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## Reprint of: “This is the medicine:” A Kenyan community responds to a sexual concurrency reduction intervention<sup>☆</sup>



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### ABSTRACT

We report the results of the first study designed to evaluate the feasibility and acceptability of an HIV prevention intervention focused on concurrent sexual partnerships. Mathematical models and longitudinal studies of stable couples indicate concurrency plays a critical role in sustaining generalized HIV epidemics in heterosexual populations, and East and Southern African nations identified concurrency reduction as a priority for HIV prevention. “Know Your Network” (KYN) is a single-session community-level concurrency awareness intervention designed to address this need. It is rooted in traditional social network research, but takes advantage of new network methodology and years of participatory action research with communities living in a region of Kenya with the highest HIV prevalence nationally. KYN combines didactic presentation, interactive exercises, high-impact graphics, and a network survey with immediate visualization of the results, to prompt a community conversation about sexual norms. We combined focus group discussions and the traditional east African baraza to evaluate the feasibility and acceptability of KYN for use with adults living in rural Nyanza Province, Kenya. We were able to implement KYN with fidelity to its components. Participants understood the intervention’s messages about concurrency and its role in HIV transmission through sexual networks. They agreed to provide anonymous egocentric data on their sexual partnerships, and in return we successfully simulated a representation of their local network for them to view and discuss. This launched a dynamic conversation about concurrency and sexual norms that persisted after the intervention. The concurrency message was novel, but resonant to participants, who reported sharing it with their children, friends, and sexual partners. With clear evidence of KYN’s feasibility and acceptability, it would be appropriate to evaluate the effectiveness of the intervention using a community-randomized trial. If effective, KYN would offer an inexpensive complement to ongoing comprehensive HIV prevention efforts in generalized epidemic settings.

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### Introduction

Worldwide an estimated 34 million people are living with the Human Immunodeficiency Virus (HIV), and 2.5 million were newly infected in 2011 (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2012). Approximately 70% of incident and prevalent infections are found in sub-Saharan Africa where just 13% of the world’s population resides (The World Bank, 2012). The greatest burden of disease is found in southern and eastern sub-Saharan Africa, where the overwhelming majority of new HIV infections are heterosexually transmitted (UNAIDS, 2011).

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## The HIV epidemic in Kenya

Kenya is experiencing a generalized HIV epidemic, with an estimated national HIV prevalence of 6.7% (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2010). There are, however, wide disparities in HIV prevalence by ethnic group: ranging from less than 1% in the Somali to 20% in the Luo. Gelmon, Oguya, Cheluget and Haile (2009) identify two culturally entrenched traditions that are thought to be important drivers of the concentrated epidemic among the Luo: lack of male circumcision and concurrent sexual partnerships.

The protective effect of voluntary medical male circumcision (VMMC) at the individual level has been demonstrated in three randomized trials (Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007), each of which showed about a 60% reduction in incidence over 18–24 months. The Kenyan Government endorsed VMMC for HIV prevention and it has made significant progress toward the national goal to circumcise 80% of uncircumcised men by 2014 (Cherutich, 2012; Republic of Kenya Ministry of Public Health & Sanitation, 2009). The Luo are the only major ethnic group in Kenya that does not traditionally practice male circumcision.

Kenya's Government also identified concurrent sexual partnerships as a key driver of its epidemic (Gelmon, 2009; Kenya National AIDS Control Council [NACC], 2009) following the lead of the Southern African Development Community (Southern African Development Community [SADC], 2006). In lay language, concurrency occurs when a new sexual partnership begins before the current one ends. The technical definition of concurrency is an act of sex with one partner that occurs between two acts of sex with a different partner (UNAIDS Reference Group On Estimates Modelling Projections [UNAIDS RG], 2009).

Concurrent partnerships have two effects on disease transmission that distinguish them from serial monogamy (Morris, Epstein, & Wawer, 2010; Morris & Kretzschmar, 1997). Both stem from the extension of the original partnership pair into a "triplet." For the person who practices concurrency (the "index case"), concurrency accelerates the connection to a new, possibly infected partner because it is not necessary to wait for the existing partnership to end before starting another. This exposure of the index case in turn puts the original, monogamous partner of the index case at indirect risk of infection. This is concurrency's unique effect - the monogamous partners' increased risk of exposure to infection without a concomitant increase in their own "risky" behavior. Because men are more likely to report having concurrent partners than women in most populations (Gourvenec, Tarubereker, Mochaka, & Kasper, 2007; Gregson et al., 2010; Kenyon, Buyze, & Colebunders, 2013; Morris et al., 2010; Morris et al., in press; Voeten, Egesah, & Habbema, 2004), women are more likely to be put at risk from the indirect exposure that concurrency creates.

Concurrency also interacts with the unusual infectivity profile of HIV. A person is most infectious to others during the brief window of acute infection that immediately follows HIV acquisition (Quinn et al., 2000). Secondary transmission during the short acute stage requires either relatively high rates of partner acquisition, or concurrent sexual partnerships. Concurrency maximizes the impact of the acute stage, without requiring high rates of partner change. Mathematical models indicate the interaction between concurrency and the higher probability of disease transmission during acute HIV infection is a key determinant of the size and persistence of an HIV epidemic in a general heterosexual population (Eaton, Hallett, & Garnett, 2011; Goodreau et al., 2012).

### Cultural aspects of concurrency among the Luo

Two practices among the Luo may be perceived as sanctioning concurrent sexual partnerships: widow inheritance and polygyny.

Widow inheritance is a practice where a brother or cousin to the deceased assumes responsibility for the widow in a relationship where sex is a core component (Agot et al., 2010; Ayikukwei et al., 2008). The brother or cousin, known in local terms as an inheritor, is often married and thus in concurrent sexual relationships with both the widow and the wife or wives. The Luo traditionally practiced polygyny and though formal polygynous marriages are less common than in the past (KNBS and ICF Macro, 2010; National Council for Population and Development, 1994), there is evidence that the practice of having concurrent sexual partners remains prevalent in Nyanza Province (Voeten et al., 2004; Westercamp, Mattson, & Bailey, 2013; Xu, Luke, & Msiyaphazi Zulu, 2010) suggesting effective concurrency reduction interventions could have a significant impact on the spread of HIV.

### Study purpose and aims

Our interdisciplinary, international team developed a new educational intervention—"Know Your Network" (KYN)—to raise awareness of concurrency's effect on HIV transmission. To our knowledge this is the first community-level concurrency reduction intervention developed with and pre-tested by communities highly affected by HIV/AIDS. The purpose of this qualitative study was to determine whether the KYN intervention was feasible and acceptable for use with Luo adults living in Nyanza Province, Kenya. We assessed feasibility by determining whether the intervention could be implemented as designed and understood by the target audience. We assessed acceptability by engaging participants in a discussion about whether the intervention message was appropriate and relevant to their community. Our three study aims were to: 1) refine the design of KYN using feedback from the target audience; 2) pilot test the KYN intervention with 100 participants; 3) elicit evaluative feedback about KYN several weeks after the pilot test. If this project proved successful, a small community randomized trial of the KYN intervention was planned as the next step.

## Overview of the Know Your Network intervention

### Intervention development

The elements of our intervention emerged as an unanticipated outcome of an earlier study (Agot et al., 2010). In 2008, we convened community meetings to disseminate research results to study participants in eight rural Nyanza villages. During these meetings we developed an interactive exercise, illustrated in Fig. 1, to communicate the difference between multiple serial and concurrent partnerships for disease transmission.

We followed the exercise with a discussion of Fig. 2 (Morris, Goodreau, & Moody, 2007) which shows how small changes in the prevalence of concurrency can lead to very large changes in connectivity in a partnership network.

While the mathematics behind Fig. 2 are complicated, it communicated key concepts about concurrency in the lay context of our meetings. During the dissemination, we could see that this way of presenting the information had an immediate impact in the group, stimulating questions and discussions. This led us to consider it as the basis for an intervention.

### Theoretical framework

The intervention is based on a conceptual model (Fig. 3) that draws on two broad classes of behavior change theory: those emphasizing mediators between information and individual behavior change (Fishbein & Ajzen, 1975) and those emphasizing the interaction between individuals that leads to the diffusion of

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