receive same-day test results at their homes. The participants and testing counsellors together disposed of the used testing kit in pit latrines at the participants' homes to ensure confidentiality and to allay participants' suspicions.

Approximately 75% of those who were tested and obtained results in 2004 were contacted for a repeat test. 92% (2758) of participants contacted agreed to take an HIV test in 2006. Nearly all those who received negative results in 2004 were likely to test again in 2006 ($p = 0.01$). Whereas, only about half of those who tested positive in 2004 were contacted for 2006 testing and about 80% of them accepted the repeat test and obtained their results. The authors attributed this difference to differential morbidity and mortality by HIV status. They noted that some people who tested positive for HIV in 2004 might have died or were hospitalised with HIV-related infections by 2006.

Overall, about 90% of those who were contacted accepted PITC over the two years, signifying high testing uptake. The authors found that distance to the testing centre negatively affected testing uptake and the greatest advantage of home testing is reduced cost of travelling to the clinics. In 2004, the nearest testing clinic to one of the study sites was about three hours bus journey at a cost of about US\$4 equivalent.

The authors also felt that home testing might have reduced the psychosocial costs of coping with unfamiliar urban settings that the participants faced when they went for testing at urban clinics, and allayed the general perception that health professionals at the hospitals are unfriendly. The authors further attributed the success of the 2006 repeat test to rapid testing, noting that the time lag of about four months between test and results in 2004 may have reduced PITC uptake.

Availability of treatment in 2006 was another motivation for testing, the authors found. Public awareness created through the first Malawi national testing week campaigns that ran prior to the testing survey may also have played a role.

The authors noted that the majority of the participants received negative test results and because they might have over-estimated their chances of testing positive, the disclosure of negative test results may well have motivated others to test too (to find out if they also were negative).

The authors concluded that repeat door-to-door PITC was almost universally accepted in rural Malawi and is likely to be similarly acceptable in other rural settings if context-specific barriers are tackled and individuals who have already tested can later be located for repeat testing.

Testing and counselling as part of a 'combination prevention' approach: Project Accept

Project Accept is the first international multi-site community randomised controlled study to look at the potential success of multi-level structural HIV prevention interventions and measure the impact on HIV incidence and reduction in stigma. It aims at increasing HIV knowledge, changing community norms, increasing testing uptake and increasing social support for people living with HIV (PLHIV). It is an example of a prevention programme which integrates testing into a wide-ranging package of activities targeting the whole community, **in order to develop a climate in which knowledge of HIV status is more likely to result in sustained behaviour change.**

The trial is being carried out by a team of international researchers and is based in four different countries: at one site in

Tanzania (Kisarawe), Zimbabwe (Mutoko), Thailand (Chiang Mai) and in two sites in South Africa (Soweto and Vulindlela).

The community participants are randomised into either control or intervention communities. Control communities belong to the "standard-of-care" arm and receive clinic-based testing and counselling within existing hospitals and health centres. The project has set up clinics reflective of local services for the Tanzanian and Zimbabwean sites because there were no existing counselling and testing services. There has been no active recruitment beyond the standard procedures used by local clinics to promote testing for the control group.

The intervention arm provides participants with community mobilisation, community-based mobile testing and counselling and post-test support services (PTSS). The intervention uses three key strategies based on different theories.

Community mobilisation

(CM) is aimed at increasing HIV testing and free discussion about HIV through community outreach work. This is based on "diffusion theory" which asserts that in every community there are a small number of people who adopt changes ahead of everyone else (early adopters) and then influence others in their social networks.

Each site has a co-ordinator who supervises a community working group made up of community leaders, gatekeepers and community health workers most of whom are early adopters of testing and counselling. There are outreach workers who disseminate all relevant information through print-outs, one-to-one and group discussions. They do this around mobile testing sites, door-to-door campaigns, at community meetings or social events. Lastly, community-based outreach volunteers 'diffuse' (relay) the intervention throughout their networks of friends and colleagues after being trained.

Community-based HIV mobile voluntary counselling and testing

(CBVCT) is aimed at increasing access to testing and counselling and normalising HIV status within the communities. This component uses "tipping point theory" which asserts that a turning point (tipping point) occurs when a certain level of adoption takes place in a social network. This implies that when more people accept testing and counselling, a point would be reached when testing and talking about HIV would become a routine activity for the community thus reducing stigma.

This component is also meant to remove structural barriers to testing and counselling for example, testing fees, transport costs and waiting times for the results by providing testing and counselling services at the village level. Easy access to testing and counselling would increase testing rates, change social norms about testing and increase HIV awareness and discussions in the community so decreasing HIV transmission risks.

The community testing locations are primarily social places, for example, like markets and transport centres, identified in consultation with the community. The four African sites offer testing and counselling services in tents and caravans while the Thailand site uses community centres and temples. Each site has a schedule for the mobile unit's visits which include weekdays and weekends as well as evenings to allow access for those community members in full-time employment.

Counsellors obtain informed consent. Counselling sessions include a condom demonstration with participants being given condoms to take home. Rapid tests with same-day results are offered to all testing and counselling participants but those who wish to receive their results later are given identification cards with

details of the next mobile team's visit. To reduce stigma, the mobile team also serves people only seeking information without testing. Regardless of test results, all participants are referred to post-test support services.

Comprehensive post-test support services

(PTSS) are aimed at improving the psycho-social health of PLHIV and helping those who test negative to maintain their negative status, by providing a culturally relevant support system. It is based on "social action theory" which argues that health protective behaviours are the result of 1) an individual's ability to exercise self-control 2) the influence of external factors, for example, whether an individual is in a relationship or not and 3) the individual's response to internal emotional states.

The investigators anticipated that PTSS would improve the individual's technical skills, for example consistent condom use, social skills including safer sex negotiations as well as interpersonal skills which might include problem-solving skills, all of which could help reduce HIV transmission. Support groups in conjunction with coping effectiveness training and stigma reduction workshops help PLHIV to manage depression and stress.

From the preliminary results, the researchers found that community-based testing and counselling resulted in a fourfold increase in uptake. These findings are similar to other studies showing that home-based testing and counselling increases testing uptake.^{43, 44}

Results also show that most 'intervention communities' used mobile testing services provided by Project Accept rather than standard testing clinics. However, in Thailand about a third of individuals from intervention groups took their tests at standard community testing centres compared to two-thirds taking a test at the mobile testing centres.

The investigators attributed this to the fact that unlike in the African sites, standard testing clinics in Thailand are easily accessible to the community. Overall, very few control communities sought testing from neighbouring intervention communities (17 individuals in Zimbabwe, 7 in Tanzania and 23 in Thailand).

The researchers concluded that increased uptake of testing and counselling in the intervention communities in all three African sites and the utilisation of clinic-based standard testing by intervention communities in Thailand validated the theoretical background of the study. They noted that this intervention was designed for use in resource-limited settings and its implementation is relatively cheap because it relies heavily on volunteers and peer support. While this is in line with WHO's recommendation that interventions should be simple and inexpensive, it assumes a ready supply of volunteers.

The cost and effectiveness of four HIV testing and counselling strategies in Uganda

45, 46

Although new methods of providing testing are emerging, there is still little in the way of cost-effectiveness data to guide decision-making about which interventions are the best use of resources. Previous studies have shown that cost per test and counselling-service user at a stand-alone centre is about US\$13-36.

Uganda was the first sub-Saharan African country to offer HIV client-initiated testing and counselling by 1990. However, population testing is still low with indications of increasing sexual risk-taking that could lead to increased HIV prevalence in the country.⁴⁷

The conventional testing and counselling method used in Uganda is client-initiated. People who want an HIV test can go to free stand-alone clinics. Recent technologies have revolutionised testing

leading to more PITC strategies that involve taking testing and counselling to the communities.

A recent study compared costs and effectiveness of four different testing and counselling strategies used in Uganda:

- The first is stand-alone testing and counselling. A conventional client-initiated set-up where attendance is promoted through campaigns such as posters placed at clinics and other strategic locations. It involves group counselling with key messages repeated to an individual in private pre-test and post-test sessions. Those with a positive diagnosis are referred to local health services for follow-up.
- The second is hospital-based testing and counselling. A PITC intervention offered to all patients with unknown HIV status seeking health services regardless of their illness, with an opt-out option. Those who test positive are referred to further care. However, it identifies many people with HIV at very low CD4 cell counts, often too late to benefit from effective treatment.
- The third strategy is door-to-door testing and counselling using mobile teams to offer testing and counselling to individuals in their homes. It is offered to all adults and children under 14 years of age whose mothers are infected, deceased or of unknown HIV status. It involves initial group counselling for family members followed by pre- and post-test counselling for those accepting the test. It has the potential to reduce testing barriers, reach underserved populations and increase couples testing.
- Lastly, household-member testing and counselling is where testing and counselling is offered to individuals in their homes targeting household members of those who have had a positive HIV diagnosis. Voluntary consent of the household member who has already tested positive is sought. All adults and children under 14 years of age whose mothers are infected, deceased or of unknown HIV status are offered a test.

The authors collected data from the project accounts and inventories as well as from interviews with the projects' personnel. Cost-effectiveness analyses were performed to compare the average crude cost per person tested, the cost per new testing and counselling client (those who never tested before) and the cost per new HIV-positive diagnosis.

Results showed that household-member testing and counselling reached more people under 15 years of age, compared to the other three strategies while hospital-based testing and counselling received more (68%) female service users, possibly through antenatal care. The three provider-initiated interventions attracted more first-time testers and recorded testing and counselling acceptance of around 99% with the door-to-door service recording the highest number of couples tested.

The authors also found that stand-alone and hospital-based testing and counselling recorded the highest service-user HIV prevalence suggesting that many people who sought hospital care were already infected and ill. Hospital-based testing and counselling identified more people with lower CD4 cell counts (< 200 copies/mm³) whereas door-to-door testing and counselling identified more individuals with higher CD4 cell counts.

Lastly, the researchers found that the PITC cost less (range, US\$8-15) per new client and client tested than conventional stand-alone client-initiated testing and counselling (US\$20-30). Door-to-door testing and counselling was found to be the least expensive per client tested (US\$8.30) and cost effective in reaching new service users (US\$9.30). On the other hand, hospital-based testing and counselling was the most cost effective in identifying

HIV-infected individuals at an average cost of about US\$43 per patient tested positive.

This evidence suggests that door-to-door testing is cost effective in screening for population level HIV incidence whereas hospital-based testing is best for diagnostic purposes to confirm whether reported or observed illnesses are as a result of seroconversion.

Implications for policy and practice in similar settings

- Project Accept validates theoretical foundations of community engagement by proving that opinion leaders in communities can be engaged in interventions to influence the rest of the community. This suggests that interventions should involve communities as much as practically possible.
- All the studies have proved that provider-initiated testing and counselling increases testing uptake and when planned and executed properly, door-to-door testing and counselling has a potential for very high testing uptake.
- Rapid testing increases testing by removing anxiety and attrition involved in long waiting times under conventional testing set-ups. The evidence suggests that rapid testing should be accompanied by proper referral systems to reduce losses to follow-up.
- These studies also prove that resource-limited settings do not have to wait for expensive testing centres to roll out population testing. It has been shown that simple units such as tents, caravans and community centres can be used for testing with very high success rates. This confirms the potential success of similar initiatives like the ones in [Kenya](#) where testing and counselling services are taken to rural communities on bicycles.
- The studies also show that different strategies reach different sub-groups of people which suggests that both client-initiated and provider-initiated interventions have a mutual role in scaling-up testing. For example the household member testing in the Uganda study screened more young people who would otherwise not go to hospitals by themselves unless taken by their parents, suggesting that reliance on hospital testing alone might be missing out this sub-group. The Uganda evidence also shows that hospital-based testing reaches more women than men and therefore other interventions such as door-to-door household member testing might be useful in reaching men too.
- The studies identify some key barriers to testing and counselling uptake: distance to the nearest testing centre, cost of travelling to the testing centre, stigma, discrimination and perception about hospitals and hospital staff, and lack of treatment and care. As shown by the studies, testing uptake is high where treatment is available. In terms of costs and cost effectiveness, there is still very little evidence on intervention costs. However, the Uganda study provides some evidence for resource-limited settings. It suggests that door-to-door intervention is cost effective in reaching individuals who have never tested before and also reaching large numbers of people, an important component of scaling-up testing and counselling.
- However, hospital-based testing and counselling is cost effective in capturing positive testers because more people tested at hospitals are likely to be ill. However, many are identified with very low CD4 counts, too late to benefit from effective treatment. Integration of testing and counselling with other health services, notably TB and STI services, will help identify people at a stage of infection that will allow them to access and benefit from treatment.

- Integration of testing and counselling into family planning clinics is a key strategy to incorporate the four-pronged approach to PMTCT. And, importantly means HIV-positive women can be identified in the family planning clinics enabling them to access care and treatment early as well as be in a position to make an informed choice in regard to having more children.

Innovations in technology

Challenges to scaling-up testing and counselling persist as highlighted above. Whether it be the difficulties of early infant diagnosis, the capacity and availability of counsellors, ensuring that all pregnant women have access to testing and counselling as part of a minimum care package or increasing the availability of couples counselling and extending it to non-cohabiting couples, the need for innovative ways to achieve testing and counselling for universal access is a constant. New technologies also have a role to play.

Tests

Rapid tests are now being used in most countries with increasing numbers using finger-prick sample collection for on-site testing. The United States Agency for International Development (USAID) [approves forty HIV rapid tests](#).

It is important to use test kits that meet quality standards, since research by the US Centers for Disease Control showed that half of the tests evaluated did not meet quality criteria. However, quality control goes beyond procurement. WHO, PEPFAR and US CDC have developed [guidelines](#) for the quality assurance of rapid testing.

In addition WHO has published [guidance](#) on rapid test algorithms.

There is also an urgent need to identify people at the stage of acute infection, since those with acute infection are likely to be highly infectious. Individuals with acute HIV infection (AHI) usually test negative on rapid antibody tests since the body has not had time to develop antibodies. In addition people with AHI have very high viral loads in their bodily secretions. Two methods to address this need have been proposed.

The first, based on discordant test results from multiple rapid antibody tests using different kits, proposes the use of a risk score algorithm adapted to identify those at high risk for AHI. Those with AHI were 41 times more likely to have discordant test results.

The second, testing for antigen, identifies people before antibodies are produced. A feasibility study, of a new test for both antibody and antigen detection is currently on-going in Ethiopia.⁴⁸

So-called 'fourth generation' tests which combine antibody and antigen testing can detect HIV infection within 3-4 weeks of exposure, but are more expensive than rapid antibody tests currently in use in most settings.

New methods of data collection

The effective collection and use of data helps guide, monitor and so improve counselling and testing programmes including their cost-effectiveness.

The US PEPFAR counselling and testing technical working group (CT TWG) is assessing the use of innovative portable tools for improved data collection, storage and communication. These include: tablet personal computers, personal digital assistants (PDAs)/phones/pocket personal computers, digital pens and smart cards.

PDAs used in Tebelopele counselling and testing centres in Botswana resulted in improved data quality and more efficient counselling times.

Counsellors entered behaviour and biologic data into the PDAs during counselling sessions. Data were downloaded twice daily to a computer and uploaded monthly to a national database.

In Zambia SmartCare portable care cards are being used to facilitate referral linkages from HIV testing and counselling to PMTCT to ART to TB resulting in an improved continuum of care. Touch screens allow for ease in entering data. Patients are responsible for data transfer between service providers. The cost of the card is approximately US\$1 and the card reader US\$7.

In Malawi a touchscreen system developed by Malawian programmers is being implemented at hospitals and counselling and testing sites. At the point of care data are captured with a barcode on the individual's health passport. Previous computer skills are not necessary.⁴⁹

Self-testing is proposed as a means to increase the uptake of HIV testing and respect patient autonomy. Currently self-testing is illegal in many countries. However, a rapid test kit can be purchased online. The UK Medicines and Healthcare Products regulatory agency has warned the public not to purchase such kits online advising that they may not meet European safety and quality standards and that their reliability cannot be guaranteed.

In the United States, OraSure, manufacturers of rapid HIV tests using saliva are conducting studies to determine whether people are able to use their device as well as review the psychological risks of those receiving a positive result. Self-testing at home, as its name implies, does not have a pre- or post-test counselling component.

In South Africa, Project Masiluleke is exploring the potential of mobile technology, the cellphone, to increase uptake of HIV testing. A future component, still in its conceptual stage, is the use of self-testing kits in conjunction with mobile phone counselling units. Successful linkage to treatment and care as well as protocols resulting in behaviour change will be important measures in determining the benefits of self-testing.

Challenges in the scale-up of testing and counselling

Task-shifting

Rapid scale-up of antiretroviral therapy has brought to light weaknesses in the health systems of developing countries. WHO estimates that over four million health workers are needed, and the shortage of medical doctors and other health workers trained to deliver HIV treatment and care has been identified as the most serious barrier to the sustained scale-up of ART in resource-limited settings. This chronic shortage of healthcare personnel in resource-limited settings is no less an issue for testing and counselling.

Task-shifting involves the delegation of healthcare tasks from more highly trained individuals to those with less training, and it has been increasingly employed as a way to help address the shortage of highly trained staff in many resource-limited settings.

There is a reluctance to legalise task-shifting due to concerns about the capacity of the workers, as well as the quality of care provided.

However, studies have found lay counsellor testing performance to be equal to laboratory-based testing. For task-shifting to be effective there is agreement that good training, with ongoing supervision by laboratory and clinical staff, is essential.⁵⁰

Repeat testing

Current messages regarding repeat testing for the window-period are considered out-dated and result in unnecessary repeat testing.

⁵¹ Recommendations vary as to the optimum time for retesting varying from four weeks to three months after possible exposure. With the introduction of newer and more sensitive tests some estimate that the time between exposure and detection of infection is even shorter, perhaps between one and three weeks. In addition individuals will vary in the time they take to produce detectable antigens and antibodies. For those in industrialised countries at high risk and with access to care the current guidelines may well deter individuals from testing during primary infection when individuals are highly infectious.⁵² WHO will be issuing new guidance on repeat testing.

The question of HIV repeat testing within the context of behaviour change has been raised. Does repeat testing substitute for behaviour change? Could intensified repeat counselling (and repeat testing when needed) support behaviour change with individuals using repeat testing as a means of confirming that they remain HIV-negative?⁵³

Issues relating to provider-initiated counselling and testing

No standardised protocol for provider-initiated counselling and testing exists. Site specific issues include space, staff recruitment and retention, clinical service as well as patient flow. A consistent supply of test kits remains problematic.

Dr Elizabeth Marum of the United States Centers for Disease Control, at the recent HIV Implementers' Meeting in Namibia, raised a number of questions open to debate:

- Do you test all patients or only those with clinical indications?
- Should a separate rapid test be performed or should HIV testing be performed along with other medical tests?
- Who should deliver post-test counselling?

Dr Marum also highlighted an ongoing multi-country (South Africa, Tanzania, Uganda and Ivory Coast (Côte d'Ivoire)) evaluation of provider initiated counselling and testing in outpatient departments.

She noted in particular that although outpatient departments provide a good setting to identify HIV-positive patients early this raises the question of how an already overstretched outpatient staff will cope with more tasks.⁵⁴

Effective referrals – testing and counselling part of the continuum of care

As previously highlighted the most difficult component of testing and counselling is effective referral, follow-up and retention in care.

Studies confirm that what is being done currently is inadequate and ineffective. Patients are lost to follow-up. Anonymous testing makes referrals and follow-up difficult if not impossible.

As noted earlier, the continued high rate of early mortality in patients on antiretroviral therapy supports the findings that many patients are accessing ART too late. Dr Marum has raised the question as to whether testing and counselling sites should be offering CD4 testing on all HIV-positive clients to facilitate early care.⁵⁵

The question of how referral and pre-ART care can be improved to reduce loss to follow up and late initiation will be addressed in a future edition of HATIP.

Current debates

In the event that antiretroviral therapy is restricted (rationed) how will this affect testing and counselling? Should services be reduced? Testing and counselling serves multiple functions and is

the lynchpin for referral to care as well as for personal and family decisions.

Questions persist as to how testing and counselling is integrated into other prevention programmes. For example, what should the role of testing and counselling be in combination prevention?⁵⁶ Why is it that many HIV-negative women are getting infected during pregnancy and lactation? This would further highlight the need for integration of testing and counselling into other programmes as the example of ICAP in Ethiopia succinctly illustrates.

Conclusion

- Expanded testing and counselling is aided by multiple models, rapid testing and task shifting. Community-based and door-to-door have proved successful in many places.
- Changes in data collection methods will support improved quality of data and so improved treatment and care.
- Guidance on repeat testing for the window period needs to be provided (WHO).
- Testing and counselling needs to be better integrated into health facilities and in particular within other health care programmes (tuberculosis, family planning, antenatal care clinics, sexually transmitted infection clinics) to facilitate detection of acute infection, early diagnosis and prompt referral and follow-up.
- Couples and partners testing and counselling needs to be increased.
- While expanded testing and counselling is needed it must always be part of a continuum of care; improvement and evidence of referrals, enrolment and follow-up are vital; cost-effectiveness, quality assurance and sustainability as well as prevention integration and prevention counselling skills are all part of the continuum.

Further resources

- 1 Latest guidelines on provider-initiated HIV counselling and testing in health facilities (2007). Downloadable at www.unaids.org/en/KnowledgeCentre/Resources/PolicyGuidance/OperationGuidelines/20070517_policies_testing_keyoperationalguidelines.asp
- 2 Practical guidelines for intensifying HIV prevention towards universal access. Downloadable at <http://www.unaids.org/DocOrder/OrderForm.aspx?doctype=c>
- 3 Priority interventions: HIV prevention, treatment and care in the health sector. Downloadable at www.who.int/hiv/pub/priorityinterventions/en/index.html
- 4 Essential prevention and care interventions for adults and adolescents living with HIV in resource-limited settings. Downloadable at <http://www.who.int/hiv/pub/guidelines/EP/en/index.html>

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- (18) *Making the world safe for more routine HIV testing*, March 22, 2007 aidsmap
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PLHIV provide recommendations for revision of ART guidelines

During Summer 2009 GNP+ identified key recommendations for the revision of the World Health Organisation's Recommendations for Antiretroviral Therapy (ART) for HIV Infection in Adults and Adolescents (ART Guidelines). In two technical consultations at the IAS 2009 Cape Town and ICAAP 2009 Bali conferences, as well as an e-consultation, people living with HIV discussed what they expect from their treatment programmes, what should be included in the coming ART Guidelines revision, and what should not be included.

Consultation participants recommend that the ART Guidelines should be based on the best scientific knowledge, and should

recommend that treatment is initiated when CD4 cell counts fall below 350. However, people living with HIV must be able and empowered to make their own individual decisions about when to start and change treatment based on accurate information about treatment options, side-effects, drug resistance and co-infections. WHO guidelines should no longer recommend d4T but recommend tenofovir in its place.

In addition, PLHIV should have access to regular CD4 counts and periodic viral load tests (at least to confirm treatment failure before switching to second line). The role of resistance testing needs to be assessed in resource constrained settings.

People living with HIV participating in the consultations agreed that their lives could be directly impacted by the revised ART Guidelines. However, they also noted that actual clinical practice was rarely up to the standards recommended by the ART Guidelines — including the treatment they themselves received. They highlighted the role of people living with HIV to use the ART guidelines as an advocacy tool, in ensuring that governments and funders see the long-term cost-effectiveness of starting treatment earlier and with better drugs.

Along with ITPC, ICW and Young Positives, GNP+ is continuing supporting of the ART Guidelines revision process, including the participation of people living with HIV in WHO meetings on the ART and PMTCT Guidelines in October 2009.

Click here to access the consultation reports:

[Summary of Key Recommendations 60.50 Kb](#)

[Final Report of GNP+ Consultations on WHO ART Guidelines 667.46 Kb](#)

[Technical Consultation in partnership with APN+ at ICAAP 2009, Bali, August 2009 212.66 Kb](#)

[Technical Consultation in partnership with TAC at IAS 2009, Cape Town, July 2009 303.13 Kb](#)

[E-Consultation in partnership with NAM, July - August 2009 327.17 Kb](#)