Mobility and HIV transmission across three urban communities in Zambia: using qualitative data to interpret phylogenetics in a mixed methods analysis of HPTN 071 (PopART) data.

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BACKGROUND

MOBILITY AND HIV TRANSMISSION

- Despite increased ART coverage, HIV incidence in sub-Saharan Africa not falling as fast as expected.
- In Zambia, in 2018 approximately 48,000 new HIV infections were recorded.
- Mobility is among the key drivers of the HIV epidemic in Zambia.
- Mobile populations face challenges with engaging and remaining in HIV care and prevention services.

STUDY SETTING AND AIM

- The HPTN 071 (PopART) study was a 3-arm, cluster randomized controlled trial conducted in 21 communities in Zambia and South Africa (2013 – 2018).
  - The communities were allocated into seven matched triplets.
- Nested in the HPTN 071 (PopART) study in Zambia was the HPTN 071-2, phylogenetics ancillary study.
- This analysis uses HPTN 071 (PopART) qualitative research data describing mobility factors to understand phylogenetics data estimates of HIV transmission patterns within and across three of nine HPTN 071-02 study sites in southern Zambia.

DATA SOURCES

PHYLOGENETIC DATA

- HIV RNA was isolated from blood samples collected from HIV-positive study participants at health care facilities and in the communities.
- Phylogenetic analysis was carried out to identify likely transmission pairs and thereby learn more about the demographic correlates of transmission in these communities.

QUALITATIVE DATA

- A range of qualitative research data collection methods used to collect data for each of the data collection phases below.

Broad Brush Survey (BBS - 2013):

- Rapidly gauge both key features of each community and perceptions of and experiences with HIV prevention, treatment and care options.

Story of the trial (2014 – 2018):

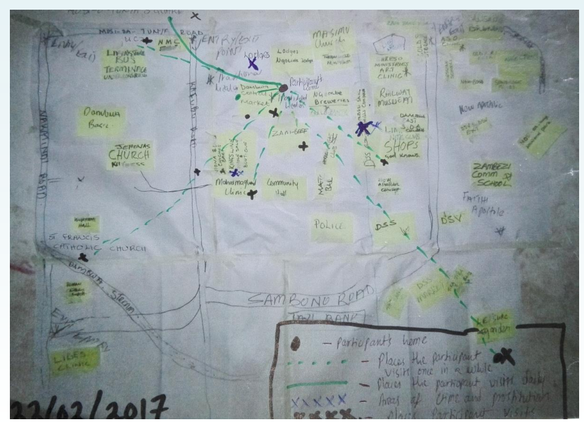
- Routine data collection throughout the HPTN 071 (PopART) intervention delivery to understand different community responses to the intervention and document intervention/study implementation.

Qualitative cohort (2017 – 2018):

- To describe contextual, social factors in the HPTN 071 (PopART) study communities in relation to a diversity of community members' experiences of HIV, ART, UTT, and related health and public health variables.
- 13 participants in one of the three community sites in this analysis.

ANALYSIS

- HIV sequences identified by whole-genome viral sequencing
- Qualitative research audio recordings transcribed verbatim
  - Identified themes relating to mobility and HIV transmission
    - Population mobility
    - Sexual behaviour risks
    - Key populations and
    - HIV service access and factors influencing uptake of the HPTN 071 (PopART) intervention.
- Summary profiles of qualitative cohort participants relating to livelihood options, mobility and response to the combination HIV prevention intervention.



Mapping exercise showing participant's mobility pattern.

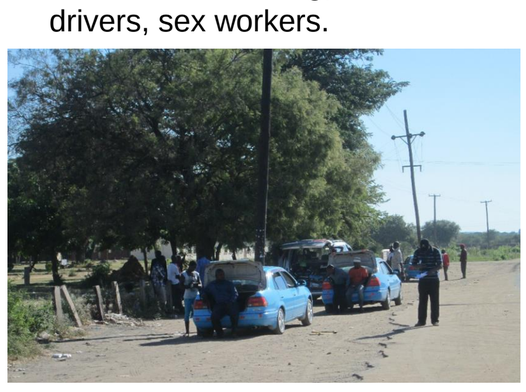
RESULTS

MOBILITY FACTORS

- Cross border trading
- Tourism
- Labour migration – change in provincial capital, civil servant influx.
- Transient populations – truck drivers, sex workers
- Employment and livelihood options
- Links with rural communities to visit relatives or farm

TYPES OF MOBILITY

- Daily mobility
  - Formal/ informal employment
- Seasonal mobility
  - Farming, charcoal trading, fishing
- Spontaneous mobility
  - Cross border trading, truck drivers, sex workers.



Transport depot to international borders

PHYLOGENETIC ANALYSIS

- 2,113 samples successfully sequenced
  - Age range: 18 – 78 years.

Sex	Community 10 (Arm A)	Community 11 (Arm B)	Community 12 (Arm C)	Total
Female	466	357	517	1,340
Male	243	212	318	773
Total	709	569	835	2,113

TABLE 1. Summary of sequenced samples per community

HIV RISKS

- Being away from home influences treatment uptake and adherence
  - Challenges with accessing HIV services at different facility
  - Non- disclosure of HIV status

"…I want to emphasize on the truck drivers… especially those who normally go to international routes, sometimes they default, sometimes somebody can stay a year without taking a drug. I lost a friend, I did not know that he stopped taking the drugs because of the nature of the job," (BBS FGD, old men_Z12).

- Risky sexual behaviours
  - Multiple sexual partners, non-adherence to treatment increasing risk of HIV transmission, sex work.

- Of the opposite-sex directed transmission pairs identified in the Zambian communities, 108 transmission pairs had at least one participant from the three communities in triplet four (see figure figure 1).
  - Most individuals in the pairs were between the ages of 20 – 35 years (most women between 20 – 24 and 25 – 35 for men.

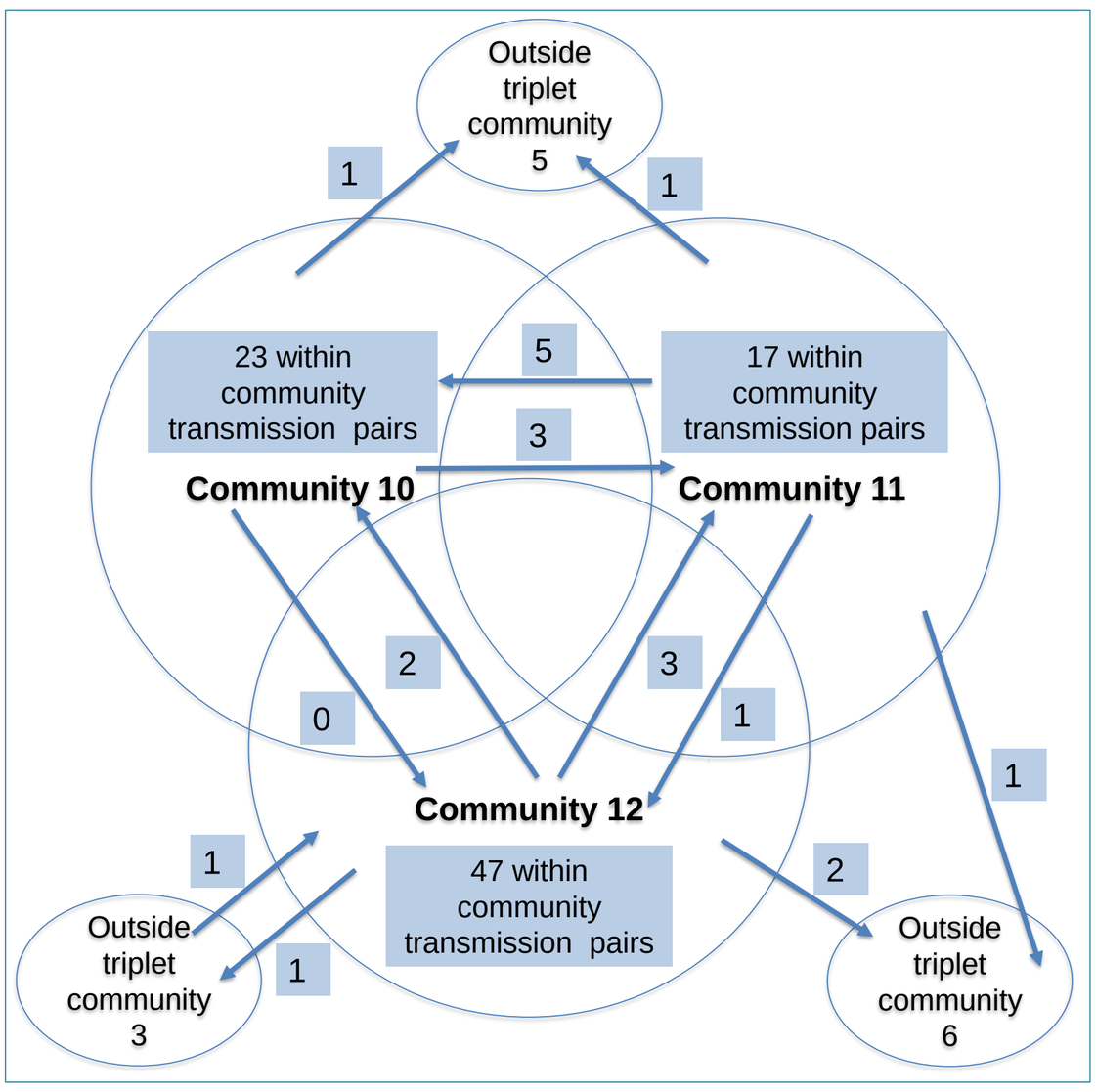


FIGURE 1. HIV transmission pairs within and across the three communities

CONCLUSION

- For most transmission pairs, the two participants lived in the same community.
- Mobility influenced uptake of HIV services and disrupted adherence to treatment.
- Mobility contributed to HIV transmission within and across the three study communities.
- Increased efforts needed for HIV interventions to reach mobile populations including professional class and civil servants.
- Future research to focus on mobility and socio-economic characteristics of individuals in sexual relationships to provide insights on HIV transmission.

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