



## Increasing the acceptability of HIV counseling and testing with three C's: Convenience, confidentiality and credibility<sup>☆</sup>

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### ABSTRACT

Agencies engaged in humanitarian efforts to prevent the further spread of HIV have emphasized the importance of voluntary counseling and testing (VCT), and most high-prevalence countries now have facilities that offer testing free of charge. The utilization of these services is disappointingly low, however, despite high numbers reporting that they would like to be tested. Explanations of this discrepancy typically rely on responses to hypothetical questions posed in terms of psychological or social barriers; often, the explanation is that people fear learning that they are infected with a disease that they understand to be fatal and stigmatizing. Yet when we offered door-to-door rapid blood testing for HIV as part of a longitudinal study in rural Malawi, the overwhelming majority agreed to be tested and to receive their results immediately. Thus, in this paper, we ask: why are more people not getting tested? Using an explanatory research design, we find that rural Malawians are responsive to door-to-door HIV testing for the following reasons: it is convenient, confidential, and the rapid blood test is credible. Our study suggests that attention to these factors in VCT strategies may mitigate the fear of HIV testing, and ultimately increase uptake in rural African settings.

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### Introduction

In high HIV prevalence countries of sub-Saharan Africa, energetic campaigns have been mounted to halt the spread of HIV. Initially, the predominant prevention approach was an emphasis on

educating the population in three prevention methods: abstinence, marital fidelity and consistent condom use (“ABCs”). When the ABCs diffused but the continued spread of HIV made it clear that knowledge was not enough, AIDS activists, donors and governments tried other approaches. One such approach was the promotion of voluntary counseling and testing (VCT) under the assumption that individuals would act in their own self-interest to learn their HIV status and change their sexual behavior (The Voluntary HIV-1 Counseling and Testing Efficacy Study Group, 2000; UNAIDS, 2000). Over time, the number of facilities in the region grew and the cost of testing was reduced dramatically, such that most testing is now free.

But despite surveys that showed high proportions reporting that they would like to be tested for HIV, few people have utilized the available testing services. Recent demographic and health surveys (DHS) in several African countries reported that over two-thirds of individuals who did not know their HIV status said they would like to get tested, yet the proportion of adults who reported actually having been tested was much lower, below 15% in some areas (Glick, 2005; Obermeyer & Osborn, 2007). Even when individuals

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choose to have an HIV test, many do not return for their results (Cartoux et al., 1998; Ekwueme, Pinkerton, Holtgrave, & Branson, 2003); in clinics across Africa, only about 65% of individuals returned to learn their result after being tested (Thornton, 2008). The discrepancy between intention and actual behavior (see Fylkesnes, Haworth, Rosenvård, & Kwapa, 1999; Fylkesnes & Siziya, 2004; Sherr et al., 2007) has prompted much speculation on why people living amid the pandemic are seemingly reluctant to know their HIV status. The conventional explanation has been psychological or social barriers, namely that people fear learning they are infected with a disease that they understand to be fatal and stigmatizing (UNAIDS, 2004; Obermeyer & Osborn, 2007).

Simply inferring that fear is the cause of the underutilization of VCT, however, may not be sufficient. Acceptability studies are based largely on hypothetical questions that may over-predict readiness to be tested (see Duffy, Wolfe, Varden, Kennedy, & Chrystie, 1998; Kakoko, Åström, Lugoe, & Lie, 2006; Yoder, & Matinga, 2004). When studies offered VCT at home (see Matovu, Kigozi, Nalugoda, Wabwire-Mangen, & Gray, 2002; Wolff et al., 2005; Yoder et al., 2006), mobile clinics (see Morin et al., 2006), the work site (see Corbett et al., 2006), or other easily accessible locations (Yeatman, 2007), for instance, uptake was much higher (Sherr et al., 2007), indicating that the mode of service delivery – and the types of VCT strategies they may entail – may also be important in assessing its acceptability (Glick, 2005).

In this study, we utilize an explanatory design (Cresswell, Plano Clark, Gutmann, & Hanson, 2003)<sup>1</sup> to examine the acceptability of HIV testing from three rural districts in Malawi. Malawi is an appropriate country in which to assess deterrents to VCT: HIV prevalence is relatively high; the population is well aware of the risks of death from AIDS; VCT has been available since the mid-1990s, and has expanded markedly since 2003 to government hospitals, and since 2004 to rural areas; and the 2000 Malawi Demographic and Health Survey (MDHS) showed that 70% said they would like to be tested (National Statistical Office, 2001), but, by 2004, a substantially smaller percentage reported that they had actually been tested and learned their results (15% of men; 13% of women) (National Statistical Office, 2005). We aim to accomplish two tasks. First, using quantitative data on response rates, we provide evidence that HIV testing is quite acceptable: when people were offered an HIV rapid blood test in their homes, the overwhelming majority agreed to be tested and receive their results immediately. Second, we use qualitative data to answer a follow-up question: why then are more people not getting tested in the general population? To address this question, we consider why respondents agreed to be tested in their homes while uptake in health facilities remains low. We conclude with recommendations for increasing the uptake of VCT in high-prevalence, rural sub-Saharan African settings like Malawi.

## Methods

### Sample

The data for this study derive from a longitudinal household panel study, the Malawi Diffusion and Ideational Change Project (MDICP), a collaborative project between the University of Pennsylvania and the Malawi College of Medicine. The study is conducted in approximately 120 villages in three districts of Malawi, one in each of the three regions of the country: Rumphu (North), Mchinji (Centre), and Balaka (South). Approximately 25% of all

households in each village were randomly selected to participate in 1998; 1500 ever-married women between the ages of 15–49 and their husbands from these households were interviewed in 1998, 2001, 2004 and 2006. In 2004, a random sample (stratified by age and sex) of approximately 800 adolescents (both married and unmarried) between the ages of 15–24 years old and residing in the sample villages was added. The total sample size is found in Table 1 for the various categories of respondents.<sup>2</sup>

### HIV testing

All respondents in the 2004 and 2006 waves were offered door-to-door testing for HIV by trained VCT counselors, who came from areas of Malawi outside of the respondent's district and were native speakers of the local language. In 2004, 91% of respondents contacted agreed to be tested, of whom 70% received their results; in 2006, 92% agreed to be tested, of whom 98% received their results.

In several ways, the VCT protocols followed in 2004 and 2006 were similar. Following an introduction, respondents were asked to provide informed consent to be tested and to receive their results. For never-married adolescents, consent from a parent or guardian was also asked. Consenting respondents were then provided with pre-test counseling, during which time the testing techniques were explained in detail. Precautions were taken to ensure confidentiality by assigning a special identification number to each respondent's specimen.

There were differences, however, between the VCT offered to respondents in 2004 and 2006. In the former, the test was an oral swab (OraSure<sup>®</sup>). Samples were sent to a laboratory to be tested and results were not available for at least several weeks. In 2006, the test was a rapid blood test (parallel Determine<sup>™</sup> and UniGold<sup>™</sup>), which provides results in 15 min. Next, in 2004, results were available at a portable tent site within a short distance from the respondent's home (approximately 2 km), whereas in 2006 respondents had a choice whether to receive their results in their home or at a portable tent site. Finally, in 2006, before testing began in a village, VCT counselors met with village chiefs to organize village meetings. The meetings explained the purpose of the home visit and allowed respondents (and other attending community members) to see a first-hand demonstration of the testing technology – how the finger prick works and the amount of blood drawn. The explanation was repeated at the time of testing, and VCT counselors let respondents examine the lancets used to prick the finger to draw blood and showed respondents how to interpret the test results. After approximately 15 min, VCT counselors provided the test results by showing respondents the red line(s) on the testing device – one visible line indicated a negative HIV test result, while two visible lines indicated a positive test result. At post-test counseling, respondents who were negative were encouraged to remain that way and to be re-tested after three months; those who were positive were told about how to care for themselves, and were also encouraged to be re-tested and receive information about anti-retroviral treatment. Subsequently, the respondent accompanied the counselor to the nearest pit-latrine to dispose of all test-related devices; in the absence of a pit latrine, the test kits were burned.

The MDICP prevalence, while low relative to national estimates that include urban areas, are similar to rural estimates: the Malawi DHS found rural HIV prevalence estimates to be 5.2% in the Northern region, 7.3% in the Central region, and 16.7% in the

<sup>1</sup> An explanatory design is a two-phase mixed methods study whereby qualitative data help explain or build upon quantitative findings (Cresswell et al., 2003).

<sup>2</sup> For further sampling details, see [http://www.malawi.pop.upenn.edu/Level%203/Malawi/level3\\_malawi\\_sampling.htm](http://www.malawi.pop.upenn.edu/Level%203/Malawi/level3_malawi_sampling.htm).

**Table 1**  
Proportion accepting HIV test 2004 and 2006.

| Year of test | Accepted test | Refused test | Not available | Upper bound acceptance in 2006 | Lower bound acceptance in 2006 |
|--------------|---------------|--------------|---------------|--------------------------------|--------------------------------|
| 2004         | 2894          | 291          | 474           | 0.909                          | 0.791                          |
| 2006         | 2748          | 228          | 483           | 0.923                          | 0.794                          |

Note: Refusal of tests were recorded by VCT counselors at the time of the testing. In 2004, VCT counselors also recorded if a respondent was absent, not found/unknown, or other, which we include in the code for 'not available'; 'not available' also includes those who were surveyed in 2004, but do not have an HIV test refusal or acceptance outcome. In 2006, this same standard of coding was not used; instead, we code 'not available' as those who were surveyed in 2006, but did not have an HIV test refusal or acceptance code.

Southern region; HIV prevalence estimates in the MDICP sample is 4.4% in the Northern region (Rumphi), 6.4% in the Central region (Mchinji), and 7.9% in the Southern region (Balaka) (Thornton, 2008).<sup>3</sup>

#### Qualitative data: semi-structured interviews and observational data

Given that the vast majority of MDICP respondents agreed to be tested and learn their test results, what explains the low uptake of VCT at health facilities? To address this question, we rely on two types of qualitative data collected in 2006: semi-structured interviews and observational data. The interviews were conducted by trained Malawian interviewers with a sub-sample of 63 MDICP panel respondents in the Northern region. Respondents were sampled through a purposive strategy: an MDICP scout, familiar with the project villages, selected eight respondents in each village from a complete listing of respondents who had already been approached for an HIV test by the study team. The interviewers—though they represented the MDICP research team—were themselves not familiar with the respondents prior to the study. The interviews addressed questions related to the respondent's experience with HIV testing, lasted approximately 45 min, and were conducted in respondents' native languages, either chiChewa or chiTumbuka. All interviews were tape recorded, translated into English, and transcribed by the interviewers. This sample included respondents who tested HIV negative (47) and respondents who tested HIV positive (12), and both those who accepted the test and learned their results (59) and those who refused testing (4). Because both the overall refusal rate and the HIV prevalence rates were low for the sample, it was necessary to oversample respondents who refused testing and those who tested HIV positive.

Reactions to VCT were also captured in each of the three sites by the VCT counselors, who kept observational journals in which they wrote what they heard people say about VCT (see Watkins, 2004; Watkins & Swidler, *in press* for a similar methodology). The "journalists" reported conversations in a variety of settings: talk overheard at a borehole, comments made during village meetings, questions addressed to off-duty counselors, interactions in VCT sessions. As a result, the journals include comments made both by those who are in the MDICP sample and those who are not. We attribute the observational accounts in this paper by including a pseudonym for the journalist's name (e.g.,

Aaron), the region in which the journalist was working (e.g., Central region), and the date of the entry, beginning with the year, followed by the month and day (e.g., 060613).

Interview transcripts and the observational data were all reviewed by members of the study team as they were collected in each of the study sites, such that clarifying questions could be asked of the interviewers and journalists, and initial themes identified. The data were then analyzed and coded separately. The findings reported here are the common themes that emerged in the two sets of qualitative data. Despite grammatical errors, we leave the wording as is, but insert brackets to explain parts that may be unclear. The journals and interview transcripts have been anonymized to remove any identifying information.

This study was approved by the Ethical Review Committees of the University of Malawi's College of Medicine, and the University of Pennsylvania and Thomas Jefferson University in the United States.

## Results

### Acceptance rates

There are several competing explanations as to why MDICP respondents were so willing to accept an HIV test and test results. We consider these explanations in turn and then draw on the qualitative data to explain what respondents – and other community members – had to say about HIV testing.

### Social pressure from counselors

It might be argued that respondents felt pressured into being tested by the VCT counselors. There are two measures built into the MDICP testing protocol that guard against coercion: (1) the counselors were all trained in the Ministry of Health's (MOH) protocol on HIV counseling and testing, which is explicit about seeking informed consent from clients and (2) respondents were asked to sign two consent forms, one in which they agree to be tested (or not) and the other in which they agree to receive their test results (or not). Nonetheless, we recognize the possibility that respondents might have felt uncomfortable saying 'no', or that the counselors might not have always acted in accordance with the MOH protocol (see de Paoli, Manongi, & Klepp, 2002; Rennie & Behets, 2006; Yoder & Konate, 2002).

To address this argument, we consider the idea that not being available to be offered an HIV test may be a passive form of refusal. Accounts from our observational journals reported that some respondents would leave their homes when the VCT counselors entered their village so as to avoid being approached for an HIV test (e.g., Aaron journal, Central Region, 060613), suggesting that individuals may refuse the offer through avoidance. Thus, we treat not being able to be located by the study team as signifying a respondent's refusal and construct lower and upper bounds around our acceptance estimates that factor in this plausible passive refusal. Defining refusals in this manner yields a range of 79–92% acceptance of the HIV test. We account for the upper and lower bounds of acceptance in our statistics so as to not overstate high levels of acceptance.

### Familiarity with study team

It is possible that in a longitudinal panel study like the MDICP, the high acceptance rates could be explained by the mutual trust built since the project began in 1998. To address the possibility that panel respondents are more likely to accept an HIV test, we consider the response rate among members of the MDICP sample who were not located by the research team in 2004. We find that

<sup>3</sup> The estimates may be biased downwards as a result of longitudinal sample attrition due to death or migration (Anglewicz, 2007), as well as the disproportionate number of individuals who learned they were positive in 2004 and did not re-test in 2006; also, there is a disproportionate number of young adults aged 15–24 included in the sample (33.4% of respondents), who have a lower overall infection rate of 2.7% (Thornton, 2008).

**Table 2**  
Proportion accepting HIV test in 2006 by 2004 acceptance/refusal.

|                         | N    | Accepted test in 2006 | Refused test in 2006 | Not available | Upper bound acceptance in 2006 | Lower bound acceptance in 2006 |
|-------------------------|------|-----------------------|----------------------|---------------|--------------------------------|--------------------------------|
| Accepted a test in 2004 | 2270 | 1990                  | 110                  | 170           | 0.948                          | 0.877                          |
| Refused a test in 2004  | 211  | 137                   | 49                   | 25            | 0.737                          | 0.649                          |
| Not available in 2004   | 193  | 144                   | 20                   | 29            | 0.878                          | 0.746                          |

between 75% and 88% of respondents not offered a test in 2004 accepted the HIV test in 2006 (Table 2).<sup>4</sup>

#### Knowledge of HIV status

It is also possible that respondents were more willing to be tested in 2006 because they already knew their HIV status, and were perhaps certain that it had not changed. To address this, we also consider the number of respondents who refused to be tested by the MDICP in 2004, but accepted in 2006.

Among those who tested HIV negative in 2004 and who learned their results, between 90% and 96% accepted a test in 2006; among those who tested HIV negative in 2004 and who *did not* learn their test result, between 84% and 93% accepted a test in 2006.<sup>5</sup> This shows that among those who learned their results in 2004, the acceptance rate in 2006 is higher, which either could be due to a causal effect of learning HIV negative results or due to other factors correlated with learning HIV results in 2004. However, given that the difference in the range of acceptance between those who learned their HIV negative results and those who did not learn their HIV negative results is only 6 percentage points at the lower end and 3 percentage points at the upper end, any causal effect would have been extremely small, if there was any at all. Therefore, it is unlikely that the overall acceptance of an HIV test in 2006 is attributable to having previously received one's results. Furthermore, a study of repeat VCT among the MDICP sample found no significant variation in the socio-demographic or behavioral characteristics of those who agreed to be tested again (Obare et al., 2009), suggesting that this is not the dominant explanation.

Even among those who refused an HIV test in 2004, the range of acceptance in 2006 is between 65% and 74%. This could be due to an overall time trend in acceptance of HIV testing in Malawi between 2004 and 2006 (Glick, 2005), particularly with the availability of anti-retroviral treatment, or perhaps as a favorable response to rapid blood testing (see Hutchinson, Corbie-Smith, Thomas, Mohanan, & del Rio, 2004; Marum, Taegtmeier, & Chebet, 2006; Sangiwa, van der Straten, Grinstead, & The VCT Study Group, 2000). Alternatively, it could be due to a social multiplier effect in which those who had tested in 2004 talked about it, influencing recalcitrant neighbors. The likelihood that an individual obtained test results in 2004, for instance, was found to be significantly associated with nearby neighbors also obtaining theirs (Godlonton & Thornton, 2009). The data, however, do not permit us to distinguish among these mechanisms statistically (Tables 3 and 4).

<sup>4</sup> When we consider the response rate among the adolescent sample added in 2004, we find that approximately 90% of adolescents agreed to test (results not shown). Since these adolescents are still in MDICP project villages, they likely do not represent a random adult not in the MDICP sample, yet they may proxy those individuals who are not exposed to a long-term project influence.

<sup>5</sup> Only 3% of MDICP respondents reported having been tested for HIV between 2004 and 2006.

**Table 3**  
Proportion accepting HIV test in 2006 by 2004 HIV status.

|               | Accepted test in 2006 | Refused test in 2006 | Not available | Upper bound acceptance in 2006 | Lower bound acceptance in 2006 |
|---------------|-----------------------|----------------------|---------------|--------------------------------|--------------------------------|
| Indeterminate | 11                    | 0                    | 0             | 1.00                           | 1.00                           |
| HIV negative  | 1905                  | 94                   | 155           | 0.953                          | 0.884                          |
| HIV positive  | 74                    | 16                   | 15            | 0.822                          | 0.705                          |

#### Qualitative data

By 2006, VCT was more widely available than in 2004. Spatial analysis shows, for example, that the majority of the population in Mchinji, one of the three MDICP districts, lives within 10 km (approximately 2 hours walking) of a VCT clinic (Fleming, Yeatman, Lungu, & Chilonga, 2007). Only 18% of respondents surveyed in 2006, however, had ever been tested for HIV in a setting aside from with the MDICP (results not shown). The MDICP qualitative data provide explanations as to why this might be the case. In contrast to facility-based testing, the data suggest that rural Malawians like door-to-door testing because it is convenient and confidential. Moreover, they like rapid blood testing particularly because the results are easy to interpret and thus seen as credible. We find no substantive differences in the responses of those who tested HIV positive versus those who tested HIV negative.<sup>6</sup> In the analyses that follows, we explore each of these issues, combining semi-structured interviews conducted with a sub-sample of panel respondents with observational data of local conversations about VCT.

#### Convenience

Structural barriers to VCT have been well-documented and suggest that distance is a prohibitive factor for accessing testing services, particularly in rural areas (Thornton, 2008; Morin et al., 2006; see also Simwaka et al., 2007). Not surprisingly then, respondents favored door-to-door testing because it was convenient. The most frequent comment was that it removed the obstacle of travel, which is time-consuming and costly:

"Sometimes we think of going to the hospital in M'Bimbe but you find that you don't have transport money, then we are forced just to stay [at home] without being tested" (Female, 53 years old, 060712).

Other respondents noted that without a more pressing reason to go to the hospital, it is not worth making the trip: not only are health facilities far, it often takes a long time to be seen by a health provider. As one journalist recalls of a VCT session:

He accepted [the test] because he was also longing to be tested and he failed to go to the VCT center because it is too far...he added that he's a busy man and he heard from his friend that it takes a long time to be tested [at the hospital] because there [are] many people who went [go] there...I also asked him why he wished to be tested. He said that he is a business man. Sometimes he goes to the lake to catch fish...and when he comes back his partner always shouts [at] him that he slept with other partners, so he wanted to be tested with an aim of breaking that burden between him and the spouse (Mary journal, Southern Region, 060711).

Indeed, traveling to reach a health facility imposes both a direct cost (for a mini-bus or bicycle rental), but also the opportunity costs

<sup>6</sup> One exception was concerns about accessing anti-retroviral treatment, expressed by some respondents who tested HIV positive.

**Table 4**  
Proportion accepting HIV test by knowledge of HIV status.

|                                      | Accepted test in 2006 | Refused test in 2006 | Not available | Upper bound acceptance in 2006 | Lower bound acceptance in 2006 |
|--------------------------------------|-----------------------|----------------------|---------------|--------------------------------|--------------------------------|
| <b>Learned result in 2004</b>        |                       |                      |               |                                |                                |
| Indeterminate                        | 8                     | 0                    | 0             | 1.00                           | 1.00                           |
| HIV negative                         | 1430                  | 60                   | 98            | 0.960                          | 0.901                          |
| HIV positive                         | 49                    | 12                   | 11            | 0.803                          | 0.681                          |
| <b>Did not learn results in 2004</b> |                       |                      |               |                                |                                |
| Indeterminate                        | 3                     | 0                    | 0             | 1.00                           | 1.00                           |
| HIV negative                         | 475                   | 34                   | 57            | 0.933                          | 0.839                          |
| HIV positive                         | 25                    | 4                    | 4             | 0.862                          | 0.758                          |

of hours traveling and waiting to be seen by a provider. Given these considerations, door-to-door testing may provide those who would not otherwise pursue an HIV test at a health facility with the opportunity to learn their HIV status.

#### Confidentiality

During our time in Malawi, we repeatedly heard stories that health personnel are rude and do not keep one's affairs secret (see also Adebajo, Bamgbala, & Oyediran, 2003; Kaler & Watkins, 2001). Thus, it is not surprising that respondents would have concerns about getting tested for HIV at a health facility:

"It's because if I can be tested at Mhojo Health Centre, VCT counselors there know me and if that counselor at the VCT [centre] finds me with the virus then he can start spreading the messages to friends of mine, and if I know about that then it becomes very bad to my life, that's why to be tested with someone else whom you never know it's good" (Male, 48 years old, 060721).

Even some villagers not in the study sample asked the MDICP VCT counselors if they too could be tested in their homes. When the counselors referred them to health facilities, some complained of a lack of confidentiality. As one journalist recalls:

We sat down on the veranda of a nearby house.... The woman started the conversation by saying "I want to have a test with your group [the MDICP]. I was tested in November 2003 in Lilongwe and the counselor there told me to have a second test after 3 months but up to now I am not yet tested." When I asked her why she decided not to have a second test, she answered "Counselors at Mkati Health Centre [local health facility] do not keep secrets...they tell you, your results nobody will know them but a few days later you find the results are known by some of the villagers" (David journal, Central Region, 060613).

In contrast, the MDICP VCT counselors came from areas of Malawi outside of the sample villages and were, therefore, not familiar with respondents prior to testing. Their presence was also ephemeral, as they were only in the project villages for a few weeks before leaving. As one respondent notes:

"...the [MDICP VCT] counselor can't reveal the secret because he doesn't know anyone in the villages and he will not have time to reveal because we expect him after testing to go somewhere else where there is no one who is familiar with me" (Male, 48 years old, 060721).

Some respondents contrasted door-to-door testing with the lack of anonymity in health facilities (see Yoder et al., 2006). The sheer openness of hospital settings, where there are often separate wings for VCT, easily exposes to others the purpose and outcome of one's visit (see Yoder & Matinga, 2004). As one respondent explains:

"...if you go to the hospital, then many people will know that you have gone for testing because the Hospital is an open place. And many people know that at the Hospital there is a separate room for HIV testing and therefore many people see you coming into the room with a smiling face, but when you are coming out they find you with a disappointed face, then they just conclude that you have been found HIV positive...testing that is done here at home, it is only you and the counselor who know the results" (Male, 37 years old, 060727).

#### Credibility

A final, commonly reported reason for the favorable response to HIV testing is that the testing technology – the rapid blood test – was credible. Respondents noted that they preferred the swiftness of the rapid test to HIV testing with delayed results. The rapid test ensured that their results had not been tampered with and/or confused with someone else's; it also eliminated the anxiety of the waiting process (see Hutchinson et al., 2004; Marum et al., 2006; Sangiwa et al., 2000):

"If they say you should wait you may never know whether they can swap the results. But to get your results the same time is good because you are able to see for yourself" (Female, 35 years old, 060801).

"I didn't want them to tell me [my HIV test results] on a different day. I was afraid that I could be thinking too much...you start doubting for yourself if your HIV status will be found okay [HIV negative]. So I wanted to know my results at the same time" (Male, 24 years old, 060726).

Respondents also favored the rapid blood test because it convinced them of the accuracy of their test result. The red line(s) on the test kits allowed respondents to see their test result with their own eyes, rather than having to trust that the counselor was reporting the correct results, and that no error had occurred out of sight:

"It is not easy to believe what you are just told [by a counselor] and because this year [MDICP 2006] I was able to see [test results] for myself that's why I believed my results" (Female, 34 years old, 060719).

When time came to reveal the results, I told her that her results were ready and I gave her [the test kits].... I reminded her of the lines and she told me that if two lines appear on the test kits it means that she is positive but if a single line appears on the test kit it means that the person is negative.... Then I asked her what are these results meaning to you, and she asked me "is that I am negative?" I said yes, then she said "thank you, today.... I am going to cook fish with a lot of oil to show that I am happy to be negative" (Joyce journal, Southern Region, 060714).

The MDICP's solution to disposing the test kits in front of the respondent was also seen as an advantage, as it ensured that the evidence of the test itself was removed permanently:

"Yes the place [the home] was good and I hope [believe] that confidentiality will be there because after testing the result was shown to me and after that the testing material and blood were thrown in the toilet" (Male, 26 years old, 060717).

In 2004, when the Malawi DHS was in the field testing with blood, we heard of difficulties in persuading respondents to consent to providing their blood. In 2006, we also heard similar stories: for example, some commented that their blood would be sold or sent to hospitals which lacked an adequate supply (Aaron journal, Central Region, 060613). In some cases, respondents

expressed trepidation over the amount of blood that would be drawn and whether the finger prick would hurt. Transparency in the testing process, however, may assuage such fears:

I tested her, but at first she was a bit afraid with the lancets and the capillary. She said that she's old...and has got...little blood in her body.... I explained that we don't fill the whole capillary with blood.... After her results were out, I showed her and I just saw her clapping the hands and she shook my hand. She was so happy (Joyce journal, Southern Region, 060714).

We do not disregard the argument, based on the low uptake of VCT, that there is a fear of testing: people are indeed concerned that they will learn they are HIV positive. Since in 2004 anti-retroviral treatment was not available to those living in rural villages, and even in 2006 few had begun to take it, learning that one is HIV positive was understood as akin to learning that one would die soon. Many of those we interviewed, in fact, assumed that they would test HIV positive. This assumption was also evident in the 2004 MDICP survey, which showed a gap between the proportion who consider themselves to have some likelihood of infection (27% of men and 34% of women), and the proportion of those who actually were (7% of men and 8% of women) (Anglewicz & Kohler, 2006). An analysis of this gap showed that respondents vastly overestimated infectiousness of the virus (Anglewicz & Kohler, 2006; Watkins, Santow, Bracher, & Biruk, 2006). It is not surprising, therefore, that many delay confirmation of their HIV status until they are sick and seek treatment in the hope that their illness is treatable, not fatal (see Hatchett et al., 2004). It is also possible that the fear of testing is augmented when the process is time-consuming: actively seeking an HIV test at a health facility involves anticipation, travel, and waiting time at the clinic, which may heighten anxiety (Beardell & Coyle, 1996; Fylkesnes et al., 1999). We find, however, that fear – to the extent that it exists – can be mitigated by deliberate VCT strategies.

## Discussion

So why do we find high acceptability of HIV testing while facility-based testing remains disappointingly low? Our first finding has to do with convenience. In other rural African settings, door-to-door HIV testing increased uptake by removing the barriers of cost and accessibility (see Matovu et al., 2002; Wolff et al., 2005; Yoder et al., 2006; see also Bateganya, Abdulwadud, & Kiene, 2007; Were, Mermin, Bunnell, Ekwaru, & Kaharuza, 2003). These results should not surprise. Indeed, direct and indirect costs of accessing care in poor, rural settings are not unique to HIV testing services; in Malawi, for example, they also have been found to affect tuberculosis diagnosis and follow-up (Simwaka et al., 2007), and adherence to anti-retroviral treatment (Nyirenda, Makwiza, Bongololo, & Theobald, 2006), both of which involve frequent trips to a health facility for not only the individual, but also his/her family caregiver (Hatchett et al., 2004). Therefore, unless one is already sick, for most the opportunity to learn one's HIV status does not appear to be a sufficient incentive to pay these costs.

Our second finding has to do with confidentiality, particularly the interactions between health personnel and clients and the environment in which that interaction takes place. We have no first-hand information on what actually happens in the VCT encounter in health facilities, and so we rely on what our respondents tell us (see Angotti, Dionne, & Gaydosh, 2008; Hutchinson et al., 2004; Sangiwa et al., 2000). The consistency and tone of their emphasis on the importance of confidentiality with door-to-door testing suggests a compelling advantage (see Yoder et al., 2006). Also convincing to us is their concern that familiar health personnel may not keep their test result secret (Fylkesnes et al., 1999),

particularly in tightly-knit communities where counselors are deeply embedded in local social networks (Angotti, 2008).

Our final finding is the perceived advantages of the rapid blood test in terms of credibility. Respondents appeared to trust results they could see and interpret for themselves. Studies from other African countries report similar findings: persons receiving VCT with a rapid blood test expressed greater confidence in the test outcome (Marum et al., 2006); and, because the rapid test reduced the waiting time to receive results, it minimized stress and loss to follow-up (see Kassler et al., 1998; Roberts, Grusky, & Swanson, 2007). Respondents' trust also seemed to be enhanced because they had control over the dissemination of the results: not only were the VCT counselors from outside the area, assuaging concerns that someone other than themselves would reveal their test outcome, respondents who were tested also disposed of the testing technology. These results support a well-established literature in psychology that giving a client control reduces anxiety and enhances adaptive behavior (see, for example, Green & Baston, 2003).

This paper also raises important methodological considerations for how we understand responses to innovations in HIV prevention. We conclude that actually offering VCT – rather than posing hypothetical questions as other studies have done – may be the only valid way to assess its acceptability (see Fylkesnes et al., 1999), and that large discrepancies between hypothetical and actual acceptability of any innovation raise suspicions about the validity of the response to the hypothetical question (Thornton, Bula, Chavula, Bignami-Van Assche, & Watkins, 2005). We also recognize that favorable responses expressed to interviewers may well reflect the respondent's hope that benefits will come and continue (Miller, Zulu, & Watkins, 2001). A comparison of reactions to the MDICP 2004 testing found more negative comments in the public exchanges than in the interviews themselves (Thornton et al., 2005).

It is important to note that this study has limitations, namely that apart from the observational qualitative data, we do not consider responses from non-MDICP participants. While we attempt to address the panel effect in our statistics, as with any study, there remains the possibility that our high response rates are influenced by the duration of the study team's presence in the project villages, and external validity is difficult to determine. Findings from studies of door-to-door and rapid blood testing in other settings, however, are similar to the ones reported here and provide encouragement that the results we present are generalizable to similar settings.

How might these results inform policy and program efforts to increase the rural uptake of VCT? Lessons drawn from our study design suggest several ways. First, while providing home-based testing may not be feasible on a national scale, providing convenient services or mobile VCT units may attenuate structural barriers to testing (Morin et al., 2006). Indeed, the introduction of an annual, week-long national testing campaign in Malawi, which consists of providing mobile VCT counselors and services throughout the country, has had marked success in increasing uptake (WHO, 2008; Yeatman, 2007). Employing VCT counselors from outside the area to conduct the testing may assuage concerns expressed by respondents that local counselors, who may be familiar to them or someone they know, would spread their HIV test result. Next, our study suggests that the testing process be made as transparent as possible: village meetings demonstrated the rapid blood test in detail and gave community members the opportunity to have their concerns about HIV, and HIV testing, addressed. This is indeed something that government and NGO programs – in collaboration with village chiefs – could implement at minimal cost. Finally, once counselors are with their clients, it is

important that clients are shown the test kit in advance, and that they, not the counselor, interpret the results and dispose of the test kit, perhaps in a large plastic bag which contains other used test kits such that they can see that theirs cannot be identified.

All things considered, we note an important caveat for programming efforts in HIV prevention: the *acceptability* of VCT (the focus of this study) and the *behavioral impact* of VCT are two different things. While our intervention showed marked success with respect to testing uptake, careful investigation of behavioral outcomes under different VCT strategies is needed to maximize HIV prevention (Corbett et al., 2007; Sherr et al., 2007; Thornton, 2008).

## Conclusion

In Malawi, and throughout other high-prevalence countries of sub-Saharan Africa, UNAIDS and other agencies have emphasized the importance of HIV voluntary counseling and testing (VCT) as a critical strategy for HIV/AIDS prevention and treatment. Yet despite high numbers reporting that they would like to be tested, uptake remains disappointingly low. In this paper, we examined reactions to door-to-door rapid blood testing for HIV in a rural African setting using an explanatory design. Our results show that in rural Malawi, the overwhelming majority of those offered an HIV test in their homes agreed to be tested and to receive their results immediately. Our study suggests that when the testing process combines “three Cs”—that is, when testing is made convenient and confidential, and when the testing technology is perceived as credible—fear is not an insuperable barrier to accepting an HIV test and learning one's test result.

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