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Where did they go? – an exploration of "silent" and "non-silent" cross-facility geospatial movements of persons on HIV treatment in Kenya, 2020-2021

Anthony Waruru[1], Jacques Muthusi[1], Amos Kibisu[2], Margaret Ndisha[1], Kevin King'utu[3], Kennedy Muthoka[4], Elphas Okango[3], Lydia Odero[5], Kenneth Masamaro[1], Sasi Jonnalaggadda[1], James L. Tobias[6], Rose Wafula[2]

1) US Centers for Disease Control and Prevention (CDC), Division of Global HIV & TB, Kenya; 2) National AIDS and STI Control Program (NASCOP); 3) Global Programs for Research and Training (GPRT); 4) Palladium; 5) The United States Agency for International Development (USAID); 6) US Centers for Disease Control and Prevention (CDC), Division of Global HIV & TB, US

Introduction

The issue:

- A superficially "leaky" HIV treatment cascade may result from inaccurate accounting of persons living with HIV (PLHIV).
- PLHIV may register afresh in a different facility as "silent transfers" soon after initiating antiretroviral therapy (ART) or transfer out officially ("non-silent" transfers).
- We analyzed longitudinal data from HIV case-based surveillance (CBS) system, rolled out in 40/47 counties.

Aim:

- To describe "silent," and "non-silent" inter-facility geospatial movements and factors associated with the movements of PLHIV initiated on treatment from 2020-2021.

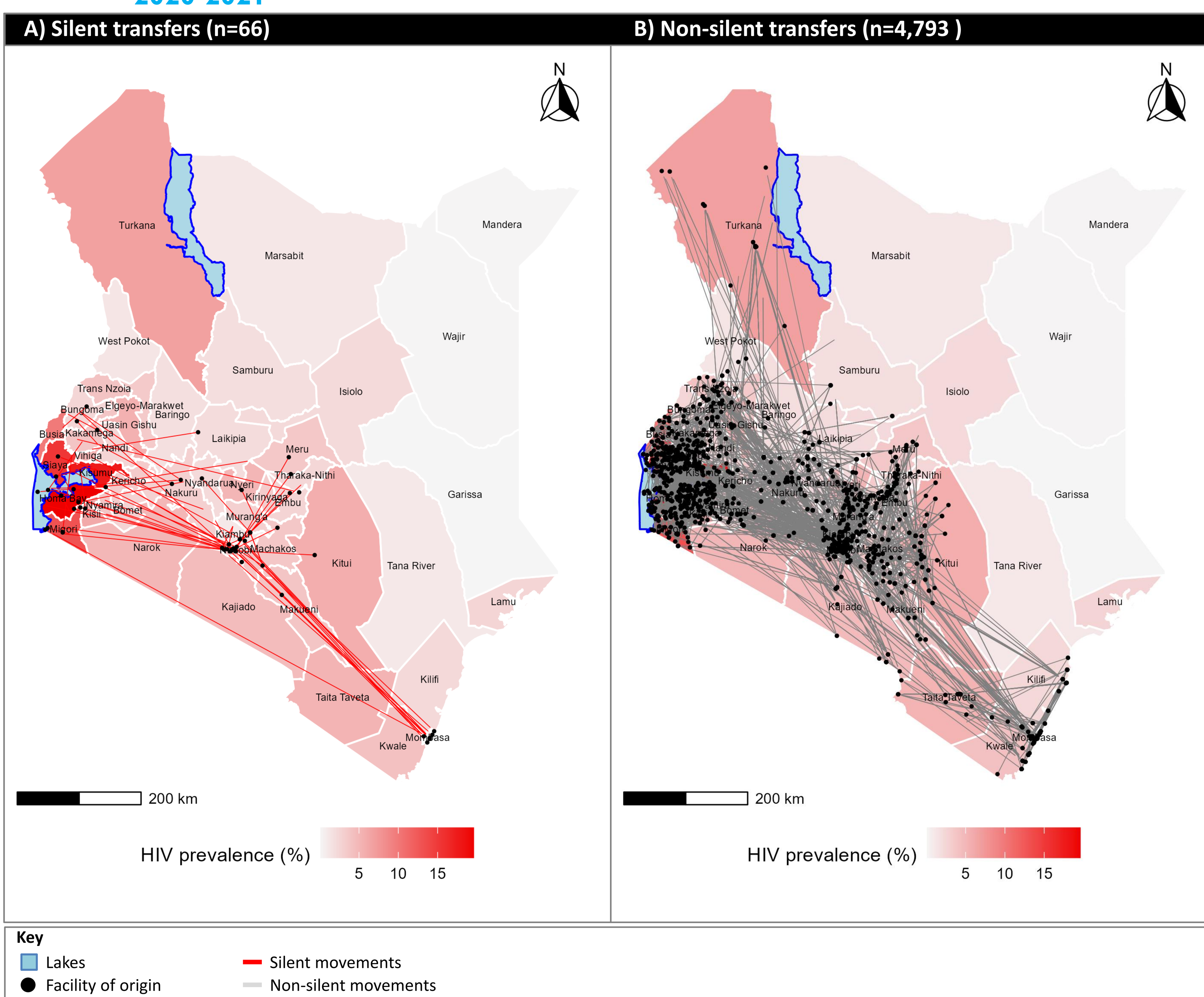
Methods

- PLHIV, who initiated treatment during 2020-2021, were 201,465.
- Number of facilities: 1,409.
- We selected a few demographic variables and clinic numbers for patient-matching purposes:.
- Used Stata® *dtalink* package to match and identify duplicate PLHIV who had moved from the facilities where they initiated ART.
- We mapped interfacility movements using R.
- We explored factors associated with these movements using logistic regression.

Results

- Of the 201,465 PLHIV who initiated ART in this period, 4,859 were duplicate PLHIV.
- Among duplicate PLHIV, 66 (1.4%) had silently moved from their original facility, and 4,793 (98.6%) were non-silent transfers (figure 1).
- Half, 2,473 (50.9%) PLHIV, were documented as still active in their original facility - 27 (40.9%) of the "silent" and 2,446 (51.0%) of the "non-silent" transfers.

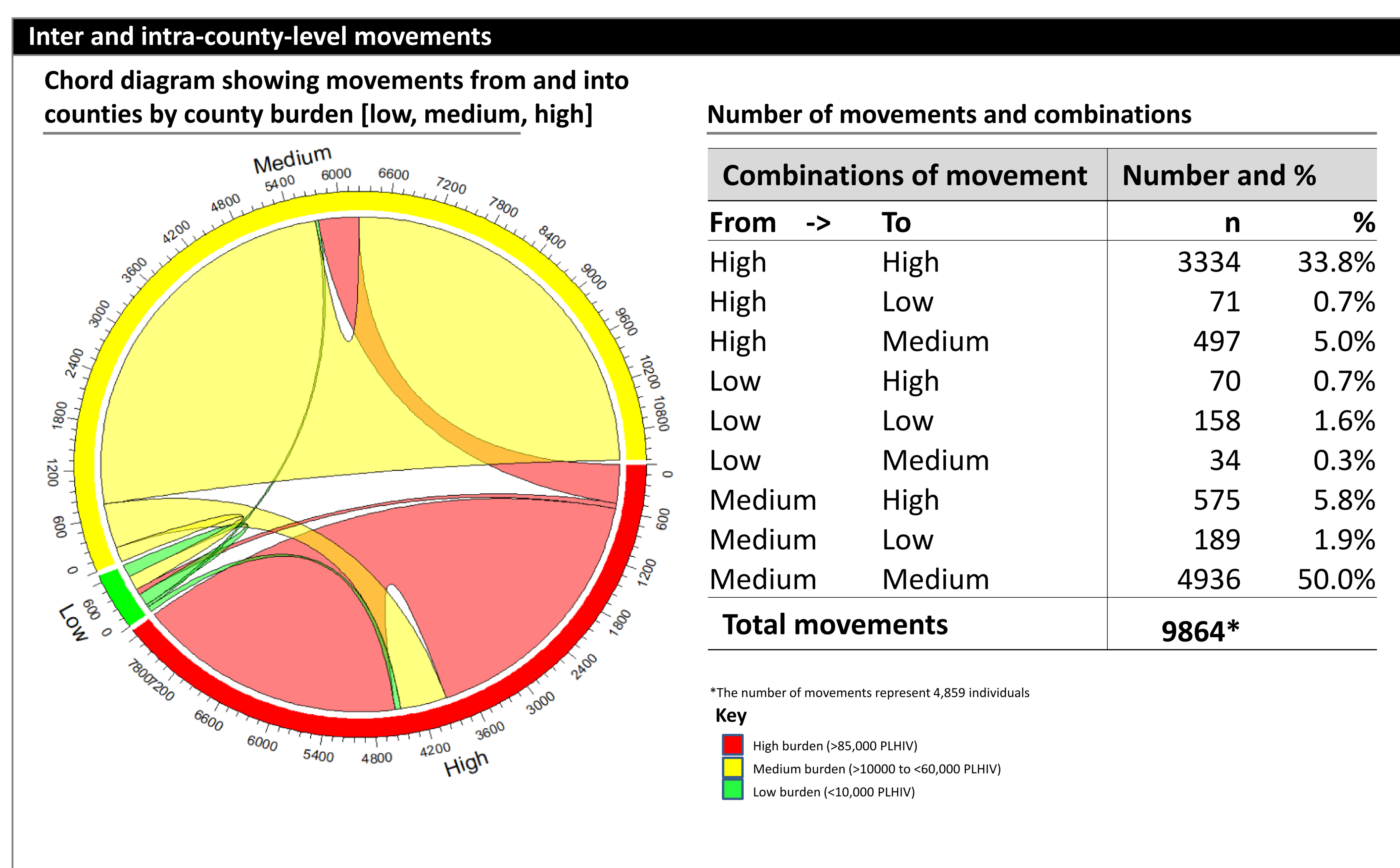
Figure 1 a)silent and b)non-silent interfacility movement of PLHIV on treatment in Kenya, 2020-2021



Results

- Over half of the PLHIV (55.8%) moved within 1-3 months, 1,396 (28.7%), and 1,315 (27.1%) within 6-12 months.
- Half of all the movements were within medium HIV burden counties (figure 2).

Figure 2 Inter and intra-county movement of PLHIV on treatment in Kenya, 2020-2021



Number of movements and combinations

Combinations of movement		Number and %	
From ->	To	n	%
High	High	3334	33.8%
High	Low	71	0.7%
High	Medium	497	5.0%
Low	High	70	0.7%
Low	Low	158	1.6%
Low	Medium	34	0.3%
Medium	High	575	5.8%
Medium	Low	189	1.9%
Medium	Medium	4936	50.0%
Total movements		9864*	

*The number of movements represent 4,859 individuals

Key
- High burden (>85,000 PLHIV)
- Medium burden (>10000 to <60,000 PLHIV)
- Low burden (<10,000 PLHIV)

- Factors independently associated with PLHIV inter-facility movements were:
  a. Females compared to males aOR 1.3, (95% CI: 1.2-1.4).
  b. Having secondary aOR 1.2 (95% CI: 1.0-1.4) or above secondary 1.5 (95% CI: 1.2-1.8) education compared to none.
  c. Being single, aOR 1.4 (95% CI:1.1-1.8); separated or divorced, aOR 1.3(95% CI: 1.0-1.7), compared to widowed.
  d. PLHIV who initially registered in levels 5 or 6 facilities compared to lower-level facilities, aOR 1.3, (95% CI: 1.1-1.6), (Table 1).

Table 1 Factors associated with movement of PLHIV on treatment in Kenya, 2020-2021

Variable	aOR* [95% CI]	p-value
Sex: base "Male"		
Female	1.3 [1.2, 1.4]	<0.001‡
Age at diagnosis: base "15+"		
0-14	1.2 [1.0, 1.4]	0.115
Education: base "Below primary or none"		
Primary	1.2 [1.0, 1.4]	0.101
Secondary	1.2 [1.0, 1.4]	0.029‡
Above secondary	1.5 [1.2, 1.8]	<0.001‡
Marital status: base "Widowed"		
Single	1.4 [1.1, 1.8]	0.002‡
Separated or divorced	1.3 [1.0, 1.7]	0.033‡
Married or cohabiting	1.2 [0.9, 1.4]	0.206
Facility level†: base "Level 2-4"		
Level 5-6	1.3 [1.1, 1.6]	0.007‡

Key:
*Adjusted odds ratios
†Level 2- dispensaries, level 3 - health centers, level 4 - sub-county, level 5 – county, level 6 –referral hospitals
‡Factors independently associated with PLHIV inter-facility movements

Conclusions

- Individual-level and facility factors influence the movement of PLHIV.
- Identifying these factors is an important step in optimizing HIV treatment initiation.
- A functional national unique person's identifier (NUPI) will help classify inter-facility PLHIV movements better through shared health records and make PLHIV management efficient as they re-engage in care.
- In the absence of a NUPI, algorithms such as *dtalink* come in handy to help in patients' matching and deduplication.

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DISCLAIMER
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