Introduction

There is broad agreement globally that a “one size fits all” model of HIV services is not optimal for cost efficiency and will not succeed in providing sustainable access to antiretroviral therapy (ART). Differentiated care simplifies and adapts HIV services to reflect preferences of specific groups of people living with HIV, while also reducing unnecessary burdens on the health system, allowing for reallocation of resources to those most in need. As the National AIDS Control Program (NACP) in Tanzania adopted a “test and start” policy for HIV treatment (as of October 2016), the number of people eligible for treatment is dramatically increasing, calling for increased efficiency of services.

Currently, NACP is in the process of finalizing a manual and training package for differentiated service delivery models (DSDMs) with plans to roll out a pilot in three regions. Results from two analyses—one by the Health Policy Project (HPP) in 2016 and one by the follow-on Health Policy Plus (HP+) project in 2017, both funded by the U.S. Agency for International Development (USAID) and U.S. President’s Emergency Plan for AIDS Relief (PEPFAR)—can help inform policy decisions around allocation of resources to more effectively deliver care in ways that lead to better access for underserved populations and improve the quality of care for people living with HIV.

Costing ART Resource Requirements and Potential Efficiency Gains

In April 2016, HPP assessed the cost for site-level ART service delivery needed to achieve NACP treatment targets in Tanzania. HPP also estimated the monetary savings that could potentially be achieved from more efficiently delivering treatment services, focusing on multi-month prescription refill scripts (MMS) for antiretroviral drugs (ARVs) and a differentiated algorithm for laboratory monitoring and initiation. The analysis looked at costs for ARVs, laboratory tests and consumables, supply chain management, and other site level costs such as for human resources and shared overhead. Findings showed that NACP, which is already resource constrained and heavily dependent on donor financing, would need to increase its facility-based resource envelope 91 percent by 2020 to meet ART targets, if efficiency measures are not undertaken (Forsythe et al., 2016). However, by adopting NACP’s fifth edition ART guidelines, which reduce the number of clinical visits per year from 12 to 4 for stable patients (as defined in Box 1), and adopting PEPFAR’s 2016 technical considerations on laboratory monitoring and initiation, total ART costs could be reduced by USD 258 million from 2016-2020. The main drivers of efficiency gains are from a reduced need for human resources and overhead/supplies per patient due to less frequent
Box 1: Defining Stable Patients

At the time of this study, NACP did not have clear guidelines on how to determine if a patient receiving ART was “stable.” In practice, medical officers used various methods including looking at improvements in CD4 levels to defined thresholds while others simply made a clinical assessment based on no visible illness that required regular monitoring. For the purpose of this analysis, HPP assumed that 70% of ART patients were stable based on a combination of different published sources (Nyogea et al., 2015; Dow et al., 2014; Mosha et al., 2013).

NACP has since included the following criteria to consider a patient receiving ART as “stable” in its 2017 National Guidelines for Management of HIV and AIDS:

- Above 5 years of age
- Received ART for at least 6 months
- No adverse drug reactions that require regular monitoring
- No current illness (opportunistic infections or co-morbidities)
- Lifelong adherence of 95% and kept clinic visit appointments for the past 6 months
- On first-line ARVs, with undetectable viral load (below 50 copies/ml)
- In the absence of viral load monitoring, rising CD4 counts (greater than 350 cells/mm)

Benefits of Implementation of Differentiated Service Delivery Models

In 2017, HP+ conducted a subsequent analysis on the benefits of implementation of DSDMs and the need for community-based support initiatives. HP+ met with ART service managers of seven PEPFAR IPs based in Dar es Salaam and randomly selected six care and treatment facilities from each IP to collect data for a 12-month period using a structured questionnaire. Data collected included facility patient numbers, staffing, location, operating hours, and capacity (as defined in Box 2). HP+ also interviewed IP director-level staff to discuss staffing and overcapacity issues, the potential for cost savings from efficiency gains, resource needs for adherence and retention support, and programs targeting key populations. While there are other potential benefits of DSDMs, such as catering to clients’ preferences or facility visits. These efficiency gains could allow NACP to redeploy freed-up human resources and facility space/overhead to scale up other health areas or to manage an increase in ART patient load. Savings in the use of diagnostic services could be redeployed to the scale-up of commodity procurement efforts.

At the time of the study, using differentiated care instead of undifferentiated care and assuming adoption of viral load testing per the NACP guidelines, fifth edition, the number of ART patients that could be supported in 2020 given Tanzania’s 2015 resource envelope increases by 53,193 patients (see Figure 1). However, the implementation of new DSDMs needs to be carefully planned. Both NACP and implementing partners have voiced concerns about potentially increasing the number of patients that are lost to follow-up as clients have fewer contacts with the healthcare system.
reducing opportunity costs related to travel and time spent at facilities, measuring these benefits was outside the scope of this study.

**Differences by Facility Type, Capacity, and Utilization**

On average, urban facilities see 10 more patients per day than rural facilities, while utilization of capacity is virtually the same. Hospitals see the highest number of ART clients per day on average and, logically, stand to benefit the most from switching to MMS. Surprisingly, the number of ART patients seen on average per day at health centers does not differ much from the number seen at lower-level dispensaries, despite being significantly better staffed. Consequently, health centers have the most underutilized capacity, although, operating at 100 percent capacity, on average, may not be optimal given that there are likely times when facilities experience surges in patient visits, in which case

**Box 2: Capacity Definitions**

*Capacity:* The total number of ART patients that can be serviced per day at a facility, as determined by the facility manager, given the facility’s staffing, operating hours, and size constraints.

*Under capacity:* When the total number of ART patients that can be seen per day, given the facility’s capacity, exceeds the actual average number of ART patients seen per day.

*Over capacity:* When the actual number of ART patients seen per day exceeds the total number of ART patients that can be seen per day, given the facility’s capacity.
having excess capacity would reduce patient inconveniences (see Figures 2A–E).

Out of the 40 total facilities, 10 reported operating at 100 percent capacity, 4 operated at over 100 percent, and 26 operated at below 100 percent (see Figure 3A). Two of the facilities that reported being over capacity were significantly congested, seeing 40–70 additional patients per day beyond their capacity. Most often, facilities respond to congestion by extending hours to see all patients, with no facility reporting having to turn patients away because of congestion issues, although it is unclear whether patients left due to long wait times. Generally, if patients are still waiting at the end of clinic hours, the facility could pay staff overtime to keep the clinic open. Health workers at certain PEPFAR-supported facilities are entitled to overtime pay (PEPFAR, 2015), estimated at TZS 5,000–10,000 (USD 2.21–4.42) per worker per hour. However, overtime pay is rare in most other public health facilities in Tanzania due to lack of funds.

In the longer term, facilities can try to increase capacity by hiring more staff, which may take anywhere from two months to two years. Retention of staff was widely reported as a challenge. Typically, when facilities are overburdened, the result is that health workers rush through procedures and spend only a few minutes with each patient (see Figure 3B), thus decreasing the quality of care. Increasing the number of days that a facility is open appears to be a method to reduce congestion and may improve quality of services, although it would require additional resources. Facilities that are open more than 300 days per year appear to have lower average daily ART patient loads (see Figure 3C).

**Potential to Reallocate Resources from Efficiency Gains**

Despite being in the NACP guidelines, fifth edition, movement toward MMS had not happened in practice in Tanzania at the time of the study (although in a few facilities some patients were coming in every other month to refill their prescription). Consequently, IPs could not report on the actual effects that MMS had on facility operations. However, respondents believed that more efficient service delivery models would directly lead to staff time saved, and nearly all responded that any staff with free time would be deployed to perform other tasks, such as HIV testing services, tracking patients that are lost to follow-up, treating other diseases, giving vaccinations, or providing family planning services. Some additional training may be required for health staff to be able to perform these tasks. A few IPs responded that the main value added from DSDMs resulting in time savings for health workers would be improved quality of service. As per the respondents, overburdened health workers spend the minimum time possible on patient visits, which may result in lower quality. If a more efficient model resulted in fewer patient visits per day, healthcare workers would have more time to spend with patients.

Regarding physical space, some IPs responded that there is an opportunity to reconfigure waiting area space with reduced patient visits, but other space, such as examination rooms, can probably not be further utilized for other purposes. All IPs identified a need for additional storage space for ARVs if MMS or community-based ARV distribution were to be scaled up. Several also recognized a need for an information system upgrade as inventory management becomes more complex under MMS, not only for stock management but also for proper recordkeeping of drug delivery and receipt at the community level.

**Adherence and Retention Initiatives to Mitigate Negative Impact from Less Frequent Facility Visits**

At least one IP reported that 25 percent of new patients are lost to follow-up (LTFU) within three months of initiation and NACP
Figure 2: Differences between Urban and Rural Facilities and Facility Types

A. Average Number of ART Clients Per Day, Urban and Rural Facilities

B. Average Facility Capacity and Utilization, by Location

C. Average Number of ART Clients Per Day by Facility Type

D. Average Number of Clinical Staff by Facility Type

E. Utilization of Capacity by Facility Type
has raised similar concerns about allowing too much time between facility visits for new patients, especially since it is difficult to determine if a patient is stable until after one year. All IPs agreed that this was an important topic and shared ideas on support interventions (see Box 3). One IP suggested special clinics for children and adolescents that provide youth-friendly services to help with adherence if MMS is implemented. No actual cost data was available, but IPs indicated that community programs and upgraded storage facilities would require the most additional resources. Three IPs responded that MMS may reduce staffing burden for ART, but may increase transport expenses and staff time to visit communities more frequently.

**Service Delivery Models for Key Population Groups**

The analysis intended to determine if there are any potential cost efficiencies from DSDMs targeting key populations of female sex workers, men who have sex with men, and injecting drug users. IPs confirmed that there are nongovernmental organizations that run outreach programs targeting such populations in the communities where facilities are located, but in nearly all cases, the facilities themselves did not operate any differentiated models of care specifically targeting key populations and subsequently had no actual data for the cost of such interventions. Only 4 out of 42 facilities surveyed operated outreach programs for key populations, estimating that they each spent between TZS 0.54–14.40 million (USD 239–6,368) per year on such programs. Nongovernmental organizations refer key populations to treatment facilities, but these patients do not self-identify as members of a key population upon registration and there is no distinction in how they are tracked or reported. There is also no difference in how they are treated clinically. Forty-three percent of respondents said that there is a need for targeted programs that can
improve linkage to treatment initiation for key populations and provide some added interventions such as management for sexually transmitted infections.

**Conclusion and Discussion**

Differentiated care can reflect adaptations away from the traditional clinic-based service model appropriate for the general population, to better reflect individual needs of key populations most at risk of HIV. This may improve the effectiveness of the HIV response in Tanzania.

The implementation of DSDMs, such as MMS and differentiated labs algorithm, has the potential to significantly reduce cost and improve efficiencies. Cost savings totaling USD 258 million can be achieved by switching gradually from the practice in Tanzania at the time of the study to the efficient service delivery scenario. These costs can be broken down by overhead/supplies (42%), human resources (30%), laboratory commodities (22%), and supply chain (6%). Although savings from the differentiated labs algorithm that accrue from eliminating or reducing the frequency of certain laboratory tests (and associated procurement and supply chain management costs) account for only 28% of the overall cost savings, or USD 72.2 million from 2016–2020, these savings are more likely to be realized than others. This is because it is uncertain if human resource and facility capacity that is freed up from implementation of MMS can be capitalized on.

According to IPs, perhaps the most significant impact that could be achieved by switching to MMS would be increased quality of services resulting from reduced client load, allowing clinical workers to spend more time with patients. There is a concern, however, that the use of MMS may potentially increase the number of patients lost to follow-up, since clients will have less regular clinical contact. Conversely, the introduction of MMS services might reduce loss to follow-up by increasing clinical time spent with patients and freeing up staff to do community outreach. Therefore, the rollout of MMS in Tanzania should consider a careful assessment of how it may affect loss to follow-up and consider additional support interventions that are needed for adherence and retention. These interventions, such as community support groups, will have incremental costs, which must be anticipated.

While MMS and a differentiated labs algorithm were the only models of differentiated care included in the 2016 analysis, DSDMs can also be tailored in regards to service frequency, location,

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**Box 3: Suggested Adherence and Retention Support Interventions**

- Clinics for youth-friendly health services
- Home-based care services
- Support groups for people living with HIV
- Reference brochures on medication
- Additional adherence counseling
- Strong mechanisms to track patients that are LTFU
- More community health workers to track patients that are LTFU
- Use of map cue cards
- Use of appointment system
- Additional outlets for drug dispensing
- Tracking clients by viral load status
- Improving incentives for clinical staff
- SMS (text) reminder messages
- Community sensitization on HIV services
- Improved storage facilities for ARVs
- Service delivery model in which ARVs are collected on behalf of a group
- Strong logistics management information system and staffing for ordering drugs
intensity, and cadre. Each of these components represent a flexible lever for adjusting care to serve a specific patient population in a given geographic area as determined by the needs and preferences of the client. Through the development and roll-out of its new operational guidelines for DSDM, NACP is working to provide HIV program managers and service providers with guidance on how to be most responsive to the needs of people living with HIV. As this process continues, the results of this analysis can be used to inform cost-efficient program considerations for inclusion in the guidelines.

**Next Steps**

Given the limits of scaling up MMS and programs targeting key population groups in Tanzania, meeting the initial objectives of the 2017 analysis were challenging, especially with minimal expenditure and cost data. As a follow-on analysis, HP+ is working with NACP and IPs to estimate the cost of community support program components that were suggested by IPs. The analysis will define and examine a package of community and treatment retention services for stable and advanced patients and determine the incremental costs of these services through a costing exercise based on interviews with IPs that are operating or piloting community-based services for HIV.

In addition, HP+ will determine cost efficiencies from improved treatment outcomes from reduced LTFU and improved adherence among patients receiving community-based support. These efficiencies would derive from reduced costs related to tracking patients that are LTFU and reintegrating them back into care and treatment. Given the lack of known data from Tanzania on the efficacy of community-based interventions in this context, assumptions can be made using data from other countries, such as Kenya, Mozambique, South Africa, Swaziland, and Uganda. As the final differentiated care plan for Tanzania has not yet been finalized, this follow-on analysis can be used to inform decisions on the ideal mix of reduced facility-level services and increased community interventions.

**References**


PEPFAR Tanzania. 2015. “PEPFAR Tanzania 2015 HRH Inventory.” Dar es Salaam: PEPFAR.