

Increasing Uptake and Yield of HIV Testing Services

Non-Monetary Economic Nudge Techniques in Tanzania

HP+ POLICY *Brief*

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Introduction

The most recent population-based HIV impact assessment shows that Tanzania has about 1.5 million people living with HIV and has managed to diagnose only an estimated 61 percent of those with the virus (TACAIDS and ZAC, 2018). In order to meet the first “95” objective of the UNAIDS 95-95-95 targets (95 percent of all people living with HIV will know their HIV status by 2025) and to reach epidemic control, the government of Tanzania and the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR) are prioritizing high-yield case identification and testing approaches. Therefore, Tanzania needs to understand how it can optimize its outreach and HIV testing strategies so that more people are tested and those who are positive are identified, while minimizing costs. Tanzania incidence studies have identified particularly low testing and case-finding rates among men and youth as barriers to achieving the first “95” objective. According to the impact assessment, only 52 percent of approximately 493,000 HIV-positive males in Tanzania are aware of their status (TACAIDS and ZAC, 2018). Meanwhile, youth aged 15-24 years are at considerable risk for contracting HIV and young men in particular have been least reached by PEPFAR (TACAIDS and ZAC, 2018).

From a policy perspective, identifying more cost-effective testing modalities will become increasingly important as Tanzania begins to get closer to

Box 1. What is an Economic Nudge?

An economic nudge is a small, monetary or non-monetary incentive that serves as positive reinforcement to influence the behavior and decision making of groups or individuals.

achieving the first “95” target. Even with a well-targeted testing strategy and an appropriate mix of testing modes, finding the last 5 to 20 percent of undiagnosed people living with HIV will be difficult and expensive because of diminishing testing yields. The cost per patient found can be expected to increase significantly over time as more and more people living with HIV know their status. Economic nudge techniques (Box 1) may be a way to improve testing yields for the remaining undiagnosed people living with HIV who are hard to find and/or don’t come forward on their own. This approach, despite some incremental costs for the incentives, may be more cost-efficient in the end, when measuring from a cost-per-patient-found basis, due to improved yield curves.

Study Objectives

The Health Policy Plus (HP+) project, funded by the U.S. Agency for International Development (USAID) and PEPFAR, conducted a field trial from May to July 2019 to examine two issues. The first was

the feasibility of implementing economic nudge techniques in combination with HIV testing approaches. The second was whether this approach could be cost-effective in identifying HIV-positive individuals in priority populations. These incentives were targeted toward client populations who do not typically come forward on their own to get tested, specifically youth and men. Studies globally have shown that costs for these approaches are minimal and incremental but may yield large aggregate benefits.

If the intervention is deemed feasible, field trial results will inform the design of a full evaluation to determine whether such an intervention could be implemented at scale. The field trial will also contribute to the understanding of policymakers at the Ministry of Health, Community Development, Gender, Elderly and Children; PEPFAR Tanzania; and other partners on how incorporating economic nudge techniques into targeted HIV testing services may impact yields among priority populations and contribute to cost efficiencies for HIV programming. Findings can help stakeholders identify circumstances in which economic nudges can be used to bolster testing approaches to help combat diminishing yields.

Approach

Literature Review

HP+ completed a desk review of Tanzania's Policy Guidelines for HIV Testing and Counseling and recent evidence from settings in which incentives for HIV testing and counseling have been launched and reviewed. Results from using incentives for other HIV interventions, including some conducted in Tanzania and some targeting males and/or youth, were also reviewed. In one example, non-monetary items that promote good health, such as soap and deworming medication, increased testing uptake in Zambia (Wall and Allen,

2017). In another example, monetary incentives, structured through a system in which participants could win a prize as small as US\$2 if their name was drawn from a lottery, resulted in an uptake in testing in Zimbabwe (Kranzer et al., 2018). Within Tanzania, conditional cash transfer programs have been successfully used to encourage behavior change among female sex workers to increase testing for sexually transmitted infections (Packel et al., 2018). Of the interventions reviewed to improve HIV testing uptake, the incentive costs were minimal (a median of US\$5).

In total, HP+ reviewed 24 published journal papers and all showed improved results, though there was no clear relationship between increasing costs of the incentive and its impact. For studies on HIV testing interventions, there was an average of 156 percent improvement in testing uptake under the intervention arms compared to the control arms. However, only one study reported testing yield. The two interventions that used a lottery system achieved improvement rates close to the 120 percent median result of all studies.

This review provided a stronger understanding of the challenges, implementation designs, and sustainability concerns associated with these interventions. The desk review was supplemented by informational interviews with partners in Tanzania to learn about their experiences with incentives and various approaches to increasing HIV testing uptake among different populations.

Workshop

HP+ facilitated a workshop with representatives from PEPFAR, key HIV testing and counseling implementing partners in Tanzania, and the government of Tanzania to discuss findings from the desk review. HP+ also shared preliminary modeling results that provided indications of potential costs (based on unit costs from

existing secondary data), threshold points for testing rate increases, and potential yield. Participant feedback was solicited for recommendations on modeling scenarios and measures of success, and to gain consensus on the design of the field trial. Participant feedback also informed the HIV testing modalities and incentive types and amounts used in the study.

Field Trial

To determine the feasibility of implementing economic nudge techniques that may promote higher levels of testing and case-finding in Tanzania, HP+ worked with PEPFAR implementing partner USAID Boresha Afya-Southern Zone to implement a three-month incentive feasibility test. The trial was undertaken in Morogoro Region, which has a population of 2.2 million, an adult HIV prevalence rate of 4.2 percent, and a high unmet need for HIV testing (TACAIDS and ZAC, 2018). Morogoro has five of the “scale-up to saturation” councils prioritized in PEPFAR planning, so selected because they represent a large proportion of the national burden. Morogoro also has low enrollment (less than 10 percent of the population) in the Improved Community Health Fund (iCHF) insurance scheme (NHIF, 2017).

The rapid feasibility study introduced options for non-monetary incentives to be distributed at three facilities in two districts (Kilombero and Morogoro) where HIV testing and counseling was ongoing. It assessed the attitudes of HIV testing and counseling clients toward these incentives, identified any programmatic issues in rolling out such an intervention, and evaluated any unintended consequences.

(This feasibility study was not intended to assess whether these incentives increase demand; such an analysis would require a separate full trial, which may be subsequently implemented as a follow-on study.) Best practices were documented and will be considered for scale-up. Findings also provide more accurate data inputs for modeling and analysis. HP+ worked with a local research institution, Muhimbili University of Health and Allied Sciences, to collect quantitative and qualitative data.

Methods

Site Selection

Three facilities with high volumes of HIV testing and counseling clients in Morogoro Region were selected for data collection. The facilities are supported by USAID Boresha Afya-Southern Zone and their selection was made in consultation with USAID; PEPFAR implementing partners; the Ministry of Health, Community Development, Gender, Elderly and Children; and the President’s Office—Regional Administration and Local Government.

These facilities serve the general population, including the targeted population groups: males aged 25-49 years and all youth aged 16-24 years (the age of consent for HIV testing in Tanzania is 16 years). The facilities had been in operation for more than two years and represented one rural and two urban locations. The total sample size of participants interviewed was 399 clients (59 percent youth, 41 percent adult men) and 16 service providers. Additional details on the participant population for the intervention can be found in Table 1. Data

Table 1. Number of Intervention Participants by Facility

Sampling	Mang’ula	Saba-saba	Morogoro Hospital
Total Client Participants	159	161	79
Adult Male Participants	47	77	38
Total Youth Participants	112	84	41
Male Youth Participants	87	45	32

were also collected from clients who were eligible for the incentive but not tested. Data collection took place for one month at each of the three facilities.

Incentives

The incentive targeting youth was airtime valued at TZS 5,000. The incentive for adult males was an iCHF insurance card valid for one year for a household of six, administered through a lottery system. The cost of each iCHF card was TZS 30,000 and the probability of winning was 54 percent. Use of a lottery system protected against oversubscription, a necessary step as the intervention had a set budget. Adult males who won the lottery and who were already enrolled in the iCHF would have their membership renewed for an additional year, though HP+ did not come across a scenario in which the participant was already an iCHF member. In all cases, incentives were administered and disbursed by the Muhimbili University of Health and Allied Sciences.

HIV Testing Modalities

HP+ implemented the intervention at each facility under three HIV testing modalities. The selection of the three testing modalities was based on their availability at each of the three trial sites, alignment with national HIV testing guidelines, historic coverage of the target populations, and representation of both voluntary and provider-initiated testing. The intervention was intended to complement existing PEPFAR program initiatives.

Voluntary Counseling and Testing

(VCT): A poster and local radio advertisement¹ were placed in the catchment areas of the participating facilities to announce that incentives would be available to members of either targeted population that gets tested. Community health workers also explained to people how the

intervention would work and provided some details on the incentive itself. Clients voluntarily came to the facility to get tested for HIV and underwent risk screening using a tool developed by the Ministry of Health, Community Development, Gender, Elderly and Children. Only those identified to be at risk were tested. Use of the risk screening tool is a government policy meant to improve targeted testing and to prevent over-testing. Clients were required to indicate how they heard about the intervention (e.g., from the advertisement) to be eligible for the incentive. Eligible clients received the incentive regardless of whether they were identified to be at risk.

Provider-Initiated Testing and Counseling (PITC):

The risk screening tool developed by the Ministry of Health, Community Development, Gender, Elderly and Children was applied to clients receiving standard outpatient care; qualifying clients were recommended for provider-initiated testing and counseling. Clients in the target population groups were informed of the HIV testing incentive by the healthcare provider only if they initially chose to opt out.

Index Testing: Index testing is a voluntary process in which clients list sexual or injecting partners within the past year. The process is initiated when an individual is newly diagnosed as HIV positive and/or an HIV-positive individual is enrolled in HIV treatment. If the client agrees, partners are contacted, informed that they have been exposed to HIV, and offered voluntary HIV testing services. Target population group partners were informed of the incentive intervention when contact was made.

Data Collection

After the project received ethics approval, data were collected from the selected sites via structured interviews with

¹ HP+ would like to acknowledge the FHI 360 Tulonge Afya project for providing support for the radio advertisement in Morogoro Region.

HIV testing and counseling healthcare providers, facility managers, and clients. A survey was developed for the collection of both qualitative and quantitative data. The data collection instrument was used to obtain information on the facility and program, demographic details of the client, HIV testing and counseling unit costs, and clinical outcomes, including testing yields disaggregated by sub-population. The survey also asked about ease of administration, client attitudes toward the intervention, preferred testing modality, preferred mode of communication, and potential issues or unintended consequences of the intervention.

Modeling

HP+ estimated the cost and impact of introducing non-monetary incentives for HIV testing among specific population groups in Tanzania.

Results

Participant Profiles

Participant characteristics by age, marital status, and employment status can be found in Table 2. Household sizes ranged from 1 to 14, with an average size of five. No participants identified as a female sex worker, a man having sex with men, or a person who injects drugs, though 3 percent of participants did identify as a partner of someone in one of those key population groups.

Perception of and Preferences for the Intervention

Eighty-five percent of respondents viewed the incentive intervention very favorably while 2 percent viewed it unfavorably (Figure 1). Sixty-eight percent of those interviewed found participation in the intervention to be very easy, while only 2 percent found it to be moderately difficult (Figure 2). Voluntary counseling and testing was the preferred testing modality

Table 2. Participant Profiles

	Adult Males	Youth
Average Age	35	21
% Male	100%	69%
Marital Status		
Married/Living Together	65%	16%
Single	29%	82%
Separated/Widowed	6%	1%
Employment Status		
Civil Servant	4%	3%
Organized Private Sector	2%	2%
Informal Sector Worker	12%	5%
Self-Employed	79%	49%
Housewife	0%	3%
Student	2%	31%
Unemployed	1%	7%

Figure 1. Opinion of Intervention

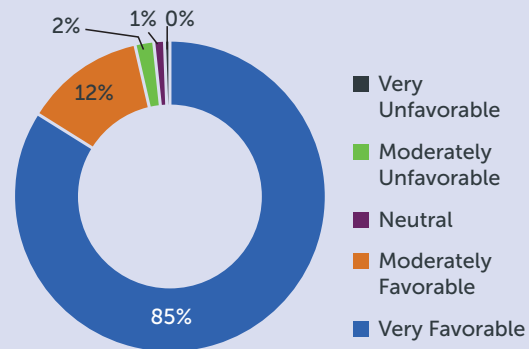
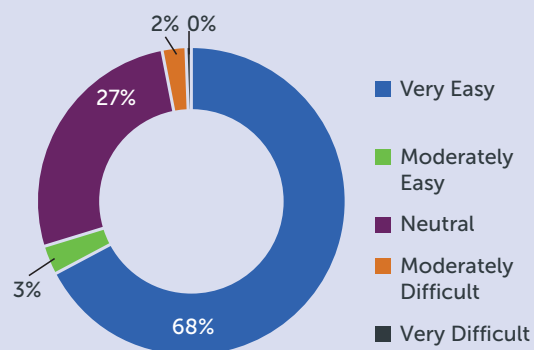


Figure 2. Ease of Participation



for 92 percent of respondents. Most clients preferred to be notified of the intervention by radio advertisement (56 percent), though poster advertisement (22 percent) or contact by a health worker (22 percent) were preferred by significant minorities.

Respondents were asked to identify from a pre-determined list possible positive and negative consequences of incentives to encourage HIV testing and counseling. (The choices were formulated during the stakeholder workshop.) Participants were asked to check all that applied. The most common potential positive effect was a reduction of incidence (Figure 3). Reduced stigma and improved quality of health service delivery were the next most frequent responses. Among potential negative effects, cheating (i.e., participants attempting to claim the incentive multiple times) was the most common response (Figure 4). Increased stigma was the second-most frequent answer, while decreased linkage to care was the third.

The preferred incentive option was the iCHF insurance card, followed by cash and airtime (Figure 5). All other incentive types received significantly fewer votes, with transport reimbursement being the highest among them. (Participants' transport costs to reach the facility ranged from zero for those who walked to as high as TZS 15,000 [US\$6.56] with an average of TZS 1,824 [US\$.070]). Responses were likely skewed toward a preference for the iCHF card because of its higher monetary value, though it is unclear if participants knew the exact cost for iCHF membership.

HIV Testing Uptake

Testing uptake increased during the intervention month compared to the previous month (Table 3), but uptake was only slightly higher for the intervention month year over year. Uptake during the intervention month was down compared to average District Health Information System 2 (DHIS2) figures from the previous 12 months.

Figure 3. Potential Positive Effects

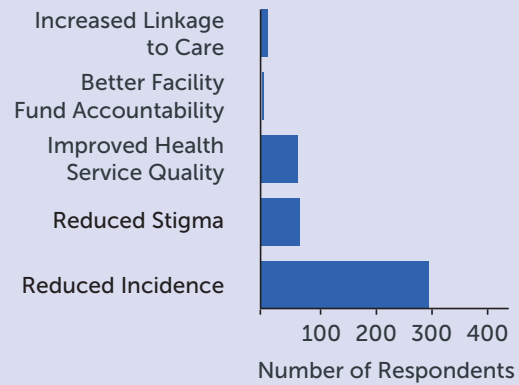


Figure 4. Potential Negative Effects

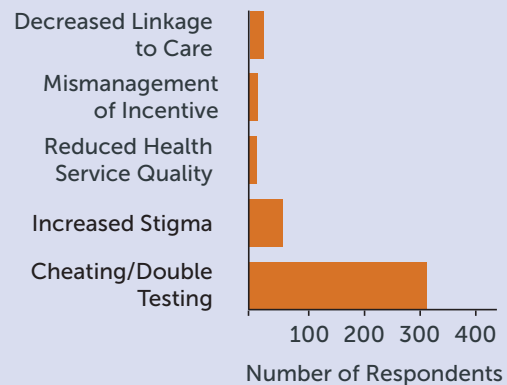
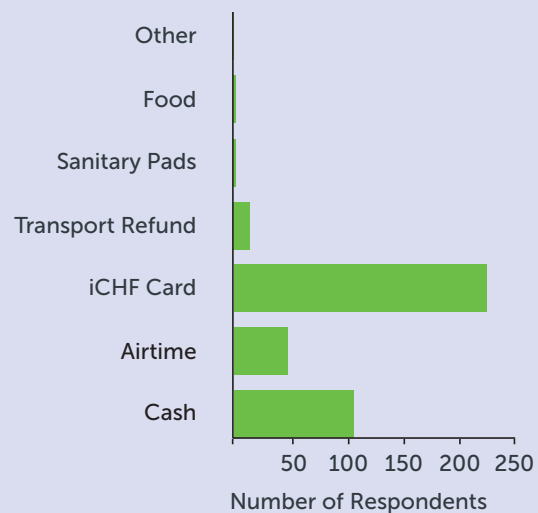


Figure 5. Preferred Incentive Option



Historically, May and June see lower than average testing volumes because these months coincide with the Tanzanian rainy season. Lower testing volumes are also likely an indication of the shift in PEPFAR's testing strategy to be more targeted and

cost-effective as the number of remaining undiagnosed people living with HIV declines over time.

Of the 399 clients in the intervention, 395 participated through voluntary counseling and testing, four through provider-initiated testing and counseling, and none through index testing (Table 4). Of the 395 intervention participants who presented for testing through voluntary counseling and testing, only 31 (8 percent) were deemed not at risk according to the ministry risk screening tool and therefore not tested. The small proportion diverted from testing may indicate the screening tool is not sufficiently specific in its identification of clients at risk.

Low intervention participation through provider-initiated testing and counseling can be largely explained by strong emphasis on increasing testing uptake at outpatient departments. USAID Boresha Afya-Southern Zone estimates that 98 percent of clients using outpatient departments are tested for HIV. Therefore, only a few clients, who opted out, were eligible to participate in the intervention. All four provider-initiated testing and counseling participants who initially opted out ultimately changed their minds and were tested for HIV upon hearing about the incentive opportunity.

No clients participated in the intervention through index testing. This was due to three PEPFAR partners implementing index testing in the region, including USAID Boresha Afya-Southern Zone. Under PEPFAR's previously initiated strategy, each partner deploys teams of community health workers to ensure targeted clients go to a clinic to get tested, often making home visits when initial outreach is unsuccessful. Vehicles or a transportation allowance are often provided by PEPFAR partners for these home visits. In some instances, one client may be followed up with by all three PEPFAR partners in the area. Each community health worker is rewarded with TZS 10,000 (US\$4.34) for each HIV-positive

Table 3. HIV Testing Uptake by Population Group

	Adult Males	Youth
Intervention Only	162	237
Full Facility Intervention Month	306	349
Full Facility Previous Month	188	196
Full Facility Same Month Previous Year	290	308
Full Facility Previous 12-Month Average	406	479
National Previous 18 Months	3.1 million	4.9 million

Source: HP+ calculations; DHIS2, 2019

Table 4. HIV Testing Uptake by Testing Modality

	VCT	PITC	Index
Intervention Only	395	4	0
Full Facility Intervention Month	122	466	67
Full Facility Previous Month	56	267	61
Full Facility Same Month Previous Year	40	558	0
Full Facility Previous 12-Month Average	59	813	11
National Previous 18 Months	0.9 million	5.4 million	1.0 million

Source: HP+ calculations; DHIS2, 2019

Note: HP+ data do not reconcile with DHIS2 data on testing modality (VCT and PITC) for the intervention month, possibly due to variability in coding or data collection.

individual found through index testing. This added incentive for the community health worker and the intensive follow-up process for index testing left no clients to participate in the HP+ intervention through the index testing modality. Although index testing was shown by the end of the study to be fully saturated at the trial facilities, its inclusion for examination in the study was prioritized given its importance in PEPFAR's overall HIV testing strategy.

Testing Yields

Of those tested for HIV, six tested positive, three adult males and three female youth (see yields in Table 5). All who tested positive participated in the intervention through voluntary counseling and testing (Table 6). A full trial is needed to assess if incentives improve testing yields. However, given the low yields from intervention participants, almost all of whom participated via voluntary counseling and testing, it can be inferred that such a strategy is not targeted enough toward those who exhibit high-risk behaviors (e.g., multiple sexual partners, inconsistent condom use, alcohol and substance abuse) and their partners for incentives to be a cost-effective stand-alone intervention.

Modeling

HP+ conducted mathematical modeling to illustrate how the intervention, assuming that it can improve testing yields, can affect the cost per positive patient found. Using baseline assumptions, the cost per positive patient found would increase from \$291 to \$2,238 by 2023 (Figure 6). This scenario is based on 237,000 undiagnosed adult men living with HIV in Tanzania, holds the 2.1 million tests conducted for adult men over the last 12 months constant, and assumes a baseline yield of 4.6 percent for previously undiagnosed adult men and a unit cost of \$13.37 per test (CDC, unpublished).

The desk review showed that the median improvement on uptake of HIV testing from

Table 5. HIV Testing Yield by Population Group

	Adult Males	Youth
Intervention Only	1.9%	1.3%
Full Facility Intervention Month	15.4%	4.0%
Full Facility Previous Month	25.5%	3.6%
Full Facility Same Month Previous Year	3.8%	1.0%
Full Facility Previous 12 Months	5.9%	2.5%
National Previous 18 Months	5.6%	1.9%

Source: HP+ calculations; DHIS2, 2019

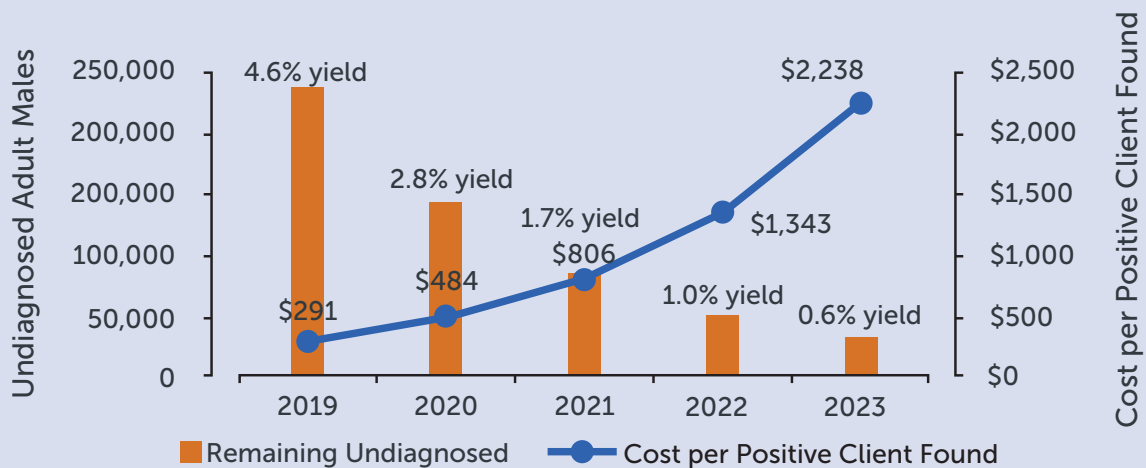
Table 6. HIV Testing Yield by Testing Modality

	VCT	PITC	Index
Intervention Only	1.5%	0.0%	0.0%
Full Facility Intervention Month	4.1%	7.9%	23.9%
Full Facility Previous Month	0.0%	10.1%	45.9%
Full Facility Same Month Previous Year	12.5%	5.2%	0.0%
Full Facility Previous 12 Months	9.3%	3.4%	27.9%
National Previous 18 Months	3.4%	2.3%	8.9%

Source: HP+ calculations; DHIS2, 2019

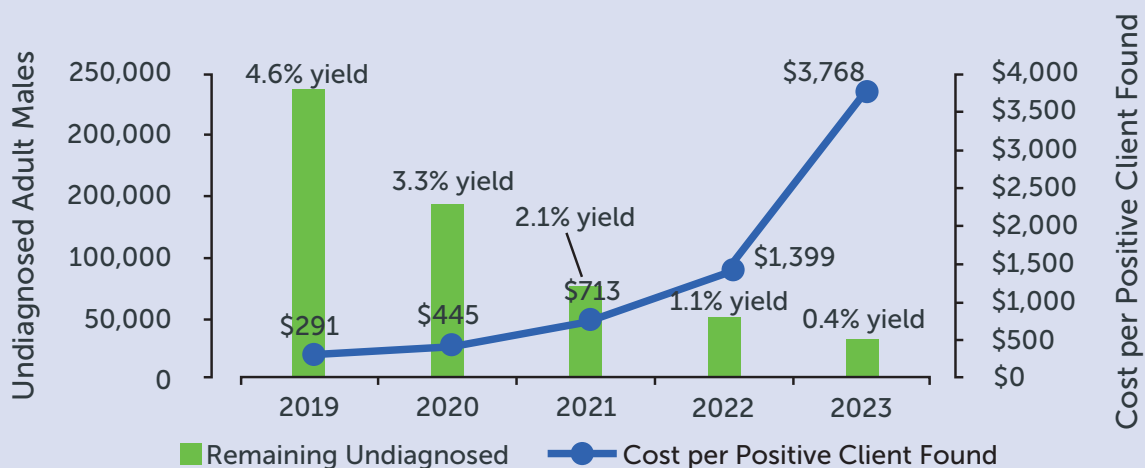
economic nudge interventions was 120 percent. Applying this improvement rate to testing yields would decrease the cost per patient found in year 1 from \$484 to \$445 and in year 2 from \$806 to \$713 (Figure 7). This scenario keeps all other baseline assumptions constant and assumes an incentive cost of US\$4.18 per patient tested, the expected value of incentives from the HP+ trial. The median percentage increase from incentives suggested by the desk

Figure 6. Increasing Cost per Positive Patient Found Due to Declining Yields



Source: CDC, unpublished; HP+ calculations; TACAIDS and ZAC, 2018

Figure 7. Potential Effect on Cost per Patient Found with Increased Yields



Source: CDC, unpublished; HP+ calculations; TACAIDS and ZAC, 2018

review refers to testing uptake, not yields. Furthermore, it is not valid to assume testing volumes will remain constant, as PEPFAR’s strategic priorities for HIV testing in Tanzania are likely to decrease such volumes. This example is meant to indicate the potential effects of an intervention that improves testing yields on cost savings. Under this scenario, cost savings appear early in the intervention but become less prominent or disappear over time as yield curves for the baseline and intervention converge. Adjustments to testing volumes,

population and geographic targeting, etc. must be considered for the intervention to remain effective over time.

Discussion

Results from the study show that implementing economic nudge techniques does appear feasible in the Tanzanian context as 97 percent of clients and service providers were favorable of the intervention and 72 percent found participation in and administration of the incentive to be

easy. Only 2 percent of respondents found participation and administration of the intervention to be moderately difficult and none found it to be very difficult. Effective communication about the intervention—by radio, poster advertisement, or other means—is important during the early stages of the intervention, after which news quickly spreads by word of mouth.

Voluntary counseling and testing was the preferred modality among respondents and showed the highest increase in testing uptake. However, voluntary counseling and testing does not appear to improve yields, as it is not sufficiently targeted to people at high risk of HIV infection. The success of an economic nudge intervention will depend on selecting appropriate HIV testing modalities, target populations, and situations under which to introduce the incentive. For example, offering incentives to outpatient department clients who initially opt out of HIV testing appears warranted, as these individuals are among the hardest to reach. This type of targeted strategy would align with efforts by PEPFAR and the government of Tanzania to prioritize case finding while reducing excessive testing. All four provider-initiated testing and counseling participants in the study who initially opted out changed their minds and were tested for HIV upon hearing about the incentive. Additional incentives are unnecessary for index testing, given the intensive nature and high yields of the existing follow-up process, as well as existing incentives for community health workers. Although costs for the current index testing approach were not available, incentives targeting clients may achieve the same results at a lower cost. Incentives may also be useful in non-clinical settings, such as community outreach programs, where clients, especially men, are more comfortable getting tested. A final observation is the risk assessment screening tool used for both voluntary and provider-initiated testing and counseling appears

to be not sufficiently screening out those who are not at risk, leading to higher than necessary HIV testing volumes.

Limitations

Economic nudge techniques, even those with an expected value as low as US\$4.18, appear to increase testing uptake. A key limitation to a feasibility trial is that confirmation on the efficacy of the intervention requires a separate randomized controlled trial. Similarly, determining the effect on testing yields will require a full trial with a modified design.

Another limitation to the study was the low participation rates under two of the HIV testing modalities, provider-initiated testing and counseling and index testing. The feasibility trial indicated that other interventions in place were driving higher HIV testing uptake, making the incentive intervention somewhat redundant. The very low sample sizes under provider-initiated testing and counseling and index testing made it difficult to assess if the intervention had the potential to increase testing under these modalities. This takeaway should be addressed in the design of any full trial.

Lastly, data collected by HP+ during intervention months were inconsistent with the HIV testing figures facilities were reporting to DHIS2, raising questions about the accuracy or categorization of data inputted into the DHIS2. These discrepancies made comparison of HIV testing volumes to non-intervention months difficult.

Conclusions

Identifying cost-effective HIV testing strategies will become more important as Tanzania gets close to achieving the first “95” target. Economic nudge techniques in Tanzania appear feasible and able to improve HIV testing uptake when clients initially opt out of testing. Despite some incremental costs for the incentives, these techniques can be more cost-efficient than

traditional testing strategies, on a cost-per-positive-patient-found basis, if applied under the right circumstances. Appropriate adjustments must be made over time to factors such as testing volumes, targeted sub-populations, and targeted locations.

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