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
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.

Introduction

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, 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.
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’. If an acronym is required, ‘CP’ is recommended.
2. Recommended Indicators for Measuring Concurrent Sexual Partnerships in Population-Based Household Surveys

Concurrent sexual partnerships potentially increase the spread of HIV by creating more connected sexual networks, reducing the time until onward HIV transmission after acquisition, and eliminating the ‘protective sequencing’ provided by serial monogamy. 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 consensus is that the point prevalence of concurrency in a population be the main indicator of concurrency.

Point Prevalence of Concurrent Partnerships: The percentage of women and men aged 15-49 with more than one ongoing sexual partnership at the point in time six months before the interview.

Purpose: To assess progress in reducing the percentage of people who have concurrent sexual partnerships.

Applicability: All Countries

Data Collection Frequency: Every 4 to 5 years

Measurement Tool: National Population Based Surveys (Demographic & Health Survey, AIDS Indicator Survey, Multiple Indicator Clusters Survey, or other similar representative surveys).

Method of Measurement: Respondents are asked whether or not they have ever had sexual intercourse. If yes, they are asked how long ago they last had sexual intercourse, and how long ago they first had sexual intercourse with that person. If the last intercourse occurred in the past year, they are asked if they have had intercourse with any other person in the past 12 months, and if so, they are asked to give the time of last and first sex with that second partner. This is repeated for a third partner if one exists. The proportion of individuals who had more than one ongoing partnership at the exact point in time 6 months before the interview is calculated based on the dates of first and last intercourse with up to the last 3 partners in the past year.

Numerator: Number of respondents aged 15-49 with more than one ongoing partnership 6 months before the interview. 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.

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.
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; while if a person has multiple partners it will affect their own risk of being HIV positive.

Strengths
This indicator is recommended because it best distinguishes between actual concurrency and simply having many (potentially monogamous) partners. By considering partnerships that overlap at one point 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.

Limitations
There is potential for censoring bias with this indicator based on the collection of sexual histories for only the three most recent sex partners. If a respondent with an sexual partnership that is ongoing for over six months has acquired, and most recently had sex with, two or more partners within the past six months, it may be the case that there was a concurrent partner six months before the interview who was not reported in the sexual partner history of the last three partners. 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.

The indicator will provide a conservative (low) estimate of the amount of concurrency in the population. Finally, this indicator is only valid to the extent that the sexual partner history data collected in representative household samples are complete and accurate.

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.

For both the point prevalence and cumulative prevalence measures, 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. However, further research into how the selection of the denominator affects the
implications of changes in the indicator over time is required.

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 Population-Based Household Surveys

Basic Data Collection Requirements
The Reference Group recommends that population based surveys include ‘sexual partner history’ modules to collect information about 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: When was the last time you had sexual intercourse with this person? (Answer in days/weeks/months ago – [also years for the most recent partner])
Q2: When was the first time you had 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 “When was the first time you had sexual intercourse with this person?” rather than “When did this relationship begin?”

Finally 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.

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
- and location of 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 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.

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.

**Substantive 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 ones 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 to study 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 programs: Intervention programs 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 programs 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 investigating 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.
Appendix I: Specific Recommendations for DHS Questionnaire

1. The current DHS Questionnaire uses the following questions to determine the dates of first and last sex for each of the reported sexual partnerships:

"When was the last time you had sexual intercourse with this person?" and "For how long (have you had/did you have) a sexual relationship with this (second/third) person?"

The latter question is problematic because the answer is implicitly based on the respondent's perception of whether or not the relationship is ongoing, without explicitly asking the respondent's intention/perception about this. For example, if the first sex was 6 months ago, and the respondent perceives the relationship as ongoing, then they may answer "6 months", even if the last sex was 3 months ago. Then it is very hard to know if the sexual relationship lasted from 9 months ago to 3 months ago, or from 6 months ago to the current time.

For this reason, it is recommended that the following questions be used instead:

"When was the last time you had sexual intercourse with this person?"
(days/weeks/months ago - [also years for the most recent partner]) and "When did you have first sexual intercourse with this person?"
(days/weeks/months/years ago)

2. The questions about the age of partner should be asked for all respondents, instead of only for female respondents aged 15-24.

3. The privacy conditions of the interview, with regards to who else is in the room, within earshot, or in the house, should be recorded and kept as a variable in the public-use dataset. When sexual behaviour questions are skipped, it is essential to know whether the respondent refused to answer the question, or if the question was skipped because sufficiently private conditions could not be established to ask questions of a sensitive nature.

4. In addition to the questions regarding the dates of first and most recent sexual intercourse, for each reported partner the question “Are you still having sex with this person?” should be asked to determine if the partnership is ongoing or completed.

5. The response categories for the question “How many times have you had sex with this person in the past 12 months?” should be broadened. The current response categories are ‘Once’, ‘Twice’, and ‘More’. A possible recommendation for broadened response categories are ‘Once’, ‘2-5 times’, ‘5-10 times’, and ‘More than 10 times’.
### Appendix II: Meeting Agenda

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**Note:** The agenda is subject to change. Please check the latest updates for any changes.

**Date:** Monday April 20th

**Location:** Nairobi, Kenya

**Time:** April 20-21, 2009
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Session 2 - Working Groups Chair: Egal Camel

- Working Group Questions:
  - (1) What designs and interventions should be used for combating the household surveys methods to determine HIV transmission?
  - (2) What research designs should be used for thinking continuous to HIV transmission?

Session 1 - Country Studies Chair: Egal Camel

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Joseph Kagai | 30      |
Josep Kagai | 30      |
David Kulaha | 30      |
Benjamin Mungara | 00      |
Masuma Nizana | 00      |
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## Appendix III: List of Participants

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