ALTERNATIVE MODELS OF ART DELIVERY: OPTIMIZING THE BENEFITS

DIFFERENTIATED SERVICE DELIVERY MODELS FOR HIV TREATMENT IN ZAMBIA: A SNAPSHOT OF COVERAGE IN LUSAKA AND CENTRAL PROVINCES IN MARCH 2020

AMBIT is a research and evaluation project to generate evidence on the health and economic impact of differentiated service delivery (DSD) models for HIV treatment in Malawi, Zambia, and South Africa using existing and new data. A major component of the project is to analyze existing, patient-level data to understand DSD implementation and uptake under current guidelines and to evaluate outcomes, costs, and benefits of DSDs.

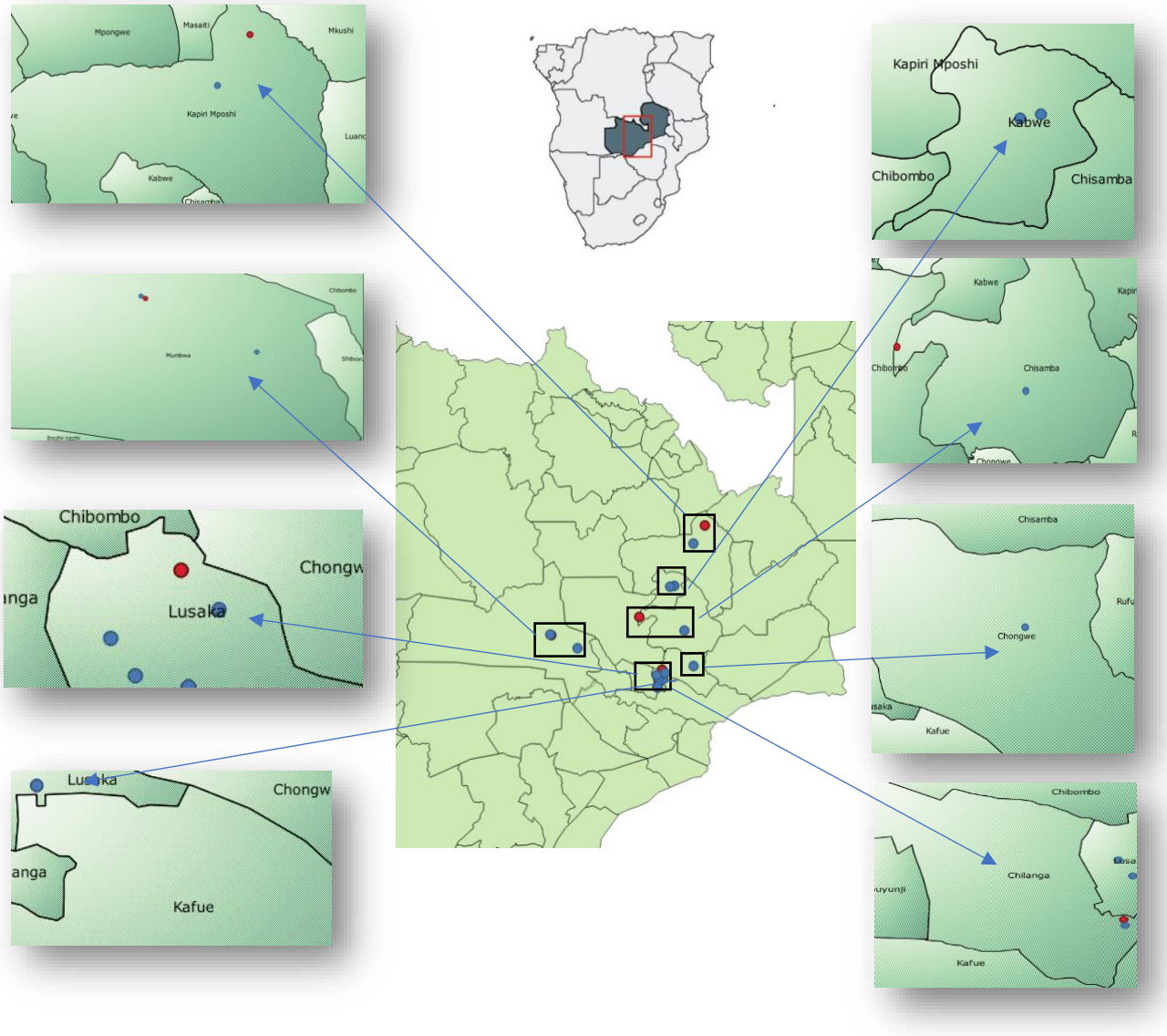
Existing electronic medical record systems in high-burden countries, however, have limited capacity to collect DSD-specific indicators, diminishing the value of national electronic medical record systems to answer DSD-related questions. AMBIT therefore identified a group of sentinel sites (healthcare facilities with their associated DSD models) in each country to collect primary, patient-level data. Here we present the methodology for sentinel site selection in Zambia and describe the extent of DSD model implementation at these sites.

To select sentinel sites we first identified two provinces Lusaka and Central, that are easily accessible, have relatively a high burden of ART patients and include both urban and rural facilities. Lusaka Province receives support from the U.S. CDC's PEPFAR partners, while Central Province is supported by USAID's PEPFAR partners, ensuring diversity of implementing partner organizations. These two provinces contain a variety of DSD models. They have a combined total of 435 healthcare facilities that offer ART—182 in Lusaka and 253 in Central—of which 218 (50%) utilize Zambia's electronic medical record system, called SmartCare. We picked four districts in each of the two provinces, with a mix of rural and urban settings: Lusaka, Chongwe, Kafue, and Chilanga Districts in Lusaka Province; and Chisamba, Kabwe, Kapiri, and Mumbwa Districts in Central Province.

Within the selected districts, we identified a preliminary set of 18 potential study sites. After consultation with the Ministry of Health and physical site assessments, we selected a final set of 12 sentinel sites, including one or two facilities per district. The sites were selected on the basis of ART patient volumes, the presence of at least two DSD models, support from an implementing partner, and the availability of SmartCare, which is needed for longitudinal follow-up. The selected sites are intended to capture variation within Zambia in terms of DSD model implementation, uptake, health outcomes, costs, and other characteristics of interest. They are not intended as a nationally representative sample of facilities in Zambia.

As part of the site selection process, assessment visits and a survey were conducted at all 18 potential sentinel sites in March 2020. We collected facility-level and DSD model-specific aggregate indicators from each facility using a structured data collection tool developed by the study team. We simultaneously carried out a survey of 10 local implementing partners to describe the scale and scope of DSD implementation in Zambia.[1] Here we provide a brief description of DSD model implementation at the 18 potential sites, based on the assessment visits.

Fig. 1. Sentinel site selection. Blue dots show the final sentinel sites; red dots were visited for assessment but not selected for the study.



RESULTS

Site description

The 18 facilities included in the survey are described in Table 1 below. At the time of the survey (March 2020), they reported serving a total of 68,664 ART patients.

Table 1. Potential sentinel sites

Facility	Level	Number on ART	DSD models	Paper register?	Smartcare?†	Implementing partner
Central Province						
Chisamba District						
Chipembi Mission*	Health Centre	771	CAGs, fast track, MMSD, outreach	Yes	Yes (E-last)	CHAZ and Discover Health
Liteta	Health Centre	3,095	Fast track, MMSD 3-5, MMSD 6, scholar	Yes	Yes (E-last)	JSI
Kapiri Mposhi District						
Kapiri Mposhi Urban*	Health Centre	6,752	CAGs, fast track, MMSD 3-5, MMSD 6	Yes, except for FT	Yes (E-last)	JSI
Nkhole Rural	Health Centre	522	CAGs, fast track, MMSD 3-5, MMSD 6	Yes, except for FT	No	JSI except for CAGs (NZP+)
Kabwe District						
Makululu Urban*	Health Centre	2,696	CAGs, MMSD 3-5, MMSD 6, scholar	Yes	Yes (E-fast and E-last)	JSI
Mahat Mahghadi*	Health Centre	3,625	CAGs, family-based CAGs, fast track, MMSD 3, MMSD 6, scholar	Yes	Yes (E-first)	JSI
Mumbwa District						
Nangoma Mission*	Mission Hospital	2,742	CAGs, fast track, MMSD	Yes	Yes (E-last)	CHAZ
Mumbwa District*	District Hospital	4,332	CAGs, MMSD 3-5, MMSD 6	Yes	Yes (E-last)	JSI
Mumbwa Urban	Health Centre	1,670	CAGs, MMSD 3, MMSD 6, fast track	Yes	Yes (E-last)	JSI
Lusaka Province						
Chilanga District						
Chilanga Hospice	Health Centre	1,983	CAGs, fast track, MMSD,	Yes	Yes (E-last)	CHAZ
Chilanga Urban*	Health Centre	1,586	MMSD, fast track	Yes	Yes (E-last)	UTH HaP
Chongwe District						
Chongwe Rural*	Health Centre	3,542	Fast track, MMSD, weekend	Yes	Yes (E-first)	CIDRZ
Kafue District						
Kafue Hospital	District Hospital	2,474	MMSD	No	Yes (E-fast)	UTH HaP
Nangongwe*	Health Centre	3,545	Fast track, MMSD 3-5, MMSD 6, weekend	No	Yes (E-fast and E-last)	UTH HaP
Lusaka District						
Chawama Hospital*	1st Level Hospital	9,572	Fast track, MMSD, CAGs	Yes	Yes (E-first)	CIDRZ and HU
Kanyama Hospital*	1st Level Hospital	11,400	Fast track, MMSD	Yes	Yes (E-first)	HU
Mtendere Urban*	Health Centre	5,519	Fast track, MMSD, UAG, scholar	Yes	Yes (E-fast)	CIDRZ and HU
Ngombe Urban	Health Centre	5,312	Fast track, MMSD 6	Yes	Yes (E-first)	CIDRZ and HU

*Final AMBIT project sentinel site †Smartcare versions defined in text below
MMSD, multi-month scripting and dispensing; CAGs, community adherence groups; UAGs, urban adherence groups

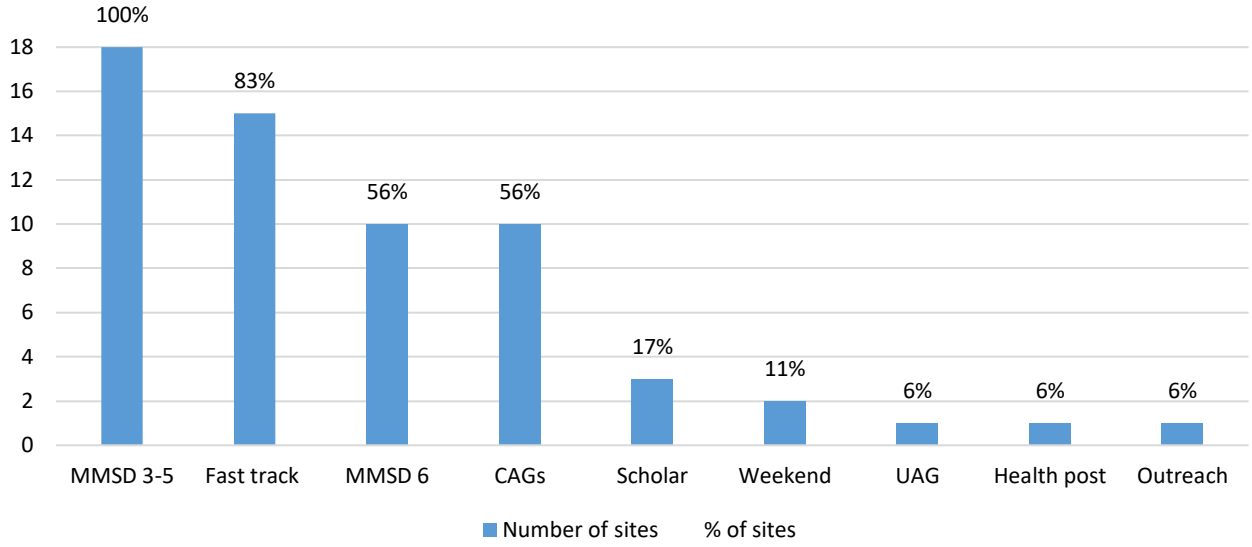
- The set of potential sentinel sites included 13 health centres and 5 hospitals at different levels.
- ART patient volume ranged from a low of 522 at Nkhole Rural Health Centre to a high of 11,400 at Kanyama Hospital. In general, health centres in urban areas and hospitals were larger, while facilities in remote rural setting had lower patient volumes.
- Nearly all the facilities made use of Smartcare, but versions of the EMR varied. Most used E-last Smartcare, in which patient data are recorded in paper files and then subsequently entered into the electronic SmartCare database by facility-based data officers. Others used either E-fast, which entails live entry of patient data into SmartCare in real time, or E-first, in which patient data are recorded in paper registers and then immediately entered into SmartCare, prior to the next patient.
- Paper registers were kept for most but not all DSD models.
- DSD model participation was poorly recorded in both paper registers and SmartCare. Clinic respondents indicated that this is due to inconsistent definitions of the models across sites and lack of staff orientation.
- In Lusaka Province implementing partners included, the Centre for Infectious Disease Research in Zambia (CIDRZ), Howard University (HU), and UTH HIV/AIDS Progamme (Hap)-CDC funded. Whilst in Central Province, partners included John Snow International (JSI), the Network of Zambian People Living with HIV/AIDS (NZP+) and Discover Health. The Churches Health Association of Zambia (CHAZ) supported mission hospitals was present in both provinces.

DSD models

The numbers and types of specific models at the visited sites is shown in Figure 2.

- The 18 facilities surveyed reported offering between one and six different models per site, along with standard or conventional care.
- All of the facilities offered multi-month scripting and dispensing, with intervals ranging from 3 to 6 months, and most (83%) offered fast track. The prevalence of these models reflects the fact that the MOH recommends that facilities implement MMSD and fast track before offering any other model.[2] Patients receiving MMSD are often also enrolled in another model as well. (It is important to note that in this analysis, 3-month dispensing is considered a DSD model.)
- CAGs remained common, with just over half of the facilities offering them. CAG popularity is declining, however, as patients opt instead for 6-month MMSD.
- All official ART documentation registers were available in all the facilities visited. Most facilities did not have designated or pre-printed paper registers for DSD models and instead use improvised notebooks.
- Procedures for implementing the fast track model varied across facilities, generally based on the implementing partner.
- Although the scholar model enrolls both children and adolescents, we report only on adolescent participation (age 14-19).

Figure 2. Number and proportion of sites with each type of model (n=18)



Eligibility and coverage

Table 2 reports DSD model participation at the time of the sentinel site assessment visits. Two of the 18 sites visited were not able to provide any data on DSD enrollment numbers to the study team, and several were unable to report how many patients are considered stable or eligible for DSD models; relevant cells in Table 2 are left blank as a result.

Table 2. DSD model participation as of March 2020

Facility	Number on ART in 2020 (a)	Number reported stable (b)	DSD Model	Number enrolled in model (c)	% of all ART patients (c/a)	% of eligible patients (c/b)
Central Province						
Chisamba District						
Chipembi Mission	771	481	CAGs	192	25%	40%
			Fast track	23	3%	5%
			MMSD	53	7%	11%
			Outreach	Unknown		
			Total	268	35%	56%
Liteta	3,095	2,618	Fast track	115	4%	4%
			MMSD 3-5	1,628	53%	62%
			MMSD 6	920	30%	35%
			Scholar	46	1%	2%
			Total	2,709	88%	103%
Kapiri Mposhi District						
Kapiri Mposhi Urban	6,752	5,675	CAGs	6	0%	0%
			Fast track with MMSD	2,622	39%	46%
			MMSD 6	3,053	45%	54%
			Total	5,681	84%	100%
Nkhole Rural	522	Unknown	MMSD (3-5)	218	42%	
			MMSD (6)	170	33%	
			CAGs	33	6%	
			Total	421	81%	
Kabwe District						
Makululu Urban	2,696	2,218	CAGs	6	0%	0%

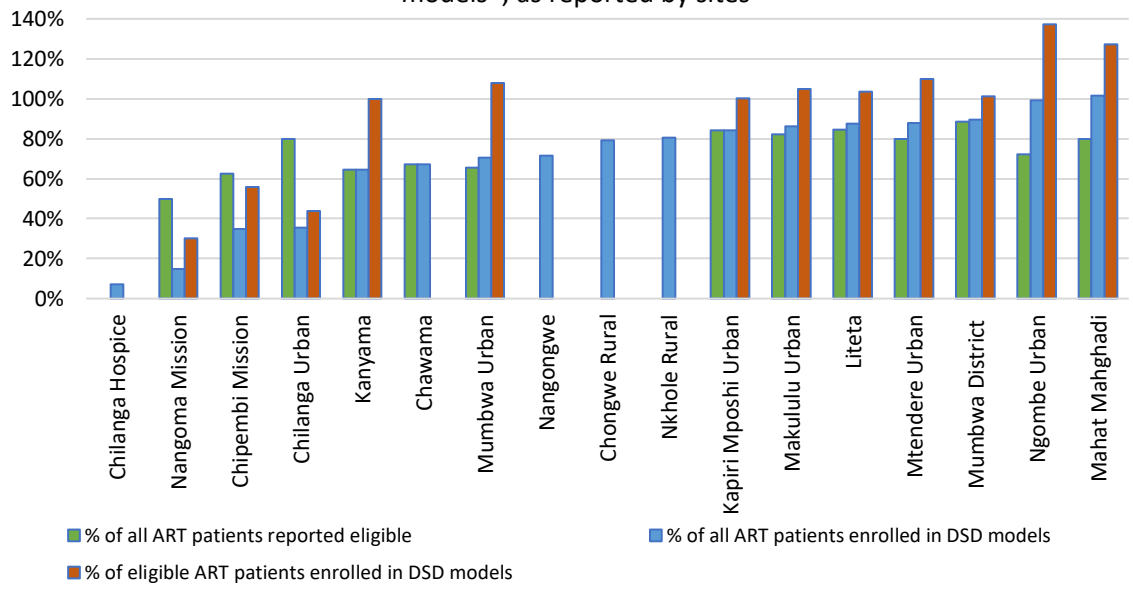
Facility	Number on ART in 2020 (a)	Number reported stable (b)	DSD Model	Number enrolled in model (c)	% of all ART patients (c/a)	% of eligible patients (c/b)
			MMSD 3-5	758	28%	34%
			MMSD 6	1,455	54%	66%
			Scholar	106	4%	5%
			Total	2,325	86%	105%
Mahat Mahghadi	3,625	2,893	MMSD 3	604	17%	21%
			MMSD 6	2,010	55%	69%
			Fast track	786	22%	27%
			CAGs	168	5%	6%
			Family based CAGs	31	1%	1%
			Scholar	80	2%	3%
			Total	3,679	101%	127%
Mumbwa District						
Nangoma Mission	2,742	1,365	CAGs	247	9%	18%
			Fast track	150	5%	11%
			MMSD	6	0%	0%
			Total	403	15%	30%
Mumbwa District	4,332	3,832	MMSD 3-5	2,574	59%	67%
			MMSD 6	1,258	29%	33%
			CAGs	42	1%	1%
			Total	3,874	89%	101%
Mumbwa Urban	1,670	1,093	CAGs	25	1%	2%
			MMSD 3	551	33%	50%
			MMSD 6	604	36%	55%
			Total	1,180	71%	108%
Chilanga District						
Chilanga Hospice	1,983	Unknown	CAGs	144	7%	
			MMSD	Unknown		
			Fast track	Unknown		
			Total	144	7%	
Chilanga Urban	1,586	1269	MMSD	564	36%	44%
			Fast track	Unknown		
			Total	564	36%	44%
Lusaka Province						
Chongwe District						
Chongwe Rural	3,542	Unknown	Fast track	2,800	79%	
			MMSD	Unknown		
			Weekend	Unknown		
			Total	2,800	79%	
Kafue District						
Kafue Hospital	2,474	Unknown	MMSD	Unknown		
Nangongwe	3,545	Unknown	MMSD 3-5	1,688	48%	
			MMSD 6	846	24%	
			Fast track	Unknown		
			Weekend	Unknown		
			Total	2,534	71%	
Lusaka District						
Chawama	9,572	6,436	Fast track with MMSD	6,436	67%	100%
			CAGs	Unknown		
			Total	6,436	67%	100%
Kanyama	11,400	7,346	Fast track with MMSD	7,346	64%	100%
			Total	7,346	64%	100%
Mtendere Urban	5,519	4,415	Fast track with MMSD	3,990	72%	90%
			UAG	587	11%	13%
			Scholar	270	5%	6%
			Health post	Unknown		

Facility	Number on ART in 2020 (a)	Number reported stable (b)	DSD Model	Number enrolled in model (c)	% of all ART patients (c/a)	% of eligible patients (c/b)
			Total	4,847	88%	110%
Ngombe Urban	5,312	3,839	Fast track	3,839	72%	100%
			MMSD (6)	1,424	27%	37%
			Total	5,263		

Percentages of all patients and eligible patients enrolled in DSD models are illustrated in Figure 3, which is arranged from low to high coverage rates (% of all ART patients enrolled in a DSD model).

- Of the sites surveyed, 10 reported numbers of stable patients and thus eligible for DSD models. Proportions eligible ranged from 50% to 88%. These estimates are roughly consistent with those in a recent publication which estimated the proportion of patients who met the criteria for stability at a sample of Zambia clinics in 2017-18 to be 74%.[3] (Criteria for DSD model eligibility, as indicated in Zambia's national guidelines, included being at least 18 years old, having been on ART for at least 12 months, having no current illness or adverse drug reactions that require continuous monitoring, not being pregnant or breastfeeding, having good adherence, and having at least one viral load test <1000 copies/ml in the last 12 months.[2])
- The proportion of all ART patients at a facility enrolled in any DSD model (coverage) ranged from 15% to 101%. These estimates include 3-month dispensing as a DSD model. In several cases, all DSD-eligible patients were reported to be enrolled in the fast track model with multi-month dispensing (duration not reported), giving these sites 100% coverage of eligible patients.
- Frequent movement of patients between models was noted and made it difficult for some facilities to report enrollment numbers by model.
- In a few instances, the number of patients reported to be enrolled in a DSD model exceeded the number reported eligible, resulting in estimates of >100%. Double-counting of model participants is likely in the dataset, particularly for MMSD (e.g. a patient who participates in both MMSD and a CAG may be counted twice by the site reporting this information).

Figure 3. Proportion of all ART patients reported stable* and enrolled in DSD models†, as reported by sites



*Not all sites reported the number of patients eligible. †Not all sites were able to report numbers enrolled in all models.

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