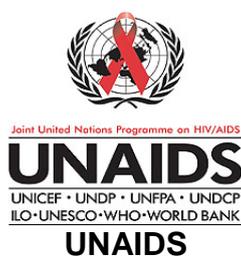

Consultation on Concurrent Sexual Partnerships

Recommendations from a meeting of the UNAIDS Reference
Group on Estimates, Modelling and Projections held in Nairobi,
Kenya, April 20-21st 2009

RECOMMENDATIONS

Published: 22 June 2009

Revised: 30 November 2009



The meeting of the UNAIDS Reference Group on Estimates, Modelling and Projections (the 'Epidemiology Reference Group') was organised for UNAIDS by the UK secretariat of the Reference Group (www.epidem.org) based at Imperial College London. Participants of the meeting are listed at the end of this document. The recommendations in this document were arrived at through discussion and review by meeting participants and drafted at the meeting.

Dr Geoff Garnett, London, June 2009.
g.garnett@imperial.ac.uk

Meeting report prepared by Jeffrey W Eaton, Kelsey K Case, and the secretariat of the UNAIDS Reference Group on Estimates, Modelling, and Projections

Introduction

Over fifteen years ago, concurrent sexual partnerships were suggested as a possible explanation for why HIV epidemics are so much more severe in sub-Saharan Africa than elsewhere in the world. Concurrency could promote the spread of HIV through two mechanisms: (1) by reducing the time between acquisition and subsequent exposure, which both decreases the time to onward transmission and increases the likelihood of exposing partners during the period of high viraemia in primary infection, and (2) by removing the 'protective sequencing' of serial monogamy, allowing partners acquired later to indirectly infect a previously acquired partner. Quantitative and qualitative sexual behaviour studies suggest that concurrent partnerships are more common and more socially acceptable in sub-Saharan Africa than other regions of the world, and mathematical models have demonstrated that concurrent sexual partnerships can increase the size and growth rate of an HIV epidemic. Studies in the United States have found that concurrent partnerships increase the likelihood of transmitting other sexually transmitted infections. Reducing the frequency of multiple partnerships across the population, which may concomitantly have reduced concurrent partnerships, has been established as one key component to successfully reducing HIV in African countries with generalised epidemics.

To date, epidemiological studies have been unable to establish an empirical association between concurrent partnerships and HIV transmission in sub-Saharan Africa, controlling for other established risk factors. There are several reasons for this. Having concurrent partnerships, in theory, facilitates the onward transmission of infection rather than the acquisition of infection, so standard epidemiological methods which identify risk factors associated with the individual having infection would not demonstrate the role of concurrency. The time scales covered by most sexual behaviour studies, typically sexual behaviour in the previous year, do not correlate well with the time scales of HIV infection, often 8 to 10 years for an individual's progression to AIDS, and 15 to 30 years for the emergence of a generalised HIV epidemic. Thus, behaviour measured in recent surveys may not be the same as behaviour when the infection was acquired or during the period when HIV spread widely.

Finally, accurately and reliably measuring concurrency in a population presents significant challenges. Sexual behaviour surveillance is suspected to suffer from selection, recall, denial and social desirability biases, and measures of concurrency are particularly sensitive to misreported data because they rely not only on accurately recalling and reporting the numbers of sexual partnerships, but also the dates at which each partnership began and ended.

As a result of these challenges, no single indicator has consistently been used for measuring concurrency in the literature, which has prevented estimates of concurrency across studies from being compared. One problem is that it is not obvious what measures of concurrency, or other network properties, correlate best with individual or population HIV risk. Thus, indicators are often chosen according to the purpose of the study and limitations imposed by the questions used.

The most common type of measure reported is the prevalence of concurrency, but different choices of both numerator and denominator make the concurrency prevalence reported in different studies incomparable.

Common choices of numerators include:

- individuals engaged in more than one sexual partnership at the time of interview or another instant in time.
- individuals having had any overlapping sexual partnerships within the past year.

- individuals who ever had sex with anyone other than their main partner during their current or most recent relationship.
- individuals who have had multiple sexual partners in a recent time period, such as the past four weeks or past three months (as a proxy measure of concurrency).

Common choices of denominators used for calculating the prevalence of concurrency include:

- the entire adult population (or sampled population).
- the population who have ever had sex.
- the population that is currently sexually active, or that was sexually active in the past year.
- the population that has had multiple partnerships in the past year.

Other approaches to measuring concurrency have included reporting the proportion of partnerships that are concurrent, or measures of the duration of overlap of concurrent partnerships, which may more precisely measure the exposure to the risk of HIV transmission conferred by concurrent partnerships.

Recently, concurrency has been identified by HIV communication and prevention experts as a key target for HIV prevention campaigns in southern and eastern Africa. A meeting hosted by the Southern African Development Community in Maseru, Lesotho in May 2006 identified “multiple concurrent partnerships by men and women with low consistent condom use, and in the context of low levels of male circumcision” as the key drivers of HIV epidemics in southern Africa and recommended that priority should be given to interventions that reduce the number of multiple and concurrent partnerships. Subsequent to this meeting, a number of meetings have convened to determine strategies and messaging for interventions targeting concurrent partnerships. National campaigns targeting concurrent sexual partnerships have been initiated in Botswana, Kenya, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe supported and implemented by PEPFAR, Population Services International, Soul City and others, and campaigns are planned in Lesotho and Malawi.

As these prevention programmes continue to roll out, the scientific and monitoring and evaluation communities need to agree on standard definitions and measures of concurrent sexual partnerships so that intervention approaches and outcomes can be reported and compared across settings. To address this, the *UNAIDS Reference Group on Estimates, Modelling, and Projections* (henceforth the ‘UNAIDS Reference Group’) convened a meeting on 20-21 April 2009 in Nairobi, Kenya, bringing a group of 34 experts representing those working on large-scale cross-sectional surveys and longitudinal cohort studies, researchers using sexual behaviour and concurrent partnership data, and monitoring and evaluation specialists.

The next section describes the Reference Group, aims of the meeting, and process of the meeting, and the remainder of the document describes the consensus recommendations of the meeting.

Meeting summary

The Reference Group on Estimates, Modelling and Projections

The Joint United Nations Programme on HIV/AIDS (UNAIDS) *Reference Group on Estimates, Modelling and Projections* exists to provide impartial scientific advice to UNAIDS, the World Health Organization (WHO) and other United Nations and partner organisations on global estimates and projections of the prevalence, incidence and impact of HIV/AIDS. The Reference Group acts as an 'open cohort' of epidemiologists, demographers, statisticians, and public health experts. It is able to provide timely advice and also address ongoing concerns through both *ad hoc* and regular meetings. The group is co-ordinated by a secretariat based in the Department of Infectious Disease Epidemiology, Imperial College London (www.epidem.org).

Aim of the meeting

The aim of this meeting was to bring together experts to reach consensus on a standard definition of concurrent sexual partnerships, recommend methods for measuring concurrency in a population, to recommend a standardised tool for collecting data about concurrent partnerships to make data collected in different settings comparable, and set out a future research agenda around the study of concurrent sexual partnerships and its association with HIV transmission.

Approach

The meeting featured presentations on relevant topics and group discussions focusing on specific technical issues. Presentations and discussion topics are listed in Appendix I.

The meeting was attended by 34 experts representing large scale cross-sectional surveys, longitudinal cohort studies, researchers utilising sexual behaviour and concurrent partnership data, and programmatic implementations around concurrent partnerships (see Appendix III for a list of participants). We would like to thank each of the participants for their attendance and hard work at the meeting, and for their insights contributing to the set of recommendations drafted at the meeting.

The recommendations drafted at Reference Group meetings provide UNAIDS and WHO guidance on how best to produce estimates of HIV/AIDS, an opportunity to review current approaches and also help to identify information needs. Earlier reports are published on the Reference Group website www.epidem.org. This transparent process aims to allow the statistics and reports published by UNAIDS and WHO to be informed by impartial, scientific peer review.

Recommendations

1. Definition and Terminology

Definition

Overlapping sexual partnerships where sexual intercourse with one partner occurs between two acts of intercourse with another partner.

This definition emphasises that for the purpose of defining concurrent sexual partnerships in the context of HIV epidemiology, sexual partnerships matter in terms of acts of sexual intercourse.

Terminology

The abundance of terminology used to identify and describe concurrent sexual partnerships was a source of confusion in group discussions. A particular confusion was expressed with the acronym 'MCP', used in some literature as an acronym for 'Multiple *and* Concurrent Partnerships', a phrase for concomitantly discussing the correlated but not identical risk behaviours of having multiple sexual partners and having concurrent sexual partners. In other instances MCP is an acronym for the phrase 'Multiple Concurrent Partnerships', for which the definition is ambiguous, but is often used as a synonym for 'concurrent sexual partnerships.' Due to the ambiguity around the meaning of 'MCP', it is recommended that this acronym is not used to identify or describe concurrency, preferring the phrases 'concurrent sexual partnerships', 'concurrent partnerships', or simply 'concurrency'.

2. Recommended Indicators for Measuring Concurrent Sexual Partnerships

The Reference Group recommends that a measure of the amount of concurrent partnerships is included in the set of indicators for monitoring national HIV epidemics.

Main Indicator

The recommended main indicator for concurrency is the **point prevalence** of concurrency, defined as the proportion of the population having more than one ongoing sexual partnership at a point in time. This indicator is preferred because it is easily interpretable and because it best distinguishes between actual concurrency and simply having many (potentially monogamous) partners. By considering partnerships that overlap at a single cross-section in time, the measure emphasises the importance of having multiple sustained overlapping partnerships versus having a single long-term partnership with occasional once-off sexual encounters, in line with the theoretical development of the concurrency hypothesis.

The Reference Group recommends that this indicator is included in the set of indicators for monitoring national HIV epidemics, and that any study on the frequency of concurrent sexual partnerships includes this indicator.

Calculating the Indicator

Numerator: Number of respondents aged 15-49 with more than one sexual partnership six months before the interview. These are identified as individuals who report at least two partners for which first sex was reported six months or longer ago, and the most recent sex is reported as less than or equal to six months ago. In the case that one partnership ends and another begins in the 6th month before the interview, this individual will not be included in the numerator as it cannot be determined whether this is actual concurrency or serial monogamy.

The time point six months before the interview is selected for the calculation of the indicator so that, in most cases, it is clear whether the respondent did have sex again with a previous partner after forming a new partnership, rather than requiring the individual to speculate about whether they will have sex with a partner again.

Denominator: Number of respondents aged 15-49

The indicator should be presented as separate percentages for males and females and should be presented for age groups 15-24, and 25-49 as sample size allows, in addition to the overall age group of 15-49. There was debate about whether the entire population aged 15-49 or only the sexually active population is the more appropriate denominator. The choice of denominator will affect how the values of the indicators respond to other changes in sexual behaviour. The entire population was selected for the recommended indicators for consistency with already established indicators of multiple partnerships (described as 'high risk sex'). However, further research into how the selection of the denominator affects the implications of changes in the indicator over time is required.

Measurement Tool: *Sexual partnership histories* (see section 3) collected in national household surveys (Demographic & Health Survey, AIDS Indicator Survey, Multiple Indicator Clusters Survey), or other representative surveys of the adult population.

Below are recommendations for dealing with incomplete or conflicting data:

- In cases where there is a missing start date or end date but the respondent reported only having sex once with the partner, assume the same start and end date.
- In cases where there is a missing start date or end date and the respondent reported having sex several times with the partner, these individuals must be discarded.
- In cases where the respondent says they had sex only once with the partner but there are different start and end dates, assume they had sex more than once using the start and end dates. The number of times they had sexual intercourse is not necessary for calculating whether there was an overlap.
- If a respondent reports that a relationship started the same month that another relationship ended, the relationships should not be classified as overlapping.
- If the data do not allow you to determine start and end dates of relationships, indicate that the concurrency status of that individual is unknown.
- Do not assume that married partners are concurrent with other partners, the respondent should specify when they last had sex with each partner, including spouses.

Interpretation

This indicator gives a picture of the proportion of population maintaining multiple ongoing sexual partnerships, which creates more connected sexual networks over which HIV may spread rapidly. Modelling suggests that even low levels of concurrency in a population can substantially increase the connectivity of the networks. The indicator does not distinguish between different 'types' of concurrency, for example polygynous marriages versus other casual partnerships. The proportion concurrent partnerships may not be directly related to risk of HIV transmission from concurrent partnerships, as this is also affected by the duration of overlap in partners, condom usage with concurrent partners, and patterns of coitus with each partner.

When interpreting the results it is important to note that if a person has concurrent partners it will affect their partners' risk of being HIV positive, not their own risk of having HIV; while if a person has multiple partners it will affect their own risk of being HIV positive.

Limitations

There is a potential for censoring bias for individuals that had more than 3 partners in the past year. If the date of first sex for 2 of the 3 reported most recent partnerships is within the previous six months, then it may be possible that another partnership may have been concurrent six months before the interview, but was not recorded. In this situation, the respondent would be incorrectly classified by the recommended indicator as not having a concurrent partner. If the indicator is employed in populations with high rates of partner acquisition, the indicator could miss a proportion of concurrent partnerships. In such situations, it may be useful to collect information about more than 3 sexual partners.

Another potential bias is where sexual partnerships are ongoing, but the last sexual intercourse with the partner occurred more than six months before the interview (for example in the case of annual labour migration cycles), in which case the partnership would not be measured as ongoing at the instant six months before the interview, and a concurrent partnership may be missed.

Finally, this indicator is only valid to the extent that the sexual partner history data collected in representative household samples are complete and accurate. With all sexual behaviour data there are limitations due to social desirability bias as well as recall bias. Social desirability bias may be avoided by innovative techniques to ensure the confidentiality of responses. However,

such innovative methods have also been associated with increased non-response to individual questions, especially cognitively difficult questions. Calculation of this indicator is particularly susceptible to missing data because a single missing response about only one partner can make it impossible to determine if the individual had a concurrent partnership or not. Such techniques should be considered for surveys collecting this indicator, but need to be weighed against the risk of increasing missing data.

Recall bias can be avoided by prompting the respondent with key events that occurred in the year prior to the interview (such as before or after the election, or before or after the festive season).

Other Indicators

Aside from the above main indicator, the Reference Group recommends two other indicators that also provide useful summaries of concurrency in a population. Programmes may wish to use these indicators in addition to the point prevalence indicator.

The first additional indicator is the **cumulative prevalence** of concurrent partnerships, defined as the proportion of the adult population who have had any overlapping relationships in the past year. This is measured by identifying the individuals for whom any of the sexual partnerships reported in the past year have been overlapping based on the sexual partner histories. This measure may give a more complete picture of the total population engaging in any form of concurrent partnership including short lived partnerships that may be missed in the point prevalence, but does not distinguish as clearly as does the point prevalence between the populations having multiple sustained overlapping partnerships, compared to having many partners.

The second additional indicator is the **proportion of multiple partnerships which are concurrent**, calculated by dividing the number of adults with concurrent partnerships in the past year by the number of adults with multiple partnerships in the past year. This indicator seeks to isolate the effect of having concurrent partnerships from the already established risk factor of multiple partnerships, which is an important measure for research into the role of concurrency in HIV transmission. However, the interpretation of this indicator is subtle and the programmatic implications of changes in this indicator over time can only be made carefully in conjunction with other indicators.

Other measures of concurrency which have been employed in the literature are (1) the percentage of individuals who have had more than one sexual partner in the past 30 days, and (2) the proportion of individuals who have ever had sexual intercourse with another person during their current or most recent partnership. Each of these measures were discussed and rejected. The first has the limitation that it does not actually measure *overlapping* partnerships, but is rather a measure of having had recent multiple partnerships, which may have been concurrent or serially monogamous. The second measure does not control for the exposure to having had concurrent partnerships, as individuals in longer partnerships will have had increased exposure to having had another partner.

3. Recommended Data Collection for Measuring Concurrent Sexual Partnerships in a General Population

Basic Data Collection Requirements

The Reference Group recommends that population based surveys include 'sexual partner history' modules to collect information about up to the **last three individuals with whom the respondent has had sexual intercourse within the previous 12 months**. Since these questions are of a sensitive nature, privacy should be ensured by the interviewer before starting to ask these questions. The privacy conditions of the interview, with regards to who else is in the room, within earshot, or in the house, should be assessed and recorded by the interviewer. In addition, respondents should be reminded to report *all* sexual partnerships, including once-off sexual partnerships as well as sexual partnerships with sex workers.

The essential questions which need to be asked for each partner to calculate indicators of concurrency are:

Q1: How long ago did you last have sexual intercourse with this person? (Answer in days/weeks/months ago – [also years for the most recent partner])

Q2: How long ago did you first have sexual intercourse with this person? (Answer in weeks/months/years ago)

Q3: Are you still having sex with this person?

The consensus was that questions about dates (e.g. first and last sex) should be asked in terms of *how long ago* (days ago, weeks ago, months ago, years ago) events occurred rather than the calendar date on which events occurred as in most settings, especially areas in which literacy is relatively low, this is likely to be easier for respondents to recall.

Questions about partners should be framed specifically around *sexual* partners and questions about dates should specifically refer to acts of sex to distinguish between disease risk behaviour and culturally defined notions of relationships. For example prompting questions should be similar to "Tell me about your most recent sexual partner," rather than "Tell me about your most recent partner" or "Tell me about your most recent relationship," and questions about dates of first and last sex should be "How long ago was the first time you had sexual intercourse with this person?" rather than "When did this relationship begin?" Extra care should be given to ensure that these distinctions are maintained in translation of questions.

Interviewers should be well trained, and interview methods should be well designed to probe for *all* sexual partners in the past year, including those who are routinely under-reported in behavioural surveys.

The third question, "Are you still having sex with this person?" is not required to calculate the indicators as they are described above. Because the questions records individuals perception about whether or not they will have sex again with a partner, it is not certain how accurate the answers might be, and further research is required into the reliability of this question. But meeting participants still recommend that this question be asked in all sexual partner histories, as if further research shows that the question is reliable, it offers a much less complicated and more contemporaneous measure of the point prevalence of concurrency. The question may also provide useful context about the relationship.

Covariates

In addition to these three essential questions for measuring concurrency, it is recommended that surveys collect other information and risk behaviour about each partner, including:

- type of relationship (such as spouse, polygynous marriage, cohabiting partner, girlfriend/boyfriend not living with respondent, casual acquaintance, sex worker, etc)
- the partner's age (for all partners)
- condom usage within the partnership
- coital frequency within the partnership
- location where the partner resides
- and place/location where met the partner.

Depending on the purpose of the survey, it may also be useful to collect information about the circumstances under which the respondent met the partner, alcohol and drug usage within the partnership, knowledge of the partner's HIV status, the exchange of money or goods in the partnerships, or other characteristics of the partnerships that may be of interest.

Finally, additional routine information on lifetime and recent sexual behaviour, including age at first sex, lifetime numbers of partners and number of partners in the past year, and attitudes towards and knowledge about HIV should continue to be collected. The design, wording, and ordering of questionnaires should be carefully considered to minimise non-response and elicit the most accurate answers as the order and way in which questions are asked can influence the findings of the survey.

4. Research Agenda for the Study of Concurrency and its Association with HIV Transmission

The recommendations on definition and measures of concurrency are based on the best data, knowledge, and experiences of the meeting participants, which represent the most advanced thinkers in the field. However, through discussion it became clear that there are many open questions requiring further research in the area of measuring concurrency and understanding the relationship between concurrency and HIV.

Methodological Research

Meeting participants came with experience in a wide variety of methods and tools for measuring sexual behaviour. However, relatively little work has been done testing, validating, comparing, or adjudicating various methods of collecting the same or similar information.

The following are specific research areas that meeting participants recommended for further methodological research.

Date Reporting

Measuring cumulative concurrency and duration of overlapping partnerships is particularly sensitive to accurately recalling dates of first and last sex with previous partners. Research is needed to assess the accuracy of date recall in behavioural surveys and test methods for improving date recall.

Suggested research designs for validating and improving date recall include:

1. Conduct in-depth follow-up interviews using calendars on a subset of national household survey participants.
2. Re-visit a sample of survey participants several months to a year later and administer the same survey.
3. In cohort studies, compare retrospective partnership histories with prospectively collected data.
4. Other tools that could improve date recall should be considered and tested, such as calendar methods that ask the respondent to recall each month specifically

Ongoing/Still Active Partnerships

One of the simplest methods for measuring the point prevalence of concurrency is for each of the sexual partnerships recorded in the partnership history, to ask the respondent whether or not they are still having sex with that partner. If the respondent reports they are still planning on having sex with more than one of their partners again, then they are having concurrent partnerships.

However, it is not known how well the reported intention to continue a partnership actually correlates to continuation of the sexual partnership. Cohort studies should investigate the validity of this question by investigating in subsequent rounds of data collection whether or not partnerships that were reported as ongoing at the previous round actually continued (and similarly whether partnerships that were reported as completed at the previous round in fact continued).

Completeness of Sexual Partner Histories

The accuracy of measures of concurrency is extremely sensitive to the sexual partner histories collected in behavioural surveys being complete. Unfortunately as there is no 'gold standard' for behavioural data with which to compare survey data, it is not possible to

definitively assess the completeness of survey data; however, by triangulating different methods, it may be possible to increase our understanding.

Proposed methods for validating the completeness of partnership histories were:

1. Conduct in-depth interviews with prompting approach (“what about sex workers, truck drivers, etc”) to improve recall and elicit additional partner information. Compare the results with response to the standard survey.
2. ‘Network census’ surveys where both partners report partnerships. There may be opportunity to nest this sort of study within existing cohort studies.
3. ‘Coital diary’ surveys where individuals prospectively record each of their acts of coitus. Historically, coital diary methods have also been suspected to be unreliably completed. They may be improved by introducing SMS or other new technologies.

Coital Frequency and Condom Usage

The most common current methods for collecting information on coital frequency and condom usage tend to be fairly crude and ask respondents to report quantities that are difficult to reliably recall and estimate. Validation of, and perhaps innovation on, the existing instruments is necessary.

Method of Survey Administration

The results of using novel survey administration methods in African settings have been mixed. More experimental work needs to be done comparing self-administered questionnaires, face-to-face interview, randomised response, voting box methods, computerised methodologies and mobile phone technology. Validation should be built through triangulation of methods. Additional research is also needed to identify how these methods vary by setting and location.

It should not be assumed that novel methods are necessarily better than standard face-to-face interviews administered in private settings with well-trained fieldworkers. Any benefits associated with novel methods should be weighed against potential drawbacks such as an increase in missing data for important but difficult to answer questions.

Qualitative and methodological research is needed to understand why respondents refuse to answer or give inaccurate answers to certain questions. As noted, social desirability bias is only one possible reason, and research needs to better quantify the contribution of different sources of biases.

Epidemiological Research

Empirical Evidence of an Association between Concurrency and HIV

While intuition and mathematical models suggest that concurrency should increase the spread of HIV, empirical evidence of such an association remains meagre. Moreover, because concurrency does not increase one's risk of *acquiring* HIV beyond the risk associated with multiple partnerships, standard epidemiological analyses of identifying risk factors for having disease will not provide empirical evidence of the association. Also, because of the long timescale of HIV infection and the importance of the short period of high viraemia after infection, individual and partnership level association studies of HIV and concurrency need to consider HIV incidence rather than HIV prevalence.

Study designs that may be able to demonstrate the empirical association between concurrency and HIV include:

1. Incidence/Transmission Studies: Existing HIV cohorts are well set up for surveying HIV incidence in a population and monitoring sexual behaviour of HIV positive individuals. Further studies should seek to identify sexual partners and link HIV

transmission events with partner's sexual behaviour, including the incidence and prevalence of concurrency.

2. Ecological Association Studies: All else equal, according to the theory communities with more concurrency should have higher HIV prevalence. Previous investigations of such ecological associations have not supported this, but this may be because of too much heterogeneity in other risk factors between the communities and differences in epidemic stage. More analyses of this sort are useful. Incorporating mathematical models may allow for more appropriately controlling for heterogeneity in other risk factors. Analyses across multiple community-based cohorts will allow studying the association between concurrency and HIV incidence, with community clusters as the unit for analysis.
3. Contact tracing studies: Studies of public health based contact tracing of STI patients in the United States has provided evidence for the effect of concurrency on STI spread in that setting. As routine HIV testing becomes more common, similar studies could be considered in African settings.
4. Evidence from intervention programmes: Intervention programmes aimed at reducing concurrent sexual partnerships that are currently being planned and rolled out provide an opportunity to study the relationship between concurrency and HIV transmission. Ideally, concurrency based intervention programs will be tested in randomised and controlled trial (RCT) settings which would provide firm evidence for the effectiveness of reducing concurrency for HIV prevention, and thereby give evidence that concurrency affects the spread of HIV. Where RCTs are not deemed possible, alternative evaluation designs should be used. As many education and prevention programmes targeted at concurrency are also likely to include components aimed at reducing other risk factors, detailed monitoring of intervention of knowledge, behavioural, and disease outcomes of interventions are necessary in order to evaluate precisely which components of the interventions are most effective.

Types of Concurrency and HIV Risk

Concurrent partnerships are formed in many different configurations and for many different reasons, and not all 'types' of concurrency may have the same risk of HIV associated with them. For example, faithful polygynous marriages are not at risk of HIV at all as long as none of the partners entering the marriage are infected. Condom usage, patterns of coitus, and duration of overlap are likely to vary greatly between different types of concurrency. In many areas with severe HIV epidemics, entrenched labour migration patterns are likely to give a unique signature to the patterns of coitus between concurrent partners.

Research into the types of concurrency and HIV risk first requires more qualitative work to define the relevant categories of concurrency and quantitative work to estimate the relative frequency of different forms of concurrency. Secondly, research needs to understand the particular risk behaviours associated with types of concurrency. Finally information of the types of concurrency and the risk behaviour needs to be intersected with HIV pathogenesis to create more accurate models of the role that concurrency has in the growth and maintenance of HIV epidemics.

Social Norms about Concurrency

Understanding local social norms around concurrency is essential for creating and targeting locally relevant messaging aimed at reducing concurrency. Some areas that require research are:

- Defining the reasons that people enter concurrent partnerships
- Understanding the social acceptability of concurrency

- Identifying the social and structural drivers of concurrency, and how changing norms around concurrency will affect other social institutions

Knowledge and Perceived Risk about Concurrency

Limited research indicates that while education campaigns have been fairly successful at conveying the HIV risk associated with some risk behaviours, such as non-condom usage and very high numbers of multiple partners, understanding by the general population of concurrent partnerships and the potential HIV risk associated with them remains fairly low. As increasing knowledge and risk perception about concurrency are likely to be a key outcome of prevention programmes targeting concurrent sexual partnerships, collecting quantitative baseline data on these targets is important for monitoring and evaluating the success of these programmes.

Innovative Research Designs

As our understanding of patterns of HIV spread becomes more detailed, the standard cross-sectional designs for epidemiological inquiry have become insufficient to answer the increasingly complicated research questions that are posed. The establishment of several HIV cohort studies have been an invaluable source of information about behavioural risk factors. More recently, partner studies including studies of sexual partnerships that span long distance labour migration and local network censuses have been innovative designs that have provided unique data on sexual networks and HIV transmission. In the future, these and other innovative study designs will be heavily relied upon for answering many of the research objectives outlined here. Established research programmes, such as cohort and surveillance sites, provide an organisational and scientific framework within which innovative studies such as local network surveys, partner tracing, or high frequency surveillance may be embedded.

Clinical trial populations may be a useful setting for investing questions around sexual networks and HIV risk because of the high frequency of contact and concentrated effort to maintain high follow-up rates, and should be encouraged to collect and output more behavioural and network data.

Meeting Agenda: Consultation on Measuring Concurrency, Nairobi, Kenya, April 20-21, 2009

Monday April 20th

Start	Duration	Subject	Speaker
900	10	Opening remarks	Peter Ghys
Session 1 - Definition and measurement of concurrency, background and theoretical importance			
910	20	Overview of concurrency measurement and modeling	Martina Morris
930	20	Concurrent sexual partnerships and other HIV risk factors	Sevgi Aral
950	20	Empirical estimates of concurrent sexual partnerships from sub-Saharan Africa	Tim Mah
1010	10	Definition and measurement of concurrency	Jeff Eaton
1020	40	Discussion	-
1100	20	Coffee break	
Session 2 - Methodology and tools for data collection and measurement of concurrent partnerships			
1120	20	The experience of GPA and UNAIDS in defining sexual networks	Michel Carral
1140	15	Review of novel interview methods	Marte-Claude Boly
1155	20	The Likoma Network Study: cautions for ego-centric network data	Stephane Hellinginger
1215	30	Discussion	
1245	75	Lunch	
1400	20	Concurrent sexual partnerships and HIV in the DHS and AIS: methods and results	Bernard Barrere
1420	20	Comparative behavioural survey methods and indicators in South Africa	Warren Parker
1440	20	Comparative measures of multiple and concurrent partnerships in Botswana	Toby Kasper
1500	35	Discussion	
1535	20	Coffee break	
Session 3 - Working Groups			
1555	5	Division into groups	-
1600	75	Working Group Questions: 1) <i>What do we really want to know and what can realistically be collected? How might this be different in national population-based surveys versus research settings?</i> 2) <i>Which elements of the tools are successful at capturing concurrency?</i> 3) <i>What additional variables need to be included to understand the link to HIV, for example, gender asymmetry, the quality of partners (sex workers, polygamy, long term partners, relation to mobility), condom use, knowing partner's concurrency?</i> 4) <i>What questions should be included in household survey questionnaires to capture concurrent sexual partnerships? (create a model questionnaire)</i>	-
1715		Close	

Appendix I: Meeting Agenda

Tuesday, April 21st			
Start	Duration	Subject	Speaker
900	15	Concurrent partnerships: gathering evidence in cross-sectional and longitudinal HIV studies	Basia Zaba
Session 1 - Cohort Studies Chair: Basia Zaba			
915	20	TAZAMA Project, Kisesa: measurement of trends in concurrent sexual partnerships	Jim Todd
935	20	Association between HIV incidence and concurrent partnerships in Rakai	Joseph Kagaayi
955	20	Measurement and estimation of concurrency in rural South Africa	Nuala McGrath
1015	15	Monitoring and evaluation of multiple and concurrent partnerships in eastern and southern Africa	Masauso Nzima
1030	30	Discussion	-
1100	20	Coffee break	-
Session 2 - Working Groups Chair: Geoff Garnett			
1120	70	Working Group Questions: 1) <i>What designs and instruments should be used for comparing the household survey methods to alternative methods and tools - can these comparisons be used to derive "correction factors"?</i> 2) <i>What research designs should be used for linking concurrency to HIV transmission?</i>	
1230	40	Working Groups continued: All groups: develop plenary presentation	
1310	70	Lunch	-
1420	15	Group 1 plenary presentation covering working group discussions from Day 1 and Day 2	
1435	20	Discussion	-
1455	15	Group 2 plenary presentation covering working group discussions from Day 1 and Day 2	
1510	20	Discussion	-
1530	15	Group 3 plenary presentation covering working group discussions from Day 1 and Day 2	
1545	20	Discussion	-
1605	15	Coffee break	-
Session 3 - Final group discussion and consensus on recommendations			
1620	50	Consensus, recommendations, and forward direction	-
1710		Close	Geoff Garnett

Appendix II: List of Participants

Eniko Akom

Population Services International
Washington DC, USA

Priscilla Akwara

UNICEF
New York City, New York, USA

Sevgi Aral

Centers for Disease Control and Prevention
Atlanta, Georgia, USA

Bernard Barrere

ICF Macro
Calverton, Maryland, USA

Stefano Bertozzi

Bill & Melinda Gates Foundation
Seattle, Washington, USA

Marie-Claude Boily

Department of Infectious Disease Epidemiology
Imperial College London, UK

Michel Carael

Department of Social Sciences
Free University of Brussels
Brussels, Belgium

Kelsey K Case

Department of Infectious Disease Epidemiology
Imperial College London, UK

Susan Cassels

Center for Studies in Demography and Ecology
University of Washington
Seattle, Washington, USA

Jeffrey W Eaton

Department of Infectious Disease Epidemiology
Imperial College London, UK

Thaddeaus Egondi

African Population and Health Research Center
Nairobi, Kenya

Jaques Emina

African Population and Health Research Center
Nairobi, Kenya

Geoffrey P Garnett

Department of Infectious Disease Epidemiology
Imperial College London, UK

Peter Ghys

UNAIDS
Geneva, Switzerland

Marelize Gorgens

The World Bank Global HIV/AIDS Program
Washington DC, USA

Timothy Hallett

Department of Infectious Disease Epidemiology
Imperial College London, UK

Stephane HELLERINGER

Columbia Population Research Center
Columbia University
New York City, New York, USA

Joseph Kagaayi

Rakai Health Sciences Program
Kalisizo, Rakai, Uganda

Tobias Kasper

Population Services International
Gaborone, Botswana

Eva Kiwango

UNAIDS
Geneva, Switzerland

Todd Koppenhaver

USAID
Windhoek, Namibia

Tim Mah

USAID
Washington DC, USA

Dermot Maher

MRC/Uganda Virus Research Institute on AIDS
Entebbe, Uganda

Mary Mahy

UNAIDS
Geneva, Switzerland

Nuala McGrath

London School of Hygiene and Tropical Medicine
Africa Centre for Health and Population Studies
University of KwaZulu Natal
Mtubatuba, South Africa

Martina Morris

Departments of Sociology and Statistics
University of Washington
Seattle, Washington, USA

Masauso Nzima

UNAIDS
Johannesburg, South Africa

Samuel Oji Oti

African Population and Health Research Center
Nairobi, Kenya

Warren Parker

Private Consultant
Johannesburg, South Africa

Jim Todd

London School of Hygiene and Tropical Medicine
TAZAMA Project
National Institute for Medical Research
Mwanza, Tanzania

Nelli Westercamp

University of Illinois at Chicago
Chicago, Illinois, USA

Basia Zaba

London School of Hygiene and Tropical Medicine
TAZAMA Project
National Institute for Medical Research
London, UK

Iryna Zablotska

National Centre in HIV Epidemiology and Clinical Research
University of New South Wales
Sydney, Australia

Carla E Zelaya

Bloomberg School of Public Health
Johns Hopkins University
Baltimore, Maryland, US

