DIFFERENTIATED SERVICE DELIVERY MODELS FOR HIV TREATMENT IN MALAWI: A SNAPSHOT OF COVERAGE IN BLANTYRE, LILONGWE, AND CHIRADZULU DISTRICTS IN APRIL 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 Malawi and describe the extent of DSD model implementation at these sites.

To select sentinel sites, we first identified three high-burden, accessible districts reflecting the national distribution of HIV treatment. We selected Blantyre and Chiradzulu Districts in the Southern Region and Lilongwe District in the Central Region. As illustrated in Figure 1, these three districts are high burden in terms of the number of both ART and non-ART patients, represent a good mix of urban and rural settings, and generally have good electronic medical record (EMR) coverage. They also contain a variety of DSD models. The three districts have a combined total of 176 ART facilities; of these, 39% use the national EMR and the remaining rely on E-mastercard.

Within each of the three districts, we chose four sites (facility plus associated DSD models) and two or three alternate sites, to allow for the possibility that specific sites could later be excluded for administrative or logistical reasons. We excluded sites that did not use the national EMR system; were privately run, with the exception of CHAM (Christian Health Association of Malawi) and NGO facilities; or were too small to allow DSD model evaluation. We purposefully selected sites to provide geographic diversity within each district. In Malawi, all ART sites use either the national EMR system, previously managed by the Baobab Health Trust and now by EGPAF or e-Mastercard, which is a simple electronic version of the patient ART card that captures the HIV testing and treatment cascade. To ensure longitudinal data access, we only chose sites using the national EMR.

As our sentinel districts and sites were being reviewed and approved by the Malawi Ministry of Health and the District Health Offices, we simultaneously carried out a survey of 11 local implementing partners and 3 other local stakeholders to describe the scale and scope of DSD implementation in Malawi. We then conducted initial visits to all potential 19 sentinel sites in April 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. Here we provide a brief description of DSD model implementation at the 19 potential sites.
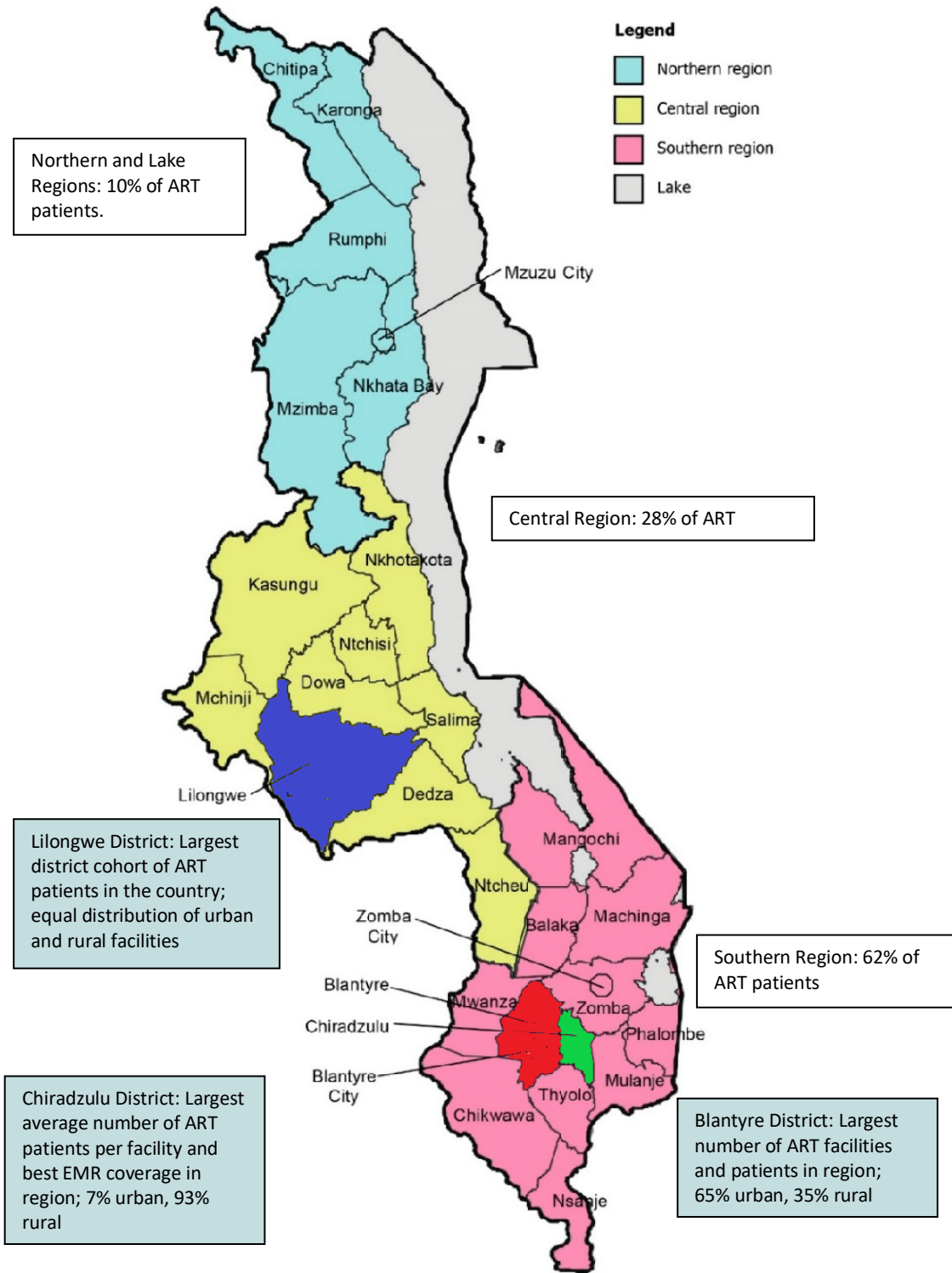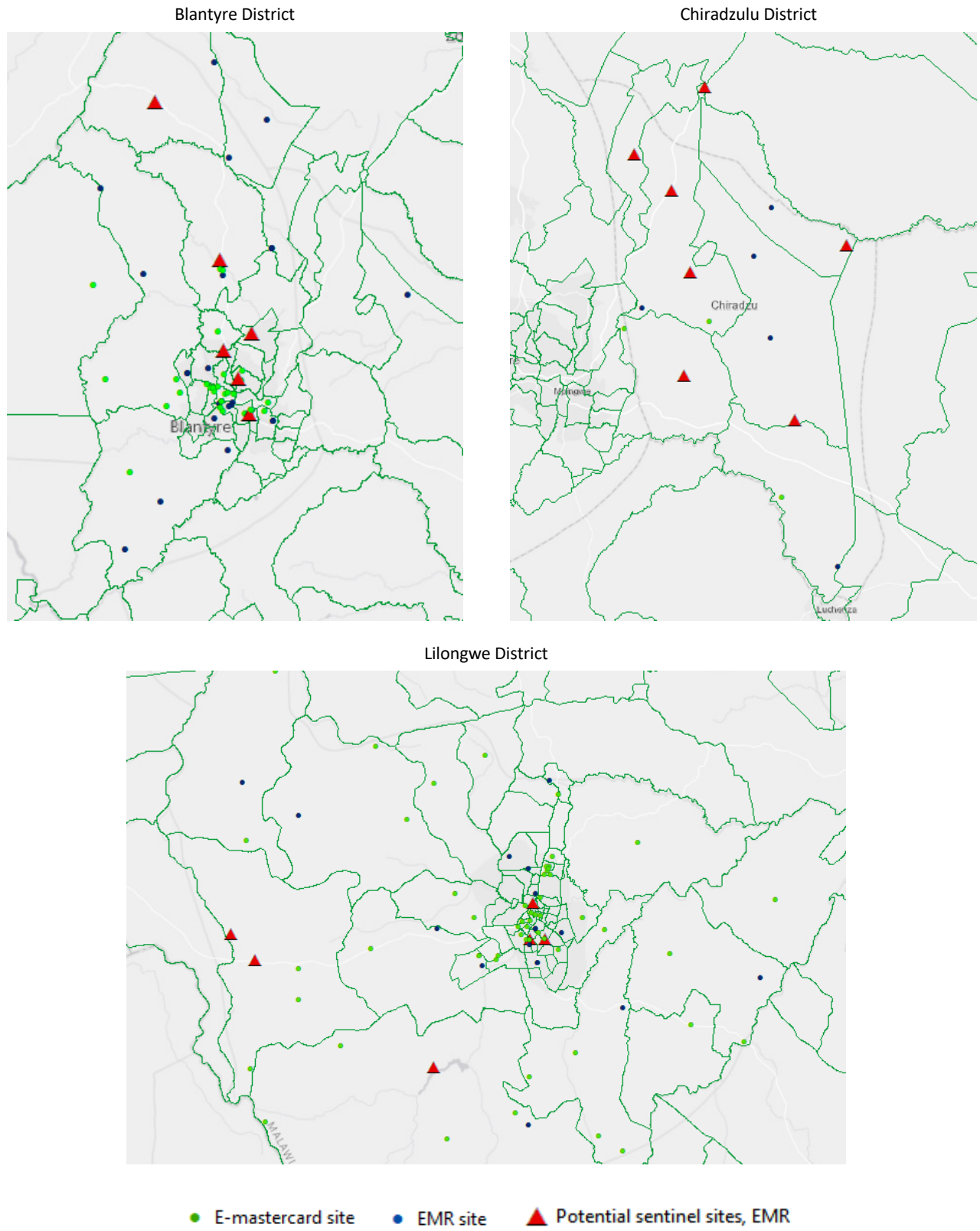
Figure 1. Selection of sentinel site districts

Legend
- Northern region
- Central region
- Southern region
- Lake

Northern and Lake Regions: 10% of ART patients.

Central Region: 28% of ART

Lilongwe District: Largest district cohort of ART patients in the country; equal distribution of urban and rural facilities

Southern Region: 62% of ART patients

Chiradzulu District: Largest average number of ART patients per facility and best EMR coverage in region; 7% urban, 93% rural

Blantyre District: Largest number of ART facilities and patients in region; 65% urban, 35% rural

Figure 2. Potential sentinel sites

Blantyre District

Chiradzulu District

Lilongwe District

- E-mastercard site   • EMR site   ▲ Potential sentinel sites, EMR

RESULTS

Site description

The 19 facilities included in the survey are described in Table 1 below.

Table 1. Potential sentinel sites

| District	Facility*	Setting	NGO partner	Number active ART patients
Blantyre	South Lunzu Health Center*	Urban	EGPAF	2,925
Blantyre	Limbe Health Center*	Urban	EGPAF	8,400
Blantyre	Chilimba Health Center	Urban	EGPAF	2,140
Blantyre	Ndirande Health Centre*	Urban	EGPAF	6,178
Blantyre	Mdeka Health Center	Rural	EGPAF	1,545
Blantyre	Mlambe Mission Hospital*	Rural	EGPAF	6,592
Chiradzulu	Namadzi Health Centre*	Rural	EGPAF	5,288
Chiradzulu	Mbulumbuzi Health Centre*	Rural	EGPAF	2,633
Chiradzulu	Chiradzulu District Hospital *	Rural	EGPAF	6,520
Chiradzulu	Namitambo Health Centre	Rural	EGPAF	5,309
Chiradzulu	St Joseph Mission Hospital	Rural	EGPAF	4,153
Chiradzulu	Chitela Health Centre	Rural	EGPAF	1,696
Chiradzulu	Milepa Health Centre*	Rural	EGPAF	3,944
Lilongwe	Malingunde Health Center*	Rural	PIH	1,025
Lilongwe	St Gabriel Mission Hospital*	Rural	PIH	2,728
Lilongwe	Bwaila Hospital*	Urban	Lighthouse	24,247
Lilongwe	Chileka Health Centre	Rural	Lighthouse	1,030
Lilongwe	Kawale Health Center*	Urban	Baylor/Lighthouse	4,200
Lilongwe	Area 18 Health Centre	Urban	Baylor/Lighthouse	4,364

*Final AMBIT Project sentinel site

Model implementation

- 3-month dispensing of ARVs, which is the standard of care (SOC) per national guidelines, was available at all the sentinel sites.

- All the sites reported following national guidelines for DSD model eligibility. Criteria included which being at least 18 years, having been on ART for at least 6 months, having no side effects or opportunistic infections, being on a first-line regimen, and having good adherence.

- The sites reported that between 66% and 100% of active ART patients (median 94%, IQR 89-99%) met the definition for stability and were thus eligible for DSD models, with the lowest proportions of stable patients reported to be 66% and 68% at two Blantyre facilities (Figure 3). (We note that a recent publication estimated the proportion of patients who met the criteria for stability at a sample of Malawi clinics in 2017-18 was 73%[1], suggesting that some of the sentinel sites may be over-estimating the proportion of patients who should be considered stable.)

- Alternative models being implemented included
  - 6-month dispensing
  - Teen clubs
  - Community adherence groups (CAGs)
  - Community outreach models

- o "Welcome back" programs
- o Intensified care art clinics
- o High viral load clinics
- o Mother-infant pairs.

**Figure 3. Proportion of stable patient among all active patients***
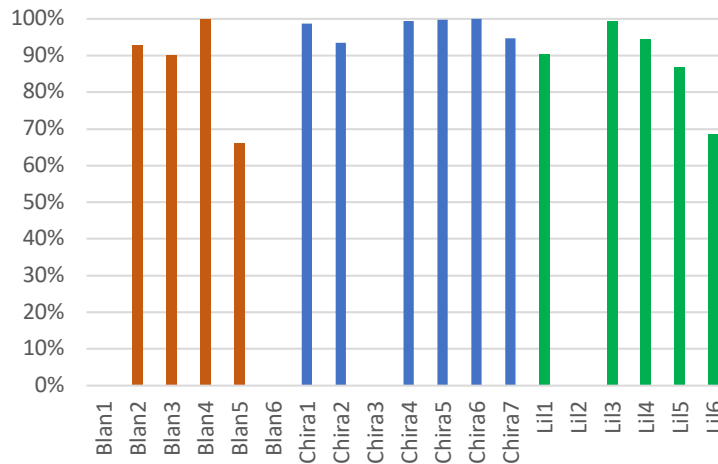
4 sites did not report their proportions of stable patients

Coverage

- Based on numbers reported by the sites, DSD model coverage (proportion of all active patients enrolled in a DSD model, excluding 3 month dispensing*) ranged very widely, from a low of 2% to a high of 100% (Figure 4).

  - o 6 facilities had <10% coverage;
  - o 5 facilities had between 10 and 50% coverage;
  - o 5 had >50% coverage;
  - o 3 facilities did not report coverage data.

  *In these estimates the numerator represents the total number of patients enrolled in any DSD model in each facility and the denominator is the total number of active ART patients in each facility.

Figure 4. Reported proportion of ART patients enrolled in DSD models
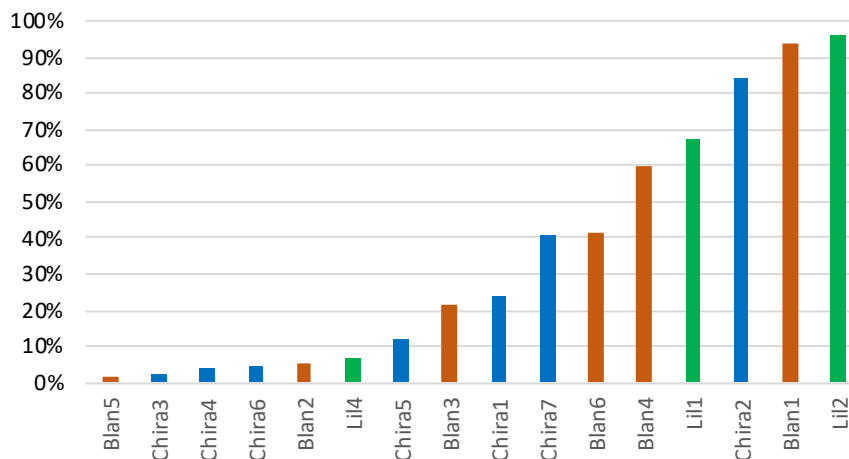
- Each sentinel site was implementing between 1 and 5 different DSD models.

  o The most widely utilized DSD model, as indicated by the number of patients enrolled as a proportion of all patients in DSD models, was 6-month dispensing, which has been incorporated into Malawi's HIV guidelines along with 3-month dispensing and is being scaled up nationally (63.6%);
  o The second most widely utilized was teen clubs (15.4%).
  o Lilongwe District had the largest variety of DSD (n=6) models underway.

Status of patient-level data capture at the sentinel sites

- Roughly four out of five sentinel facilities (79%) reported that they faced challenges with EMR data collection. Most common were power outages, which were reported by 10 of the 17 sites. During power failures, facilities collect patient data on paper and then back-enter into the EMR when electricity is available. Internet network (n=3) and human resource availability (n=1) were also mentioned as challenges to use of the EMR.
- Unique IDs with facility-specific format were automatically generated when entering a new patient, as intended.
- Most facilities (84%) did not have a "one-patient-one-file" system for the entire clinic. Among those which did not, half had no specific procedure for linking files across departments, and fewer than a third (31%) used unique IDs to connect the files within the facility.
- In three quarters of facilities (74%), viral load results were entered into the EMR immediately upon their receipt. Most of the rest (21%) entered the results when the patient returned to the facility. Only one did not enter viral load results into the EMR at all.
- As illustrated in Table 2, all facilities had registers for their HIV testing services, HIV linkage, index cases, and ANC/PNC registers. Some facilities did not make use of the new ART patient tracking (n=5) and pharmacy registers (n=9).

Table 2. Registers used in the HIV care cascade in the 19 potential sentinel sites

Site	HIV testing services register	HIV linkage register	Index register	New ART patient tracking register	Pharmacy register	ANC/PNC clinic register
South Lunzu Health Center	X	X	X	X	X	X
Limbe Health Center	X	X	X	X	X	X
Chilimba Health Center	X	X	X	X	X	X
Ndirande Health Centre	X	X	X	X	X	X
Mdeka Health Center	X	X	X	X	X	X
Mlambe Mission Hospital	X	X	X	X	X	X
Namadzi Health Centre	X	X	X	X		X
Mbulumbuzi Health Centre	X	X	X			X
Chiradzulu District Hospital	X	X	X			X
Namitambo Health Centre	X	X	X	X		X

Site	HIV testing services register	HIV linkage register	Index register	New ART patient tracking register	Pharmacy register	ANC/PNC clinic register
St Joseph Mission Hospital	X	X	X			X
Chitela Health Centre	X	X	X	X		X
Milepa Health Centre	X	X	X	X	X	X
Malingunde Health Center	X	X	X	X	X	X
St Gabriel Mission Hospital	X	X	X			X
Bwaila Hospital	X	X	X	X	X	X
Chileka Health Centre	X	X	X	X		X
Kawale Health Center	X	X	X	X	X	X
Area 18 Health Centre	X	X	X			X

References

[1]Hoffman RM, Balakasi K, Bardon AR, Siwale Z, Hubbard J, Kakwesa G, Haambokoma M, Kalua T, Pisa P, Moyo C, Dovel K. Eligibility for differentiated models of HIV treatment service delivery: an estimate from Malawi and Zambia. *AIDS* 2020;34:475-9.