
Downloaded from: http://researchonline.lshtm.ac.uk/4648613/

DOI: 10.1002/jia2.25140

Usage Guidelines

Please refer to usage guidelines at http://researchonline.lshtm.ac.uk/policies.html or alternatively contact researchonline@lshtm.ac.uk.

Available under license: http://creativecommons.org/licenses/by/2.5/
One step ahead: timing and sexual networks in population mobility and HIV prevention and care

Susan Cassels1, Carol S Camlin2,3 and Janet Seeley4

© Copyright 2018 The Authors. Journal of the International AIDS Society published by John Wiley & sons Ltd on behalf of the International AIDS Society. This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

Received 18 May 2018; Accepted 22 May 2018

1 | INTRODUCTION

Population mobility comes in heterogeneous forms and is triggered by many drivers. The diverse contexts of mobility can significantly influence the effectiveness of HIV prevention and care, as the contributions to this volume highlight. Nevertheless, some fundamental concepts are common across various forms of mobility. Two such concepts are time and sexual networks: mobility occurs in a space-time continuum, and migrants are situated within social and sexual networks. In this viewpoint, we argue that a closer examination of how (1) time scales of mobility and (2) sexual network characteristics of migrants present challenges to effective HIV prevention can help to optimize interventions.

2 | TIME

We must consider time as well as space when conceptualizing and examining how migration might affect HIV prevention and care, including Universal Test and Treat (UTT) interventions. Forms of population mobility, especially in sub-Saharan Africa, are complex and often characterized by multiple rounds of travel, seasonal migration [1] or movement events in time [2-5]. Circular migration, where migrants leave home to work (or for other reasons) but frequently return home before leaving again, is also common, especially in South Africa [6, 7]. Sexual risk behaviour of circular migrants vary over time as well: before migrating, while away and after returning home [8,9].

Basic concepts of epidemiology will predict an association between migration and the effect of an intervention if we assume a dose-response relationship: the more the exposure to an effective HIV intervention, the larger the response. Thus, the timing of migration and chances of exposure to interventions matter for effective outcomes. For example, during a community trial of UTT, a circular migrant will not be exposed to the same level of messaging and linkage to care efforts compared with non-migrants in their place of origin [10]. Additionally, treatment and prevention services may not reach migrants arriving in a new destination. Campaigns to increase HIV testing may miss new arrivals; they may not know where to get tested in an unfamiliar place, or may face political and structural barriers to care, such as those related to legal documentation status [11].

A recent longitudinal study in Uganda [12] found that HIV incidence decreased for permanent residents over time and scale-up of combination prevention efforts, but the same decline was not observed for migrants who had recently arrived. Similar evidence emerged in fishing villages in Uganda, where individuals who had been in the community for less than five years showed higher rates of seroconversion than longer term residents [13].

Migrants often exhibit riskier sexual behaviour while away from home compared with non-migrants [14-16], possibly due to an enabling environment. Moreover, behaviours of migrants vary with respect to timing of migration events as well, and seemingly converge to levels of risk behaviour of non-migrants over time [12]. Therefore, the timing of engagement into HIV care for migrants may be doubly important. Because of the non-linear nature of HIV transmission dynamics and potential for engagement in risky behaviour, a migrant disengaged from HIV care could contribute to a disproportionate amount of ongoing HIV transmission over space and time [17].

Time is also important when considering the particular stage of a person’s life in which migration takes place. Following a life-course approach [18], a younger woman may be confronted by challenges to prevention and care that are different from those of an older woman, or indeed a man of any age. A migrant’s life is situated within social relationships, and the social timing of mobility, such as moving when a single woman, a parent or a widow, impacts behaviour. For example, a single woman may face particular challenges because being seen as alone and available; travelling as a mother without her children, she may be anxious about their care and safety. If
she travels with children, she will need to find safe accommoda-
tion and time to care for them. Mobility is also situated in
historical time: when someone moves, it exposes that person
to constraints and opportunities that may differ from those of
someone moving to the same place a decade earlier or later
(this is termed, in demography, a “cohort effect”). Finally, there
are variations in the extent people can influence the course of
their life through the choices they make about mobility, sexual
behaviour, prevention and care. If a young woman is struggling
to find work in a place she has moved to, she may turn to
transactional sex to gain access to food or shelter; this may
make her vulnerable to sexually transmitted infections, vio-
lence and abuse. Human agency can be influenced by many
factors: gender, age, socio-economic status, where one comes
from and where one moves [19,20].

3 | SEXUAL NETWORKS

Sexual transmission of HIV occurs within structured sexual
networks [21-23] and the characteristics of sexual networks can
influence the effectiveness of UTT. For migrants, the peri-
ad period of migration is often associated with instability and
detachment from family, friends and previous community, with
fewer constraints from social norms governing sexual beha-
viours [24,25]. The structure and context of migrant sexual
networks are critical for understanding risks of HIV transmis-
sion [26] and the effectiveness of prevention interventions: the
location (place) and timing of sexual ties can interrupt or dilute
the effectiveness of interventions such as UTT. Migrant net-
works can bridge otherwise separate places and contribute to
ongoing HIV transmission by engaging in sex acts in different
places or maintaining relationships with sexual partners who
live in different places [27]. The reverse is also possible, but
less examined: migration can bridge places with different UTT
coverage and interrupt the effectiveness of interventions. For
example, large flows of migrants arriving in a new destination
could reduce the proportion of a population on antiretroviral
therapy below a critical threshold so that HIV could continue
to circulate. Therefore, public health surveillance needs to
account for both permanent and temporary migration flows.

The timing and sequence of migrant’s sexual partnerships is
also an important factor in anticipating and mitigating the
effects of mobility on HIV prevention and care. Typically, individ-
uals choose sexual partnerships with people who are similar to
them (e.g. age, race/ethnicity) [28]. Sexual partners of mobile
individuals may also be migrants or people living outside their
home community (assortative mixing by migration status)
[14,27]. Therefore, a migrant’s partners may lack exposure to
the same level of HIV treatment and prevention, and thus have
higher rates of HIV infection. The spatial and temporal structure
of sexual networks may result in a lower impact (e.g. population-
level incidence) given the same amount of effort/intervention.

4 | ONE STEP AHEAD

As evidenced by the articles in this supplement, population
mobility is complex. Nevertheless, there exist some fundamen-
tal concepts that we can rely on to understand when and why
mobility presents challenges for HIV prevention and care, and
how to improve interventions. Since timing of mobility can
influence the effectiveness of HIV prevention efforts, the roll-
out of interventions needs to account for time and potential
missing populations. For example, seasonal patterns of mobility
can be used to strategize and optimize interventions. For
example, in Niger, seasonal migration patterns were estimated
with satellite imagery in order to predict the most effective
time for a measles vaccination campaign [29]. Second, spatial
and temporal characteristics of migrant sexual networks may
reduce intervention effectiveness, but a network perspective
can be leveraged to improve or broaden interventions as well.
For instance, mobile individuals can distribute HIV self-tests
or deliver antiretroviral drugs to partners, possibly obtaining a
broader coverage of testing or treatment as prevention than
otherwise possible with individual interventions. Knowledge of
the mobility of specific populations in specific settings can be
used to inform, fine-tune, and thus amplify the potential effec-
tiveness of differentiated care models as well as HIV preven-
tion interventions. Such interventions are urgently needed to
enable migrants to maintain their health and that of their sex-
ual partners [30].

AUTHORS’ AFFILIATIONS

1Department of Geography, University of California, Santa Barbara, CA, USA;
2Department of Obstetrics, Gynecology and Reproductive Sciences, University
of California, San Francisco, CA, USA; 3Department of Medicine, University of
California, San Francisco, CA, USA; 4Department of Global Health and Develop-
ment, London School of Hygiene and Tropical Medicine, London, UK

REFERENCES

factor for HIV infection in rural Senegal. J Acquir Immune Defic Syndr. 1993;
et al. Households, fluidity, and HIV service delivery in Zambia and South Africa –
an exploratory analysis of longitudinal qualitative data from the HPTN 071
Understanding reasons for discontinued antiretroviral treatment among clients
21(54):e25120.
mobility and retention of HIV-positive postpartum women in antiretroviral ther-
5. Clouse K, Fox MP, Mongwenyana C, Mthathihedhi M, Buthelezi S, Bokaba D,
et al. “I will leave the baby with my mother”: Long-distance travel and follow-up
care among HIV-positive pregnant and postpartum women in South Africa. J Int
AIDS Soc. 2018;21(54):e25121.
6. Clark SI, Collinson MA, Kahn K, Drulinger K, Tollman SM. Returning home
to die: circular labour migration and mortality in South Africa. Scand J Public
Health Suppl. 2007;69:35–44.
7. Collinson M, Tollman S, Kahn K, Clark S, Garenne M. Highly prevalent circu-
lar migration: households, mobility and economic status in rural South Africa.
In: Africa On the Move: African Migration and Urbanisation in Comparative Per-
8. Cassels S, Jenness SM, Khanna AS. Conceptual framework and research
methods for migration and HIV transmission dynamics. AIDS Behav. 2014;18
lation mobility associated with higher risk sexual behaviour in eastern African
communities participating in a Universal Testing and Treatment trial. J Int AIDS
Soc. 2018;21(54):e25115.
impact of population dynamics on the population HIV care cascade: results
from the ANRS 12249 Treatment as Prevention trial in rural KwaZulu-Natal


