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Uncertainties in gender violence epidemiology

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Doctor of Philosophy (PhD) by prior publication

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Abbreviations

GBV - Gender based Violence:

GEE - Generalised Estimating Equation

GLMM - Generalised Linear Mixed Model

IPV – Intimate Partner Violence

MH - Mantel Haenszel

MVA - Multivariate Analysis

Glossary

Bias: a systematic favouritism in measurement, usually at the expense of accuracy; a biased estimate is systematically different from the population parameter of interest.

Collider bias: An association between the base set changes (usually blocked) when both exposure and outcome are related a third variable in a derived set. Called a collider because of the pictorial depiction of two causes A and B colliding on C:

$$A \rightarrow C \leftarrow B$$

Confounder: a variable extraneous (outside the causal chain) to an association between exposure and outcome, that is itself associated with both exposure and outcome, and distorts the measured association between the two.

Constraints: restrictions, like the need to use face to face interviews, limit the meaning one can draw from gender violence epidemiology; missing data also limit the meaning.

Domestic violence/abuse: also known as family violence, includes intimate partner violence, child abuse, and elder abuse; can include physical or mental abuse, controlling behaviour or economic deprivation.

Epidemiology: Presumed to refer to the patterns, causes and effects of *health* events, Epi- (over, among) demos- (people) logia (sayings, utterances) refers to *occurrence relations* – event patterns in society. It is highly relevant to health and other social events, but also to environment, animal health, and other fields of study.

Gender: Social defined discriminating characteristics and sexual roles of men and women.

Gender based violence: Many sources equate GBV with violence against women. The term includes some kinds of violence against men and male children. In this thesis,

GBV or gender violence refers to violent assertions about gender, as expressed above.

Gender violence: same as gender based violence.

Generalised Estimating Equation: Estimates the population-averaged effect and not regression parameters in a linear model. GEE allows for correlation without explicit definition of a model, which is useful where there is unmeasured clustering.

Generalised Linear Mixed Model: An extension of the generalised linear model in which predictors can include fixed effects and random effects. The random effects are usually assumed to have a normal distribution.

Intimate partner violence: Gender violence involving partners in an intimate relationship such as marriage, dating, family or friends.

Incidental clustering: People who live near each other tend to be more similar to one another than they are to people who live some distance away. In sample-based measurement, this incidental similarity can lead to underestimation of the true variance.

Informative clustering: Sometimes the cluster itself matters. Local pollution might put some clusters more at risk than others. A local culture like wife beating or child abuse might “catch on” in one cluster but not in another.

Latent variable: Latent variables are not directly observed but inferred from observable variables. For example, choice disability or constrained choice might be inferred from inability to insist on condom use or inability to say no to sex.

Mantel Haenszel: One of the most often cited statistical tests in history, the procedure specified by Nathan Mantel and William Haenszel in 1959 involves stratification, estimation of effect (odds ratio) and statistical significance (MH Chi).

Missingness: Missing data occur when no value is available for the variable in

question. Most statistical approaches to missing data assume they are missing at random. In gender violence epidemiology *missingness* is often related to experience of violence.

Multiple imputation: Imputation involves substitution of a missing data point. Multiple imputation involves generating an entire distribution of possible data points.

Multivariate analysis: MVA involves analysis of more than one variable at a time. The underlying idea is that several variables might together have a different effect in a model (of causality) than two variables on their own.

Occurrence: incidence (incidence rate, hazard rate, cumulative incidence) or prevalence (point or period) are measures of occurrence (how common is it), contrasting with associations that describe the occurrence relations (relative or absolute).

Rape: Sexual assault usually involving intercourse. Unambiguous in English, the term has no translation in most languages used in the studies of this PhD. Most communicated the meaning through the direct translation of “forced sex when you did not want to”.

Reduction: making something smaller, for example, abbreviating the life-changing experience of sexual violence to a few questions is convenient and probably necessary in gender violence epidemiology; but the very reduction carries information.

Risk factor: A variable associated with an outcome. Risk factors are not necessarily causal: age does not *cause* sexual violence but post-pubertal women are generally more at risk than very young or older (pre-pubertal or post-menopausal) women.

Systematic review: A literature review that tries to identify, appraise and synthesise evidence focussed on a specific research question. Search strategies and selection

criteria are explicit, allowing others to arrive independently at similar evidence.

Sexual violence: A sexual act using coercion. Acts can include unwanted sexual comments or advances, through to rape. Coercion covers different degrees of force, including intimidation, blackmail or inability to give consent.

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I thank all my team members who knocked on doors and worked with groups of school children to collect the data for these studies. In addition I owe thanks to the many respondents who gave their time to take part in these studies. I am especially grateful to CIET colleagues, particularly Anne Cockcroft, for input in each of the papers and in this thesis. My thanks go to Dr Louise Phillips and Professor Jonathan Elford of City University London, who guided the overview accompanying the published papers.

Declaration

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A handwritten signature in black ink, appearing to read 'M. Odum', followed by a period.

ABSTRACT

This thesis contains 11 papers published in peer reviewed journals between 2006 and 2012. The papers focused on gender violence research methods, the prevalence of risk factors for gender violence, and its association with HIV and maternal morbidity. The accompanying commentary addresses three uncertainties that affect gender violence epidemiology. These are missing data, clustering and unrecognised causal relationships. In this thesis I ask: Can we reduce these three uncertainties in gender violence epidemiology? A systematic review of the intimate partner violence literature over the last decade found that few epidemiological studies manage missing data in gender violence questionnaires in a satisfactory way. Focus groups in Zambia, Nigeria and Pakistan confirmed that missing data lead to underestimation of gender violence prevalence. A partial solution to this problem was to place greater emphasis on interviewer training. In a reanalysis of the data from the published papers I compared different approaches to dealing with clustering in gender violence epidemiology. Generalised linear mixed models and other methods found that clustering potentially plays a causal role. This can be important in interventions that target a community at large, and act throughout the cluster. In a reanalysis of several datasets I show how a history of gender violence influences measurement of many associations related to HIV, possibly due to an unanticipated role of gender violence in the causal pathway with HIV. In conclusion, it is possible to reduce the uncertainties associated with missing data, clustering, and unrecognised causality in gender violence epidemiology.

CHAPTER 1. INTRODUCTION

Summary

Chapter 1 places the published papers in the context of my work since the mid-1980s. The 11 first author papers in this thesis cluster into three themes: (i) methods in gender violence epidemiology; (ii) gender violence and HIV in southern Africa; and (iii) gender violence and maternal mortality. Limitations of this research bring three uncertainties to the surface: missing data, clustering and unrecognised causal relationships. The thesis asks how best to reduce these uncertainties in gender violence epidemiology.

1.1 CIET and the research programme

The work presented in this thesis is closely related to that of the *Centro de Investigación de Enfermedades Tropicales* (CIET). Since its founding in the south of Mexico in the mid-1980s, CIET has evolved as an international network of epidemiologists and teachers across more than 50 countries. Its two most consistent areas of work topics are public services and gender violence. Since the early 1990s, our gender violence work focused on straightforward questions: How common is it? Who is affected? The objective of this work was to draw attention to the problem and to identify actionable aspects.

This followed on from work with WHO¹ and UNICEF² to develop a community based approach to epidemiological research and measurement, to generate evidence about impact, coverage and the cost of public services, and to guide their improvement through engagement of intended users³.

Recognising the pivotal importance of *context*, neighbourhood or place, the approach that was later called Sentinel Community Surveillance (SCS)⁴ went beyond the concerns of cluster samples at that time, notably the efficiency of contacting a large

number of households with little travel. SCS held that certain characteristics of the community, like distance from a main road, and also social and cultural characteristics could be relevant to health. It also held that inclusiveness in the measurement – community involvement – could optimise information content. Inspired by the Italian “*alternativa operaia*” use of epidemiology in the 1980s⁵, the first concern was to engage and to strengthen the voice of those affected by services *through* measurement of service performance. These qualitative concerns came to define the approach.

From CIET's early days in the mid-1980s, it was clear that a full understanding of gender violence occurrence required both qualitative and quantitative evidence⁶. The approach did not propose a blend or a blurring of measurement. We broke up the research process, as in linguistics, parsed it into different moments. Each moment had a distinct character, objective and method. One could thus strive for excellence in a qualitative interaction, complete that moment with the best information available, and move on to another moment that might be quantitative. Illustrating the anticipated series of these different moments, a participatory process could set the conceptual framework for the survey. A more technical process fits standard questions to this. Piloting adjusts this to the local setting. A culturally appropriate survey (interview or self-administered questionnaire) harvests evidence⁷. Data entry digitises responses to the questionnaire, capturing exactly what they said. The task of the keyboard operator does not include editing, interpreting or representing the respondent; it is just to digitise exactly what the respondent communicated. A technical computing exercise produces the preliminary analysis. An entirely separate exercise, focus groups in each sentinel site or even household revisits, interprets the results and proposes solutions. Each self-contained step in the sequence adds value without compromising information produced by previous steps.

The approach further held that an epidemiological sample of domains (usually

communities) could result in representativeness, with the aim of improving health of women and children, repeated cycles of measurement in the same sites could be a powerful tool to understand and to use community engagement in bringing about that improvement⁸.

Sentinel community surveillance (SCS) output was coterminous multilevel (personal, household and community) data that engaged stakeholders at each level⁹. It proposed that clustering (people who live next door to each other are probably more alike than people who live in different parts of the country) was an important health development dynamic, not just something the researcher should “control”. By engaging residents of the sentinel sites in dialogue about their survey results (after completing standardised questionnaires), the approach was less about what the batteries of questions added up to in the theory-based standard, and more about what people meant and what the enquiry meant to them.

Against this background of approaching epidemiology as a living language, over the years I have attempted to improve the relevance of gender violence epidemiology.

1.2 Defining terms

1.2.1 Gender

The papers in this thesis use gender to refer to socially constructed sex roles, following Money's original use in the 1950s and in 1970-1980s “second wave” feminist theory¹⁰^{11 12}. The concern is about social meaning of power and sexual roles, going beyond the view that gender is “about women” and the use of gender to mean biological sex. Intentionally or unintentionally, these uses de-problematize gender and detract from understanding and changing inequalities based on power gradients between men and women.

1.2.2 Violence

Sometimes inequalities and power gradients express themselves through violence.

There is a body of literature that seeks to understand why this happens, from a variety of perspectives. Ferguson presents the radical-cultural feminist view that “heterosexual sexual relations generally are characterised by an ideology of sexual objectification (men as subjects/masters; women as objects/slaves) that supports male sexual violence against women”¹³. Like several other feminists of the multi-cultural school in the USA, Collins emphasised multiple sources of women’s oppression structured by interdependent economic, political and ideological dimensions¹⁴. In this context, violence is a degree of control, a degree of maintaining oppression.

In this thesis, “gender-based violence” (GBV) refers to violence in the context of socially constructed differences of sex, again following Money’s original use. Gender violence means the same thing. As the word “based” adds nothing useful, I use the term “gender violence” throughout this overview.

Gender violence is a complex of violence, sex, power and gender that continues to be theorised in a variety of ways. Much but not all of it is sexual. A man forcing sex on a woman stereotypes male superiority and female submission. But if a man forces – or men force – a boy or another man, or if a woman forces a boy, to submit to sex, that too is violence around sex roles. There is a wealth of literature dealing with these issues, much of the feminist thought on it summarised by Tong¹⁵. Harvey and Gow focus on the historical links of women being viewed as property and a gender role subservient to men or other women¹⁶. The World Health Organisation draws attention to some practical implications^{17 18}. Without underestimating the nuance or detail in this literature, the papers in this thesis view gender violence as all violence perpetrated around sex roles between men and women, men and men/boys, women and

men/boys, and women and women/girls.

Not all gender violence is sexual. Women inflicting female genital mutilation (FGM) on girls or other women is not sexual violence in the usual sense of the term, but it is violence laden with social meaning about power and gender roles^{19 20}.

In the early 1990s, at the time of some of our work in Pakistan²¹, femicide by a husband was not in the penal code. A mother-in-law might kill a daughter-in-law for being undisciplined or inadequate, or because her family had not paid the full dowry demanded; this killing was a crime but not typical gender violence. But if the husband accepted responsibility for the killing, as they often did, it was not a crime yet it was more typical gender violence. No one would be punished and the murder was trivialised as domestic violence. The papers in this thesis would consider both killings as gender violence. Both hinge on violent enforcement of power associated with sex roles, although the violence is not sexualised.

Words matter in describing and researching gender violence. Several terms are in common use within the bigger construct of gender violence. Intimate partner violence (IPV) is gender violence between spouses. Domestic violence (DV) includes IPV but also elder abuse and child abuse. The term “domestic” is not favoured by some researchers, as it can imply “private” or “small-scale” and thus unimportant. Sexual violence and sexual abuse have wide use, especially in relation to children. Child sexual abuse (CSA) is increasingly prominent in literature from the USA. Referring only to sexualised violence against children, this excludes other aspects of gender violence.

Perspectives of violence also matter. If participants in a study do not consider being forced to have sex as violence, does that count as gender violence? If children have come to believe it is “normal” to have sex with fathers or uncles, does that count as gender violence? Some would argue that a central strategy of paedophiles is to have

their victims regard the abuse as normal^{22 23}. The papers in this thesis recognised such cases as gender violence, operationalizing this judgement with caution. Cognisant of the limits of a few questions in characterising gender violence, the papers presented here all attempted to specify a particular form of violence in a particular setting (“Were you hit or beaten physically during your last pregnancy?”) This has the disadvantage of excluding other kinds of abuse. It has the advantage, by specifying the type of abuse, of firmness of the indicator.

Language is part of the problem of gender violence epidemiology. Concepts differ across cultures and across languages. Few of the dozens of languages CIET worked in across 10 countries in Southern Africa had a specific word for “rape”. “Forced sex” can refer to dry sex, a well-recognised intercourse modality where application of drying agents to the female genitals simulates the physical conditions of rape with intention of excitement^{2425 26}. Design focus groups (used to clarify concepts and language used in the design of instruments) and piloting in several provinces of each country arrived at a formulation we were able to translate into all languages, in all countries: “forced or persuaded to have sex when you did not want to”.

1.2.3 Gender violence epidemiology

An increasing part of the gender violence literature comes from an epidemiological perspective. Appendix 1 includes 75 epidemiological studies over the last decade. Lacking the depth and experiential aspects of qualitative approaches, modern epidemiology adds value by documenting the scale of the problem and thus its population relevance. Until recently, gender violence epidemiology – including some papers in this thesis^{27 28 29 30} – focussed on occurrence (how common, whether incidence or prevalence) and on risk factors for gender violence^{31 32}. In the last few years, the field has progressed rapidly to include randomised controlled trials (RCTs)

testing population-based interventions that address gender violence; some of these have started to show positive results^{33 34 35 36}.

With the increasing concern for rigour, best practices in gender violence epidemiology are emerging. A WHO expert panel on gender violence recently approved a questionnaire with standard questions^{37 38}. Other best practices include analysis of cluster samples adjusting for the effect of clustering on measurement^{39 40}. Particularly in RCTs, it has become standard practice to address statistically the potential effects of missing data^{41 42}. These current best practices seek to quantify or to contain the uncertainties implicit in epidemiological data.

An unavoidable step in gender violence epidemiology is to reduce this complex, often life-shattering experience, to a few questions. Some questions are direct (Have you ever been forced to have sex against your will?). Several “standard” instruments and scales attempt to document gender violence in its different dimensions (physical, psychological, financial, and so forth) and all reduce the real life event. Another reduction assumes that if a line of questions works in one country or cultural setting it will work in others. The reductions carry information, not least about the assumptions behind the work.

There are branches of the healing and caring sciences (like nursing and psychology) concerned with de-constructing gender violence and understanding it more fully.

Psychology has tools that help to understand the effects of gender violence on individuals. These tools explore motivations and responses. Epidemiology, at least in the papers presented here, took on a quite different task of identifying actionable risk factors for gender violence, with an explicit view to its prevention. The papers did not enquire about the nature of sexual violence or how people might be affected by it. The concern was about who is more likely to suffer gender violence and some implications of this.

Epidemiological tools necessarily summarise gender violence and lose some aspects of its meaning – in the translation to words and concepts. If the indicator, the question used in an interview, tells a story, it does so most of all about what the story allows us to omit. If, in response to a direct question, a woman says she feels safe at home, she probably indicates a low risk of physical IPV. If she declines to answer a direct question about physical IPV and says she does not feel safe at home, again there is an indication of what she omitted.

The paradigms underlying the “standard questions” also carry information and raise questions about latent variables behind the battery of standard variables. The paradigm underlying reduction of multiple variables to composite variables also carries information. For example, a 2009 Lancet article⁴³ combined unwanted touches with forced penetrative sex as a single indicator of sexual abuse of girl children. But unwanted touching could have very different co-variants than forced sex. The argument is not that unwanted touching is irrelevant, but that its inclusion along with forced penetrative sex in a single indicator may cause loss of information about the latter. Reductions change the shape of associations and do so in a way that loses information about gender violence. This particular reduction of unwanted touching to penetrative sex carries information about how the researchers see sexual abuse of girls. It does not necessarily coincide with the way girls see abuse.

Among several areas of contemporary relevance to the work in this thesis, impact assessment in HIV prevention stands out. Randomised controlled trials of gender violence prevention have begun to be reported and they will be increasingly common in the coming years. These trials will focus on impact assessment, trying to answer the key question: how much each intervention decreased gender violence. There are many drivers of this growing interest in impact assessment of gender violence prevention interventions, but one strong driver is the link between gender violence and the

HIV/AIDS epidemic in southern Africa. Our evidence synthesis on this subject⁴⁴ (Paper 8, below) concluded that around one third of the southern African population could be involved in the gender violence-HIV dynamic. Sexual violence can lead to HIV infection directly, as trauma increases the risk of transmission for victims and perpetrators. More importantly, GBV increases HIV risk indirectly. Victims of childhood sexual abuse are more likely to be HIV positive, and to have high risk behaviours.

With the growing recognition of the role of gender violence in the HIV epidemic, evidence from higher level research (such as randomised controlled trials) has begun to attract policy attention and, with that, tougher questions: how was the outcome measured (cluster versus simple random survey), how reliable and valid is the measurement (questions used, sample size), what else might explain the finding, how much missing data is there and how might this distort the findings. These questions relate to the uncertainties of epidemiological measurements of gender violence. This thesis hopes to contribute towards systematising approaches to uncertainties arising in a decade or more of research into gender violence epidemiology.

1.3 The papers in this PhD by prior publication

This thesis comprises 11 first author or single author papers published between 2004 and 2011.

1. **Andersson N**, Roche M. Gender in evidence-based planning. *Development in Practice* 2006;16:2.

2. **Andersson N**, Cockcroft A, Ansari N, Omer K, Chaudhry UU, Khan A, Pearson LW. Collecting reliable information about violence against women safely in household interviews: experience from a large-scale national survey in South Asia. *Violence Against Women* 2009;15(4):482-96.

3. **Andersson N**, Cockcroft A, Ansari U, Omer K, Ansari NM, Khan A, Chaudhry UU. Barriers to disclosing and reporting violence among women in Pakistan: findings from a national household survey and focus group discussions. *Journal of Interpersonal Violence* 2010;25(11):1965-1985
4. **Andersson N**, Ho-Foster A, Matthis J, Marokoane N, Mashiane V, Mhatre S, Mitchell S, Mokoena T, Monasta L, Ngxowa N, Pascual Salcedo M, Sonnekus H. A national cross- sectional study of views on sexual violence and risk of HIV infection and AIDS among South African school pupils. *British Medical Journal* 2004; 329(7472): 952.
5. **Andersson N**, Ho Foster A. 13,915 reasons for equity in sexual offences legislation: a national school-based survey in South Africa. *International Journal for Equity in Health* 2008;7:20.
6. **Andersson N**, Paredes-Solís S, Milne D, Omer K, Marokoane N, Laetsang D, Cockcroft A. Prevalence and risk factors for forced or coerced sex among school-going youth: national cross-sectional studies in 10 southern African countries in 2003 and 2007. *BMJ Open* 2012; 2:e000754. Doi:10.1136/ bmjopen-2011-000754
7. **Andersson N**, Ho-Foster A, Mitchell S, Scheepers E, Goldstein S. Risk factors for domestic violence: eight national cross-sectional household surveys in southern Africa. *BMC Women's Health* 2007,7:11
8. **Andersson N**, Cockcroft A, Shea B. Gender-based violence and HIV: relevance for HIV prevention in hyper-endemic countries of southern Africa. *AIDS* 2008;22 (suppl 4): S73-S86.
9. **Andersson N**. Prevention for those who have freedom of choice or among the choice-disabled: Confronting equity in the AIDS epidemic. *AIDS Research and Therapy* 2006;3:23.

10. **Andersson N**, Cockcroft A. Choice disability and HIV status: evidence from a cross-sectional study in Botswana, Namibia and Swaziland. *AIDS and Behavior* 2012;16(1):189-91

11. **Andersson N**, Omer K, Caldwell D, Dambam MM, Yahya-Maikudi A, Effiong B, Ikpi E, Udofia E, Khan A, Ansari U, Ansari N, Hamel C. Male responsibility and maternal morbidity: a cross-sectional study in two Nigerian states. *BMC Health Services Research* 2011;11(supp2):S7

The papers cluster into three themes: (i) methods in gender violence epidemiology; (ii) gender violence and HIV; and (iii) the role of gender violence in maternal morbidity.

1.3.1 Methods in gender violence epidemiology

Three papers looked at the methods of gender violence epidemiology. Paper 1, published in *Development in Practice*⁴⁵ summarises five practical steps as my first effort to strengthen the gender content of epidemiology (analysis of existing data, disaggregate survey data by sex of the respondent and the interviewer, gender stratified focus groups and cognitive mapping, gender related risk and resilience, design and logistics involving women and men, victims and non-victims). The central concern was quality and the meaning of the research findings to produce more useful and reliable evidence. This thesis builds on the five steps, attempting to make reliable estimates of gender violence more reliable for advocacy or prevention.

The second paper in *Violence Against Women* from the Pakistan Social Audit of Abuse Against Women (SAAAW)⁴⁶ is a first case in point. This paper focused on a key uncertainty in gender violence epidemiology, namely non-disclosure on the part of respondents. It describes a practical approach, since characterised as the “reverie training” to reduce non-disclosure during a large scale national survey. Chapters 3 takes up this work as it applies to the other papers presented here.

This approach definitely increased the yield of the quantitative enquiry in Pakistan, but it did not guarantee full disclosure. Also based on the Pakistan SAAAW, Paper 3 in the *Journal of Interpersonal Violence* paper⁴⁷ describes a qualitative approach – consulting age and sex stratified focus groups in every survey site – to understand why women who in the survey said they suffered gender violence had not told anyone else about it. Focus groups gave clear descriptions of disincentives like reputation and dishonour to the family; how reporting might exacerbate domestic violence and lead to divorce and loss of their children. The groups also gave a clearer view of potential solutions. They were sceptical about community leaders, councillors, and religious leaders supporting solutions or even reporting of violence.

This study confirmed that, spelled out in the *Development in Practice* paper, the gender concern must go beyond stratification by sex. In SAAAW, we separated younger women, who were in a weaker position in the households, from the more senior women (the mothers-in-law), in a stronger position. Younger women would not speak freely in front of men or the senior women, with whom they were at a power disadvantage – a power disadvantage between women but hinged on gender roles. Taken together, these three papers set the scene for the other papers, which used some of the methods and took advantage of lessons learned in early work.

1.3.2 Gender violence and HIV in southern Africa

Five epidemiological studies (papers 4-7, 10), a systematic review (paper 8) and one opinion piece (paper 9) explored the prevalence and risk factors for gender violence in southern Africa, and the implications this has for the HIV epidemic.

Published in the *British Medical Journal*⁴⁸, Paper 4 was a national cross-sectional study in South Africa which examined gender violence among male and female school children. Concern about non-disclosure, particularly in face-to-face interviews, led us to

opt for anonymous self-administered questions, with a facilitator in the classroom reading out the questions and response options, to help level the playing field for less literate students. This format might have made it easier for boys, in particular, to disclose abuse. The study focussed on attitudes relevant to HIV risk and how these related to a history of sexual violence. "Victims become villains" was an emerging theme – we reported a strong association between perpetration of sexual violence and having suffered sexual violence at a young age. Recognised in the literature^{49 50}, this is consistent in all the papers in this section.

Paper 5, a companion paper⁵¹ focussed on the rights of 126,696 male school pupils involved in this national study. The first epidemiological study from southern Africa to raise the issue of sexual abuse of boys, this focussed on the gendered definition of rape. Prior to 2007, forced sex with male children in South Africa did not count as rape but as "indecent assault", a much less serious offence. As with the *BMJ* paper, which reported prevalence and attitudes in girls and boys, we have no idea about how many others had suffered sexual abuse but did not disclose it in the survey. If we accept the premise that some boys might not disclose but few will fabricate a false history of violence, these papers describe the *minimum* levels of prevalence. Although the high rates of reported sexual violence against both boys and girls are disconcerting in their own right, a continuing concern is in the unknown level of non-disclosure. An uneven shift in the non-disclosure rate could render an impact assessment uninterpretable.

A subsequent study (paper 6) looked at the same issues among school-goers across 10 countries in southern Africa⁵². This paper reported on the analysis of two cross-sectional surveys of in-school youth, again by facilitated self-administered questionnaire, in 2003 and 2007. The same instrument in the same schools allowed us to compare rates between 2003 and 2007 (no decrease among female youth in any country and inconsistent changes among male youth). But shifts in non-disclosure

could make this difficult to interpret. Among 16 year olds in 2003, 10% (691/6939) declined to answer the question about sexual violence compared with 6% (429/7092) in 2007. Given the non-significant shift in the proportion who reported sexual violence (23.4% compared with 21.8%), the drop in non-response could conceal an important reduction in sexual violence. Over time, disclosure patterns can change.

Three papers (papers 4, 5 and 6) in this series deal with children at school. They excluded young people not in school, some of whom gender violence forced out of schooling through unwanted pregnancy. Young people fending for themselves out of school may face a higher risk of gender violence. The rates of gender violence among school-going children, high as they were, are probably underestimates of the rates among all young people.

A cluster or group variable refers to a collective attribute usually with a shared spatial identity. For example, high altitude or coastal communities describe broad group characteristics. Proximity to factories or power plants might describe another. One methodological advance of the regional study in Paper 6 was identification of cluster variables (a higher proportion of adults in favour of transactional sex, and a higher rate of intimate partner violence) as risk factors for sexual abuse of children. This begins to deal with the exposure to a clustered culture of sexual violence, to some extent overcoming the limitations of simply adjusting the standard error to take account of incidental clustering.

Taking up similar issues among adults, the 2002 regional study of adult gender issues in 29 languages (paper 7) produced comparable results across eight southern African countries⁵³. This study did not take account of clustering, nor did it pay special attention to missing data (around 6% on the intimate partner violence question). Although we did not have the depth of information on the nature or extent of violence, this paper reiterates the theme that gender violence is not simply a matter of male perpetrators

and female victims.

Notwithstanding this, a closer consideration of the dynamics of female victimhood was productive. A systematic review (paper 8) published in *AIDS* highlights the risks among younger women⁵⁴, concluding that most gender violence implications for HIV risk are indirect, with risky sexual behaviours among those who have experienced gender violence, possibly related to self-esteem issues. This increases the urgency of tackling the problem of gender violence in southern Africa, and measuring levels of gender violence and changes in this level. Recognising this was the spur for writing this thesis about important uncertainties of the epidemiological measurement of gender violence.

The opinion piece in *AIDS Research and Therapy*⁵⁵ (paper 9) sets out my view about how gender violence impacts on the AIDS epidemic, how it limits the ability of many people – especially young women – to protect themselves from HIV infection. This paper coined the term “choice-disability” to characterise the gendered process that places young women in southern Africa at disproportionate risk of HIV infection. Choice disability does not only affect young women, but it does help to explain their high risk of acquiring HIV infection. The choice disabled include people who have experienced gender violence, perhaps as children, and now have their world view coloured by that experience. It might include the younger person in trans-generational sexual relationships, at a disadvantage in a steep power gradient, or women (or men) involved in transactional sex with partners of any age providing material goods in return for sex. It might include women who are unable to insist on a condom, even when they believe their partner is at risk of HIV, perhaps because they fear violence if they try to insist; or women who wish to retain the support of their church, where the pastor insists they must not use condoms.

Based on the thinking laid out in the opinion piece, I started a cluster randomised cluster controlled trial in Botswana, Namibia and Swaziland to examine the impact of

one or a combination of interventions to reduce choice disability. *AIDS and Behavior*⁵⁶ published an analysis from the baseline survey in Botswana, Namibia and Swaziland (paper 10). The face to face interview documented indicators of choice-disability (low education, educational disparity with partner, experience of sexual violence, experience of intimate partner violence (IPV), poverty, partner income disparity, willingness to have sex without a condom despite believing partner at risk of HIV), and HIV risk behaviours like inconsistent use of condoms and multiple partners. The paper provided empirical evidence that choice disability – particularly that associated with gender violence – may indeed be an important driver of the AIDS epidemic. Among both women and men, experience of IPV, a combination of IPV and age, and a combination partner income disparity and age were all associated with being HIV positive in multivariate analysis. Additional factors were low education (for women) and poverty (for men). For both men and women, taking choice-disability indicators into account eliminated the association between HIV status and the conventional risk factors of multiple partners and inconsistent condom use.

1.3.3 Gender violence and maternal morbidity

Nigeria has one of the highest maternal mortality rates in the world and the final paper (paper 11) illustrates this important dimension of gender violence⁵⁷. The explicit view underlying the paper is that maternal mortality is a fatal form of gender violence, violence that begins with female genital mutilation and goes on through violence between intimate partners, to end in disease or death related to childbirth. Again, the importance of missing data, the way of handling clustering and the management of history of gender violence were central. The most consistent and prominent of 28 candidate risk factors and underlying determinants for non-fatal maternal morbidity was intimate partner violence (IPV) during pregnancy. Other factors in the final multivariate model were not discussing pregnancy with the spouse and, independently, IPV in the

last year. IPV, women's fear of husbands or partners and not discussing pregnancy with the spouse are all within men's capacity to change. This raised the question of a role for men in reducing maternal morbidity, which is now the focus of a major randomised controlled trial in Nigeria.

1.4 Cumulative knowledge gained

Overall messages from the papers include:

- Perhaps the first overarching lesson is that gender violence *can and must* be the subject of high level epidemiological study that goes beyond characterisation of women as victims and men as perpetrators. In southern Africa, sexual abuse remains common among both boys and girls and men also report IPV. Gender violence has other serious consequences, including its contribution to maternal morbidity and mortality; solutions involve proactive involvement of men.
- Non-disclosure of gender violence requires special attention, and the papers describe experience with two such methods – special training of interviewers for face to face interviews and facilitated, anonymous self-administered questionnaires among school pupils. All field studies described in the papers involved self-reporting of gender violence (whether experienced or perpetrated) where missing data and non-disclosure are inherent problems. The similar levels of missing data (around 6%) from self-administered (papers 4, 5 and 6) and administered questionnaires (papers 2, 3, 7, 10, and 11) are no assurance that those who did answer gave the true response. Another concern is the level of gender violence experienced by those who did not participate due to absence from the household or school. Chapter 3 explores the reasons for missing data through focus group discussions, in attempt to better understand missing data.
- All field studies included here were cluster samples and, in common with studies on

IPV from other authors (see Appendix 3), they did not distinguish between informative and incidental clustering. Incidental clustering occurs because people who live near each other tend to be more similar to one another than they are to people who live some distance away; this can lead to underestimation of the true variance. Informative clustering occurs when being part of the cluster matters or is part of the causal chain. For example, local pollution might put some clusters more at risk than others, or a local culture like wife beating or child abuse might “catch on” in one cluster but not in another. The published papers include one that adjusts for incidental clustering (Paper 11) and one that uses the cluster average of household response as a variable (Paper 6). Even then, the analysis assumed that clustering was incidental and that it falsely narrowed the confidence intervals. One study (in *BMJ Open*) used group variables from a companion household study to examine a cluster effect among school children. The idea that gender violence does cluster, that this clustering might be informative and even the basis of community-based interventions, increased the pressure for a practical way to separate between informative and incidental clustering. Contrasting with other analytical approaches which are difficult to carry out and theoretically opaque, Lamothe extended the popular Mantel-Haenszel procedure in a way that is quite intuitive. Chapter 4 tests how relevant this is to gender violence epidemiology.

- A history of gender violence might influence other associations through association with both the exposure and the outcome without being a classic confounder. The concern about a history of gender violence affecting other associations in a more complex way than as a classical confounder arose particularly in relation to Paper 7, in which we found children who had experienced sexual violence had different attitudes and behaviours than those children who had not experienced sexual violence. At one point or another in the analysis, most of the papers in this thesis

treated a history of gender violence as a potential confounder, an approach that might be incorrect if a history of gender violence is causally related to the exposure or outcome. This thesis revisits the issue of causal relationships. We need to find better ways of teasing out the relevance of a history of gender violence as a covariate in gender violence epidemiology (Chapter 5).

1.5 Research question

In the context of gender violence epidemiology, the research question is: Can we reduce the uncertainties that are a consequence of missing data or non-disclosure, clustering, and unrecognised causal relations in the data?

1.5.1 Missing data

The assumption that data are missing at random allows use of multiple imputation to estimate what those data might hold, given the data to hand. Assuming those who do not respond to questions about violence have not suffered violence can be even more misleading. Chapter 3 revisits the issue of missing data in a systematic review of studies on intimate partner violence. The objective is to flesh out a fuller approach to missing data in gender violence epidemiology.

1.5.2 Clustering

The studies in this thesis used cluster samples. There are many techniques to adjust for cluster sampling; the challenge is to distinguish whether the clustering is informative or incidental. In gender violence epidemiology, informative clustering might be the shared experience of a local culture that either supports or discourages violence.

Chapter 4 takes on the challenge of distinguishing incidental and informative clustering, revisiting some of the published papers. It tests a computational approach that makes it

possible to take informative clustering into account in gender violence epidemiology.

1.5.3 Unrecognised causality

The measured occurrence of gender violence depends to some extent on externalities – education gradients between interviewers and interviewees, or the chance the interview is being overheard by a third-party. But the measured occurrence also derives from the influence – measured or unmeasured – of gender violence. What *e/se* one measures brings into sight the influence on the association or, put in standard epidemiological terms, modifies the effect parameter. These relationships carry information about causality and sometimes lack of causality.

Accurate measurement of gender violence depends on an ability to tease out its relationships with risk factors, covariates and intermediate outcomes. A history of sexual violence or repeated alcohol abuse might affect intimate partner violence. Documenting these histories allows one to understand more about the relationships; ignoring these histories does not change their influence on IPV, it just ignores this influence.

Gender violence can also be an intermediate outcome between putative causes and important health outcomes. For example, gender violence might be a factor in women's access to care and maternal mortality. Gender violence might be on the causal pathway between HIV prevention education and HIV status.

Chapter 5 addresses the flaw in many studies, including some presented here, of treating gender violence as a potential confounder in multivariate analysis when, as in the case of HIV and maternal mortality, it could be somewhere on the causal pathway. The objective of this section is to identify an approach that I will use in future work and that might also be more widely applicable in gender violence epidemiology.

CHAPTER 2. METHODS

Summary

This chapter describes the methods to address the research question how best to reduce these uncertainties in gender violence epidemiology. A systematic review of intimate partner violence studies over the last decade includes randomised controlled trials, longitudinal studies, case-control and cross-sectional studies to documents approaches to missing data and clustering in the gender violence epidemiology literature. Focus groups in Zambia, Nigeria and Pakistan explored missing data in gender violence questionnaires. In survey sites of studies published in this thesis, focus groups discussed mechanisms for participant missing data and for item non-responses on questions about gender violence. A comparison of five different approaches to clustering incorporates conventional and new analysis techniques. Reanalysis of several data sets explores the implications of unrecognised causal linkages of gender violence.

2.1 Critical review of the published papers

Chapter 1.3 provided a summary of the methods and findings of the published papers in this thesis. I summarised the limitations of these papers and the three uncertainties (missing data, clustering and unrecognised causality) in Chapter 1.5. This critical review led me to undertake more work on the uncertainties. This chapter describes the methods I used to examine the uncertainties in greater depth, while the background and findings are in Chapters 3, 4 and 5.

2.2 Review of missing data in intimate partner violence studies

I conducted a systematic review of the handling of missing data about intimate partner violence (IPV) in experimental, longitudinal and cross-sectional studies. I chose this particular segment of the gender violence literature rather than child sexual abuse (CSA), female genital mutilation (FGM) or other dimensions of gender violence for two reasons. First, IPV is common and well delineated. Second, IPV seems to account for most of the growth in the literature related to gender violence epidemiology. More than two dozen randomised controlled trials of IPV have been conducted, compared with the handful of high quality studies in CSA, violence against the elderly, FGM and other aspects of gender violence.

I modified the search strategy for MEDLINE® and for the other databases. It was possible to improve sensitivity of search strategies by including text and key words from relevant trials accessed by the authors that were not detected by earlier searches. In order to maximize sensitivity, searches included and then excluded keywords referring to study design. Additional searches looked for publications in languages other than English and covered several databases: Ovid MEDLINE®, 2000 to March 2012; preMEDLINE®, through 5 March 2012; EMBASE, 2000 to March 2012; PsychINFO, CINHALL, and NLM gateway up to March 2011; The Cochrane Database of Systematic Reviews, Issue II, March 2012. I searched the Cochrane Controlled Trials register with the text words "AIDS/HIV; STD; ST; sexual violence (SV); intimate partner violence (IPV)". Also searched were the HIV/AIDS and STD registers of studies; Proceedings of the International AIDS Conferences in AIDSLINE; Proceedings of the International Society of STD Research (ISSTD); behavioural studies conferences focusing on HIV/AIDS, STIs, sexual violence and IPV. In addition to Google Scholar, I also scanned key journals in this field, including AIDS, and examined bibliographies of studies and earlier reviews for references to other relevant evaluation studies.

There were 75 quantitative studies with IPV as an outcome published between January 2000 and March 2012. From each study, a research assistant extracted information about the level of missing data on intimate partner violence, and about how they handled missing data in analysis, either explicitly stated by the authors or based on our examination of the numbers in the reported analysis. We categorised studies according to whether they assumed the IPV data were missing at random (MAR), or that none of the missing data cases suffered IPV. Under the MAR assumption, the missing data are deemed ignorable because the authors assume the measured responses to apply to non-responders. The results of the systematic review are presented in Chapter 3.

2.3 Qualitative research on missing data

In order to document community-based views of missing data in gender violence surveys, I designed a qualitative study comprising focus group discussions in four very different settings, in survey sites where we had previously undertaken a quantitative household survey enquiring into, among other things, IPV. The focus group discussions covered why people might not answer a questionnaire at all and why data might be missing for questions on IPV, and how those people who do not respond to such questions might differ from those who do respond, with regard to their IPV experience.

The Zambian focus group discussions took place in Lusaka in 2011, relying on snowball recruitment in an urban site where we had undertaken household surveys in 2002 and 2007. The female facilitator identified two women who invited their friends who in turn invited their friends (total 11 women). The male facilitator recruited four men to start, who in turn invited their friends (total 11 men). Using a written guide, the facilitator explored with each group the reasons for different types of missing data (absent at the time of the survey, declined the interview, participated in the survey but did not answer the question about IPV). They also estimated likely rates of experience

of IPV among the different groups of “missing data subjects”. A rapporteur took notes in the men's group, which declined the digital recording used in the women's group.

Ethical clearance for the related Zambian quantitative study came from the Ministry of Health (certificate 24 June 2007).

In Nigeria, we conducted focus group discussions in Bauchi state (predominantly Muslim) and Cross River state (predominantly evangelical Christian) in 2011. In a site in each state where we had undertaken a household survey, community facilitators recruited women and men to separate focus groups. Following the same guide as in Zambia, the facilitator explored with each group the reasons for missing data and likely proportions of missing data subjects who would have suffered physical IPV. All four groups (two in Bauchi and two in Cross River) declined to have their session digitally recorded so a rapporteur took notes, without recording names or identities. In Bauchi State, the Ethics Review Committee of the State Ministry of Health provided approval for the related survey on 5 June 2009. The Cross River State Research Ethics Committee approved the methods and survey instruments on 28 August 2009, and the qualitative procedure in January 2010.

In Pakistan, in one of the previous survey sites near Lahore, local contacts that had supported the previous survey convened a female group of eight participants and a male group of nine in 2011. Facilitators used the same guide as in Zambia and Nigeria. A rapporteur took anonymous notes of proceedings. The CIETinternational ethical review board gave approval for the related household survey and focus group discussions.

In each country, the rapporteur, together with the field coordinator, prepared a report on the discussions of each group, and the field coordinator translated this into English. Together with the field coordinator who covered the discussions in Nigeria and Pakistan, I reviewed all the reports, identified common themes, and extracted quotes.

The results of this qualitative study about missing data are included in Chapter 3.

2.4 Correlated group data: incidental and informative clustering

Lamothe applied a robust variance estimator for cluster-correlated data^{58 59} to address clustering in Mantel Haenszel (MH) estimation of a fixed or non-fixed odds ratio (OR) from a stratified last stage random sample⁶⁰. The fixed OR approach assumes incidental clustering, while the non-fixed OR approach allows for informative clustering. In a 2011 paper, we applied the two cluster-adjustments to an example of food aid and food sufficiency from the Bosnian emergency (1995-96) and compared these with conventional Generalised Estimating Equations (GEE) and Generalised Linear Mixed Model GLMM using a Laplace adjustment⁶¹. The MH adjustment assuming incidental clustering (fixed OR) generated a final model very similar to GEE. In the Bosnian study, the MH adjustment that does not assume a fixed odds ratio produced a final multivariate model and effect sizes very similar to GLMM.

I examined the approaches to incidental and informative clustering in gender violence data, in a re-analysis of the data from the 2002 eight country study of intimate partner violence (Paper 4), previously analysed using the Mantel Haenszel procedure without any cluster adjustment.

Because of the probably different meaning of the question for men and women, I re-analysed only female respondents to the question “In the last year, have you and your partner had violent arguments where your partner beat, kicked or slapped you?”

The reanalysis looked at person and household level factors: age 20-39 compared with younger and older women, food security, overcrowding of household, urban/rural, remunerated income, education, language, multiple partners in the last year.

In addition to personal and household level (between partner education or income

gradients) factors, the analysis included several *group* level factors: country (higher or lower level of IPV), language, urban/rural residence, and community-level variables created for negative attitudes to sexuality and for occurrence of gender violence. These community-level variables categorised communities (clusters) into those having above or below the country average prevalence of several negative attitudes, and above or below the country average level of IPV.

I re-analysed the potential risk factors for self-reported IPV using five multivariate approaches: (i) the naïve stratified MH; (ii) the Lamothe cluster-adjusted MH; (iii) generalised estimating equation (GEE), accessed in the R package *Zelig*⁶², applying an exchangeable correlation structure (logit.gee model, 1000 simulations); (iv) mixed effects modelling using the R package *lme4*⁶³, achieving a fit of fixed and random effects by the Laplace approximation⁶⁴ and (v) the Lamothe cluster adjusted confidence interval that does not assume a fixed effect across clusters, estimating the OR as the midpoint of the confidence interval.

In each approach, multivariate models began with personal-, household- and group-level factors. Initial models began with all candidate variables, and I used backwards elimination until only statistically significant variables remained. The GLMM treated one personal (age) and one group variable (country) as random effects. I present this re-analysis in Chapter 4.

2.5 Revisiting gender violence as a covariate

Chapter 5 re-examines the effect of gender violence as a third variable in associations between a number of putative causes and outcomes, drawn from the data sets of several different papers:

- The study in Pakistan that is the basis for Papers 2 and 3

- The study of school children in South Africa that is the basis for Papers 4 and 5
- The eight country study in southern Africa that is the basis for Paper 7.
- The 2008 study in Botswana, Namibia and Swaziland that is the basis for Paper 10

This chapter considers the influence of a history of gender violence on several outcomes including HIV status, sexual behaviours and intentions, with putative causes like educational or socio-economic status, attitudes and behaviours. In each case, I examined the effect of treating a history of gender violence as a confounder in the association, considering whether there was evidence of effect modification by such a history, and looked at multiplicative and additive models for the interaction with history of gender violence.

CHAPTER 3. MISSING DATA

Summary

In a questionnaire survey, participant non-response can be random if rain stops the interview or potential respondents are absent. Item non-response can sometimes be random through technical glitches or if the interviewer inadvertently skipped the question. In these cases, the missing data from non-response can be ignorable.

Missing data are not unique to gender violence epidemiology but, with gender violence, the reasons data are missing might well be related in some way to the violence. Very few gender violence studies in the published literature take missing data into account in a formal way. Gender stratified focus groups in Zambia, north and south Nigeria, and Pakistan discussed the possibility that non-response might be biased by gender violence. They concluded that both participant and item non-response would be affected as victims of gender violence are less likely to respond than non-victims. This leads to underestimation of the incidence of gender violence. This is especially important in interventions studies. A differential reduction in missing data in intervention communities, as it becomes more normal to talk about gender violence in intervention sites, could reduce the measured impact compared with the control sites. Part of the solution is to reduce missing data by a training protocol that increases disclosure.

3.1 Ignorability of missing data

Almost all gender violence research rests on voluntary disclosure, filtered and refracted in an unpredictable way through several lenses in the research process, in addition to the education, class and culture of respondents.

Some data are missing for reasons quite unrelated to the gender violence content of the survey. This can affect who participates (participant non-response): unexpected rain

may have stopped the interview, or the potential respondents were absent because they simply had another appointment outside the household that day. It can also affect a single item (item non-response) through a technical glitch deleting part of a record; or an answer to a question was missing because the interviewer inadvertently skipped the question. Data missing for these reasons are largely ignorable, in the sense that one expects the people whose data were missing to be the same as those who did respond, at least with regard to the variables for which data are missing^{65 66}.

Most statistical approaches assume the data are missing at random, which would be reasonable for the above cases. Multiple imputation is increasingly accepted as fitting statistical management in this setting, to generate substitutes to replace the missing data⁶⁷. By substituting missing data with imputed data, statistical analysis can be managed as though there was a complete data set. Multiple imputation occasionally shows a large gap between the average of the imputed data sets and the original, demonstrating that the data are not missing at random. In *some* of these situations, other methods can be used, including last observation carried forward, mean imputation or regression-based imputation⁶⁸.

But in gender violence epidemiology, it is possible that *most or all* missing data are non-ignorable. Some eligible potential participants fail to respond to questions for reasons related to the content. People eligible for inclusion in the survey might absent themselves or make themselves unavailable; they may decline to take part in the survey at all; or they may take part but decline to answer the specific questions about their experience. One cannot assume that those who make themselves unavailable or who decline to respond to questions are the same as those who respond. If their rate of gender violence is different (often higher) than that of respondents, then analysis assuming they are the same, ignoring them altogether, will result in under-estimates of the rate of gender violence.

Missing data on gender violence is a particular concern in intervention studies.

Interventions that affect respondents' mindfulness about gender violence might increase the disclosure rate and decrease missing data. From our review of IPV intervention studies, three out of 23 studies since 2000 provide information to evaluate differential missing data in intervention and control groups. Bair-Merritt⁶⁹ reported 16% of the control group and 12% of the intervention group skipped the GV question; Pronyk⁷⁰ reported that 55% of the intervention group skipped the GV question compared with 58% of the control group; Kalishman⁷¹ reported 5% of intervention group and 13% of the control group were lost to follow-up.

The intervention makes it more acceptable to talk about gender violence, compared with control communities. The differential reduction of missing data and probable increase in disclosure could translate as an apparent increase in gender violence, masking any real reduction produced by the intervention. So in trials that test new ways to decrease gender violence, however well they might be done, one risks failing to detect a decrease in gender violence, simply because fewer data are missing after the intervention. With the increased number of intervention trials about reduction of gender violence (three between 1990-2000 and 23 from 2000-2011), this concern about the potential distorting effect of changing rates of missing data takes on a new urgency.

There are very few formal studies of non-responders in gender violence epidemiology, but it makes sense that those who do not respond to questions about violence are different to those who do respond, in a way that relates to their chances of having experienced violence. One might sense something different about the missing data, but this does not help formal analysis. The best way to handle this concern is to do the utmost to decrease missing data. Careful design of the study, training of interviewers and quality control can help. However, even the best epidemiological studies have to report some missing data.

3.2 Review of missing data in IPV studies

The methods for this review are described in Chapter 2.

Appendix 1 lists 75 studies of IPV published between January 2000 and March 2012.

Appendix 2 list the information the authors offer about missing data and the mechanisms they used for dealing with missing data in the 75 studies. Of 22 experimental studies, most of them RCTs, only three studies actually declared the amount of missing data on IPV. For the others we could calculate the missing data from the number of responses provided: between 0.4% and 56% of data on IPV were missing. Some 16 of the 22 studies presumed the IPV data were missing at random (MAR) – the missing data are ignorable because the rate among the responders applies to non-responders – and the remaining five assumed none of the missing data cases suffered IPV.

Across the longitudinal and cross-sectional studies, the most common approach was to ignore missing data, estimating occurrence of violence among those who answered the question about violence. A handful of studies reported on differences (in other variables) between missing data subjects and participants, and some listed potential reasons for missing data.

3.3 Focus group discussions

The methods for these focus groups are described in Chapter 2.

Male and female groups in all four settings (Zambia, Pakistan, and two very different states in Nigeria) agreed that women who have experienced IPV are less likely to take part in a study or to answer questions about IPV than those who have not experienced such violence. The focus groups discussed separately participant non-response and item non-response. They considered that people who were missing from the survey

because they were “not at home” at the time of the survey might have experienced a higher rate of violence than those who responded to the survey, and gave different reasons for why they thought this. They then discussed reasons why someone might decline to answer an item on gender violence.

3.3.1 Gender roles and “indiscipline”

Women in all four places suggested that women appear to feel shame about “being undisciplined” and considered that telling others (including the interviewers) about violence in the home could be seen as an act of disobedience in itself:

“In marriage there are values that a woman is supposed to keep, and keeping family secrets is one of them: actually it is the most important. Women are taught to be submissive.”

“In the home, a woman is a child, a woman is a child in the hands of the husband. Sometimes, it is not violence but discipline. If I talk about it then I telling the other person that I am not disciplined. Usually husbands beat us in order to discipline us.”

In Zambia, women said education was an issue:

“I think the people who are educated tend to suffer more abuse in the home because the more they talk the more the abuse. Those educated are likely to be even beaten more. They want to exercise equality.”

Leaving one’s husband was nevertheless frowned upon by the women:

“I know a woman whose husband tried to throw her down from the roof of their house. She refused to leave him. She was thinking only about her children [...] Only stupid women leave their houses.”

Men said that people who experience domestic violence felt shame because they believe it is their fault and do not want others to know that they are not disciplined.

They said women may not see themselves as victims of gender violence because they believe it is their own fault that men beat them. A Zambian man explained:

“In this compound, couples fight a lot in their homes. This is because wives don’t obey their husbands like the way our mothers used to obey our fathers. You send your wife and she refuses saying that you have your own hands to do things for yourself. You end up beating her.”

3.3.2 Non-availability and violence

Participants in the men's groups emphasized that the women who are not at home and thus not available for a study, may experience IPV because they are not at home where they should be:

“You leave the house in the morning your wife leaves after you to go and play. You come home and find the house dirty, no food cooked and the children dirty. You confront her then she even raises her voice for the neighbours to hear. You beat her.”

Some women agreed that women who are often out of the home are more likely to experience violence from their partners. Others explained that women who experience violence need to leave the home, such as to find peace and comfort with friends or to earn extra money because they must fend for themselves. Others talked about leaving their home and their husbands permanently as a result of violence to seek refuge:

“They were probably upset with their husbands and left their homes to go live with their parents.”

3.3.3 Fear of violence

Another reason men cited why women who experience domestic violence are less likely to talk about domestic violence with researchers is that they know they will be beaten if they tell the secrets of the home:

"My wife would not dare share things with other people; I would beat her up again."

A similar view came from women: *"They refuse to answer such sensitive questions since they are afraid of being beaten up."*

A women's group in Zambia expressed the difficulty many women feel:

"Even me, I would be ashamed to talk about how I have been abused to someone else. It is not easy to talk about something that has happened to you. You are better off just keeping quiet or ignoring the issue. That is why we do not respond."

The women also concluded that fear of husbands contributed:

"If he found out that she has talked to you [researchers], he could have beaten her more."

One group of women described the ever-present fear of their husbands:

"Even when he is not present, his ghost is all over the house watching you".

Some women also talked about suspicion towards researchers as a reason for not disclosing their experience with violence:

"You don't know that maybe these people are just carrying out an investigation because maybe the husband has been reported to authorities."

Others explained that talking about domestic violence is simply too painful:

"No one wants to be reminded of the pain they have endured. It is like talking about a child you lost when you were young. This is not simple issue that you just talk about with anybody."

A related but distinct issue is expectation of violence, based on childhood experiences:

"You know women who saw their mothers beaten and abused are more likely to keep quiet and not talk about the pain."

3.3.4 Experience of violence among non-responders

The facilitator asked each focus group the question “Out of every 10 who refused to answer the question on domestic violence, how many are likely to have suffered domestic violence?” Women in Nigeria and men in Zambia and Pakistan guessed eight of every ten. Men in Nigeria and women in Zambia and Pakistan estimated six out of every ten.

These guesses are far above the frequency calculated from those who did respond to the household questionnaire: Bauchi Nigeria 4.1% (325/7817) ever beaten with 53 missing, Cross River 20% (1528/7673) ever beaten with 86 missing; Pakistan 33.7% (7895/23,430) ever beaten; and Zambia 27% (337/1261) beaten in the last year. One expects differences when comparing consensus rates from focus groups with rates of disclosure in personal questionnaires. Still, the gap is striking, pointing to likely underestimation of gender violence in analysis of the questionnaire data. Community awareness of this issue illustrated in the focus groups suggests that community-wide interventions to reduce gender violence might reduce under-reporting, bringing the reported prevalence closer to its real level.

3.4 Adjustments to estimates of rates of violence

As mechanisms for participant non-response were more varied than those for item non-response, I applied the focus groups guesses of violence rates among item non-responders to the missing data in the surveys in the same communities. In Zambia, there were only 88 (6.5%) responses missing to the question on IPV. If six out of every 10 of these missing data cases was a victim, using the lower estimate of the focus group finding, the real domestic violence rate would be 31% (417/1349) instead of 27% as in our study. Whatever one did by way of modelled missing data, at most this can affect 6.5% of the study population.

However, differences in violence rates in even this small amount of missing data can affect estimation of impact of interventions to decrease gender violence. As an unintended collateral impact, an intervention might also decrease missing data through increasing engagement and making discussions of gender violence more acceptable. If the intervention resulted in getting a response from some of the 6.5% of women with missing data, again assuming that 60% of the missing data participants suffered violence, this would *increase the measured gender violence* from 27% to 31%, under conditions of no impact in lowering violence rates. One would have to achieve an impact of 33% in order to show a 20% reduction in violence; instead of lowering the rate from 27% to 22%, one would actually have to lower violence to 18% to account for the reduction in missing data and its effect on the measured net rate.

The effect is more marked in studies where there are more missing data. For example, Zorrillo and colleagues in Spain⁷² reported a response rate of 73% and a domestic violence rate (ever beaten) of 10%. Focus group views about missing data mechanisms are not available from Spain but, if even one half of those missing 27% were in fact victims of violence, the measured rate of violence would be 23% -- more in keeping with other reports from Europe. The missing data fraction is even larger in other studies (Appendix 2).

3.5 An approach to minimise missing data and non-disclosure

Even with relatively few missing data in our own papers, we were concerned about the associated problem of non-disclosure and we needed a methodological approach that would minimise missing data and non-disclosure.

As long ago as 1923, Thomas⁷³ said that any definition of a situation will influence the present situation. We used this idea in training interviewers for gender violence research in Pakistan (Paper 2). At a specific point in the interview, just before the

question on violence, trainers encouraged trainee interviewers to pause in a way that defines the situation. At that point, the interviewers brought to mind someone they knew who had suffered gender violence. This tacit intention of allowing respondents to express themselves increased disclosure of gender violence. This concern for the interviewer's awareness, and her ability to communicate that to the respondent authentically and at the right time, was the basis for published paper 2 in this thesis.

For field workers to fit into measurement of gender violence, they first have to discard their own denial. The SAAAW training decreased non-disclosure and helped to decrease the risks of the study for the respondents and interviewers.

1. Selection: Our training team selected interviewers for each part of the country who came from that area, although not from the sample communities, so they were familiar with the particular local customs and norms of behaviour
2. Clothing: The interviewers also dressed according to the norms of the different communities they visited, including veiling their faces in some conservative communities.
3. Initial training and practice: The training of the interviewers began with reviewing the contents of the instruments, followed by practice interviewing in non-sample communities. We noted the disclosure rates for the different interviewers during these practice sessions.
4. In a women-only session, the trainers asked each interviewer to tell the rest of the group about an abuse case she knew of personally. The session took time and was sometimes emotional as trainees often described abuse that had happened to themselves or to a family member.
5. We asked the interviewers that in their interviews with the women respondents, just before asking them about their experience of violence and other forms of abuse,

they should bring to mind the case they had described and tell the women, “I know how hard this is to talk about. I know of someone who has experienced abuse.”

6. We continued the training and practice until all the interviewers achieved broadly similar levels of disclosure.

7. Conduct and privacy of interviews: In Pakistan and later in Nigeria, we used a multi-interviewer approach: a second female interviewer engaged the older women or children in the family; a male interviewer kept the husband or other men in the household busy.

8. The interview record included an item, typically the last one, where the interviewer confirms it was an analysable interview (private and uninterrupted).

9. During the data collection period, a daily debriefing allowed the interviewers to share the pressures of the day.

Paper 2 describes the approach more fully, but the underlying dynamics bear further consideration. At one point we thought we might be promoting empathy or at least solidarity and, as the respondent detected this, she would be more likely to disclose IPV. Since then, I have come to understand the mechanism as being more specific than empathy or solidarity. Although developed in a psychoanalytic context, Bion's concept of maternal *reverie*^{74 75} shines an interesting light on what we seem to have achieved with the training and later calling into existence during the interviews. As the mother's thinking, which Bion refers to as a “reverie”, sets up and gets into tune with what is going on inside the infant, the interviewer reverie might offer a comparable “container” or safe space for disclosure.

Our experience in Nigeria's Bauchi state illustrates the problem of non-disclosure.

Domestic violence disclosure rates in our 2009 maternal outcomes social audit in 2009 (reported in Paper 11 of this thesis) were implausibly low at only 4%. In this survey, we

were not able to offer special training about the issue of disclosure of domestic violence, due to time pressures and the lack of a senior female trainer. In our as yet unpublished 2011 survey in the same sites in Bauchi, the rates of domestic violence were 19%. This year we paid particular attention to training the female interviewers (some of whom were also interviewers in 2009) to help women report their experience of violence. Facilitated sessions during the training allowed the interviewers to talk to each other about their own experience of mental or physical violence, and importantly, to think about the experiences of the women they were about to interview. They then mentioned this to the women they were interviewing. The very marked increase in violence rates between 2009 and 2011 illustrates the effectiveness of our training to increase disclosure. The next challenge is to validate this approach in different settings, and then to promote it as a standard protocol in gender violence epidemiology.

3.6 Discussion

Focus groups explored missingness in several settings. There was striking similarity in conclusions reached in Zambia, north and south Nigeria, and Pakistan. The qualitative data from focus groups confirmed that missing data in gender violence surveys are generally not missing at random. All groups confirmed that we should expect participant non-response and item non-response to be biased by gender violence. The focus groups provided some working estimates about how large this bias might be. One could go further in any of the settings to use fuzzy cognitive mapping (FCM) where the participant constituency provides their perspective. FCM can produce weights that one could apply to the missing data mechanisms identified. One could repeat this procedure in different clusters in a cluster trial, or regions or countries in a multi-centre trial. The community generated weights might then be used for a sensitivity analysis, to see how they might affect results of the study.

The reason data are missing might be related in some way to gender violence or related factors, like engagement with an intervention geared to decrease gender violence. This "non-ignorable missingness" challenges interpretation of findings. Statistical approaches that assume ignorable missing data are inappropriate in gender violence studies. An approach that assumes no violence among those who did not respond is particularly likely to underestimate rates of violence. If all one wanted was a conservative estimate of the lowest possible level of violence in the population studied, this might suffice. But conservativeness of estimates is not necessarily what the situation calls for. In randomised controlled trials geared to reduce gender violence, one needs to know more accurately the level of gender violence and the amount it has changed. In this situation, the concern is about differences between those with or without the intervention, when the intervention itself might affect missing data levels. Or the challenge might be to measure changes over time, with an intervention or control. Time and interventions may change the levels of missing data in questions about violence.

Modelling non-ignorable missing data is a growing field. While there is really only one missing data mechanism under the assumption the data are missing at random (ignorable missing data), there are very many possible mechanisms for non-ignorable missing data. And as there is no way of verifying which mechanism or mechanisms are operating in a given study – since the data are missing – there is no statistical way to prove that the model chosen for analysis was the correct one.

We used a simple approach to estimate the possible effect of the missing data on estimates of rates of IPV. Qualitative evidence on mechanisms of non-ignorable missing data could be applied to the imputed values in a multiple imputation model. It could also be applied as a network of prior probabilities in a Bayesian regression approach.

Adjusting for the non-ignorable missing data in our published papers did not produce big changes because of the relatively small amounts of missing data. When there are only 6% of data missing, they cannot easily have a major impact on the estimation – whatever information one has about the missing data and the likely frequency of violence among these people. Studies with more missing data have a greater margin for this effect; the example from Spain [cross reference Zorrilla 2010] illustrates serious distortion by missing data. In an intervention study, the intervention might decrease missing data or increase disclosure; this would produce a mistaken impression that the intervention increased (or at least did not decrease) the risk of violence.

In conclusion, missing data due to participant non-response or item non-response can be a problem in gender violence epidemiology. This is especially true in intervention studies, where the intervention affects engagement and disclosure, and therefore the amount of missing data. One lesson from my work is that careful training of interviewers is indispensable, following the protocol presented in this chapter and in Paper 2 of this thesis.

CHAPTER 4. CLUSTERING

Summary

Most cluster surveys adjust for overestimation of statistical confidence that results from people being more similar to those who live nearby than they are to those who live far off – incidental clustering. Informative clustering occurs when being part of the cluster matters or is part of the causal chain, for example, living near a hazardous factory, or in a community with a particularly strong culture of gender violence. This chapter looks at informative clustering through reanalysis of individual and group variables in eight countries. Some clustered characteristics protect women from intimate partner violence while others place them at risk. Computed across over 200 clusters in eight countries, it is hard to summarise a single cluster effect because different cluster effects pull in different directions. In a smaller sample from a single country with 30 clusters, with less heterogeneity, generalised linear mixed model regression analysis and the Lamothe non-fixed odds ratio identified the same group and individual risk factors. This illustrates the feasibility of differentiating between incidental and informative clustering in gender violence epidemiology. Gender violence clusters and its analysis should be able to take into account when clustering – for example, living in a violent community – is itself a cause of gender violence. This can be particularly important in interventions that target a community at large.

4.1 Informative and incidental clustering

Incidental clustering in a cluster sample happens because people who live near each other tend to be more similar to one another than they are to people who live some distance away. In sample-based measurement, this incidental similarity can lead to

underestimation of the true variance. Informative clustering occurs when being part of the cluster is part of the causal chain, for example, living near a hazardous factory, or in a community with a strong culture of gender violence. Informative clustering means we have something to learn from which particular cluster people live in.

Gender violence is a clustered phenomenon. It seems to reinforce itself and to propagate where it occurs^{76 77 78 79}. This makes cluster designs a logical framework for epidemiological study of gender violence. For intervention studies, cluster randomisation can help to avoid “contamination” of non-intervention areas and to decrease other biases^{80 81}.

Many of the 75 IPV studies reviewed for this thesis (Appendix 3) and all studies in this thesis use clustered samples. In our studies, this was partly because of the need to cover large samples on a limited budget. It made no sense to pick a simple random sample of people across a country, given the time and costs to reach each community. The more important issue, however, is that violence is a collective attribute even when its outcomes are personal. Violence occurs *between* people, dividing them and holding them together. It makes sense to study violence in a cluster sample, and to look at characteristics of the cluster (community) as potential risk or resilience factors for violence suffered by people in the cluster.

Most epidemiological analysis “takes into account” clustering, seeking to “control” or decrease its influence on the measured effect. The usual concern is over-estimation of statistical confidence (p-value, chi-square or confidence interval) in a cluster sample because people who live near each other tend to be more similar than those who live further away – so variances are smaller than they would be in a simple random sample of the same group⁸².

A different concern arises when a local way of doing things *causes or prevents* the

gender violence. If there is acceptance or even admiration of wife-beating in a particular community or cluster, living in that cluster could be supportive of gender violence. And if the clustering is itself a causal factor – more generally put, if the clustering is informative – it is really important to know about it and how to act on it. Preventive actions targeting communities might well differ from those targeting individuals. A community intervention might focus on “narrative”, how people discuss violence; interventions might be structural, like change of income that place potential victims in an objectively different social position. In one case of emergency food aid in Bosnia, some clusters received international food aid through a partisan agency, placing them in a structurally different situation to people in other communities⁸³.

It might be worth knowing the real size of effect (odds ratio or risk difference), if informative clustering contributes. Here, one would ask: to what extent, if any, does the estimated size of effect of a risk factor for violence change as a result of clustering? Yet few studies of gender violence (including those in this thesis) distinguish between informative and incidental clustering.

4.2 Reanalysis of clustering for IPV

The methods used for the re-analysis of Paper 7 (an eight country survey of IPV in southern Africa) are described in Chapter 2.4. Table 1 shows the Odds Ratio (OR) and 95% confidence interval (95%CI) for the variables associated, in bivariate analysis, with experience of violence among 11,872 women across all eight countries (second column). There was no evidence of an association of IPV with education, household size and household crowding. The variable for multiple sexual partners in the last 12 months was strongly associated with reporting experience of IPV in the last 12 month

Table 1. Domestic violence in eight countries, female responses and group variables as covariates of intimate partner violence (2002)

Variable	Bivariate Unadjusted OR Cornfield (95%CI)	Naïve Mantel Haenszel OR-adjusted (95%CI)	Lamothé cluster adjusted ORmh (assuming OR constant) ^a (95%CI _{ca})	GEE Exchangeable matrix OR (robust 95%CI)	Lamothé cluster adjusted ORmh (not assuming OR constant ^a) (95%CI _{ca})	GLMM Laplace approximation OR (95%CI)
<u>Individual female or household characteristics</u>						
Multiple partners in last 12m	1.84 (1.63-2.08)	1.89 (1.67-2.15)	1.89 (1.63-2.20)	1.90 (1.66-2.17)	1.91 (1.65-2.16)	1.92 (1.69-2.18)
Age 20-39 (vs other ages)	1.67 (1.50-1.86)	1.54 (1.37-1.73)	1.54 (1.36-1.74)	1.54 (1.36-1.76)	1.55 (1.36-1.75)	Random effect
Not enough food in last week	1.21 (1.09-1.34)	1.23 (1.10-1.36)	1.23 (1.08-1.39)	1.25 (1.11-1.41)	1.23 (1.08-1.39)	1.21 (1.09-1.35)
Remunerated work	1.23 (1.11-1.35)	ns	ns	ns	ns	ns
<u>Cluster/group characteristics</u>						
Higher than average IPV	2.79 (2.54-3.08)	2.21 (1.95-2.51)	2.21 (1.80-2.71)	2.29 (2.01-2.62)	2.23 (1.93-2.53)	2.23 (1.98-2.53)
Language (Lozi/Bemba)	3.18 (2.72-3.64)	1.63 (1.34-1.98)	1.63 (1.12-2.36)	1.74 (1.28-2.39)	1.73 (1.16-2.30)	1.63 (1.35-1.99)
Country with above 18% IPV	2.12 (1.92-2.33)	1.21 (1.06-1.38)	1.21 (1.04-1.41)	1.26 (1.09-1.45)	1.22 (1.04-1.40)	Random effect
Higher than average agree "women sometimes deserve to be beaten"	1.65 (1.49-1.81)	1.19 (1.06-1.33)	1.19 (1.03-1.37)	ns	1.20 (1.04-1.36)	1.15 (1.03-1.29)
Higher than average agree "its not rape to force your partner to have sex"	1.28 (1.16-1.41)	ns	ns	ns	ns	1.12 (1.01-1.25)
Higher than average agree "women do not have right to refuse sex"	1.21 (1.10-1.33)	ns	ns	ns	ns	ns
Rural location	1.16 (1.05-1.29)	ns	ns	ns	ns	ns
11,872 records analysed Original personal/household variables in each model included: household size, crowding, education, remunerated employment, alone at the time of interview, Original group variables were: occurrence of domestic violence, language (Lozi/Bemba vs others), rural residence, and beliefs that some women deserve to be beaten, it is not rape ns=not significant, dropped from model ^a odds ratio estimated as the midpoint between cluster-adjusted MH 95%CI						

Table 2. Domestic violence in Zambia, female responses and group variables as covariates of intimate partner violence (2002)

Variable	Bivariate Unadjusted OR Cornfield (95%CI)	Naïve Mantel Haenszel OR-adjusted (95%CI)	Lamothe cluster adjusted ORmh (assuming OR constant ρ) (95%CIca)	GEE Exchangeable matrix OR (robust 95%CI)	Lamothe cluster adjusted ORmh (not assuming OR constant ρ) (95%CIca)	GLMM Laplace approximation OR (95%CI)
Individual female or household characteristics						
Multiple partners in last 12m	1.90 (1.37-2.64)	1.88 (1.34-2.64)	1.94 (1.44-2.62)	1.68 (1.28-2.20)	1.90 (1.37-2.43)	1.87 (1.33-2.64)
Age 20-39 (vs other ages)	2.07 (1.63-2.64)	1.89 (1.45-2.46)	1.90 (1.50-2.41)	1.90 (1.50-2.41)	2.00 (1.52-2.48)	Random effect
Not enough food in last week	1.45 (1.17-1.80)	1.14 (1.14-1.80)	1.41 (1.05-1.89)	1.39 (1.04-1.64)	1.46 (1.07-1.85)	ns
Remunerated income	ns	ns	Ns	1.30 (1.04-1.64)	ns	ns
Cluster/group characteristics						
Higher than average IPV	3.43 (2.02-5.82)	2.37 (1.33-4.23)	Ns	3.10 (1.52-6.34)	4.12 (1.49-6.75)	3.02 (1.63-5.62)
Language (Lozi/Bemba)	1.34 (1.08-1.65)	ns	Ns	ns	ns	Random effect
Higher than average agree "women sometimes deserve to be beaten"	2.08 (1.35-3.20)	ns	Ns	ns	ns	ns
Higher than average agree "women do not have right to refuse sex"	1.15 (0.84-1.55)	ns	Ns	0.52 (0.33-0.83)	0.67 (0.40-0.94)	0.56 (0.37-0.81)
Rural location	1.82 (1.44-2.29)	1.52 (1.18-1.97)	1.61 (1.07-2.41)	1.79 (1.23-2.60)	1.74 (1.08-2.39)	1.76 (1.34-2.32)
1605 records analysed, 30 clusters Original personal/household variables in each model included: household size, crowding, education, remunerated employment, alone at the time of interview, Original group variables were: occurrence of domestic violence, language (Lozi/Bemba vs others), rural residence, and beliefs that some women deserve to be beaten, it is not rape to force ones partner, women do not have the right to refuse sex. ns=not significant, dropped from model ρ odds ratio estimated as the midpoint between cluster-adjusted MH 95%CI						

There were weaker but still statistically significant associations with age (20-39 years, contrasted with older and younger women), absolute poverty (insufficient food in the last week), and remunerated employment.

Group-level factors associated with partner violence included higher than average level of IPV in the community, and more negative than average attitudes about gender violence (“forcing your partner to have sex is not rape”, “some women deserve to be beaten”) and about sexuality (“women do not have the right to refuse sex”) in the community.

Rates of violence disclosed by female respondents differed markedly between countries. In three of the countries (Botswana, Swaziland and Zambia), more than 18% of women reported IPV. Women in two languages in Zambia stood out as having a higher risk. These factors are part of the cluster phenomenon but, within the cluster, they are not *a priori* causally related to the outcome – in this case experience of gender violence. A different case exists for attitudes within the community and occurrence of IPV viewed as group phenomena. These clustered attitudes might well be causally related to the individual experience of IPV.

Columns 3-7 in Table 1 show multivariate models of the associations significant in bivariate analysis, with surprisingly few differences between the different models, considering the very different assumptions. Remunerated employment dropped out of all models, as did rural residence and two of the group-level attitude variables (“it is not rape to force your partner to have sex”, and “women do not have the right to refuse sex”).

The consistency of findings across the five multivariate analysis methods in the eight countries together (Table 1) results mainly from the large size of the study (11,872 records and 280 clusters) and the lack of interaction between variables. With so many

clusters, the cluster-level characteristics also show almost no difference with different approaches.

Because Zambia had the highest rates of violence (most events for sample size), I repeated the analysis in Table 2, with only 1605 women in 30 clusters. Different approaches produce important differences in the group/cluster characteristics associated with IPV. The association between IPV and the group occurrence – clusters where IPV is more common – is especially strong using GEE, GLMM and the Lamothe cluster adjustment for non-fixed OR.

Also in Table 2, GEE, GLMM and the Lamothe cluster adjustment for non-fixed OR – show an *inverse* relationship between IPV and the group-level factor of the belief that women do not have the right to refuse sex. The average woman living in a site where this belief was more common was significantly *less* likely to report IPV, than the average woman living in a site where this belief was less common.

4.3 Discussion

Both cluster adjusted fixed-OR MH and GEE presume that all clustering is incidental – the former by assuming a fixed OR across clusters and the latter by largely ignoring differences between clusters. Both Lamothe adjusted non-fixed OR and GLMM detect informative clustering, the former by not assuming a fixed OR across clusters and the latter by allowing separate regression equations across different groups of clusters. The Lamothe adjusted OR has the advantage of not assuming any particular distribution of the data.

The 8-country domestic violence data set shows little advantage of one method over the other. It is of moderately large size (11,872 women) with a large number of sites (280 clusters) and many households in each cluster (average 100). The Zambian case shows that this regional average does not tell the full story for at least one of the

countries. The sparser data set shows clear differences between analysis approaches.

The effect of clustering on reporting of IPV in the survey (as distinct from actual occurrence of IPV) is different when one considers the entire region (large sample) and when one considers a single country separately. Possibly because the cluster level association pulls in different directions in different countries, in the region as a whole there is no detectable association of reported IPV with the level of belief in the community that women do not have the right to refuse sex. In Zambia, this belief within the community might say something about that community that acts as a brake on women reporting violence in the household interviews. In the qualitative focus group discussions, women and men spoke clearly about the issue of community pressure (see Chapter 3.3). But quantitative data might be little more than individual yes/no answers to direct questions and the effect shows only with analysis techniques that detect informative clustering.

There are other differences between the regional picture and the picture within Zambia alone, where IPV rates are the highest in the region. The Lozi and Bemba languages of Zambia are prominent IPV risk factors in a regional analysis (Tables 1 and 2), but *within* Zambia they have much less effect. In the regional picture, area of residence (urban or rural) is not prominent as a risk factor, while in analysis of Zambia alone area of residence is a clear risk factor in all analysis approaches. This confirms the starting premise that gender violence clusters, that some cluster effects promote gender violence while others might inhibit it. In the regional picture, with so many sites across eight countries, it is hard to detect a single identifying group/cluster effect; Lozi and Bemba languages really just reflect Zambian sites. Within Zambia, the country reporting the highest levels of gender violence, there are other more specific factors than language groups, like a local culture of violence.

In her comprehensive review of area effects on health, Diez-Roux warns against simple explanations that consider area or neighbourhood to “just another variable”⁸⁴. Part of the solution is to get closer to the specific content of the meso-variable, like the local culture of gender violence or the negative example set by a key opinion-maker. To arrive at a working notion of causality even with the data available from the cross-sectional studies, it is the specific character of the meso-variable that matters. While one cannot say if the group effect is due to a local culture or a negative role model, *there is a group effect*.

So group characteristics can add meaning to cross-sectional studies where causal inference is a concern. But cluster samples raise other questions, including whether the clustering is part of the causal web, or whether it is a nuisance resulting in overestimated statistical confidence.

The apparently useful performance of the Lamothe adjusted OR in this particular case does not detract from the fundamental truth that a cross-sectional study remains a cross-sectional study. GEE, GLMM and the Lamothe adjustments do not get around the problem of temporality that limits causal interpretation for observational data (one knows the putative exposure and putative outcome are associated, but not which of them comes first).

In conclusion, gender violence epidemiology needs to be more attentive and better geared to understand informative clustering, as this could have implications for prevention. GLMM is a standard method that is effective at identifying informative clustering, albeit with assumptions about the mathematical attributes of the data. The important step is to identify the group characteristic in such a way that it can be incorporated in the analysis.

CHAPTER 5. GENDER VIOLENCE AND UNRECOGNISED CAUSALITY

Summary

There are several reasons why epidemiological data between outcomes (like HIV) and putative causes (like HIV prevention education) show statistically significant associations, or fail to do so. The first of these is causality or lack of causality between the putative cause and the outcome; the education works or it does not work. Confounding is another well recognised influence, which modern epidemiology seeks to exclude in a decisive way. By definition, a confounding variable is *not in the causal chain* but is associated with the exposure and the outcome. As a consequence, it can distort the measured association between exposure and outcome. Much of the analysis of observational studies seeks to detect and to take into account confounders. But a variable in the causal chain requires quite different management in analysis. This Chapter shows the effect of ignoring history of gender violence in a wide range of associations related to HIV, and looks for better ways of teasing out the role of a history of gender violence as a covariate in gender violence epidemiology. A simple test is to combine gender violence with the exposure in question and to include this as an independent term in multivariate analysis.

5.1 Introduction

A recurring theme of this overview and the papers submitted is the demand on gender violence epidemiology made by the HIV epidemic. Paper 8 in this thesis reviews how gender violence is part of the social infrastructure of HIV; Papers 9 and 10 look more closely at one particular mechanism for this.

Conventional HIV awareness initiatives in southern Africa seem to have had little

impact on HIV risks in the face of all the other information sources and the effect of living there. Despite a lifetime of exposure to educational HIV prevention programmes, our 2002 study of school-going youth in South Africa (Papers 4 and 5) reported widespread misconceptions about gender violence among both sexes. More female than male respondents held views that would put them at high risk of HIV infection (a woman can't refuse sex if a man buys her a present, you must have sex to show you love someone, it's okay for older men to have sex with teens). History of forced sex was a powerful predictor of these views about gender violence and about risk of HIV infection⁸. Similarly, our eight country study of domestic violence found partner physical violence associated with potentially dangerous attitudes to HIV infection (Paper 7). For example, men and women who reported being the victim of domestic violence were more likely to believe men have the right to sex with their girlfriends if they buy them gifts, and that forcing your partner to have sex is not rape. Male respondents who reported domestic violence were significantly more likely to say they would not change their sexual habits if they found they were HIV-positive; they were also more likely to say they would intentionally spread the infection.

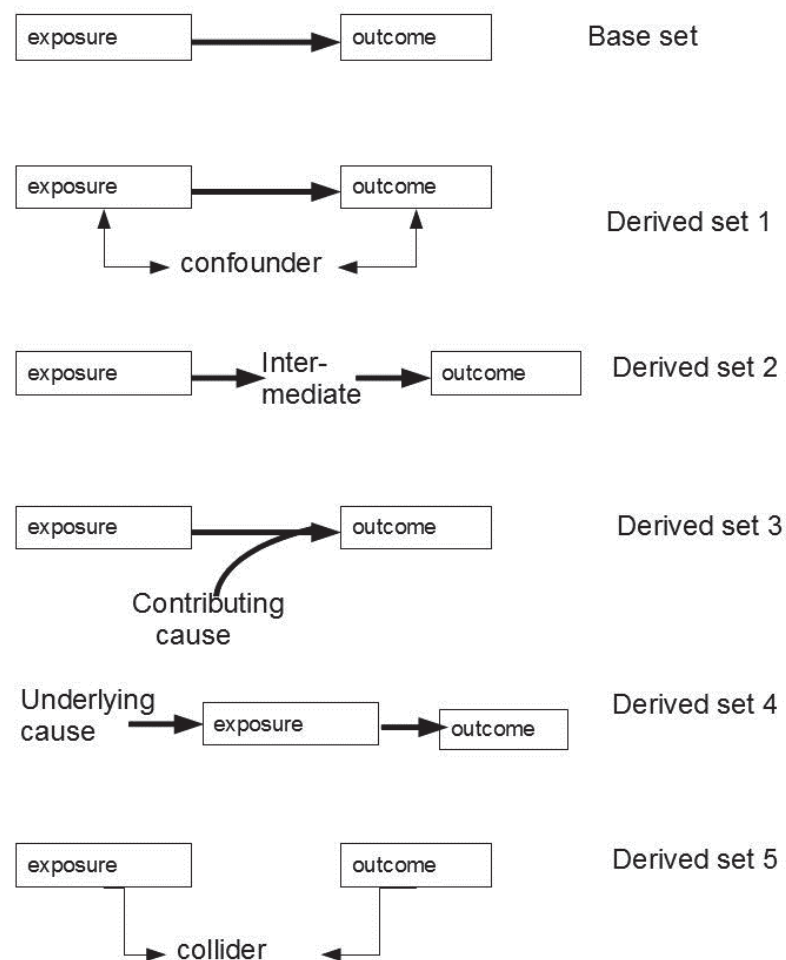
Most behaviour change models in HIV prevention postulate that beliefs and attitudes must change before the behaviour can change to have a protective effect^{85 86}. Many of the beliefs, attitudes and behaviours related to HIV also concern gender violence. It makes good sense to try to better understand the relationship between beliefs/attitudes and history of gender violence before designing interventions to change the behaviours that underlie HIV risk.

5.2 Causes, confounders and colliders

Several of the papers in this thesis (Papers 4-7, 10) show associations between aspects of knowledge of or attitudes toward HIV and HIV risk practices. For brevity, I

refer to simple pairs of exposure and outcome variables as base sets: exposure to risk education and consistent condom use might be an example. Adding gender violence derives another set of variables: risk education, condom use and history of gender violence (Figure 1 shows generic covariate relationships). With different variables in the base set, the influence of gender violence history in a derived set can be quite different:

Figure 1. Covariate relationships



(a) Gender violence can be a confounder associated with the exposure and the outcome, but not in the causal web between exposure and outcome. In an association between marital status as exposure and HIV testing as an outcome, for example, gender violence might be a confounder (Derived Set 1 in Figure 1). The analytical procedure for a suspected confounder is to adjust the association for the potential confounder, and look at the adjusted and unadjusted measures. The difference indicates confounding. Most multivariate analysis treats gender violence as an independent variable to see how taking it into account explains the association between exposure and outcome. This is simple to do but, in studies of HIV, it is likely to be incorrect.

(b) It could be that gender violence is part of the causal web, underlying or modifying the association between exposure and outcome. If the exposure in the base set is inter-partner income disparity and the outcome HIV, gender violence might be a contributing cause, an underlying cause or an intermediate cause (Derived Sets 2, 3 and 4). Often there is confounding too (adjusted odds ratio different to unadjusted odds ratio), and this can mistakenly lead one to treat the relationship only as confounding. If gender violence is part of the causal web between exposure and outcome, treating gender violence as a confounder is inappropriate, as this masks part of the effect. A useful clue is chi-square for heterogeneity, signalling a significant difference in effect between those with and without a history of gender violence.

(c) Gender violence can even produce a collider bias⁸⁷⁸⁸ where the association in the base set changes when gender violence affects both exposure and outcome. This is a common data relationship in HIV research. An example might be transactional sex and HIV. Transactional sex is associated with a history of gender violence. HIV is also associated with a history of gender violence. This complicates measurement of the

association between transactional sex and HIV. Adjustment here can mislead as it “blocks” the measured association between exposure and outcome, both associated with gender violence (Derived Set 5).

So associations that involve gender violence, even indirectly, might result in underestimation or over-estimation of effects, spurious or blocked associations. The problem, of course, is to know which relationship with gender violence affects a particular association. Multiple relationships are possible.

The issue is still more complex if the interventions intended to influence behaviour change also influence gender violence. This is an important issue for impact assessment. An intervention that stimulates openness and discussion of choices, including condom use, might affect victims of gender violence differently to the way it does non-victims. *The intervention introduces new influences.* This can distort the impact assessment in a way one can almost visualise, but that is tricky to deal with analytically.

Conventional teaching of epidemiology treats different reasons for association (confounding, causality and biases as conceptually separate issues, different chapters in a linear presentation of a textbook or lecture series. But in the practical world of gender violence epidemiology, tangles of coexisting relationships underlie many associations, clouding and distorting the information they offer. This happens whether or not one measures gender violence history.

5.3 Revisiting gender violence as a covariate

Chapter 2 described the re-analysis of a number of associations identified in papers in this thesis, treating the effect of a history of gender violence on these associations in several different ways. Table 3 summarises the results of this re-analysis. The 2009 study in Botswana, Namibia and Swaziland (Paper 10) (top row of Table 3) found a

positive association between HIV status and the respondent's intention to have unprotected sex with a partner they knew was at HIV risk using a direct question of whether respondents considered their spouse to be at risk (OR 2.15, 95%CI 1.75-2.62). There was an association between history of gender violence and HIV status (OR 1.55, 95%CI 1.29-1.84) and between gender violence history and intention to have unprotected sex with a risky partner (OR 2.09, 95%CI 1.68-2.57). This triangular relationship is the mathematical backdrop for confounding (gender violence associated with exposure and outcome), provided one can assume that gender violence is not in the causal web between intention to have unprotected sex and HIV status.

In this particular case, it is well-known that gender violence history affects risk-taking behaviour^{89 90 91 92}. By all accounts it is part of the causal web (possibly gender violence precedes risk behaviour, which precedes HIV) and we can predict that taking the gender violence history into account in the analysis (in the epidemiological sense of adjusting) will underestimate the true association between risk intention and HIV status. We lose information by treating history of gender violence as an independent potentially confounding variable.

Gender violence could be in the causal web for any example in the table. The adjusted odds ratio (aOR) in Table 3 shows the result of treating gender violence as a confounder in several such cases (column 5) In most cases, treating gender violence as a confounder results in a downward shift of the measured association (aOR 2.07 in the case of the first example).

If gender violence is not a confounder this does not mean one can ignore it by not collecting data on it or not including it in the analysis of associations with a given outcome. If gender violence is part of the causal web – a precondition, an intermediate or contributing cause – there is a risk of underestimating the strength of association in a base set and the prevention implications if one ignores it.

Table 3. The influence of gender violence history in HIV research: analyses of associations from Papers 2, 4, 7 and 10 in the thesis

	2. Outcome with Exposure (E1)	3. Outcome without exposure	4. Unadjusted OR	5. ORa adjusted by gender violence (GV) as though a confounder	6. Chi-square heterogeneity	Examining interactions				
						7. Multiplicative model: E1 and GV vs. rest	8. No exposure and no GV	9. Exposure E1 no GV	10. GV no E1	11. E1+GV
Base set (exposure & outcome)										
1. Risk intention & HIV	152/ 1005	475/ 6218	2.15	2.07	2.07	2.32	6.9%	14.3%	12.8%	18.8%
2. IPV last year & HIV	294/ 1087	733/ 6199	2.76	2.66	0.01	2.91	11%	24.8%	23.9%	45.1%
3. Multiple partners & HIV (men)	80/ 187	868/ 2632	1.52	1.46	0.007	2.07	31.5%	40.3%	48.5%	57.1%
4. Education disparity & legal access	2889/ 3374	8658/ 11659	2.06	2.09	1.11	2.34	70.0%	82.4%	81.1%	90.7%
5. Virgin myth & perpetrator	4425/ 34014	15787/ 235691	2.08	1.59	0.019	3.89	3.4%	5.2%	14.7%	21.6%
6. Gender attitude & intent HIV test	24829/ 113265	25827/ 156440	1.42	1.37	5.2 p=0.02	1.50	12.6%	16.8%	25.8%	31.7%
7. Severe poverty & knowledge of where to get HIV test (women)	1674/ 4043	2239/ 7370	1.62	1.63	0.399	1.20	30.6%	41.8%	34.9%	48.2%

Explanatory notes

Gender violence history was derived from the question “have you ever been forced to have sex without wanting to”

1. Respondent's intention to have unprotected sex with a partner they knew to be at HIV risk & HIV status (dried blood sample, Paper 10
2. Physical intimate partner violence in the last year and HIV-status measured by dried blood spot – Paper 10
3. Among men only, multiple partners in the last year and HIV-status – Paper 10
4. Educational disparity between woman and husband & belief it is okay for women to seek legal help for concerns about property – dataset Paper 6
5. Respondent believes that having sex with a virgin cures HIV/AIDS & respondent admits to having forced sex on someone else, Paper 7
6. Belief that girls like sexually violent men & intention to have an HIV test – Paper 2
7. Severe poverty (insufficient food in the last week) & knowledge of where to get HIV test – dataset for Paper 4

The implication is that we need to explore evidence of causality. This is challenging enough in cross-sectional studies, as some temporal relationships can be impossible to untangle. There are, however, exceptions. For example, history of child abuse plainly precedes HIV status of a young woman in her 20s. Even when the temporal relationships are not that clear, there is an obligation to consider a possible causal role of gender violence in many associations involving HIV.

With simplifying assumptions, one can interact gender violence history with the exposure, creating a higher level variable to look at the effect of each exposure on its own and then together with gender violence. The first row of Table 3 shows a multiplicative effect with the joint variable (those with a gender violence history who intended to have unprotected sex) in this case associated more strongly (OR 2.32, 95%CI 1.47-3.40) (column 7 of Table 3) than intent on its own (OR 2.15) (column 4 of Table 3).

We can also estimate the added risk from the proportions that were HIV-positive in different categories of exposure: neither gender violence nor the exposure, the exposure alone, gender violence alone, and gender violence plus the exposure (IPV last year, multiple partners, education disparity – in Table 3). The implicit intention is to quantify the effect of the exposure when combined with gender violence, as if gender violence was part of the causal pathway. In the case of risk intention: 6.9% was HIV-positive among people with neither the risk intention nor a gender violence history; 14.3% were HIV-positive with the intention but no gender violence history; 12.8% with a GV history but without the intention; and 18.8% were HIV-positive with a history who also intended unprotected sex. The difference between those with the intention (14.3% HIV-positive) and those with the intention *and* the history of gender violence (18.8% HIV-positive) suggests gender violence is in the causal web.

Table 3 shows several other examples with HIV-related associations from papers in this thesis. In all cases, the rate of the outcome is higher among those with a history of gender violence. In two cases (line 2 and line 6), the joint risk of the exposure in question and gender violence history is double that of the exposure alone, and in one it is quadrupled. In this last case (line 5), the association between poverty and knowledge of where to get an HIV test, adjustment by gender violence (treating it as a potential confounder) makes very little difference. Interacting poverty with gender violence in a multiplicative model produces a *lower* measured risk, possibly indicating a collider bias.

This raises the question of how to be sure that the interacted term (exposure plus history of gender violence) is more appropriate than the exposure on its own. In a multivariate analysis, one would simply include both the interacted term and exposure separately and look at which has the bigger effect.

5.4 Discussion

One advance of modern epidemiology is greater clarity on the issue of confounding and how to deal with it. The relative simplicity of dealing with confounders encourages one to treat “everything else” as a potential confounder.

In the rare cases when one is certain that experience of gender violence is a confounder, extraneous to the association between exposure and outcome, dealing with it is relatively straightforward. With data on gender violence, stratification is usually enough to clarify the effect. Conventional epidemiology has a long-standing concern with analysis of unmeasured confounders. In the 1950s, Cornfield used sensitivity analysis and external adjustments for confounding by dichotomous variables⁹³. In the decades that followed, Bross⁹⁴, Yanagawa⁹⁵, Axelson⁹⁶ and Gail⁹⁷ elaborated more external adjustment approaches. More recently, extensions to regression analysis

treated unmeasured confounders as latent variables^{98 99}.

Mathematical adjustment for confounding assumes gender violence is outside the causal web. What does one really *know* about how a history of gender violence affects attitudes, how it affects prevention practices, how it affects reporting of attitudes and practices, or anything else related to HIV? Research directed at the role of gender violence in HIV might well generate new insights on these questions. Research on HIV that ignores gender violence, for example, research focussed on the impact of an educational programme, by default rests on the assumption that gender violence has no meaningful relationship between the intervention and HIV.

Gender violence can be part of a pervasive patriarchal or neo-patriarchal culture, where sexualised violence has perceived “survival value” for victim or perpetrator¹⁰⁰¹⁰¹¹⁰². The way people live with or alongside this violence has effects even for those not affected¹⁰³. Many victims go on to become perpetrators^{7 104}, distorted resilience or emotional survival adding layers of damage^{105 106}.

This partial knowledge has methodological implications. Without knowing *a priori* that history of gender violence is extraneous to the base set, one has to treat it as potentially in the causal web – whether or not one measures it.

Gender violence in HIV prevention is not a mono-thematic influence like infection or environmental exposure. Gender violence is part of a *web of causality* of HIV with poorly understood and even more poorly documented pull and counter-pull, adjustment and accommodation. Gender violence is part of a culture that underwrites, reinforces and reproduces HIV. I have come to three conclusions about a history of gender violence, especially as this relates to HIV as an outcome in associations with putative determinants:

1. Every study in the area of HIV (probably maternal mortality too) should collect data on gender violence. Gender violence is almost always involved; ignoring it makes analysis easier but results less informative.

2. Gender violence history is rarely a classic confounder, in the sense of being extraneous to the association but associated with both exposure and outcomes, so analysis should generally *not* be adjusted for gender violence history. This avoids a colliding bias.

3. Gender violence is often part of the HIV causal web. With simplifying assumptions, one can explore the *size* of the effect of gender violence history (multiplicative and additive) by generating a higher level variable that combines this with the exposure of interest.

CHAPTER 6. CONCLUSIONS

Summary

Can we reduce the uncertainties that are a consequence of missing data, clustering, and unrecognised causality in gender violence epidemiology? A strict protocol for training interviewers can reduce some uncertainties arising from missing data.

Qualitative approaches like focus groups in the survey sites can document mechanisms of missingness. Clustering in gender violence epidemiology should always be handled as though it is potentially informative – it might play a role in causality. Particularly in relation to HIV, it is inappropriate to treat history of gender violence as an independent variable or a confounder. Given the difficulty of untangling gender violence relationships in cross sectional studies, cluster randomised controlled trials have several advantages. Correctly implemented, randomisation means that measured and unmeasured confounders, components of causality and colliders *all* convert to random differences. This advantage must be balanced against the possibility that the intervention can also affect responses, increasing disclosure in the intervention but not the control group.

6.1 Less uncertainty in gender violence epidemiology

After identifying some of the major limitations of the published papers in this thesis, the key research question is: Can we reduce the uncertainties that are a consequence of missing data or non-disclosure, clustering, and unknown causality in gender violence epidemiology? In each of these areas, I revisited the published papers to identify a working approach that might improve the quality of evidence.

6.1.1 Missing data

It is desirable to have as little missing data as possible but, whatever one does, some data are almost always missing. Statistical procedures like multiple imputation are interesting where data are missing at random. But gender violence data go missing for particular reasons and their departure from randomness gives meaning. This is lost using approaches like multiple imputation. Chapter 3 used a qualitative enquiry into missing data mechanisms and showed how this adds information. The approach supports imputation of likely values and (more complex) modelling of missingness; it could develop into a useful adjunct to quantitative studies of gender violence.

Non-disclosure of gender violence adds unquantifiable uncertainty. As we showed for SAAAW in Pakistan (Paper 5) careful training of interviewers and quality control in fieldwork can reduce non-disclosure¹⁰⁷¹⁰⁸. The big increase in disclosure of gender violence we noted in Nigeria between 2009 and 2011 (see Chapter 3) illustrates the importance of precise protocols to reduce non-disclosure. Gender violence studies need standardised disclosure optimisation protocols, like that proposed in Chapter 3.

6.1.2 Clustering

Clustering, the second source of uncertainty addressed in this thesis, is a perennial problem in gender violence epidemiology and associated clustered interventions. Generalised estimating equations (GEE) deal with clustering by modelling the in-cluster association and ignoring the between- cluster variation. Generalised Linear Mixed Modelling (GLMM) generates separate estimates for an individual predictor and its group-level mean allowing separation of random effects from fixed effects. This approach can show the group level (cluster) effects though it is computationally opaque and relies, as the name indicates (“linear”), on certain mathematical assumptions. In

large studies but without assumptions about the mathematical distribution of the data, Chapter 4 shows the Lamothe MH statistic with non-fixed OR adjusts for clustering and may discriminate usefully between informative and incidental clustering.

As knowledge accumulates about how this works in different settings, the Lamothe adjustment might prove its wider value. In the meantime, the lesson of Chapter 4 is that gender violence epidemiology must and can look at the informative nature of clustering. Gender violence epidemiologists need to understand the meaning of clustering, not just to adjust away the effect of clustering on the estimation of standard error.

6.1.3 Unrecognised causality

The concern about confounding is almost as old as epidemiology itself. Chapter 5 contributes to the understanding that in some prevalence relations like HIV, gender violence history is hardly ever a confounder. Several examples from the papers in this thesis implicate gender violence history, direct or indirectly, in a wide array of HIV-related outcomes. Its likely role in the causal web means we have to consider gender violence as possibly contributing to causation in analysis of many outcomes. Chapter 5 proposes a practical approach to this issue, a tool for questioning possible causal associations – which precludes treating a history of gender violence history as a potential confounder in a multivariate analysis.

6.2 Implications for future research

Reducing uncertainties in measurement is all about increasing confidence in causal inferences. There is nothing new about the idea that causal inference relies on assumptions that cannot be derived from quantitative observations on their own. This is especially true of gender violence epidemiology. If this thesis shows that off-the-shelf

approaches are useful but insufficient for gender violence epidemiology, it also shows that the search for alternatives is far from over.

There is not just one type of gender violence and one cause^{109 110}. A web of causes underlying gender violence results in a complex tapestry. There may occasionally be an important and easily identifiable association, like that between having multiple partners and experience of IPV in our eight-country study in southern Africa (Paper 7). But few would recommend a violence prevention programme based entirely on reducing multiple partners, especially as both multiple partners and gender violence may well be the result of some other underlying factors. More often interventions try to pull one or a handful of threads in the tapestry, in the hope that these somehow add up to a reduction in gender violence. If these threads include some that won't budge, some that are not really related to gender violence in this setting or even some that pull in the other direction, this will decrease the measured impact of the intervention.

The first point here is that the threads that move gender violence are local. This shows through very different levels of domestic violence in our 8-country study (Paper 7) and the very different levels of gender violence in schools (Papers 4, 5 and 6). The names for and the culture of gender violence are quite local. In measuring gender violence, the mechanisms of missing data are local. The neighbourhood or clustering effects are local as a matter of definition. The inescapable implication of this local meaning and context of gender violence is that prevention strategies should be local too.

The second point is how to measure the efforts to change these complex local tapestries. There is a recognized gradient in the value of epidemiological evidence — its ability to channel resources to solve a given issue — from anecdote through case series, cross-sectional, case-control, longitudinal/cohort studies to randomised controlled trials (RCTs). RCTs answer some of the uncertainties dealt with in this thesis.

If RCTs are what it takes to get resources allocated to decrease gender violence, then gender violence researchers should look closely at doing RCTs.

One defining characteristic of RCTs is relevant to the uncertainties addressed in this thesis. Formally put, complete randomisation means that exposure occurs independently of all events that precede it. Given the frustrations of untangling relationships around gender violence history, this is crucial. It means that measured and unmeasured confounders, components of causality and colliders *all* convert to random differences.

Correctly implemented, randomisation means one does not have to untangle the complex relationships that limit observational studies.

For people whose primary concern is care of gender violence victims, RCTs focussed on prevention might seem pointless. To some they are distasteful, raising ethical concerns about intimate disclosure and imagery about tricking people with placebos^{111112 113}. This imagery of RCTs in biomedical research comes largely from the pharmaceutical industry, where subjects are very literally experimented upon, to prove the effect of products that are then marketed.

There is another way forward for gender violence epidemiology¹¹⁴. In partnership with 12 Aboriginal women's shelters across Canada, our team introduced the first Aboriginal-run, actually community run, clustered randomised controlled trial. This project (Rebuilding from Resilience) tests the impact and cost implications of evidence-based community-led initiatives to decrease domestic violence¹¹⁵. For the Aboriginal women's shelters taking a driving seat in their own research, randomisation is just a fair way of working out whose turn it is next to receive the available resources. At a design meeting in 2008, each shelter director drew a number out of a hat, indicating whether their shelter would join the first wave or the second wave. The comparison between the

first wave and a second wave provides the “control” comparison.

In each community, a detailed development and consultation process led to design of a baseline study, using other gender violence questionnaires as reference. A local facilitator named by the shelter received training in interviewing and conducted the baseline. The results fuelled a series of discussions and workshops on how to prevent gender violence, specific to the community but sharing experience of what seemed to work in other places. Interventions varied from place to place, usually including a school based intervention and some door-to-door visits. The baseline for the second wave provides an unexposed contrast for the follow-up study of the first wave, after 18 months of interventions.

The example shows how RCT research can be locally owned and informed, with technical advice by external epidemiologists. The trial is about how communities stop their own gender violence, not about a silver bullet behaviour change intervention.

6.3 Endnote

Measurement of gender violence is at times frustrating, but prevention of gender violence can be loaded with a sense of hopelessness: it's about things you can't change. This is very much how the public viewed ischaemic heart disease 40-50 years ago: it struck people down in their prime and the huge investment in treatment after the fact, including heart transplants, did nothing to decrease the incidence. Then people started taking seriously the epidemiology of ischaemic heart disease, trying to untangle the complex web of factors underlying the problem to look upstream at how to prevent it. Governments and industry alike invested in prevention. Many people decided to change their lives, to stop smoking, to exercise and to eat more healthily to decrease their risks of IHD. It became fashionable to do so. Then epidemiologists got better at

measuring the impact of these shifts and confirmed that what people were doing worked: the positive feedback loop.

What would happen if one looked upstream from gender violence and understood its prevention dynamics – or even if one *used* current understanding of the upstream dynamics of gender violence – and documented carefully the impact each intervention has in preventing gender violence?

With subsequent investment to decrease gender violence, what would have the biggest impact? How would one know its impact? Primary prevention of gender violence means moving upstream to impact on risk factors for gender violence; how does one do this and how does one know one has done it to good effect?

This was the starting point for this thesis. The few uncertainties examined here show that current gender violence epidemiology has important limitations. On its own, each of these three measurement uncertainties is narrow and, in importance, incomparable with the big uncertainties such as how common gender violence really is, or whether a given intervention had any effect on it.

Taken together, however, the three uncertainties (missing data, clustering and unrecognised causality) illustrate space for methodological advances that might produce more accurate measurement of gender violence. As in the case of ischaemic heart disease, this can help to set up a positive feedback loop and help to attract interest and investment in gender violence prevention.

In conclusion, it is possible to reduce the uncertainties that are a consequence of missing data, clustering, and unrecognised causality in gender violence epidemiology. This requires careful training of interviewers, supplementing epidemiological studies with qualitative methods, attention to informative clustering and a formal test to

examine the possibility of unrecognised causality. With these efforts, however, gender violence epidemiology will not be free of uncertainty.

Paraphrasing Austin Bradford Hill¹¹⁶, all scientific work is incomplete, but this does not free us to ignore the knowledge we already have or to postpone the action it appears to demand. The spirit of this thesis is to recognise the uncertainties, to face them as squarely as possible, and then to take responsibility for the best science we can manage under the conditions.

Paper 1.

Andersson N, Roche M.

Gender in evidence-based planning.

Development in Practice 2006, 16;2.

STATEMENT OF CONTRIBUTION

Andersson N, Roche M. Gender in evidence-based planning. *Development in Practice* 2006, 16;2.

The contribution of Neil Andersson included authoring the original texts on which this drew, conceptualisation of the article, writing and final approval

Neil Andersson 

Melissa Roche 

Gender and evidence-based planning: the CIET methods

Neil Andersson and Melissa Roche

Epidemiological combined with experiential evidence from communities can produce important and sometimes surprising insights into gender relations, to inform policies that address changing needs. CIET has standardised a community-based cross-design for the gender-sensitive collection and analysis of three types of evidence: impact, coverage, and costs. Five steps help to ensure that women's voices are heard in planning. Gender-stratified analysis of existing data is a starting point. Stratification of all responses by sex of the respondent prevents a numerical bias in favour of men translating into a gender bias in the analysis. Female focus groups inform survey design, interpretation, and appropriate strategies for change. Gender is a factor in risk and resilience analysis. Finally, gender-sensitive logistics ensure women's equal participation. First-order outputs include actionable gender data to advocate in favour of women. Second-order outputs include an enabling environment for equitable development, challenging the gendered patterns of economic marginalisation.

The need for evidence

Women's strong presence in the informal labour market—including the labour of reproduction—and their hampered access to services in the public sphere mean that they are often invisible in official statistics. Two-thirds of the world's 876 million illiterates are female and, of the world's one billion poorest people, some 60 per cent are women and girls (UNDP 2001:20–28). We know little about the factors that create and perpetuate this gendered dynamic and, perhaps more important, we know little about how best to change things for the better.

In order to allocate public resources in a way that fulfils women's needs and promotes their position in society, planners must first know how women fare in terms of access to public services. Appropriate evidence on women's status contributes to gender equality by orienting planners towards appropriate policies that meet women's practical and strategic needs. Practical gender needs are those within women's given gender roles; strategic gender needs are needs that challenge women's subordination (Moser 1993:38). If planners and policy makers are to assess the impact of resource allocation in terms of gender, equity, and human rights they need to make comparisons across time and between places. If they are to define new approaches to gender equality they need to identify particularly vulnerable subgroups and relations of vulnerability. For all of this they need reliable evidence.

Most countries produce at least some data of direct relevance to gender-sensitive planning and management, but these data are of variable quality and seldom integrated into the planning

process. At the local level, public service facilities like schools, health centres, and police stations generate volumes of documented information. Data relevant to gender planning might include information on the percentage of registered students who are girls; the number of women who attend antenatal clinics; or the number of registered cases of sexual violence. These records are important in tracking the service performance. But because they are based on who reaches the services—not who *needs* them—they can actually cover up more than they reveal about women's access. As management tools for running services, routine data sources generally fail to identify solutions, particularly for those women who do not reach services.

Official statistics can mask the injustices faced by women. For example, a CIET (Community Information for Empowerment and Transparency) study on sexual violence in Johannesburg found a significant difference between the number of women who said they had reported sexual violence and the official reports of sexual violence in the police stations (Andersson and Mhatre 2003:8). Across the broad sample of 12 police station catchment areas, 16 times more women said they had reported sexual violence than were registered in the police records. This adds to the already well-recognised majority of rape victims who do not report. One way to bridge this gap is to complement institutional monitoring with community-based monitoring.

Community-based measurement addresses issues of both users and non-users of services. Going to the people in their homes makes it possible to identify reasons why they do *not* use services and, among those who do, the specific conditions for positive outcomes. When community-based data are disaggregated by sex, they produce important pointers to why women and men might relate differently to services. Correctly handled, this evidence can generate gender-sensitive solutions in both community and institutional settings.

Routine data collection

There is little benefit to collecting information unless doing so contributes to development. It is a curious paradox that routine information systems in many countries are largely independent from resource-allocation processes, particularly for information on gender equality. International commitments require countries to collect routine data on the status of women, but this generally has little to do with policy and planning. The inauguration of the UN Decade for Women in 1975, for example, gave priority to disaggregating by sex all national economic and social statistics. Countries that signed the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) must present routine statistical evidence on women's status. But most seasoned development players agree that data available on women in developing countries are entirely inadequate. They do not show the extent of women's participation in economic and social life or their true income, health, and education status (Evans 1992:39).

There are sound and familiar arguments in favour of routine data-collection schemes in services like education and health. Routine data can assist governments to *monitor* some gender dimensions of service delivery, keeping an eye on programmes and the changing uptake of services. There are two concerns: how much information is collected without being put to practical use; and how much information is *not* collected despite being needed. Besides wasting financial and human resources that might be put to better use in delivering services, many data-collection schemes produce cumbersome and unmanageable amounts of data that few countries can analyse, much less apply.

To correct these shortcomings and to put data to use for equitable development, attention must focus on relevance, the nitty-gritty of how the data are collected and, then, how they

are used. Evidence must be able to answer hard questions, guide reallocation of resources, and benchmark progress—not serve only as background reading.

A common language: impact, coverage, and cost

For a gender-sensitive measurement process to be lean and effective it requires a common framework for collection and analysis, and there should be a way to share information effectively between levels and across sectors. A common ‘language’ can help planners to make comparisons and to measure progress over time and, more importantly, to view data as evidence that can and must spur action.

Adopting a common language is not simple, as each level of planning and management and indeed each interest group will have its own information requirement, putting mixed demands on any system. Since national planners and managers tend to have louder voices than the regional or local levels, information flows are frequently geared from the periphery to the centre. Competing subsectoral interests (such as antenatal care versus immunisation in the health sector) can bias or fracture even a one-way flow of information.

A gender-sensitive information system needs to address these challenges. CIET uses three linked concepts as the shared language to facilitate communication between levels within a single sector and between sectors:

1. *Impact* is the change of status (for example, literacy, employment, education or, on the negative side, death, violence, loss of income) that can be attributed to a particular intervention.
2. *Coverage* refers to the proportion of people who obtain a particular service (such as health, education, water) out of all those who need it.
3. *Costs* include time, personnel, cash, supplies, transport, and all other elements required to supply or, from the viewpoint of a potential user, to take advantage of a given service.

Improving service delivery means improving *impact*, *coverage*, and *cost effectiveness* of services. Exploring and making explicit the gender dimensions of each of these can mainstream gender into all policies, programmes, and planning.

Impact

Those concerned with the allocation of resources at any level need to know how well their investment works: how many cases of domestic violence get prosecuted, how many cases of HIV infection are avoided, and so forth. The measurement of impact of a particular activity is the foundation of evidence-based planning. There may also be unwanted outcomes. For example, household water supplies in some settings may deprive women of their only opportunity to socialise at a communal water point.

It is crucial in planning not to confuse effectiveness—the potential impact of an activity—with its actual effect (impact) in reality. Obviously, a measure should not be introduced unless it has the potential for impact, but the most pressing recurrent need is for planners to assess actual impact. For example, if we measure the change in incidence of low birth weight among women who attend antenatal clinics, we may be measuring effectiveness and not effect (impact). The women who received antenatal services may be in better health and have better access to resources and therefore nutritional care, than those pregnant women who did not attend antenatal clinics. Planners need to know the effect that antenatal care has for the whole population of pregnant women, not simply among those who benefit from the service.

In the 1980s and 1990s, development agencies put effort into clarifying the distinction between different types of results, namely output, outcome, and impact. Donors and some

governments required the ubiquitous logical framework ('logframe') analyses. In education, for example, output might refer to the number of pupils going through a particular education system. Outcome might be their performance, for example on a standardised test. Impact would refer to the social contribution they make, through employment, participation in governance and so forth. The reasonable concern was not to assume that an output, such as receiving education, would as a matter of course produce the desired social impact, like economic equality. In the education sector, girls might face discrimination in school that does not allow them to acquire the requisite knowledge and skills, and they might face barriers in the social and cultural environment that prevent them from applying their education to make social impact. If evidence is gathered on both the school and the social impact, it can be a tool for advocating gender equality, as an issue of human rights and as a means to increase the return on social investments. The modern trend is perhaps less pedantic, considering outcomes as types of impact, but allowing that one or other will be specified as a 'final impact' of a given programme (Bolger 2000:3–4).

Coverage

Coverage refers to the proportion of those who obtain a particular good or service out of all those who need it. For example, antenatal care coverage might refer to the proportion of all deliveries attended by trained personnel; coverage of basic education might be the proportion of all children (of school-going age) who attend school. This is not the same as deliveries or children 'programmed' (in the words of some planners) to benefit from these services, a definition of coverage that is still used in some contexts.

The difference between the two definitions raises, however unintentionally, a question of equity. In the first definition, coverage is population-based: those who benefit out of all those in need. A second definition of coverage is service-based: those who benefit out of all 'programmed' to benefit. The relation between population and service-based calculations of coverage can be likened to the relation between effect (impact) and effectiveness. It may be useful to know how activities work out among those who are exposed to them, but this is not enough. The concern should be for those who do not use the services.

Obviously, coverage requires both that the service be *available* and that people be able to *access* it. When we see that only a certain percentage of potential users access a service, or that users are all of the same sex or social group, we must go to the non-service-users to learn why they choose not to use the service and the factors influencing this. Access is often determined by gender factors, such as social norms about public spaces, mobility, information, culture, education, and disposable income. In order to ensure adequate coverage of a service, these barriers must be identified and removed.

The attainment of gender-equitable coverage should not be an end in itself. It is the means to an end, mediated through the impact it can produce. An equitable planning process requires that coverage and impact go hand in hand.

Linking coverage and impact: a management and prediction tool

Because individuals perceive their future well-being as risk or the absence of risk, this is a good entry point for an analysis of impact from a particular service activity. In the allocation of development resources, the concept of risk probably has more intuitive and personal meaning than do rates or absolute numbers. It is not very helpful to know only that a given service is provided for 30 per cent of the population except, of course, if elsewhere in the country it is provided for 80 per cent—then the issue is one of equity. To identify ways to improve the effectiveness and

efficiency of services, we need more specific information that can be linked with the impact of the service and used for planning and management.

Ultimately, the reason we want to measure impact is for predictive value. In epidemiological terms, an estimate of relative risk (the risk incurred by a certain individual with one characteristic compared to an individual with another characteristic) is a first step in this prediction. For example, a CIET social audit of the gender gap in primary education in Pakistan found that a girl whose mother had no education was about three times as likely *not* to be enrolled in school as a girl whose mother had some education. Many mothers also believed that their daughters should not receive formal education. The mothers' lack of education and belief about their daughters' rights were *risk factors* that predicted girls not attending primary school (CIET 1998). The relevance is the predictive value: increasing female education and changing what mothers believe about education might reduce the gender gap in primary education.

The converse of risk, *resilience*, can also be a useful parameter. In South Africa, despite popular assumptions, men who were employed and men with higher levels of education did not show any additional resilience in comparison with other men in this study. Instead, factors that made men resilient to being sexually violent were: not being exposed to domestic violence during childhood; not having sexually violent friends; and not holding a violent self-image (Andersson and Mhatre 2003:8).

Data disaggregated to a large number of districts, areas, and sites provide the opportunity for separation of coverage with a given service into its component parts. This then allows, within the limits of scientific probity, attribution of impact to one or other specific component. In Nepal, a CIET study was able to link the incidence of childhood diarrhoea in several locations to local factors like sanitation, clean water, cultural hygiene practices, and levels of maternal education (CIET 1997b). By linking data from household surveys to those from institutional reviews—a process called meso-analysis in CIET terminology—it was possible to separate the component effects of the various interventions. This addresses the question: given a certain level of coverage of a particular service, what is the impact under specific local conditions?

Cost

Some issues in the deployment of resources are not and should not be settled on the basis of cost alone. Gender equity is often an imperative in planning that transcends analysis of short-term costs. For example, there is often a large cost for services to marginalised rural communities but, in keeping with the principle of equity in development, these resources must be deployed. It is also difficult to put a price on self-reliance in the national and local community context.

There is something distasteful about assessing impact in terms of cash. The real weigh-up in life or development is not in relation to cash, but impact in relation to more (or improved) impact, life in relation to more (or improved) lives. At no point in the equation do we attempt to place a cash value on life. Choices have to be made: this activity rather than that, these facilities rather than those. The choices should seek to balance the maximal benefit for the largest number of people, with the minimum waste of resources. This requires an appraisal of the cost of each activity in relation to its impact.

Costs include financial and human resources to provide *and to take advantage of* a particular service. From the supply side, official costs are relatively easy to measure, because data exist on the cost of such things as purchasing inputs, transporting to a community level, and delivering through personnel. The hidden management overheads and the costs of supervision are less readily available. One frequently forgotten cost is the time of volunteers. Virtually every developing country has at one time or another developed a scheme based on unpaid volunteer labour,

most of the real costs of which are never formally analysed. Volunteers are often young people and women, whose time is incorrectly considered to be free and elastic.

Costs of the service to the community are seldom available from existing sources. Elevated costs to users prevent people from accessing goods or services. These costs are generally expressed in terms of money and time, but they can also be more elusive, if more gender specific, such as having to bear social humiliation or unprofessional treatment (for example, someone seeking an HIV test at a health centre might fear criticism by health workers in front of other patients). Cash costs for accessing medical care are easily quantified. In Pakistan, for example, it was possible to show that parents pay for medical attention for a higher proportion of boy than girl children—and they pay more on average.

Time, like cash, is a finite and valuable resource, yet it is seldom considered formally in development planning. A CIET assessment of the impact of a government-sponsored development initiative in the Wild Coast, South Africa, found that time was a significant cost for using government health and administration services (Mitchell et al. 2001:12–14). In the health sector, those visiting private or traditional health services waited an average of 57 minutes, while those visiting the hospital waited close to two hours per visit. This was in addition to time spent travelling back and forth to the health facility, which was often a great distance from their residence. The cost of time is disproportionately borne by women, who are the primary caregivers in households and communities. There are also costs of *not* providing adequate services—and most often these costs are not spread evenly through the community. In the same survey, the average household spent 39 minutes per day collecting water, usually from unprotected sources. Since it is the children and women who have to collect the water, this non-provision of services is effectively a transfer of the cost of services onto them. Reversing this distortion by improving water provision would be especially beneficial to women; less time gathering water could mean additional time for more productive activities.

Similar to the idea of transferring costs of services, a prime concern for CIET is to measure costs to those who do not use or who underuse available services. Who has to pay and how much do they pay, for example, if a given preventive option like vaccination is not accessed (Andersson et al. 1992:263)? The methodology is simple: in each cycle of fact finding and analysis, we ask about knowledge of existing services, use of those services, and the reasons they are not used. In the same interview, information would be obtained on what the service attempts to prevent (perhaps measles in childhood) and the costs in terms of medical attention (traditional, private, or public), medications, and care in the home. The idea is to obtain data on costs, including cash, time, and attitudes, which can be linked to data on impact and coverage of the services.

There is another reason for obtaining evidence on costs. In the reform of any public services, there are usually so many things needing to be changed that planners quite simply do not know where to begin. A question like ‘What single thing would you most like to change in the service?’ can be followed by ‘What is the maximum you would be prepared to pay to see this change happen?’ Contingent valuation based on these answers allows planners to prioritise reforms based on how the users see the cost of the flaw to be corrected. At this point, it is crucial to have gender-stratified responses. Women might have an entirely different weigh-up of cost and benefit, so planning for their needs must rely on their own answers, not those of men.

Gender dimensions of CIET methods

Since the 1980s, CIET methods of evidence-based planning have been adapted in 49 countries to help governments and communities respond more effectively to development challenges. The CIET cross-design combines epidemiological, management, and anthropological

methods in the uptake of evidence. The methods were conceived in Central America in 1984 initially as a capacity-building tool to produce accurate, detailed, and actionable health data rapidly and at a low cost. Since their inception, they focus on combining qualitative and quantitative data in local and national planning. The methods introduce evidence into dialogue in the sites where data are collected, producing a second tier of evidence: what specific segments of those communities think about the quantitative household evidence (who has what problem and what should be done about it). The two types of evidence are then shared throughout the domain represented by the sites. This may be a municipality, a city, a state, a number of provinces, or an entire country.

All too often, participatory methods hide gender in such inclusive terms as 'the people' or 'the community'. Yet 'the community' often represents the opinions and priorities of those with more power and greater ability to voice themselves publicly. Without conscious attention to a gender, women and marginalised groups may continue to be inaudible to research and social audits. The very processes that claim to challenge unequal power relations may perpetuate them.

In the CIET methods, a gender approach is continuously tested and evolved in each setting where it is applied. This is a learning process that produces valuable lessons. So far, CIET has identified five definitive steps that together make a pragmatic foundation for gender-aware evidence and ensuring that women's voices are heard.

1. Gender analysis of existing data

Each CIET cycle begins with the critical review and analysis of existing studies and data from routine sources. One reason for non-use of data from these sources is the shortage of analytical capacity in the face of the sheer volume of data produced. Even if the data from these sources are incomplete and of imperfect quality, beginning to use them and to compare them with other sources is a first step to improving capacity for their management and, over time, the improvement of the data themselves. An early step to any CIET analysis of existing data is disaggregation by sex. For many traditional data sets, national and sub-national, simply requesting the data in this form will produce it. Based only on secondary analysis of data from published sources, Marks and Andersson (1990:50–58) demonstrated a sexualised culture of violence in apartheid South Africa.

2. Disaggregation of responses by sex

It is standard CIET practice to identify all survey data by the sex of the respondent. The usual CIET approach is to ensure as many female responses as possible; or as many male responses as possible when respondents are predominantly female, as was the case when measuring the social impact of landmines in Bosnia, Cambodia, and Mozambique (Andersson et al. 1995:720). Provided there are sufficient female responses to analyse, the issue is not that the responses make up 80 per cent, 50 per cent or 10 per cent it is a question of how different they are to the men's responses.

In some contexts, it is difficult to hear women's opinions and experience. In Afghanistan, it was predictable that in the context of the suppression of female education under the Taliban, the official data showed practically no girls attending school. However, from household data, it turned out that women had organised illegal underground schools to educate their daughters. The numbers of schools were not great, but they showed one dynamic that could be built upon. In Afghanistan in 1997, it was almost impossible to interview women in their households. In these cases, it was necessary to ask men about the status of women and children in order to get some usable information (CIET 1997a). Recognising the sex of the respondent prevented over-interpretation of the responses. Collecting gender-stratified data can also challenge official statistics.

In Pakistan, with careful logistical sensitivity and extra expenditure for bodyguards to prevent harassment of female interviewers, it was possible to speak to reproductive-age women in almost all households. However, even within these households, a real issue for further investigation was the difference in conditions of those women who do or can respond and those who do not. In the social audit of the gender gap in primary education in Pakistan, the non-reporting of girls was a common gender bias. Many respondents, male and female, simply did not report the existence of female children and efforts had to be made to quantify the undeclared girls (CIET 1997).

3. Female focus groups to interpret results and design strategies

While CIET data management follows standard and rigorous steps, the *interpretation* of emerging results relies on insights and perspectives of focus groups and service workers. Focus groups are single-sex and stratified by generation in order to maximise confidentiality and to capture the differences in experiences of different population subsectors. Data from female respondents are not only fed into women's groups nor are data from male respondents fed only into men's groups. Some perceptive commentary comes when men's focus groups are asked to reflect on evidence from women's experience. In a cycle in Pakistan investigating the link between the care of a mother and the care of her child (the 'bond of care'), focus groups of men discussed evidence showing that reducing the mother's workload during pregnancy has a beneficial effect on her child's health (CIET 1999). Men discussed this evidence and started to develop strategies to relieve women's workload, some of them included changes in male behaviour.

Focus groups also offer the opportunity to discuss issues people feel they cannot disclose in a survey. In the same study in Pakistan, for example, women discussed the issue of domestic violence more openly in focus groups than in the household surveys. While the household data described a relatively low incidence of domestic violence, data from women's focus groups indicated that beating of women was common and generally accepted in relationships (CIET 1999).

4. Gender risk and resilience analysis

More than 100 surveys since CIET's inauguration in 1986 have focused on inequalities. It is standard CIET practice to look at malnutrition, vaccine efficacy, costs of corruption and land-mines, access to education, justice, and transport as gender issues. Gender is approached as a factor that might put individuals at greater risk for a negative developmental impact.

For example, 'head of household' is a real economic and sometimes repressive category. The CIET concern is that, in male-dominated societies, female-headed households have quite different life chances because of reduced access to resources and entitlements. Development programmes can redress some of these, provided hard evidence is produced about their mechanisms. Epidemiological risk and resilience analysis bases its categories on demographic characteristics of the household (defined usually as those who eat from the same 'plate'). It is also possible to group together those households that do not have males over a certain age—typically 18 years, depending on the country—to contrast them with households that do have an economically active male. Household composition is a strong risk factor for access to basic services and food security.

5. Design and logistical sensitivity

Building the community voice into planning requires much more than manipulation of data. It requires that we develop conditions to enable female participation and that we deal with sensitive issues, such as domestic violence or sexuality, in a respectful and confidential manner. In the survey on the Bond of Care in Pakistan, for example, CIET fieldworkers had to take special

steps to ensure that a woman felt comfortable answering personal questions on domestic violence, including getting mothers-in-law to leave the room during particular questions by politely asking for a drink of water.

Also in Pakistan, a survey on women's access to justice in Karachi tested new tools for improving disclosure and the accuracy of response for questions about domestic violence (Mhatre et al. 2002). Interviewers gave the women key chains, with a mirror on one side and helpline numbers on the other, towards the end of the interview. Choosing a moment when they would not be overheard, the interviewer explained to the respondent that she was going to ask a sensitive question about the woman's experience of abuse in the last year and that she should simply answer by showing one or another side of the key chain. A woman could respond more honestly because she did not risk being overheard by other members of the household. By not expressing her answer aloud, she had technically not spoken without permission; she had not lost what her family might see as her honour and, through anonymity, maintained her personal safety.

Gender outputs of the CIET methods

The CIET approach to evidence-based planning has two orders of output.

First order: reliable and actionable place data

The first order is actionable quantitative and qualitative evidence about a given development problem, evidence that can be applied to locally led solutions and strategies.

CIET methods for evidence-based planning involve data-collection and analysis cycles in a defined panel of sentinel sites. These sentinel communities—in effect, enlarged clusters in a standard cluster sample—are representative of a broader area, perhaps a district, region or country. Typically, the sample would be stratified by region/province and urban/rural, with the last stage being the random selection of sentinel sites. Concentrating measurement resources and different methods in these sites, it is possible to generate detailed and reliable information to supplement existing information systems.

The ability to repeat measurement in the same place makes impact estimation relatively straightforward. These households can be contacted in reiterative cycles, perhaps six months, a year, or two years later, to measure differences over the period. These differences can be related to programmatic input and other factors, which might be heterogeneous across different sites. The impact assessment is based on the time sequence and the heterogeneity between sites.

The cornerstone activity in each site is the household survey, which focuses on evidence that cannot ordinarily be gleaned from the routine database—for example, attitudes towards a particular service and reasons (costs) for failure to use available services. Complementing surveys with qualitative processes such as focus groups and interviews with key informant increases insight into development issues. The household questionnaires begin to capture some key beliefs and behaviours, while the qualitative methods explore the causality of these indicators and the reasons why responses might differ among different social groups. The intersection of these methods in the same population domain has the powerful advantage of capturing gender issues that lie 'between households' in the culturally accepted mores and values of a community.

For data collected in sentinel sites, as by any mechanism in an information system, the first concern is that they should be manageable. The data are therefore simple—if abundant, to increase confidence in statistical analysis.

The logic behind the method is to initiate a repeatable series of cycles that delineates a priority problem; lists questions to be answered in the planning process; reviews existing data in that area, noting what is not available; collects data in locations that can be followed over time for a longitudinal perspective; generates a communication strategy; and reallocates resources that address the problem in question.

Second order: an enabling environment for sustainable development

Measurement can contribute to development through advocacy, better planning and management, but also through what one might call *dynamism*, its active dimension. When citizens are involved in measurement, their broader participation in the planning process may be sparked. Interaction around development-related data as they are gathered can catalyse and support local initiatives.

The goal of CIET methods is not only to collect actionable data, but to create an enabling environment for equity-oriented development. This means looking beyond narrow concerns to avoid biases when research 'subjects' change as they participate in the study. Much of the success of evidence-based planning is the extent to which it *can* create, document, and repeat this very effect. One can avoid biasing responses simply by interviewing other individuals in subsequent cycles. The aim is to change levels of knowledge, attitudes, and opinions as a result of the fact-finding and feedback, but to do so in a way that does not undermine impact assessment. Key to this is that feedback is not limited to the sentinel (measurement) sites, but extended to the whole domain represented by the sites.

Most data-collection and monitoring processes tend to be supply-driven, concerned with the measurement obligations of the service providers rather than the needs of clients and potential clients/users of the services. A participatory, evidence-based planning methodology can put the clients first, emphasising their rights as client-citizens. Insofar as it manages to do this, it can contribute to a culture where citizens are increasingly empowered to assert their entitlements to goods and services supposed to be provided by the state and, therefore, to monitor the state's provision of quality goods and services. Civil-society institutions have a complementary role in this process. By involving non-governmental and community-based organisations in the measurement process, the CIET approach helps include public services in the network of governance issues on which there is meaningful interaction with the public.

Capacity refers to people's material resources, their social structures, their knowledge and skills, and their beliefs and attitudes. It is this capacity that determines how people are able to respond to development challenges. An evidence-based planning process that is driven from the community level builds the capacity of both women and men to respond to their unique and joint challenges. CIET methods build capacity in three key areas.

First, CIET builds capacity in the *skills of evidence-based planning*, including questionnaire design, qualitative processes, computer-based analysis, and interpretation and presentation of data. CIET is a teaching institution; the transfer of skills and knowledge is integral to all its programmes. In most CIET surveys, one or two international research fellows work with a team of national counterparts, providing them with on-the-job training in evidence-based planning. In Pakistan, for example, five field coordinators have received training since 1996 in CIET institutions in Pakistan, Canada, and Mexico. Government officials from the district and provincial administrations and the Bureau of Statistics have participated in fieldwork and data entry. At least 150 fieldworkers have also been trained to conduct household surveys and to facilitate focus groups. During the workshops held to discuss results, hundreds more government and NGO officials have received exposure to the concepts and examples of evidence-based planning.

Second, CIET builds *community capacity*, including evidence-based dialogue, group liaison, and development management. The first CIET initiative in Canada trained a group of urban indigenous youth in Winnipeg to research problems of addictions and antisocial behaviour among their peers. By the second cycle of the project, the group of youth researchers had gained experience and confidence and were able to produce their own strategy for dealing with their problems. Through this process, young people learned how to facilitate communication and problem solving and to be leaders in their own communities. Also among First Nations communities, the Talking Circle, a traditional means of sharing and analysing information, was integrated as a component method in the cross-design methodology. In addition to being an excellent means to gather and process evidence related to the research question, it was also an opportunity for the communities themselves to explore new ways of using their existing information structures.

Third, CIET builds local *skills and confidence to analyse their reality*, actively participate in the planning process, and assert their rights vis-à-vis the state. For many women, participating in a focus group is their first opportunity to publicly voice their opinions and talk about their experiences. CIET's work on sexual violence in south Johannesburg led to members of more than 30 NGOs being trained in implementing evidence-based planning.

Empowerment and governance are concepts that go beyond participation. They imply people's ability to understand their situation, to reflect on actionable factors underlying it and, most critically, take steps to improve it. A specific aim of an empowering methodology must therefore be to catalyse a process that leads to new forms of awareness and self-confidence of the governed, in relation to their governments.

CIET methods facilitate a process of 'collective consciousness raising', to use the terminology of Paulo Freire. When focus groups convene to interpret the data of the household surveys, they are reflecting on their own realities—the information that they themselves provided. With local fieldworkers, participants are encouraged to make causal linkages between different influences, for example between women's lack of access to adequate information and childhood nutrition and from that to reflect on socially-constructed patterns of power and oppression. This process can be a spark for individual or collective action to change attitudes and behaviours.

The circle is closed when, in a subsequent cycle to assess impact, people are able to see how their voices, their decisions, were determinant in changing their situation.

Conclusion

The CIET cross-design means development of linked quantitative and qualitative instruments in consultation with a local or national steering committee, local fieldworkers, and other stakeholders. This offers a tool to collect different types of evidence on the gender dynamics of impact, coverage, and costs of public services to which women and men are entitled. When this evidence is applied to planning, it is possible to orient services and to allocate resources better to meet needs of both women and men and challenge the gender patterns of poverty and marginalisation.

Just as important as the evidence collected is the process by which it is done. When the evidence that has been generated is assimilated, interpreted, and owned by the communities whom development planning is meant to serve, evidence-based planning has an additional effect of creating an environment of sustained participation and transparency. Governments acquire the skills to facilitate an evidence-driven and participatory process and civil society, including women's organisations, become more able advocates for effecting change at all levels.

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Paper 2.

Andersson N, Cockcroft A, Ansari N, Omer K, Chaudhry UU, Khan A, Pearson LW.

Collecting reliable information about violence against women safely in household interviews: experience from a large-scale national survey in South Asia.

Violence Against Women 2009;15(4):482-96.

STATEMENT OF CONTRIBUTION

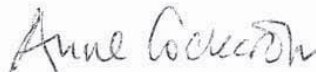
Andersson N, Cockcroft A, Ansari N, Omer K, Chaudhry UU, Khan A, Pearson LW. Collecting reliable information about violence against women safely in household interviews: experience from a large-scale national survey in South Asia. *Violence Against Women* 2009;15(4):482-96.

The contribution of Neil Andersson included design of the study, technical oversight of the training, conceptualisation of the article, writing and final approval

Neil Andersson



Anne Cockcroft



Collecting Reliable Information About Violence Against Women Safely in Household Interviews

Experience From a Large-Scale National Survey in South Asia

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This article describes the first national survey of violence against women in Pakistan from 2001 to 2004 covering 23,430 women. The survey took account of methodological and ethical recommendations, ensuring privacy of interviews through one person interviewing the mother-in-law while another interviewed the eligible woman privately. The training module for interviewers focused on empathy with respondents, notably increasing disclosure rates. Only 3% of women declined to participate, and 1% were not permitted to participate. Among women who disclosed physical violence, only one third had previously told anyone. Surveys of violence against women in Pakistan not using methods to minimize underreporting could seriously underestimate prevalence.

Keywords: *domestic violence; household survey; methodology*

There is good evidence that violence against women, especially in the domestic setting, is a common problem in both developed and developing countries (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006; Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002; Watts & Zimmerman, 2002), and it is recognized as a serious public health problem (Campbell, 2002; Heise, Raikes, Watts, & Zwi, 1994; Krantz, 2002). But

research into violence against women is not easy. Even the definition of what constitutes violence against women varies from place to place and between researchers, making comparisons between studies difficult (Piispa & Heiskanen, 2005; Schwartz, 2000). Researchers have used various survey methods to measure the prevalence and incidence of different forms of violence against women, involving samples representing the adult female population of regions or whole countries (e.g., Ellsberg, Pena, Herrera, Liljestrand, & Winkvist, 1999; Fanslow & Robinson, 2004; Garcia-Moreno et al., 2006; Jewkes, Penn-Kekana, Levin, Ratsaka, & Schrieber, 2001; Johnson, 1996; Tjaden & Thoennes, 2000). Because the data collection method can make a big difference to the prevalence of violence found in a population, comparisons between surveys in different places and over time are unreliable unless the surveys used similar methods (Posselt, 2005; Rand & Rennison, 2005).

Surveys of violence against women present particular methodological and ethical challenges, and several authors have reviewed these and offered pointers for conducting such surveys (Ellsberg & Heise, 2002; Ellsberg, Heise, Pena, Agurto, & Winkvist, 2001; Jewkes, Watts, Abrahams, Penn-Kekana, & Garcia-Moreno, 2000). The World Health Organization (WHO) has developed guidelines for ethics in surveys on violence against women (WHO, 2001), which extend overall ethical guidelines for research involving human subjects (Council for International Organizations of Medical Science, 1991). Among the most important concerns about surveys are underreporting of violence and the physical and emotional risks for respondents and interviewers. There is evidence that women are more likely to disclose sexual assault to a female interviewer (Sorenson, Stein, Siegel, Golding, & Burnham, 1987), and the interview context and setting, including training and support of interviewers, can make a big difference to violence disclosure rates (Ellsberg et al., 2001). Ensuring privacy of the interview is crucial, both to minimize underreporting—shown to be more likely if someone else is present (Walby & Myhill, 2001)—and to protect the safety of the respondent and interviewer (Ellsberg et al., 2001; WHO, 2001). A further ethical consideration is that the findings should be used to support efforts to reduce the level of violence against women, thus balancing the real risks of the survey with potential benefits (Ellsberg & Heise, 2002; Jewkes et al., 2000; WHO, 2001).

We developed a practical approach in a large, nationally representative household survey of violence against women in Pakistan to deal with these concerns, especially to minimize underreporting and to ensure physical and emotional safety of the women respondents and interviewers. In designing and implementing the survey on this sensitive topic, we built on our experience of undertaking large-scale household surveys throughout Pakistan (Cockcroft et al., 2003) and of a study about access to

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justice for women in Karachi, Pakistan, in which we piloted methods for allowing women to disclose privately sensitive issues in the context of a household survey within an extended family setting (Mhatre, Andersson, Ansari, & Omer, 2002). We also used lessons from a survey of women's experience and reporting of sexual violence that we undertook in Johannesburg, South Africa (Andersson & Mhatre, 2003). A separate article will describe the efforts we made to ensure use of the findings to inform and encourage programs to reduce violence against women in Pakistan.

Background to the Survey in Pakistan

It is generally believed that rates of violence and other forms of abuse against women in Pakistan are high. But there is little quantitative evidence from representative samples of women. Civil society groups and bodies such as the Human Rights Commission for Pakistan have typically collected and reviewed reports from the press and cases reported to official bodies such as the police (Niaz, 2003). A study of 150 married women attending outpatient clinics in Karachi found that 34% had experienced physical violence and 73% of those who had were anxious or depressed (Fikree & Bhatti, 1999), and a recent Karachi study reported that 44% of 300 women in postnatal wards had experienced marital physical abuse (Fikree, Jafarey, Korejo, Afshan, & Durocher, 2006). But at the time of our study (2001-2004), there were no reliable figures for abuse among the overall population of women in Pakistan, and our study remains the only one to estimate rates of abuse in a representative national sample of women. When designing the study, we talked to many of the researchers who had carried out previous studies, especially about the problems they had encountered during the work and the solutions they had found to these problems.

In Pakistan there are cultural norms about women's movements and interactions that can pose challenges for household surveys, irrespective of the topic. In some parts of the country, it is not acceptable for a woman to move outside the home other than under limited conditions and accompanied by a male family member. It is not acceptable for men, other than family members, to enter a household, and it is generally not acceptable for men to interview women. It is often not acceptable for female members of an interviewing team to travel in the same vehicle as the male members, so special transport arrangements are needed, as well as arrangements for secure accommodation for the female team members. In some conservative communities, elders and religious leaders will not allow women members of field teams to enter the community as they are considered to be acting inappropriately by undertaking this sort of work away from their homes. When the survey was being planned, some researchers indicated that they thought it would not be possible to carry out the survey in all districts, because of the very restrictive attitudes about women in some districts and the considerable security concerns in some places, increasing the difficulties of travel and accommodation for women interviewers.

Survey Method

The study took place between 2001 and 2004 and comprised a design phase, reviewing previous work in Pakistan and elsewhere and consulting widely; a large-scale, nationally representative household survey to establish the frequency of violence and other forms of abuse against women and the factors increasing and decreasing the risk; community focus groups to discuss the findings separately with women and men and explore potential solutions; and a phase of sharing the findings with stakeholders to plan interventions to reduce the problem, based on evidence from the study. The CIET ethical review board, expanded for the occasion to include female members from Pakistan, gave approval for the household survey in September 2002 and for the focus group work and key informant interviews in July 2003.

Sample

A stratified cluster sample (last stage random) design was used to give representation of the four provinces and at the national level. Each district (97 at the time) contributed data, although not at a level sufficient to declare figures for individual districts. In each sample community, the survey team covered about 100 households, working together. The resulting sample of 23,430 eligible women older than 14 years lived in 20,034 households across the country.

We deliberately used as the sample a proportion (randomly selected in each district) of the sample sites previously visited in a different, less sensitive survey (Cockcroft et al., 2003). This meant the communities were already familiar with our field teams and could interpret the new survey as some sort of follow-up to the previous survey, rather than as something specifically about abuse against women, which may have led to community leaders refusing the team entry into the community at all. Not making public the topic of the survey also helped to minimize the risk of retribution against women in the community who participated in the survey as well as to reduce security risks for the women interviewers.

Survey Instruments, Interviewers, and Field Processes

We spent six months on the design and piloting of survey instruments and field processes, testing successively different methods to increase the rates of disclosure about violence and other forms of abuse, while taking precautions to protect both respondents and interviewers. The design involved wide consultations and a series of design focus groups. Pakistan is a culturally and socially diverse country, so we tested the instruments and procedures in different parts of the country to ensure they worked effectively in the different social and cultural conditions prevailing in different areas.

Increasing Disclosure

Questionnaire. The main questionnaire was completed in an interview with each eligible woman present in the household, excluding the most senior woman (the mother or mother-in-law) unless she was alone in the household. The questionnaire included questions about family norms and covered opinions about what constitutes abuse as well as about the experience of different forms of abuse, including physical violence, and reporting of this abuse. It also included questions about educational status, literacy, work activities, and income inside and outside the home, as factors potentially related to a woman's risk of experiencing different forms of abuse. We tested several possible options for ordering and wording of questions to make women feel more comfortable to disclose about abuse when they reached this point of the questionnaire. Among other things, it proved helpful to include, just before the questions about their own experience of forms of abuse, some questions about their sisters' experience of abuse. The questions about sisters also allowed us to collect information about violence against women leading to death, including so-called honor killings.

We also developed a second questionnaire, which we administered to the senior woman in each household, and to any male household members present. This questionnaire covered much less sensitive topics, including the household demographics and their norms and traditions. It included some questions about the acceptability of different practices related to restrictions and disciplining of women but did not include any direct questions about violence or other forms of abuse. We asked about these household characteristics and family beliefs because of their potential relationship to a woman's risk of experiencing violence.

Selection and training of interviewers. The women interviewers needed to be able quickly to establish a relationship with the women respondents so that these women felt able to disclose to them something as sensitive as having experienced physical violence or some other form of abuse. We mostly selected interviewers for this survey from among women who had worked with us previously and proved themselves to be efficient and conscientious. For this work, we selected women who were more than 20 years old (mostly 25 years and older) and who projected self-confidence as well as empathy. In the early piloting of the instruments and field processes we found that younger women, for example university students, although they could be very efficient interviewers generally, had a lower rate of disclosure of abuse than their older colleagues. We selected interviewers for each part of the country who came from that area, although not the sample communities, so they were familiar with the particular customs and norms of behavior, which vary quite markedly across Pakistan. The interviewers also dressed according to the norms of the different communities they visited, veiling their faces, for example, in some communities.

The training of the interviewers included as usual reviewing the contents of the instruments, and practice interviewing in nonsample communities. For this survey,

Table 1
Effect of Women Discussing “A Case of Abuse They Knew About”
and Bringing This to Mind When Interviewing Women About Their
Experience of Violence and Other Forms of Abuse

	1st Day	2nd Day	3rd Day
Number of interviews	31	53	35
Refusals	1	0	0
Disclosure of violence and other forms of abuse			
Restrictions as a form of punishment	4	20	10
Emotional or verbal abuse	10	37	26
Harassment outside the home (verbal or physical)	6	13	17
Physical violence	1	19	15

Note: 1st day: Interviewers had not had the session about recalling a case of abuse they knew of and did not share anything about their own experience with the women they interviewed; 2nd day: Interviewers had attended a session about recalling a case of abuse they knew of and they mentioned about “knowing of a case” to the women before asking them about abuse; 3rd day: Interviewers had reviewed their experiences of the day before and discussed with each other the best way to mention to women about themselves knowing of cases of abuse.

we noted the disclosure rates for the different interviewers during their field practice sessions. We continued the training and practice until all the interviewers were achieving similar levels of disclosure. We found that in the first field practice session, most of the interviewers had low rates of disclosure in their interviews. At this point, we added a women-only session in which we asked each interviewer to tell the rest of the group about a case of abuse of which she knew personally. The session took time and was sometimes emotional. The interviewers reported that it helped them to appreciate how hard it is to talk about such matters; in many cases, the abuse they described had happened either to themselves or to a family member. After this session we asked the interviewers that in their interviews with the women respondents, just before asking them about their experience of violence and other forms of abuse, they should bring to mind the cases they themselves had described and tell the women, “I know how hard this is to talk about. I myself know of someone who has experienced abuse.” We found that after this session in the classroom, the interviewers achieved markedly higher rates of disclosure of abuse, particularly for physical violence. Table 1 shows an example of the effect on disclosure rates. The interviewers reported that this simple procedure had a noticeable effect on the women they were interviewing. They themselves felt more comfortable asking the women about their experience of abuse, although they also felt more connected with the women and more affected by their painful stories.

Conduct and privacy of interviews. In the extended family setting still prevalent in many parts of Pakistan, it is difficult for a single interviewer to enter a household and interview a woman in private, particularly a more “junior” woman when a “senior” woman (such as the mother-in-law) is in the house. A request for privacy with the junior woman stimulates the curiosity and suspicion of the senior woman, who may either refuse the request for an interview or insist on being present. To allow women to be interviewed without being overheard, at least two women interviewers entered each household. One of them interviewed the senior woman (the mother or mother-in-law) using the less sensitive questionnaire, while the other interviewed the eligible women, using the main questionnaire. If necessary, additional interviewers were called in to help interview the eligible women. If there was only one woman in a household, she responded to both the senior-woman questionnaire and the main questionnaire for eligible women.

The interviewer of the senior woman deliberately kept that interview in a public area of the household and conducted the interview in a loud voice, allowing other people to be present and listen in if interested. She continued the interview with some extra general questions provided for the purpose, even after the formal questionnaire was completed, until her colleague(s) had completed the interviews with the other women in the household. The interviewer(s) for the other women in the household took each woman aside—preferably into another room or another part of the courtyard—and conducted the interview quietly. If other women were waiting to be interviewed, the interviewer(s) did not allow them to listen in, but politely requested them to carry on with their tasks until their turn to be interviewed. Children over the age of 2 to 3 years were kept away from the interviews, recognizing they might repeat what they had heard while the woman was being interviewed.

At the beginning of the interview, the interviewers explained to the eligible women respondents that this was a survey about the experiences of women, that their responses would be treated as confidential, that their names were not recorded, that they could decline to be interviewed, that they could discontinue the interview at any point, and that they could decline to answer any question they were not comfortable with. They then sought their verbal consent to continue the interview. Of the 31,407 eligible women identified in the households (all those more than 14 years of age, irrespective of their marital status), some 23,430 (75%) were interviewed. Among those not interviewed, the usual reason was that the woman was not available in the household at the time (21%, 6,465). Only a few women declined to be interviewed (3%, 1,061), and even more rarely someone else in the household (usually the senior woman) declined to allow an eligible woman to be interviewed (1%, 451).

In most households, men were not present when the interviewers entered. If men were present, the interviewers explained to them that a male team member was outside the household and would like to interview them if they would step outside for this. They gave them a slip identifying which household they were from to ensure their data could later be matched to the correct household. When the men went

outside, the male interviewers conducted their interviews, using the same questionnaire as that used for the senior women in the households. This technique both removed men from the household while the women were being interviewed and allowed us to collect male views about issues potentially related to the risk of violence against women.

Ensuring Safety of Women Respondents and Interviewers

Physical safety of women respondents. Our arrangements to ensure privacy of the interviews (as described above) were intended not only to increase disclosure but also to ensure that the women who disclosed did not suffer for doing so. The fact of talking about these issues at all, whether or not they disclosed any violence or other forms of abuse, may be enough to get women in trouble with their families. Therefore, we advised the women respondents not to talk in any detail about what they had been asked and rather to mention some of the general questions if they were asked about the interview. The interviewers suggested to the women what questions they should mention if asked. The intention was to leave the impression that their questionnaire was similar to or the same as the less sensitive questionnaire administered to the senior women or the men in the households.

We cannot be certain how well these procedures protected all the women interviewed. However, we did have an opportunity to check this when we returned to each of the sample communities to undertake the focus group discussions. We undertook separate focus groups of eligible women (who had completed the main questionnaire), senior women (who had completed the other questionnaire), and men. At the time of the household survey we had asked women if they would be willing to participate in later focus groups. In one community, of the 200 in the sample, we were not able to hold a focus group of eligible women because, as one of them explained to us, they were frightened to attend because husbands and mothers-in-law were already suspicious of them after the household survey. In general though, women attending the focus groups did not report that they had experienced any difficulties after the survey, noting that other people did not know what they had spoken about in their interviews. Some had been questioned about the survey and had used the suggested responses to allay suspicions.

Physical safety of women interviewers. Each field team included 12 female interviewers (working in six pairs) and three male members, as well as one female member responsible for quality control. The role of the male members was to interview any male household members present when the women interviewers entered the household, as well as to make contact with the community leaders on entering the community and get their permission to proceed with the interviews. They also had responsibility for ensuring the safety of the women team members. Each male team member accompanied a group of four women interviewers. He always knew which

households the women were in and could check that all was well if they were delayed. The male team members were also responsible for safety of the whole team during travel and in the places where they stayed overnight. In particularly difficult places, the senior male provincial coordinators also accompanied the team to add further support and protection. In some areas it is dangerous to mention any non-governmental organization (NGO) connection as conservative elements perceive NGOs as subversive and even “evil,” so the teams took with them documents making it clear they were conducting the survey on behalf of a government department.

The fieldwork was not without incident and some of the field teams had to deal with significant threats to their safety. They had practiced methods of dealing with various scenarios. The threats were mostly related to the general social and cultural environment in some communities, which reacted to the presence of a large group of female interviewers, rather than to suspicions about the topic of the survey. For example, in one community a religious scholar (*moulvi*) became incensed that women were walking about in the community and talking to community women, and he informed men in the community that if these women visited their houses they had the right to marry them forcibly. Mostly the women team members dealt with the threats themselves, but the male team members were always on hand in case they were needed.

Emotional safety of women respondents and interviewers. Talking about the experience of abuse is emotionally difficult for both the woman respondent and the woman interviewer. Among women who disclosed physical violence, only one third had told anyone at all before the interview. The women interviewers were not trained nor in a position to offer counseling to women who disclosed physical violence or other forms of abuse. The training emphasized that the interviewers could not offer the women specific help and they should not raise any expectations of this. Respondents provided information of their experiences on the understanding that we would bring together their collective experiences and report them, in an attempt to help the women of Pakistan in the future. Many respondents specifically said they were willing to reveal their experiences in the hope that this might improve matters for other women in the future. Some said they felt relief by telling someone what had happened to them without fear of getting into trouble.

We gave careful consideration to the recommendation that researchers should give women survey participants details of sources of emotional support and other help (WHO, 2001). In the few places (mainly big cities) where there were services available, the interviewers offered the women respondents contact details for these services, having first checked that they could receive and keep the information safely. However, in most parts of Pakistan there is no such support available. An additional problem in Pakistan is the very low literacy level among women, limiting the usefulness of written material, which they would not be able to ask a male family member to read on their behalf.

The women interviewers heard many harrowing stories of respondents' experiences of violence and other forms of abuse during every day of their work. This is upsetting and emotionally draining. We provided for safe and private accommodation for the interviewers and, at the end of each day, the female quality control coordinator on the team facilitated a session to allow the women interviewers to share their experiences and emotions. This was also an opportunity to discuss how interviewers had dealt with different situations and to plan and prepare for the ongoing work. The teams worked together to cover each community and stayed together throughout the period of data collection, becoming close and supportive groups. In each region, a more senior female quality control associate regularly visited the teams to check progress. Part of her role was to check on how interviewers were coping with the emotional burden of the work and to provide additional support for individual interviewers experiencing any difficulties. None of the interviewers had to drop out because of not being able to cope with the emotional stresses of the work. Although they were upset about what they heard, many of the team members, female and male, said that their participation in the research had changed their lives and they felt proud to have been part of it. As one female interviewer said, "I learned that I should not keep silent about abuse and I should say things are wrong if they are wrong. I try to defend my rights now."

Discussion

We believe we have been able to comply with the intention of all the guidelines of the WHO about ethical conduct of studies of violence against women (WHO, 2001), although in some instances we used methods different from those recommended in the guidelines.

We went to considerable lengths to protect both the women participants and the research teams. Our method of ensuring privacy of interviews in the Pakistani household context, with at least two interviewers entering each household, proved very effective. We did not limit the number of women interviewed per household to one, as suggested in the guidelines to prevent details of the interview from becoming known. We believe that sometimes it is important to try to find all women present as one might otherwise miss those most at risk, such as a separated or divorced woman living with her parents. In practice, we typically interviewed one or at most two women per household, mostly because others were not present at the time of the visit. We protected the privacy of the interview contents by advising women not to discuss the details, even with other women in the house, and by the implication that the content was the same as that of the much less sensitive questionnaire administered to the senior woman and any male household members who were present. We carefully trained our interviewers and they did not conduct or continue interviews when they could be overheard or when interrupted.

We arranged the fieldwork and logistics to protect the women interviewers as well as the women participants, including the role of the male team members. Despite our careful safety arrangements, the field teams did experience difficult situations, especially in the most conservative parts of the country. Nothing serious happened either to any of the interviewers, or to any of the interviewed women, as far as we could ascertain when we returned to the communities to conduct focus group discussions about the findings. But it is important not to underestimate the real risks of undertaking and participating in this sort of research.

The arrangements to protect the safety of the women participants and interviewers added to the costs of the work. We formed larger field teams to allow for two interviewers per household, added additional male members to the teams, and made special transport and accommodation arrangements for the teams.

In planning the study, we reviewed the existing evidence about how to minimize underreporting of violence in surveys (Ellsberg et al., 2001; Jewkes et al., 2000) and drew on our own experience. We designed the instrument to facilitate disclosure and piloted the instrument extensively in different parts of the country. We used only women interviewers, in any case usually a requirement in Pakistan when interviewing women on any topic, and selected and trained them carefully, testing the effects on disclosure rates as part of our piloting and then actual trainings. A key element was the empathy generated by interviewers recalling a case of abuse of which they themselves knew, and interviewers sharing this insight with the women at the point of the interview just before they asked about the actual experience of violence and other forms of abuse. This produced a marked increase in disclosure rates achieved during field practices as part of the training.

From the details provided by respondents regarding their abuse, we do not feel this procedure led to any false disclosure among women who had not been abused. Other authors agree that overreporting, or fabrication, of abuse is very rare in surveys (Ellsberg et al., 2001; Jewkes et al., 2000; Koss, 1993; Smith, 1994). We are aware, however, that any follow-up that does not include this step in the training will almost certainly underreport abuse, producing a misleading impression of a decrease in violence against women.

We believe our efforts were effective in increasing disclosure and minimizing underreporting. This conclusion is supported by the finding in our survey that only a third of the women disclosing physical abuse had told *anyone* about it before. Nevertheless, there will have been some abused women who did not feel able to disclose this in the interview, so the rates we found should be considered minimum estimates. The overall nonresponse rate among eligible women was 25%, but this was mainly because they were not present in the household when the interviewers entered; women only rarely declined to be interviewed (3%) or were not allowed to be interviewed (1%). Those women who were not interviewed may have had a different, and potentially higher, rate of abuse than those interviewed. Rates of violence and other forms of abuse reported from household surveys that do not include special

arrangements to increase disclosure, such as those we employed, are likely to be serious underestimates. For example, if a repeat survey after an intervention is carried out without using the same arrangements to enhance disclosure used in the initial survey, it could lead to a spuriously large decline in estimated rates of abuse attributed to the intervention.

We made special arrangements to provide support for the field teams, especially the women interviewers. We believe these were largely successful; no women had to leave the work because of stress or emotional difficulties. What made it easier to provide support were the fieldwork arrangements that kept the teams working together in one place rather than scattered and working alone. Similarly, we made efforts to reduce any negative emotional consequences for women respondents recalling painful memories. Our interviewers were trained in what was to be done if a woman became upset during the interview, and they ended the interviews on a positive and empowering note (Parker & Ulrich, 1990). It was not possible to comply with the guideline about referring women to sources of support because these are largely absent in Pakistan. Setting up short-term support mechanisms in the context of a countrywide survey was not feasible, but as a result of the survey, improved mechanisms of support and reporting of violence against women are being developed.

We were strongly aware of our responsibility to ensure correct interpretation of our findings and their use in efforts to tackle the problem of abuse against women in Pakistan. Indeed, this was our only promise to the women who took part in the survey: that we would use the experiences they shared with us to try to help other women in the future. We would draw attention to the value—in ensuring use of findings to support interventions—of collecting information not only about the prevalence of violence against women but also about the factors that increase or decrease the risk. This allows an analysis of the possible benefits of actions aimed at decreasing the risk and allows planning for action to go beyond the laudable intention of “we must do something” to actual plans based on evidence of what might have the most impact (Andersson & Roche, 2006). We collected such information about potential risk factors and analyzed their actual relationships with the risk of violence and other forms of abuse. After taking account of the effects of other variables, we found that a woman was more likely to have experienced violence if she or her husband had no formal education, she was from a very poor household, she was married without her consent, the family had certain marriage practices such as polygamy and bride-price, and if there was a family history of physical abuse. A woman who was in paid employment was actually slightly more likely to have experienced violence than a nonworking woman, and a woman who had experienced violence was more likely to believe that male violence against women could be justifiable. We used these findings, and others, to good effect in our presentations to different stakeholders. The details of the survey findings and our efforts to use the findings to promote action will be covered in separate papers.

The design and methods of this national survey produced, for the first time, a reliable estimate of the overall rate of violence and other forms of abuse experienced by women in Pakistan. Importantly, we were also able to examine the factors that increased or decreased the risk of abuse in the overall population of women, and this formed the basis for the constructive discussions about the findings that followed.

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Neil Andersson



Anne Cockcroft



Barriers to Disclosing and Reporting Violence Among Women in Pakistan: Findings From a National Household Survey and Focus Group Discussions

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Abstract

Worldwide, many women who experience domestic violence keep their experience secret. Few report to official bodies. In a national survey of abuse against women in Pakistan, we examined factors related to disclosure: women who had experienced physical violence telling someone about it. In focus groups, we explored why women do not report domestic violence. Nearly one third of the 23,430 women interviewed had experienced physical violence. Only 35% of them had told anyone about it, almost always someone within their own family. Several personal and family factors were associated with disclosure. Having discussed the issue and feeling empowered to discuss violence were consistent associations. Of the 7,895 women who had

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suffered physical violence, only 14 had reported the matter to the police. Female focus groups said women who report violence risk their reputation and bring dishonor to the family; women fear reporting violence because it may exacerbate the problem and may lead to separation or divorce and loss of their children. Focus groups of men and women were skeptical about community leaders, councilors, and religious leaders supporting reporting of violence. They suggested setting up local groups where abused women could seek help and advice. There are strong disincentives to reporting violence in Pakistan, which are well known to women. Until better systems for reporting and dealing with reported cases are in place, domestic violence will continue to be a hidden scourge here and elsewhere.

Keywords

violence against women, reporting, Pakistan

Background

Abuse against women is a common problem globally, with serious consequences for emotional and physical health (Ellsberg, Jansen, Heise, Watts, & Garcia-Moreno, 2008; Watts & Zimmerman, 2002). Yet this is largely a hidden scourge, and official statistics of reported abuse are well recognized to be no more than the tip of the iceberg (Gracia, 2004). Violence against women flourishes in a climate where the majority of survivors remain silent about it.

In Pakistan, the vast majority of cases of domestic violence are not reported to any official body (Hayat, 2002). According to the Human Rights Commission of Pakistan, in 2001 even in the handful of cases where police register a First Information Report for cases of burns—a common form of violent assault on women perpetrated by their in-laws—the injuries suffered by the women were mainly attributed to accidents involving stoves (Hayat, 2002). The incidents of abuse against women that are reported officially are mostly the extreme cases where the victim is burnt, disfigured, raped, tortured, or murdered (Hayat, 2002).

Pakistan does not have any explicit and specific laws that protect victims of domestic violence and penalize the perpetrator. The only recourse for a victim of domestic violence is to have a case registered under the *Qisas* (lit. retribution) and *Diyat* (lit. compensation) Ordinance 1990. This ordinance penalizes all acts of causing intentional or unintentional physical harm to another including murder, attempted murder, or hurt. The ordinance is based on Islamic criminal laws, and evidentiary requirements are very strict. The

ordinance also treats an offence as a crime committed against an individual, rather than one against the state—a crime can be revoked if the victim chooses to take money or decides to reconcile. Therefore, once a crime has been registered under this ordinance, an abused woman can face tremendous pressure to “forgive” her perpetrator.

In the absence of explicit criminalization of domestic violence, police and judges have tended to treat it as a nonjusticiable, private or family matter or, at best, an issue for civil, rather than criminal, courts (Hassan, 1995). Due to this lack of formal recognition, the judicial system, from police officials to Pakistani courts, tends to view domestic violence as a private affair and not open to legal scrutiny (Bettencourt, 2000).

Especially in countries like Pakistan where the mobility of women outside the home is limited, women are more at risk of violence from an intimate partner than from any other type of perpetrator. The home, which is supposed to be the most secure place, is where women are most exposed to violence (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006; Heise, Ellsberg, & Gottemoeller, 1999). Reporting abuse often involves life-changing decisions for the victim and her family.

A number of authors have examined the reasons why many abused women do not tell anyone what has happened to them, let alone report to the authorities. Studies in developed countries have found that people were less likely to report partner assaults than those by strangers (Felson & Pare, 2005); that attitudes toward reporting domestic violence against women were less positive when there was perceived neighborhood societal disorder (Gracia & Herrero, 2007); that women were more likely to report violent crime when the perpetrator was their partner (Kaukinen, 2002); that women in indigenous communities reporting sexual violence faced problems with language and lack of women officers, protection, and information (Taylor & Putt, 2007); and that women students were less likely to report sexual than physical assault because they felt ashamed and felt they would be blamed (Thompson, Sitterle, Clay, & Kingree, 2007).

Underreporting of abuse against women may be even more of a problem in developing than in developed countries (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2005; Heise et al., 1999; Naved, Azim, Bhuiya, & Persson, 2006; Usta, Farver, & Pashayan, 2007). This may be because in some cultures, violence against women is seen as “natural” and related to deep-rooted beliefs and attitudes (Gracia, 2004). It may also relate to lack of institutional support and an unfavorable legal system for those women who do report (e.g., Bettencourt, 2000). The few studies that have examined reasons for South Asian women not revealing abuse cite fear of damaging family

honor, fear of stigmatization, fear for children, and fear of worsening the abuse (Naved et al., 2006; Raj & Silverman, 2007; Siddiqui, Hamid, Siddiqui, & Akhtar, 2003).

Increased reporting is an important aspect of tackling abuse. It may allow victims to access support services, and it raises awareness of the issue by making the occurrence more visible. To develop policies and programs to increase reporting of abuse, we need to understand better the reasons why many women do not report abuse and to hear from them what would help abused women to reveal their experience.

We undertook a nationally representative survey of abuse against women in Pakistan in 2004 (Andersson et al., 2009). We report here our analysis of the factors related to whether women who had suffered physical abuse had told anyone, inside or outside the family, about their experience. We also conducted focus group discussions to explore, among other things, the barriers to women reporting abuse and women's views about what would help women to report abuse.

Method

The CIET ethical review board, expanded to include female members from Pakistan, gave approval for the household survey and focus group discussions.

The Household Survey

We describe the methods of the national household survey in detail elsewhere (Andersson et al., 2009). The stratified last stage random cluster sample of communities was nationally representative and representative of each of the four provinces of Pakistan (Punjab, Sindh, Balochistan, and North West Frontier Province [NWFP]); it was a subsample of a national sample for a household survey examining the impact of devolution on public services (Cockcroft et al., 2003). We randomly selected at least one community from each of the (then) 97 districts, with the proportion of urban and rural sites according to the urban/rural balance in each province. In each community, interviewers visited around 100 contiguous households, starting from a random point in the community, with no subsampling within the site.

The questionnaire for eligible women (those aged above 14 years old, whether married or not) covered age, marital status, education, work, and perceptions about abuse. It asked specifically about the experience of different forms of abuse: verbal or emotional abuse, restrictions (e.g., of food, movement, communication with family) as a form of abuse, physical abuse,

and sexual abuse. It enquired about whether women who had experienced abuse had told anyone about it, whether inside or outside the family. The questionnaire for senior women (the most senior woman in the household, usually the wife of the household head and the mother or mother-in-law of other women in the household) and men (any men present in the household) covered household demographics, household practices relevant to abuse (such as marriage practices), and perceptions about abuse.

We trained field teams, composed mainly of women, in each province, with particular emphasis on ensuring privacy and establishing a rapport to allow abused women to disclose their experience. In each household, female interviewers attempted to interview all eligible women as well as the senior woman; sometimes this woman was also the eligible woman in the household. Male interviewers meanwhile interviewed any male household members present, taking them outside to do so. This ensured the men did not disturb the interviews with the women as well as allowing us to collect information on their views.

Focus Group Discussions

Trained teams revisited the communities included in the household survey to conduct focus group discussions. Where possible, they facilitated three separate focus groups: of eligible women, of senior women, and of men. At the time of the household survey, women participants indicated their willingness to take part in a later discussion group. The field team visited these households to set up groups, using a snowball method to recruit additional group participants. Trained male team members facilitated and recorded the focus groups with men, whereas trained female team members conducted the focus groups with women. They conducted 194 focus groups of eligible women, 187 focus groups of men, and 176 focus groups of senior women. Each group comprised between 6 and 12 participants.

In the focus groups of eligible women, the facilitators shared the finding that most women who suffered abuse did not report it to anyone, either in the family or outside. They asked the participants why women do not tell anyone about abuse and the problems a woman would face if she tried to report abuse formally, for example, to the police. In the focus groups of senior women and of men, the facilitators asked for views about whether abused women should tell someone in the family or outside the family. In all the focus groups, the facilitators probed about what community mechanisms could help women to report abuse and the possible role of religious leaders, community leaders, and women members of local government councils.

Data Management and Analysis

All data were entered twice and validated to reduce key stroke errors. Further cleaning looked for inconsistencies and out-of-range responses, with checking back to the original data records as necessary. Analysis used the CIETmap geomatics and epidemiology software package (Andersson & Mitchell, 2002, 2006). We calculated weights to allow for over- and undersampling between districts and to bring the sample back into proportion with the population distribution across the country. All national figures mentioned in this article are shown weighted.

Our analysis here focuses on the reporting behavior of women who had experienced physical abuse. We examined the factors related to whether a woman who had suffered physical violence had revealed her experience to someone; first in bivariate analysis and then in multiple logistic regression models, including in the initial models variables related to telling someone about physical violence in univariate analysis as well as those who had prior reason to expect to be related to reporting. Because of interaction between province and other explanatory variables, we constructed a separate model for each province. We report the adjusted odds ratio for each variable in the final models with 95% confidence intervals calculated with an adjustment for clustering (Bieler & Williams, 1995; Williams, 2004).

We identified recurring themes in the focus group reports from the four provinces. Trained field team members coded the focus group reports under supervision, adding new themes as necessary, and extracted relevant quotations from the reports.

Results

The Population Sample

We interviewed 23,430 eligible women, 8,706 senior women, and 1,572 men. One quarter of the eligible women (24%, 7,977/31,407) identified by field teams could not be interviewed. The usual reason was that the women were not available in the household at the time of the interview (20%, 6,465/31,407). Very few refused to be interviewed (3%, 1,061/31,407). Rarely, someone else, usually the senior woman, refused to allow an eligible woman to be interviewed (1%, 451/31,407).

Table 1 shows the characteristics of the interviewed eligible women. More than half had no formal education. Most were not in any form of employment outside the household, and only a fifth had any income of their own. Nearly

Table 1. Characteristics of the Interviewed Eligible Women

Characteristic	Weighted %	Based on
No formal education	56	14,308/23,398
No employment outside the household	82	19,612/23,354
Had some income of their own	22	5,114/23,373
Marital status		
Married	61	14,797/23,430
Single	35	7,835/23,430
Widowed	3	585/23,430
Divorced/separated	1	213/23,430
Among married or previously married women		
Husband had no formal education	43	6,979/15,436
Husband unemployed/unskilled laborer	63	9,839/15,419

two thirds were married, a third were single, and a few were widowed, divorced, or separated. Four out of ten married women reported their husbands had no formal education, and two thirds said their husbands were unemployed or in unskilled labor. The mean age of the senior women interviewed was 46.0 years, whereas that of the men interviewed was 38.7 years.

Telling Someone About the Abuse

The women disclosed experiences of verbal and emotional abuse, restrictions, physical abuse, and sexual abuse. About two thirds had experienced one or more of these forms of abuse. Almost one third of women (30%, 7,897/23,408) disclosed they had suffered beatings. Among these women, only a third (35%, 2,664/7,828) said they had told anyone about it. For two thirds of survivors of physical abuse, the interviewer was the first person they told about the beating(s). The proportion of survivors who had told someone was lower in NWFP (26%) than in the other three provinces (37% in each). Women who had told someone nearly always chose someone within their own immediate family: 18% had told their mother, 4% their father, 3% a sister, and 2% a brother. Others had told various other relatives.

Only 111 of the 7,897 women who had survived physical violence said they had told someone outside the family. Of these, most (91) had told a friend or a neighbor. Just 14 had reported their experience of violence to the police, and 6 had told a local councilor. There were too few women who reported their experience of physical violence outside the family to allow a quantitative analysis of which women did report.

Table 2 shows the final logistic regression models from the four provinces of the variables related to a beaten woman telling someone about it. The variables included in the initial saturated models are listed in the footnote to Table 2. There were important differences between the models from the four provinces, with some common factors. In Balochistan and NWFP, beaten women were more likely to tell someone if they came from a less overcrowded household; other measures of household socioeconomic status did not remain in any of the final models. Characteristics of the women were relevant in some provinces: younger women (in Sindh and Balochistan), those with some formal education (only in NWFP), and those with some income of their own (in Sindh, NWFP, and Punjab) were more likely to have told someone they were beaten. In Balochistan only, married women were less likely than nonmarried women to have told someone about being beaten. Certain attitudes made a difference. In Sindh and Punjab, women who did not think a man hitting a woman could be justified were more likely to have disclosed about their beating. In all four provinces, women who said they had discussed violence against women with someone and those who felt they could discuss the issue with community elders were more likely to have told someone about their beating. Perhaps paradoxically, in NWFP and Punjab, beaten women who said they were treated well by the elders in the household (most often their in-laws) were *less* likely to have told someone about their beating.

Understanding Why Women Do Not Report Abuse

Telling someone within the family about the abuse. In two thirds of men's groups, participants thought a woman *should* disclose her experience of abuse within the family; they mostly recommended she should tell her mother, or perhaps her father or other family elders. However, participants in more than half of the senior women's groups concluded that women should *not* tell anyone they were abused, even within the family.

Focus groups of women discussed the reasons why few battered women tell someone in the family about their experience. Most groups said that women do not tell anyone because to do so would give her a bad name and bring dishonor; telling someone about the abuse often makes the problem worse; and women are afraid that if they reveal the abuse, they risk being separated or divorced by the husband and losing their children.

Everyone blames the women. No one says anything to the men even if they are at fault. That's why women don't tell anyone even if they are abused. (Women's focus group, Balochistan)

Table 2. Variables Related to a Woman Who Has Been Beaten Telling Someone About Her Experience (From Logistic Regression Models)

Variable	Adjusted OR	Cluster-Adjusted 95% CI of Adjusted OR
Sindh		
Has some income of her own	1.36	1.01-1.83
Less than 31 years old	1.74	1.25-2.42
Does not think a man hitting a woman can be justified	1.81	1.39-2.35
Has discussed violence against women with someone	1.44	1.14-1.82
Feels she could discuss violence against women with community elders	1.37	1.07-1.75
Balochistan		
From non-overcrowded household	1.44	1.14-1.82
Married	0.79	0.66-0.94
Less than 31 years old	1.37	1.05-1.79
Has discussed violence against women with someone	1.45	1.13-1.85
Feels she could discuss violence against women with community elders	1.39	1.12-1.73
NWFP		
From non-overcrowded household	1.32	1.04-1.67
Has some formal education	1.42	1.07-1.90
Has some income of her own	1.57	1.07-2.31
Has discussed violence against women with someone	1.63	1.17-2.27
Thinks elders in household treat her well	0.55	0.45-0.66
Feels she could discuss violence against women with community elders	1.39	1.10-1.75
Punjab		
Has some income of her own	1.24	1.04-1.47
Does not think a man hitting a woman can be justified	1.19	1.02-1.39
Has discussed violence against women with someone	1.48	1.23-1.77
Thinks elders in household treat her well	0.81	0.66-1.00
Feels she could discuss violence against women with community elders	1.89	1.60-2.23

Note: OR = odds ratio; CI = confidence interval; The variables in the initial models were non-overcrowded household, has some formal education, married, has some income of her own, less than 31 years old, does not think a man hitting a woman can be justified, has discussed violence against women with someone, thinks elders in the household treat her well, and feels could discuss violence against women with community elders. Other variables were not significantly related to the outcome in univariate analysis: urban/rural location, household vulnerability status, type of roof, income of breadwinner, household food sufficiency, perceived relative household poverty, education of the household head, whether the woman worked outside the house, think okay to report violence to police, think honor of family depends on woman, have seen information about violence against women.

Whom should we tell? When our parents marry us, they tell us that for them we are dead and don't exist any more. Neither father nor brother listen to us or help. (Women's focus group, Punjab)

A woman has a fear that if she were to complain it would worsen the situation, she may get divorced and her children could be taken away. (Women's focus group, Sindh)

Reporting abuse to someone outside the family. Participants in most of the senior women's and men's focus groups believed that women should *not* report abuse *outside* the family. Very few thought women should tell the police or other formal body; if women reported abuse outside the family, this would bring dishonor to their family members. They felt that telling outside the family would make matters worse and said women should rather solve their problems within their homes.

It's a matter of family respect and honour. It should not be told to people outside. In our system such problems are solved within the family. This system has existed for many ages and has been helpful in solving these problems. (Men's focus group, Balochistan)

Women should not tell about abuse outside the family. People only make fun out of it. It's of no use. (Senior women's focus group, Punjab)

None of our women has ever gone to the police. This is not our tradition, nor do we allow our women to do this. (Men's focus group, Balochistan)

Participants in most groups of women held similar views to those of men and senior women about women reporting abuse outside the family. A woman reporting about abuse outside the family would bring dishonor to her or to the family; reporting could lead to an escalation of the abuse; and it could lead to divorce, separation, and loss of her children.

If you would remove clothes from your tummy, it would only be you who would be exposed. Reporting abuse outside would serve for nothing but self disgrace and dishonour to yourself. (Women's focus group, Punjab)

If a woman goes to report outside, the husband and the family members would say that before this we were keeping her in the house and

tolerating her, but now she has crossed the limit and brought disgrace to the family. They would just throw her out of the house. (Women's focus group, Balochistan)

Not only do women fear to report but also they think it is pointless as it does not help and often there is no one to report to.

What's the use? We have to go back and live at the same place. It would only aggravate the situation and cause disgrace to us. (Women's focus group, Punjab)

Participants in groups of women described the difficulties they thought a woman might face if she decided to report abuse outside the family. They mentioned problems such as she would simply not find anyone to help her; she would face resistance from her husband and family; she would encounter a bad attitude and bad behavior from the police; she might face divorce or separation; she would not know how to report or who to report to; and she would lack financial resources.

It's of no use because the police would call our men and they would bribe the police to remove the case and then would taunt and abuse us for the rest of our life. (Women's focus group, Punjab)

Women don't have any money and the police ask for bribes. (Women's focus group, NWFP)

What Would Help Women to Report Abuse

On a more positive note, women's groups discussed what systems in communities could help women to report abuse. They most commonly suggested setting up local groups or organizations specifically for women, where they could go to seek help and advice. They also mentioned it would help to have more women police officers; that community leaders and possibly local councilors could play a role; and that women in the community could help other women.

There should be some system where some women visit door to door and ask women about their problems. (Women's focus group, Sindh)

Groups of senior women and men also favored setting up local groups or committees. They recognized that men would have to play a role in this.

If a local committee has to be formed it should be of men, not women. It is the men who can take the initiative to solve these problems, not women. (Senior women's focus group, Punjab)

A committee of community elders and influential people should be formed. Their wives should also be members of this committee, so that if a woman is abused she can inform them and they in turn can inform their men about it to solve the problem. (Men's focus group, Balochistan)

Role of community leaders. Many participants of women's groups were skeptical about the potential role of community leaders.

Whether it's the problem of men or women, no one wants to involve themselves in others' affairs. Neither does anyone like an outsider to interfere in their household matters. Hence no one can help. (Women's focus group, Punjab)

However, many of the senior women's and men's groups thought community leaders could help by talking to men about the issues and by involving community elders and mobilizing the community.

The community leader can play a role as he is influential. But he has to be just, impartial and trusted by people. (Men's focus group, Punjab)

Role of women councilors. At the time of the study, there had been a recent big increase in the number of women councilors (elected members of local governments) as part of the local government reform. Some women's groups thought women councilors could help by talking to abused women and helping them to disclose their problems, by communicating abused women's problems to a higher level, or by helping women take cases to the police or courts. Some participants were less optimistic, thinking that women councilors either did not help or could not help.

Only a woman can understand women's problems. Men only favour men. Hence if the women councillors can take the initiative, this would help women. (Women's focus group, Punjab)

Senior women and men had little awareness about the potential role of women councilors, and most participants did not think they could help.

There is no role for a woman councillor in our area as she cannot speak in front of men. In any case this is our local issue and in our area men are the ones who influence such matters. (Men's focus group, Balochistan)

Role of religious leaders. Most of the focus groups of women thought that the Pesh Imam could not help, but some thought that the Pesh Imam could talk to the community and give religious advice to reduce the risk of women being abused or lead by example as a respected person. Some participants said the Pesh Imam himself was part of the problem, being against rights for women.

The Pesh Imam should tell men about Islamic preaching by quoting *Hadith* or put the fear of God in their mind. He should explain to them about women's rights in Islam. (Women's focus group, Punjab)

Those who, although they preach religion, don't follow it themselves, how can they help others? (Women's focus group, Balochistan)

Most of the senior women's focus groups and half the men's focus groups thought the Pesh Imam could not help. Some thought the Pesh Imam could help reduce abuse against women by giving religious advice and speaking out against abuse.

The new generation does not listen to their elders. They don't even listen to their family elders. How would they respect the Pesh Imam's advice? (Men's focus group, Punjab)

The Pesh Imam is knowledgeable about religion. He has a lot of respect especially in rural areas. He can resolve the problem in accordance with religion. (Men's focus group, Punjab)

Discussion

Telling Anyone About the Violence

In our study, we looked not only at reporting violence to official bodies but also at whether women told anyone at all about abuse they experienced. Only about one third of women who survived physical violence had told anyone about it. Other authors have reported similar findings from different countries

(Garcia-Moreno et al., 2005; Heise et al., 1999). In the WHO multicountry study on domestic violence against women, between 21% (Namibia city) and 66% (Bangladesh) of women who had experienced physical violence by their partner had not told anyone about it (Garcia-Moreno et al., 2005). The low rate of telling anyone in Bangladesh, also reported separately (Naved et al., 2006), is similar to our finding in Pakistan. As in our study, in the WHO multicountry study, those women who told someone about their experience of violence usually told a family member—28% to 63% told a family member (Garcia-Moreno et al., 2005). In a small survey of women visiting obstetrics and gynecology departments in public sector hospitals in Pakistan, nearly all had experienced some form of domestic violence (verbal and physical). Among the 209 women who had experienced violence, only a third said they had told someone, usually a family member, about it (Shaikh, 2003).

Our analysis of factors associated with telling someone else about their experience of domestic physical violence showed differences between provinces. Women with some income of their own were more likely to have talked to someone about the violence, except in Balochistan. Only in NWFP were women with some education more likely to have told someone. In Sindh and Balochistan, younger women were more likely to have told someone about the violence. These findings differ from those reported from Bangladesh, where women with more education (in the rural area) were more likely to have told someone of their experience, but women who earned their own income were not significantly more likely to have disclosed to someone (Naved et al., 2006).

We also found that attitudes and discussion were relevant to a woman's decision to tell someone about the violence. In Sindh and Punjab, a woman who does not think violence against women can ever be justified is more likely to tell someone if she experiences violence. A consistent finding in all provinces was that feeling empowered to discuss the topic of violence against women with community elders and having actually discussed the topic with someone were both associated with women having told someone about the violence they had themselves experienced.

We have described a behavior change model that expands the well-known knowledge-attitude-practice (KAP) model, called CASCADA (*conscious knowledge, attitudes, subjective norms, intention to change, agency, discussion, action*; Andersson et al., 2005; Andersson, Ho-Foster, Mitchell, Scheepers, & Goldstein, 2007; Andersson & Ledogar, 2008). According to this model, a number of intermediate steps lie between knowledge and action. Agency (empowerment) and discussion are immediate precursors to taking action. Our finding—that women who felt empowered to discuss violence with

elders and who had discussed violence with someone were more likely to have taken action to tell someone about their own experience of violence—seems to be in accordance with the CASCADA model.

The association we found in NWFP and Punjab between a physically abused woman considering she was well treated by household elders and being *less* likely to tell someone about the violence might have arisen because abused women who have spoken about their experience are treated badly by the elders as a result (because they have broken the silence). Alternatively, it may imply they have kept their good treatment within the family at the cost of keeping quiet about the physical abuse or even that they have decided their situation is tolerable because of the support they receive from their in-laws.

The reasons why many abused women do not talk to anyone about their experience of violence may vary between different societies and cultures. Our findings should be interpreted within the social and cultural context of South Asia, where women have a particular role within the family structure and in maintaining family honor. Our focus group findings were similar to those reported from in-depth interviews with 28 women physically abused by their husbands in Bangladesh (Naved et al., 2006). The main reasons for abused Bangladeshi women not telling anyone were fear of jeopardizing family honor, stigma and damage to the woman's reputation, securing the children's future, fear of repercussion, hopelessness, hope that things would change, threat of murder, and belief that the husband has the right to use violence (Naved et al., 2006). In a small survey of 298 industrial workers in Pakistan, the main coping mechanism for domestic violence was either "no response" or "discussion"; respondents did not approve of reporting violence to the police, parents, or friends, and women said they were too embarrassed to tell anyone about their experience of violence (Siddiqui et al., 2003). A small study of battered South Asian women living in the United States found that many did not disclose their experience to anyone, fearing stigmatization or escalation of the abuse or simply not knowing where to turn to for help (Raj & Silverman, 2007).

Reporting to the Authorities

Of the 7,897 women who had suffered physical violence in our study, we found only 6 (0.08%) had told a local councilor and only 14 (0.2%) had reported the matter to the police. In Pakistan, if a woman reports abuse to the police, it is not uncommon for the police to harass, intimidate, and even physically abuse the complainant and her family members (Burney, 1999). According to reports compiled by international human rights monitors, a high

proportion of women in Pakistan suffered some kind of domestic violence, but very few complaints were made about such crimes (Hayat, 2003). In the rare event that a victim manages to reach the police station, police confronted with complaints of domestic violence are known to refuse to register the complaint, to humiliate the victim, or to advise the battered woman to return home. Even the staff of state women's shelters frequently advise women to accept reconciliation and return home (Amnesty International, 2002).

Other authors have also reported low rates of reporting of violence to the police, especially in developing countries. There was considerable variation in the proportion of abused women who reported to formal bodies (including the police, shelters, NGOs) in the WHO multicountry study, with the lowest reporting rates in Bangladesh, Japan, Samoa, and Thailand (Garcia-Moreno et al., 2005). In Bangladesh, only 2% to 4% of women who had suffered violence had reported to the police, local leaders, or NGOs (Naved et al., 2006). A study of 599 mostly married women in Turkey reported high rates of physical violence but found that only 1% of the abused women had reported to the police and only 0.2% had filed a complaint (Ilkcaracan & Women for Women's Human Rights, 1998). In Lebanon, 8% of women exposed to domestic violence reported it to the authorities (Usta et al., 2007).

The reasons given by women in our focus groups in Pakistan for why women do not report abuse to authorities outside the family echo those reported by authors from studies in other countries. These include a perception that the violence is "normal" or "not serious," fear of the consequences of reporting, that reporting would bring shame to the family, and belief that the authorities would not respond helpfully (Garcia-Moreno et al., 2005). In our focus groups, both women and men generally thought women should not report abuse outside the family. Particularly in the men's groups, the participants made a clear distinction between telling someone within the family (which many of them supported) and telling someone outside the family, which they felt would bring dishonor to the family.

Women in our focus groups were well aware of the problems women face if they attempt to report violence to the police and other authorities. They believe they are unlikely to be helped by the police, that the police may side with the abuser, or that they may even face abuse from the police themselves. Most women in Pakistan are economically dependent on their husbands, and reporting abuse can have very serious consequences for them, including loss of their children. Therefore they choose to keep quiet and tolerate the abuse, feeling the alternatives are even worse. They rationalize the violence as being their own fault or justifiable. This belief makes them less likely to tell anyone at all about their experience (see Table 2).

In our study, despite the general view that women should *not* reveal abuse outside the family, focus groups of women, senior women, and men suggested setting up local organizations where abused women could go for help. They distinguished such bodies from existing institutions, such as the police, and seemed to envisage helping abused women without causing problems for the family. Women in particular stressed the need for such local organizations to be run by women.

We discussed the findings from the household survey and focus groups with government and other stakeholders nationally and in each province, with the intention of providing evidence for policies and for planning services to help prevent violence against women and support survivors. The suggestion from focus groups about local bodies where women could report abuse was a stimulus for a subsequent project to mobilize reconciliation committees in selected districts and train the members of the local councils constituting the committees, with the intention of making them able to deal with cases of violence against women. These committees were mandated under the new local government system, to deal with all kinds of local complaints and disputes without recourse to the courts, but in most districts they were not actually functioning. By June 2007, the project supporting the reconciliation committees reported a success rate of 72% settled cases in those union councils where they had established reconciliation committees (Federal Project Management Unit, 2008). But it is not clear how many of these cases, if any, involved violence against women. Such alternate dispute mechanisms may help victims of violence to come forward and report the matter to public authorities and help to educate people about rights of the disadvantaged, especially women. However, their efficacy remains to be tested in formal, well-conducted, randomized trials.

Conclusion

Most women in Pakistan who experience domestic physical violence tell no one, and very few report to any official body. There are strong disincentives to reporting violence, which are well known to women. Until better systems for reporting and dealing with reported cases are in place, domestic violence will continue to be a hidden scourge.

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Bios

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Paper 4.

Andersson N, Ho-Foster A, Matthis J, Marokoane N, Mashiane V, Mhatre S, Mitchell S, Mokoena T, Monasta L, Ngxowa N, Pascual Salcedo M, Sonnekus H.

A national cross- sectional study of views on sexual violence and risk of HIV infection and AIDS among South African school pupils.

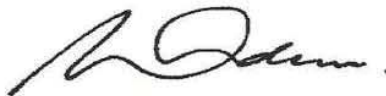
British Medical Journal 2004; 329(7472): 952.

STATEMENT OF CONTRIBUTION

Andersson N, Ho-Foster A, Matthis J, Marokoane N, Mashiane V, Mhatre S, Mitchell S, Mokoena T, Monasta L, Ngxowa N, Pascual Salcedo M, Sonnekus H. A national cross- sectional study of views on sexual violence and risk of HIV infection and AIDS among South African school pupils. *British Medical Journal* 2004; 329(7472): 952.

The contribution of Neil Andersson included design of the study, participation in design of instruments, technical oversight of the survey, analysis of data, conceptualisation of the article, writing and final approval

Neil Andersson

A handwritten signature in black ink, appearing to read 'Neil Andersson', with a stylized, cursive script.

Steven Mitchell

A handwritten signature in blue ink, appearing to read 'Steven Mitchell', with a stylized, cursive script.

Primary care

National cross sectional study of views on sexual violence and risk of HIV infection and AIDS among South African school pupils

Neil Andersson, Ari Ho-Foster, Judith Matthis, Nobantu Marokoane, Vincent Mashiane, Sharmila Mhatre, Steve Mitchell, Tamara Mokoena, Lorenzo Monasta, Ncumisa Ngxowa, Manuel Pascual Salcedo, Heidi Sonnekus

Abstract

Objective To investigate the views of school pupils on sexual violence and on the risk of HIV infection and AIDS and their experiences of sexual violence.

Design National cross sectional study.

Setting 5162 classes in 1418 South African schools.

Participants 269 705 school pupils aged 10-19 years in grades 6-11.

Main outcome measure Answers to questions about sexual violence and about the risk of HIV infection and AIDS.

Results Misconceptions about sexual violence were common among both sexes, but more females held views that would put them at high risk of HIV infection. One third of the respondents thought they might be HIV positive. This was associated with misconceptions about sexual violence and about the risk of HIV infection and AIDS. Around 11% of males and 4% of females claimed to have forced someone else to have sex; 66% of these males and 71% of these females had themselves been forced to have sex. A history of forced sex was a powerful determinant of views on sexual violence and risk of HIV infection.

Conclusions The views of South African youth on sexual violence and on the risk of HIV infection and AIDS were compatible with acceptance of sexual coercion and "adaptive" attitudes to survival in a violent society. Views differed little between the sexes.

Introduction

In South Africa sexual violence is probably exacerbated by the country's violent past. The endemic violence is now highly sexualised and is aimed at the most vulnerable members of society.^{1 2} HIV infection and AIDS have spread widely as a result of unprotected and forced sex.^{3 4}

The consequences of sexual abuse during childhood are well recognised as is the link between sexual violence and HIV infection.⁵⁻⁹ In South Africa, several studies in youth have shown that they are affected by sexual violence, that there is a high prevalence of misconceptions about sexual violence and about the risk of HIV infection and AIDS, and that responses to communication about behaviour change may be less positive than expected.¹⁰⁻¹⁸ We investigated the views of South African school pupils towards sexual violence and towards the risk of HIV infection and AIDS.

Methods

We based our sample on the South African 2001 census, stratifying the enumeration areas of each province into metropolitan or capital, urban, or rural. We randomly drew sentinel enumeration areas proportional to the population in each stratum, and we matched schools to each enumeration area from a list of registered schools provided by the provincial education authorities. Over-sampling in three provinces, the result of additional funding, was weighted to derive national indicators (see bmj.com).

All nine provincial departments of education gave permission to administer a questionnaire within their curriculum. The researcher in each classroom explained to the pupils that the questionnaire was voluntary, that they could stop at any time, and that answers would be anonymous. The classrooms were arranged for privacy.

Our questionnaire elicited views on, and experiences of, forced sex and was provided in nine languages: English, Sesotho, Sepedi, Setswana, Setsonga, Tshivenda, IsiZulu, IsiXhosa, and Afrikaans. We used the term "forced sex without consent," as the equivalent word for "rape" does not exist in some languages.

With teachers absent, the researchers—mostly young female fieldworkers—read each question in the languages requested.

Views on sexual abuse included: a person has to have sex to show love; sexual violence does not include touching; sexual violence does not include forcing sex with someone you know; girls have no right to refuse sex with their boyfriends; girls mean yes when they say no; girls like sexually violent guys; girls who are raped ask for it; and girls enjoy being raped. We used three or more of these eight beliefs as a summary measure of misconceptions about sexual violence. We defined views that would put someone at high risk of HIV infection as believing that sex with a virgin can cure HIV infection or AIDS, believing that condoms cannot protect against HIV, having no intention of going for an HIV test, having no intention of telling the family if HIV positive, and intending to spread HIV if positive. We analysed risk with the Mantel-Haenszel test.^{19 20}

Results

Between September and November 2002 we invited 5162 classes in 1418 South African schools to take part in our study. Overall, 283 576 youth agreed to participate. Their ages ranged from 10 to 22 years. We excluded those over 20 years of age, leaving



Weighting factors are on bmj.com

Primary care

Table 1 Beliefs and views among South African youth on sexual violence. Values in brackets are weighted by province or metropolitan, urban, or rural area. Values are numbers (percentages) of respondents

Belief	10-14 year olds		15-19 year olds		Weighted national estimate	Missing data†
	Males (n=54 483)	Females (n=71 049)	Males (n=72 213)	Females (n=71 175)		
Person has to have sex with boyfriend or girlfriend to show that they love them	22 341 (34.1)	16 182 (17.2)	37 509 (43.5)	16 619 (17.6)	92 651 (28.3)	998 (0.3)
Sexual violence does not include unwanted touching	30 922 (55.4)	41 646 (55.9)	38 991 (47.8)	38 834 (47.3)	150 394 (51.4)	3770 (1.4)
Sexual violence does not include forcing sex with someone you know	34 877 (60.8)	46 624 (62.0)	44 130 (55.2)	43 992 (53.7)	169 623 (58.1)	2806 (1.0)
Girls do not have right to refuse sex with their boyfriend	17 518 (33.1)	23 381 (34.3)	23 680 (28.4)	20 866 (26.6)	85 445 (30.0)	1951 (0.7)
Girls mean yes when they say no	29 273 (51.9)	35 140 (46.6)	43 340 (56.0)	35 459 (43.2)	143 212 (48.5)	1763 (0.65)
Girls like sexually violent guys	12 501 (22.2)	8996 (10.8)	20 721 (27.3)	8235 (9.2)	50 453 (17.2)	2717 (1.0)
Girls who are raped ask for it	6252 (12.4)	5112 (8.3)	11 157 (15.1)	5635 (7.7)	28 156 (10.6)	3112 (1.2)
Girls enjoy rape	16 759 (27.7)	21 651 (27.4)	23 955 (28.9)	18 709 (21.1)	81 074 (26.4)	1283 (0.5)

*Includes respondents who were unsure.

†Percentage who did not respond or who responded with both yes and no.

269 705 participants (average age 14.8 years). The questionnaire was returned by all participants. The non-response rate to individual questions was between 0% and 4.3% (tables 1-3).

Table 2 Misconceptions among South African youth about sexual violence and about risk of HIV infection. Percentages in brackets are unweighted

Characteristic	Have more than two views on sexual violence	Would not have HIV test*	Believe that condoms cannot protect against HIV†
Residential area			
Urban or metropolitan	38 251/110 786 (34.5)	42 010/109 379 (38.4)	46 579/110 084 (42.3)
Rural	81 640/158 919 (51.4)	71 255/156 852 (45.4)	61 579/157 711 (39.0)
Age of respondents (years)			
10-14	53 588/125 532 (42.7)	52 524/123 937 (42.4)	52 612/124 612 (42.2)
15-19	65 866/143 388 (46.0)	60 404/141 557 (42.7)	55 212/142 428 (38.8)
Sex of respondents			
Male	67 107/127 097 (52.8)	53 029/125 364 (42.3)	44 400/126 226 (35.2)
Female	52 784/142 608 (37.0)	60 236/140 867 (42.8)	63 758/141 569 (45.0)
Endured forced sex in past year			
Yes	16 462/27 118 (61.0)	12 302/26 748 (46.0)	10 112/26 847 (37.7)
No	103 429/242 587 (42.6)	100 963/239 483 (42.2)	98 046/240 948 (40.7)
Believe infected with HIV			
Yes	44 887/88 932 (50.5)	37 407/87 765 (42.6)	34 938/88 285 (39.6)
No	74 513/179 690 (41.5)	75 491/177 620 (42.5)	72 807/178 521 (40.8)
Source of education on risk of HIV infection			
Family:			
Yes	48 233/123 659 (39.0)	46 605/122 051 (38.2)	45 652/122 983 (37.1)
No	68 880/140 483 (49.0)	64 274/138 870 (46.3)	60 319/139 586 (43.2)
Love life:			
Yes	70 716/168 044 (42.1)	66 825/166 043 (40.2)	61 820/167 142 (37.0)
No	46 230/95 855 (48.2)	43 895/94 673 (46.4)	43 944/95 179 (46.2)
Soul City:			
Yes	76 758/183 299 (41.9)	73 126/181 260 (40.3)	68 531/182 379 (37.6)
No	39 133/78 895 (49.6)	36 922/77 843 (47.4)	36 681/78 318 (46.8)
Youth group:			
Yes	55 532/131 072 (42.4)	51 595/129 450 (39.9)	47 933/130 386 (36.8)
No	60 265/130 574 (46.2)	58 192/129 103 (45.1)	57 061/129 770 (44.0)
Church:			
Yes	33 544/77 340 (43.4)	30 228/76 256 (39.6)	30 253/76 873 (39.4)
No	81 565/182 714 (44.6)	78 905/180 774 (43.6)	74 215/181 751 (40.8)
Class:			
Yes	75 323/185 517 (40.6)	72 359/183 407 (39.5)	71 007/184 615 (38.5)
No	40 369/76 349 (52.9)	37 450/75 413 (49.7)	34 034/75 749 (44.9)

*3474 non-responders.

†1910 non-responders.

Males were more likely than females to have misconceptions about sexual violence (table 1). The younger respondents (10-14 years) were more likely than the older ones (15-19 years) to believe that sexual violence does not include touching, that if you know someone, forcing sex is not sexual violence, and that girls have no right to refuse sex with their boyfriend. Respondents who were male or lived in a rural area were more likely to express three or more of the eight views (table 2).

Knowledge, views, and beliefs about risk of HIV infection*Condoms*

Overall, 57.1% (weighted value based on 147 416/258 080) of respondents stated that condoms could prevent pregnancy, 49.8% (weighted value based on 131 021/262 977) that they can prevent sexually transmitted diseases, and 59.6% (weighted value based on 159 637/267 795) that they can help prevent HIV infection. In urban areas, younger females were significantly less likely than older females to believe that condoms could prevent the spread of HIV infection and AIDS (odds ratio 0.71, 95% confidence interval 0.70 to 0.73; 16 904/32 123 v 144 643/237 582).

HIV test

Around 60% of respondents intended to have an HIV test. A gradient was seen between rural and urban or metropolitan or capital areas, with little difference between ages or sex (table 2).

Talking about sex

In total, 34.0% (weighted value based on 108 284/269 705) of respondents reported that they never spoke to anyone about sex. When they did report having talked to someone it was associated with the intention of being tested for HIV (odds ratio 1.34, 95% confidence interval 1.32 to 1.37); of those who intended to have a test, 60.9% (98 318/161 421) had someone to talk to and 53.7% (58 122/108 284) did not have someone to talk to. Overall, 15.7% (19 720/124 120) of males and 14.4% (20 303/141 184) of females said they would not tell their family if they were HIV positive (table 3).

High risk behaviour

Overall, 15.8% (42 658/269 704) of respondents said they would have unprotected sex and 15.7% (weighted value based on 41 904/266 903) said they would spread the infection intentionally. These views were expressed most by older (15-19 years) males from rural areas (table 3).

Table 3 Misconceptions among South African youth about risk of HIV infection. Values are numbers (percentages; unweighted)

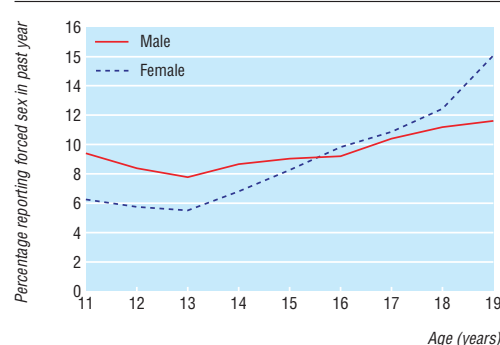
Variable	Would not tell family if HIV positive	Would spread HIV if positive	Believe that sex with a virgin can cure HIV infection or AIDS
Residential area			
Urban or metropolitan	14 087/109 781 (12.8)	13 253/110 786 (12.0)	11 383/110 786 (10.3)
Rural	25 936/157 092 (16.5)	28 651/158 919 (18.0)	22 631/158 919 (14.2)
Age (years) of respondents			
10-14	17 084/124 120 (13.8)	16 431/125 532 (13.1)	18 536/143 388 (12.9)
15-19	22 770/142 015 (16.0)	25 322/143 388 (17.7)	15 353/125 532 (12.2)
Sex of respondents			
Male	19 720/125 689 (15.7)	21 446/127 097 (16.9)	17 765/127 097 (14.0)
Female	20 303/141 184 (14.4)	20 458/142 608 (14.3)	16 249/142 608 (11.4)
Had forced sex in past year			
Yes	5437/26 817 (20.3)	7069/27 118 (26.0)	5438/27 118 (20.1)
No	34 586/240 056 (14.4)	34 835/242 587 (14.4)	28 576/242 587 (11.8)
Believe infected with HIV			
Yes	13 433/88 103 (15.2)	18 055/88 932 (20.3)	14 260/88 932 (16.0)
No	26 384/177 928 (14.8)	23 665/179 690 (13.2)	19 609/179 690 (10.9)
Source of education on risk of HIV infection			
Family:			
Yes	14 040/122 736 (11.4)	18 993/123 659 (15.4)	15 566/123 659 (12.6)
No	24 975/139 080 (18.0)	21 993/140 483 (15.7)	17 613/140 483 (12.5)
Love life:			
Yes	21 270/166 844 (12.7)	27 640/168 044 (16.4)	21 500/168 044 (12.8)
No	17 682/94 776 (18.7)	13 359/95 855 (13.9)	11 675/95 855 (12.2)
School:			
Yes	22 576/182 079 (12.4)	28 974/183 299 (15.8)	22 840/183 299 (12.5)
No	15 883/77 952 (20.4)	11 712/78 895 (14.8)	9917/78 895 (12.6)
Youth group:			
Yes	16 878/130 132 (13.0)	22 260/131 072 (17.0)	17 125/131 072 (13.1)
No	21 659/129 330 (16.7)	18 391/130 574 (14.1)	15 639/130 574 (12.0)
Church:			
Yes	10 409/76 682 (13.6)	13 494/77 340 (17.4)	10 476/77 340 (13.5)
No	27 791/181 291 (15.3)	26 837/182 714 (14.7)	22 041/182 714 (12.1)
Class:			
Yes	23 604/184 267 (12.8)	28 081/185 517 (15.1)	22 142/185 517 (11.9)
No	14 800/75 479 (19.6)	12 508/76 349 (16.4)	10 566/76 349 (13.8)
Missing data	2830/269 705 (1.0)	2801/269 705 (1.0)	2795/269 705 (1.0)

Virgin myth

The belief that sex with a virgin could cure HIV infection or AIDS was reported by 12.7% (34 014/266 910) of respondents and was more common in youth from rural areas (table 3). Those respondents who had learnt from school about the risk of HIV infection were significantly less likely to believe this myth (odds ratio 0.84, 0.82 to 0.87). This protective effect remained after taking into account other sources of information on HIV, age, sex, and history of sexual abuse.

Links between sexual violence and risk of HIV infection

Overall, 8.6% (weighted value based on 27 118/269 705) of respondents said they had been forced to have sex in the past year. Younger males were more likely to report this than younger



Proportion of children who had been forced to have sex in year before survey (percentages weighted by province)

females (figure). In the older age group, more females than males reported having been forced to have sex in the past year.

Respondents of either sex who had been abused in the past year were more likely to have misconceptions about sexual violence and about the risk of HIV infection and AIDS (table 2). Sexually abused youth were more likely to believe they were HIV positive (odds ratio 1.90, 1.85 to 1.92; 43.0% (36 235/84 321) who reported sexual abuse *v* 28.6% (52 237/182 921) who did not report sexual abuse). Respondents who had been sexually abused in the past year were more likely to have no intention of taking an HIV test, more likely to say they would not inform their family if they were HIV positive, and more likely to believe that sex with a virgin could cure HIV infection or AIDS (tables 2 and 3). Youth who had been forced to have sex were more likely to say that they would intentionally spread HIV (odds ratio 2.39, 2.34 to 2.44; table 4). This attitude did not differ between the sexes.

Overall, 33.0% (weighted value based on 88 932/268 622) of respondents thought that they were HIV positive. This response was more common in youth from rural areas. Those respondents who had never had sex (25.8%; 34 987/135 708) still feared they might be HIV positive. They were also more likely to say they would spread the infection if they were HIV positive and were more likely to believe the myth about virgins (table 3).

Attitudes associated with sexual abuse perpetrated by youth

No less than 65.8% (9159/13911) of males and 71.2% (4428/6216) of females who admitted to forcing someone else to have sex had themselves been forced to have sex. The influence of forced sex was especially pronounced on females (odds ratio 7.0, 6.7 to 7.4; table 4). Perpetrators were also twice as likely to believe that sex with a virgin could cure HIV infection or AIDS (odds ratio 2.13, 2.07 to 2.20; 22.6% (4988/22 114) *v* 12% (30 705/255 771). This association could not be explained by age, sex, school grade, urban or rural area, type of school, language, attitudes to sexual violence, and other attitudes to risk of HIV infection.

We found an association between misconceptions about sexual violence (one has to have sex to show love, girls like violent guys, girls enjoy being raped, girls mean yes when they say no) and the claim to have forced someone else to have sex.

Discussion

South African school pupils seem to have internalised their risk of sexual abuse into misconceptions about sexual violence and about the risk of HIV infection and AIDS. Participants who

Primary care

Table 4 Factors associated with claim among South African youth that they had forced someone else to have sex

Factor	Males			Females		
	No (%) with risk factor	Crude odds ratio	Adjusted odds ratio (95% CI)*	No (%) with risk factor	Crude odds ratio	Adjusted odds ratio (95% CI)*
Been forced to have sex:						
Yes	9159/44 989 (20.4)	4.13	3.35 (3.32 to 3.48)	4428/39 750 (11.1)	7.03	5.30 (5.02 to 5.59)
No	4752/81 413 (5.8)			1788/102 116 (1.8)		
Age (years):						
15-19	9782/72 213 (13.6)	1.91	1.61 (1.55 to 1.68)	4509/71 175 (6.3)	2.76	2.29 (2.16 to 2.34)
10-14	4127/54 483 (7.6)			1699/71 049 (2.4)		
Beliefs						
One has to have sex to show love:						
Yes	8977/60 041 (15.0)	2.18	1.66 (1.60 to 1.72)	2417/32 899 (7.4)	2.20	1.57 (1.49 to 1.66)
No	5000/6756 (74.0)			3818/109 709 (3.5)		
Girls like sexually violent guys:						
Yes	5584/33 355 (16.7)	2.06	1.47 (1.42 to 1.53)	1485/17 301 (8.6)	2.38	1.58 (1.48 to 1.69)
No	8393/93 742 (9.0)			4750/125 307 (3.8)		
Girls enjoy rape:						
Yes	5751/40 858 (14.1)	1.56	1.15 (1.11 to 1.20)	2378/40 510 (5.9)	1.59	1.16 (1.09 to 1.22)
No	8226/86 239 (9.5)			3857/102 098 (3.8)		
Girls mean yes when they say no:						
Yes	9092/72 850 (12.5)	1.44	1.17 (1.12 to 1.21)	3625/70 785 (5.1)	1.43	1.13 (1.07 to 1.19)
No	4885/54 247 (9.0)			2610/71 823 (3.6)		
Unwanted touching is not sexual violence:						
Yes	7744/70 132 (11.0)	1.01	0.93 (0.90 to 0.97)	3734/80 704 (4.6)	1.15	1.02 (0.97 to 1.08)
No	6233/56 965 (10.9)			2501/61 904 (4.0)		
It is not rape to force sex on someone known						
Yes	8295/79 251 (10.5)	0.87	0.85 (0.82 to 0.88)	3949/90 874 (4.4)	0.99	0.92 (0.87 to 0.97)
No	5682/47 856 (11.9)			2286/51 734 (4.4)		

*Simultaneous stratification by other factors shown.

claimed to have been forced to have sex were more likely to say they had forced someone else to have sex and were more likely to have views that would put them at high risk of HIV infection—for example, sex with a virgin can cure HIV infection or AIDS, condoms do not protect against HIV.

Our questionnaire was provided in nine languages and was completed by respondents in the best achievable conditions for anonymity. We have no way of knowing how many pupils exaggerated their responses or were inhibited by the proximity of peers in crowded classrooms. Although we obtained high response rates to individual questions (95.7%-100%), the brevity of our survey did not allow for detailed responses. Because of the nature of our study design, we were only able to look at associations between attitudes and sources of information on risk of HIV infection. A longitudinal study of educational initiatives would confirm beneficial effects.

Our survey reflects the situation of school pupils only. Youth absent from school at the time of the survey may have been at higher risk. The extent of sexual abuse among females may be underestimated because of those who had to leave school as a result of pregnancy due to sexual abuse.

The belief that it is not rape to force sex on someone who is known was “protective” in our model of misconceptions about sexual violence and self declared perpetration of sexual violence. This could be because youth who believed it is not sexual violence to force sex on someone known were less likely than others to say they had forced sex on someone else, since their definition of rape excluded forced sex with anyone they knew.

The apparent expectation of sexual coercion among the youth and the associated adaptive attitudes contribute to a

culture of sexual violence. Males and females were affected similarly, showing a reaction to and a reinforcement of their everyday risk of sexual abuse. It is important that those responsible for educating youth about HIV infection take into account that youth may be changed by their personal experiences and environment and this is likely to condition their reaction to educational messages. We found no convincing association between attitudes and education on risk of HIV infection from a national non-governmental education programme, youth group, or church. The classroom setting seemed to be the only source of education consistently associated with fewer misconceptions. One in three youth believed they could be HIV positive. One in four of these had not even had sex, an indicator of ignorance of the mechanism of HIV infection. This failure of education comes at an important cost: youth who believed they were HIV positive had misconceptions about sexual violence and about the risk of HIV infection similar to those who had forced someone else to have sex.

Contributors: NA was principally responsible for designing and planning the study, analysis, and reporting. AH-F, JM, NM, VM, SMit, and MPS helped design and plan the study. AH-F coordinated the fieldwork and managed the data. JM helped with the fieldwork and data entry. NM helped with data entry. VM helped coordinate the fieldwork. SMha and LM helped design the study and supervise the fieldwork. SMit helped with the fieldwork, analysing the data, and reporting. TM and NN helped with the design of the study, the fieldwork, and data entry. MPS helped supervise the fieldwork. HS helped with the fieldwork. NA, AH-F, and SMit are guarantors.

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What is already known on this topic

Several studies report a high incidence of sexual abuse among South African youth

What this study adds

A history of sexual abuse distorts perceptions about sexual violence and the risk of HIV infection

South African youth of both sexes have a high prevalence of misconceptions about sexual violence and about the risk of HIV infection

Most of the youth who forced someone else to have sex had themselves been forced to have sex

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Paper 5.

Andersson N, Ho Foster A.

13,915 reasons for equity in sexual offences legislation: a national school-based survey in South Africa.

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STATEMENT OF CONTRIBUTION

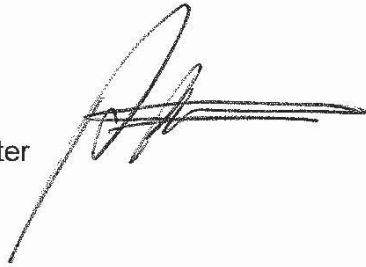
Andersson N, Ho Foster A. 13,915 reasons for equity in sexual offences legislation: a national school-based survey in South Africa. *International Journal for Equity in Health* 2008;7:20.

The contribution of Neil Andersson included design of the study, participation in design of instruments, technical oversight of the survey, analysis of data, conceptualisation of the article, writing and final approval

Neil Andersson

A handwritten signature in black ink, appearing to read 'Neil Andersson', with a stylized, cursive script.

Ari Ho Foster

A handwritten signature in black ink, appearing to read 'Ari Ho Foster', with a stylized, cursive script and a long horizontal flourish.

Research

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13,915 reasons for equity in sexual offences legislation: A national school-based survey in South Africa

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Abstract

Objective: Prior to 2007, forced sex with male children in South Africa did not count as rape but as "indecent assault", a much less serious offence. This study sought to document prevalence of male sexual violence among school-going youth.

Design: A facilitated self-administered questionnaire in nine of the 11 official languages in a stratified (province/metro/urban/rural) last stage random national sample.

Setting: Teams visited 5162 classes in 1191 schools, in October and November 2002.

Participants: A total of 269,705 learners aged 10–19 years in grades 6–11. Of these, 126,696 were male.

Main outcome measures: Schoolchildren answered questions about exposure in the last year to insults, beating, unwanted touching and forced sex. They indicated the sex of the perpetrator, and whether this was a family member, a fellow schoolchild, a teacher or another adult. Respondents also gave the age when they first suffered forced sex and when they first had consensual sex.

Results: Some 9% (weighted value based on 13915/127097) of male respondents aged 11–19 years reported forced sex in the last year. Of those aged 18 years at the time of the survey, 44% (weighted value of 5385/11450) said they had been forced to have sex in their lives and 50% reported consensual sex. Perpetrators were most frequently an adult not from their own family, followed closely in frequency by other schoolchildren. Some 32% said the perpetrator was male, 41% said she was female and 27% said they had been forced to have sex by both male and female perpetrators. Male abuse of schoolboys was more common in rural areas while female perpetration was more an urban phenomenon.

Conclusion: This study uncovers endemic sexual abuse of male children that was suspected but hitherto only poorly documented. Legal recognition of the criminality of rape of male children is a first step. The next steps include serious investment in supporting male victims of abuse, and in prevention of all childhood sexual abuse.

Introduction

In May 2007, the Sexual Offences Bill passed by the South African National Assembly expanded the definition of rape to include forced sex with men [1]. Until then, sexual abuse of boy children could only be charged as indecent assault – a considerably more trivial offence than rape.

Each year in South Africa, there are over 50,000 rapes and attempted rapes reported to the South African Police Services – and less than 10,000 indecent assaults. Apart from rape being a more serious offence, the implication here is that at least five times more females are raped than males. Sexual abuse of female victims can also be charged as indecent assault.

Recent publicity of sexual abuse in church schools, and sizeable compensation paid by the Catholic Church to victims of abuse in Canada and the USA, has focused international attention on male victims of sexual abuse. Recent reports of male abuse among peers at schools in the USA and Canada [2-4], Germany [5], Ghana [6] and Zimbabwe [7] indicate that, if looked for, abuse of boy children is fairly common. Female perpetrators are also beginning to receive attention internationally [8].

We set out to find out how common male sexual abuse is in South Africa, and to identify some of the relationships between male child rape and behaviours of schoolboys.

Methods

Sample

Based on census data, we divided electoral areas into metro/capital, urban and rural. Proportional to the population in each resulting stratum, we drew a random sample of enumeration areas. From a list of all registered schools, we matched schools to each enumeration area, identifying a total of 1194 schools in this way. In three of the nine provinces, additional funding allowed over-sampling to increase the local relevance.

Ethical review

The Provincial Departments of Education in all nine provinces gave permission for the study as part of curricular activity, typically in the context of Life Skills classes. The facilitator explained to each class that the questionnaire was voluntary and could be stopped at any time. Facilitators also explained that no questionnaire would be marked with an identity, and they arranged classroom logistics to permit each learner some privacy.

Concept development and pilot

Because there is no word for rape in several of the South African languages, we used the expression "forced sex without consent" in nine of the 11 official languages. We arrived at this through feedback from results of a pilot

study that included 9000 youth in urban, rural and remote communities in the nine provinces (27 pilot sites, in nine languages). The pilot questionnaire used "rape" or its equivalent in three languages, and a variety of phrases in other languages, intended to communicate the same meaning. In each site, separate focus groups for male and female youth considered the pilot results and discussed the wording in their own language. After translation and back-translation of the resulting phrase by someone not associated with the study, the final formulation went through two to five rounds of questionnaire piloting in the nine languages of implementation. Focus groups in urban and rural areas in each province discussed and validated the outcomes, as the design team tried to be sure we were measuring what we intended to measure.

Instruments

The anonymous, facilitated self-administered instrument included questions on attitudes and experience regarding sexual violence and HIV risk. In each classroom, a facilitator read each question and explained its meaning following a pre-tested script in English, Sesotho, Sepedi, Setswana, Setsonga, Tshivenda, IsiZulu, IsiXhosa and Afrikaans, depending on the needs of the class.

Outcomes

Schoolchildren answered questions about the following outcome measures: did you suffer forced sex without consent in the last year; have you ever been forced to have sex without your consent by a learner, a teacher, another adult, a family member; at what age were you first forced to have sex without your consent; were you forced to have sex without your consent by a male, female, both. In addition to their age and sex, learners also provide information on HIV risk-related knowledge, attitudes and practices, their exposure and preferences towards national intervention programmes, and perceived HIV status – we share findings concerning those measures elsewhere [9].

Data collection and management

Data collection took place from 7 October to 22 November 2002. Teams visited a total of 5162 classes in 1191 schools. We employed several measures to reduce bias. Facilitators asked educators to leave the class prior to the survey, and asked participants not to write their names or any identifying marks on the questionnaires. Facilitators made serious efforts to prevent viewing of questionnaire responses by nearby students, instructing children to cover questionnaire responses with exercise books. They arranged for the provision of "shield" books for pupils who did not have one. Respondents completed questionnaires on their own, turning them facedown once completed. Facilitators collected questionnaires from learners and placed them in an envelope which they immediately sealed. The sealed envelopes were only opened again at

data entry. We informed learners of this process prior to handing out questionnaires, to assure them their responses would remain anonymous. Four scanners read and verified data from the questionnaires.

Analysis

We rebalanced unequal representation of provinces by weighting estimates of national occurrence indicators of forced sex in the last year and "ever". The full sample and the raising factors applied to estimate national prevalence rates are reflected elsewhere [9]. Risk analysis used the Mantel-Haenszel procedure [10] which stratifies the main contrast by other factors to make sure the finding cannot be explained by covariants (age, sex, HIV risk-related knowledge, attitudes and practices, exposure and preferences towards national intervention programmes, and perceived HIV status).

We adjusted for the dependency between reports from participants from the same cluster, using the adjusted Mantel-Haenszel chi-square statistics of Zhang and Boos [11]. This reduces chi-square estimate, increasing the confidence intervals roughly in proportion to the intra-cluster correlation coefficient. We opted for 99% confidence intervals to offset the effect of multiple testing in the principal contrasts. We then examined the mutual influence of factors that affected forced sex using logistic regression (stepping down from a saturated model) using CIETmap, which derives odds ratios for each determinant, taking into account the others in the final model [12]. The saturated initial model included urban/rural, type of school, province, age, attitudes about sex (need to have sex to show love, girls have the right to refuse sex, girls like sexually violent guys), age at sexual debut, how often they talk about sex, ever forced sex with someone else, believe condoms prevent HIV/AIDS, belief about personal HIV status and other abuse (verbal, beating).

Findings

Occurrence of male child rape

Weighted by province and urban/rural areas, 9% (based on 13915/127097) reported forced sex without consent in the last year. In answer to a separate question, 44% of 18 year-olds said they had "ever" been forced to have sex (weighted value of 5385/11450).

Age

The age of 126,696 male respondents ranged from 10 years to 19 years (average age 15 years, SD 1.426). Reports of forced sex in the last year varied across age groups: 14% (87/614) at age 10 years, 10% (436/4353) at age 11, 9.8% (1253/12729) at 12 years, 9.5% (1643/17251) at 13 years; 10.4% (2029/19,536) at 14; 11% (2126/19337) at 15 years; 11% at 16 years (2049/18711); 11.9% (1886/

15890) at 17 years; 12.8% (1467/11450) at 18 years and 13% (893/6825) at 19 years.

Urban/rural

Rural schoolboys were more likely than their urban or metro counterparts to report forced sex in the last year (odds ratio 1.7, 99%CI 1.42–1.99; 9659/74382 reported forced sex in rural areas compared with 4256/52715 in urban areas).

Province

There was also a notable difference between provinces, with Limpopo (the least economically developed and mostly rural province) suffering the highest rates and Western Cape the lowest. Table 1 shows the rates of forced sex in the last year across the nine provinces.

Beating and other abuse

Weighted by province and urban/rural, 21% (29,296/127,097) of schoolboys reported verbal insults in the last year; 15% (22768/122666) reported being beaten in the last year; 15% (22525/127097) reported unwanted touching. There was a marked association between schoolboys who had been beaten and those forced to have sex in the last year (odds ratio 4.17, 99%CI 3.1–5.18; 5923/22768 of those who had been beaten were also forced to have sex, compared with 7509/99898 of those who had not been beaten in the last year). In urban areas, the association between beating and forced sex was slightly stronger (OR 4.96, 99%CI 3.9–6.01, 1740/7826 forced among those who had been beaten 2352/43174 forced among those not beaten) than in rural areas (OR 3.89, 99%CI 2.98–5.1; 4143/14942 forced among those who had been beaten compared with 5157/56724 forced among those not beaten).

Age of first consensual and forced sex

Some 20% (25,698/127,097) of all male respondents gave an age when they were first forced to have sex (some may have been forced many times). We used this as the basis for exploring age related patterns. Excluding the 19,271 schoolboys who said they were raped in the last year or ever, but did not give an age when this first occurred, Figure 1 shows the cumulative first rape between the ages of six and 18 years, based on 1919, 1921, 1358, 1174, 2183, 1554, 2583, 2794, 3045, 3131, 1964, 1179 and 893 reports each year between the ages of 6 or less, and 18. It also shows the cumulative age of first consensual sex, based on 5479, 5273, 3584, 3016, 5639, 3630, 6106, 6969, 7412, 7450, 4638, 2439 and 1290 reports each year between the ages of 6 or less, and 18.

The perpetrators

Some 28% (12661/44969) of those who had been abused said they were forced by an adult (not family or a teacher).

Table 1: Percent (and number affected) of schoolboys aged 10–18 years who reported being forced to have sex

Provincial characteristics		Male youth forced to have sex in the last year % (number raped)
Limpopo	Most northerly province, four major ethnic groups, least economically developed, mining provides its main income; 10% of the land, 12% of the national population; 77% living in poverty – 6.6 assaults reported per 1000 people per year	16.1% (n7653)
Mpumalanga	Agriculture, tourism, manufacturing and mining; 6% of the land, 7% of the national population; 57% living in poverty – 8.6 assaults reported per 1000 people per year	11.9% (n302)
Northwest	Mining and agriculture; 9% of the land, 8% of the national population; 52% living in poverty – 10 assaults reported per 1000 people per year	10.6% (n349)
Free State	Economy based on mining and agriculture; 11% of the land, 6% of the national population; 68% living in poverty – 13.7 assaults reported per 1000 people per year	10.3% (n276)
Northern Cape	A new province since 1994, diamonds provide main income; 31% of the land, 2% of the national population; 61% living in poverty – 25 assaults reported per 1000 people per year	10.0% (n182)
Gauteng	Economy based on mining, finance, manufacturing; highest income/capita, highest literacy, highest population density (576 per sq km); 1% of the land, 19% of the national population; 42% living in poverty – 11.2 assaults reported per 1000 people per year	8.3% (n528)
KwaZulu Natal	Economy based on tourism and agriculture; 8% of the land, 21% of the national population; 61% living in poverty – 6 assaults reported per 1000 people per year	7.7% (n3354)
Eastern Cape	Economy based on agriculture, livestock and manufacturing; 14% of the land, 14% of the national population; 72% living in poverty – 10 assaults reported per 1000 people per year	6.9% (n1162)
Western Cape	Highly developed, diverse economy; 11% of the land, 10% of the national population; 32% living in poverty – 16.5 assaults reported per 1000 people per year	4.8% (n109)

in the year prior to the survey.

Sources of information on provinces <http://www.sarpn.org.za/documents/d0000990>; <http://www.iss.org.za/CrimeIndex/00Vol4No2/ThinBlueLine.html>

Another 28% (12578/44969) said they had been forced to have sex by a fellow schoolchild, while 20% had been abused by a teacher (9038/44969) and 18% (7985/44969) by an adult family member. An important proportion reported being forced to have sex by more than one type of perpetrator: 25% of schoolboys (11040/44969) were victims of sexual abuse by at least two types of perpetrator (schoolchild, teacher, family member or other adult). Some 8% (3595/44969) reported being forced to have sex by both fellow students and teachers.

Rural respondents were significantly more likely to report abuse at school by a fellow student and teacher than were urban counterparts (odds ratio 1.36, 95%CI 1.25–1.47; 2288/29836 rural abused said they had been raped by *both* students and teachers, compared with 874/15153 urban schoolboys who had been abused).

In response to the question about the sex of the perpetrator, 32% of those who answered (7755/23889) said the perpetrator was male, 41% (weighted value for 9879/23889) said she was female and 26% (6255/23889) said they had been forced to have sex by both male and female perpetrators. Male abuse of schoolboys was much more common in rural areas while female perpetration was more an urban phenomenon. Excluding those who had been abused by both male and females (which was not very different a proportion in urban and rural areas), an urban schoolboy was less like to be abused by a male than

was his rural counterpart (odds ratio 0.67, 95%CI 0.92–0.47; 2125/5677 urban victims were abused by males compared with 5630/11957 rural victims).

There was also an important association between victim age and sex of the perpetrator. Again excluding victims who had suffered abuse from both male and female perpetrators, younger victims (aged 10–14 years at the time of the enquiry) were more likely to report a male perpetrator than those aged 15–19 years (odds ratio 1.65, 95%CI 1.26–2.06; 3331/6424 younger victims reported a male perpetrator, compared with 4391/11137 older victims).

Teachers soliciting sex

One in every twenty schoolboys (4.6%, weighted value of 7125/121491) said they had been asked to have sex by a teacher. This was significantly less common in urban than rural areas (odds ratio 0.52 95%CI 0.71–0.33; 1981/50716 in urban areas and 5144/70775 in rural areas were asked by a teacher to have sex). Reports of teacher solicitation increased steadily with age (145/4181, 491/12243, 703/16554, 916/18749, 1026/18537, 1131/17888, 1131/15145, 940/10838 and 605/6438 for 11 to 19 years of age respectively.)

Victims become villains

Some 11% (13977/127097) of male respondents said they had forced sex on someone else. This report was more common in rural than urban areas (8762/74382 in

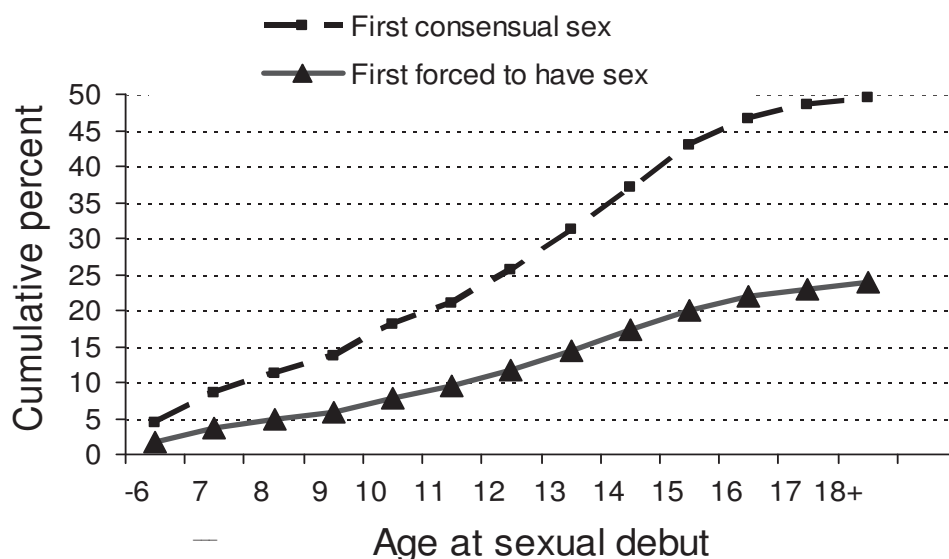


Figure 1
Cumulative rates of forced and consensual sex, among South African schoolboys who reported an age of sexual debut.

rural compared with 5215/52715 in urban areas said they had forced sex on someone else; this difference was not statistically significant after taking account of the effect of clustering). Youth perpetration of sexual violence was marginally more common in poorly resourced schools (7303/66287 in poorly resourced schools compared with 3284/34840 in well resourced schools, although this difference was not statistically significant after taking account of the effect of clustering).

Discussion

Male schoolchildren in South Africa suffer high rates of sexual abuse, many of the assaults perpetrated in school. By the age of 18 years, two in every five schoolboys reported being forced to have sex, mostly by female perpetrators. These rates of sexual violence are consistent with at least one other national study [13].

In this national sample, suffering forced sex was associated with a history of beating and verbal insults. Younger males were more likely to be abused by male perpetrators. Male perpetrators were more common in rural areas while female perpetrators were more commonly reported in urban areas. One in ten school boys surveyed admitted they had forced sex on someone else.

The considerable size and national representation of this survey under controlled classroom conditions provides unprecedented power to estimate rates of sexual abuse. The survey instrument did not allow for more nuance or

discussion of responses. Another regrettable limitation is that we cannot estimate the overall *burden* of sexual abuse: how many times each child was forced to have sex or the degree of accompanying violence. We did not distinguish transactional sex, although it is not strictly forced sex without consent. And we did not document the age of the perpetrator when this was a fellow school child.

A general limitation of all questionnaire-based research on sexual violence is that the information depends entirely on the response of the participant. They can exaggerate and they can withhold information, and we have no way to verify this. It remains a weakness of all questionnaire-based enquiries of sexual violence. The instrument development involved a rigorous design process where we validated questionnaire responses through qualitative follow up in gender-stratified focus groups in each pilot site. Translation and back translation processes relied on language speakers from areas similar to the study population.

This study was a cross-section of children present at sample schools during a single field visit. The anonymous, facilitated self-administered questionnaire prevented registering class members not present at the time of the visit, and no effort was made to contact those who were not present as this would make them identifiable as individuals. It seems reasonable to assume that, if anything, the survey underestimated sexual violence among schoolboys.

Potential policy implications

Boys who are victimized quite probably experience a similar range of psychological consequences as girls. Studies of adolescent males have also found an association between suffering rape and a variety of negative behaviors including absenteeism from school [14]. Boys who are perpetrators of gender violence can also be viewed as victims of a narrowly constructed male gender role that provides boys limited opportunities for expressing their masculinity and condones or even encourages displays of power over girls as appropriate behaviour. It seems reasonable to expect similar power dynamics will affect both sexes.

Many child perpetrators of rape have themselves been victims of sexual abuse [15]. It is also well established that people who have been sexually abused as children are more likely to become abusers themselves [16-18]. There is increasing recognition of links between sexual abuse and high-risk attitudes to sexual violence and HIV risk [19-21]; sexually abused children are also more likely to engage in HIV high-risk behaviour [22].

The likely consequence of all this for South African society is the multiplication of sexual abuse. Our findings offer strong support to the 2007 Sexual Offences Bill, indicate the need to raise awareness about rape of male children, and warrant further efforts to prevent sexual violence in South Africa.

Authors' contributions

AHF participated in the design of the study and supported the statistical analysis. NA conceived of the study, participated in its design and coordination, and conducted the principal analysis. Both authors read and approved the final manuscript.

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Paper 6.

Andersson N, Paredes-Solís S, Milne D, Omer K, Marokoane N, Laetsang D, Cockcroft A.

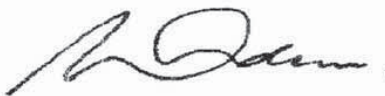
Prevalence and risk factors for forced or coerced sex among school-going youth: national cross-sectional studies in 10 southern African countries in 2003 and 2007.

BMJ Open 2012; 2:e000754. Doi:10.1136/ bmjopen-2011-000754

STATEMENT OF CONTRIBUTION

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The contribution of Neil Andersson included design of the study, participation in design of instruments, technical oversight of the survey, analysis of data, conceptualisation of the article, writing and final approval

Neil Andersson 

Anne Cockcroft 

Prevalence and risk factors for forced or coerced sex among school-going youth: national cross-sectional studies in 10 southern African countries in 2003 and 2007

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ABSTRACT

Objectives: To study prevalence at two time points and risk factors for experience of forced or coerced sex among school-going youth in 10 southern African countries.

Design: Cross-sectional surveys, by facilitated self-administered questionnaire, of in-school youth in 2003 and 2007.

Setting: Schools serving representative communities in eight countries (Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe) in 2003 and with Tanzania and South Africa added in 2007.

Participants: Students aged 11–16 years present in the school classes.

Main outcome measures: Experience of forced or coerced sex, perpetration of forced sex.

Results: In 2007, 19.6% (4432/25 840) of female students and 21.1% (4080/21 613) of male students aged 11–16 years reported they had experienced forced or coerced sex. Rates among 16-year-olds were 28.8% in females and 25.4% in males. Comparing the same schools in eight countries, in an analysis age standardised on the 2007 Botswana male sample, there was no significant decrease between 2003 and 2007 among females in any country and inconsistent changes among males. In multilevel analysis using generalised linear mixed model, individual-level risk factors for forced sex among female students were age over 13 years and insufficient food in the household; school-level factors were a lower proportion of students knowing about child rights and higher proportions experiencing or perpetrating forced sex; and community-level factors were a higher proportion of adults in favour of transactional sex and a higher rate of intimate partner violence. Male risk factors were similar. Some 4.7% of female students and 11.7% of male students reported they had perpetrated forced sex. Experience of forced sex was strongly associated with perpetration and other risk factors for perpetration were similar to those for victimisation.

Conclusions: Forced or coerced sex remained common among female and male youth in 2007.

ARTICLE SUMMARY

Article focus

- Cross-sectional studies 2003 and 2007.
- History of coerced sex and its perpetration.
- Individual, school and community risk factors.

Key messages

- No evidence of decline 2003–2007.
- Community factors include views of transactional sex.
- School factors show clustering.

Strengths and limitations of this study

- Cross-sectional study limits causal inferences.
- School base excludes out of school youth.

Experience of sexual abuse in childhood is recognised to increase the risk of HIV infection. The association the authors found between forced sex and school-level factors suggests preventive interventions in schools could help to tackle the HIV epidemic in southern Africa.

INTRODUCTION

Sexual violence against children is a major public health problem in its own right, and it is directly and indirectly relevant to the HIV epidemic. The physical trauma of sexual violence can increase the risk of HIV transmission directly^{1–3} and the psychological damage related to abuse can result in increased risk-taking behaviours, re-victimisation^{4–7} and perpetration of sexual violence.^{8–9} Even for those not directly involved, having a friend or neighbour who suffers sexual abuse builds an environment where sexual violence is seen as an everyday occurrence.¹⁰ Gender violence in general

CSV in 10 southern African countries 2003 and 2007

(including forms other than sexual violence) is an important factor increasing the risk of HIV infection among young women in southern Africa.¹¹

Sexual abuse of children is believed to be common in East and southern Africa but there are few quantitative studies, mostly in South Africa.^{12 13} Different methods of data collection and differing definitions of what is included within the term sexual violence can produce very different estimates of occurrence. A national South African study using a self-administered questionnaire reported 10% of school-going youth (both females and males) suffered forced or coerced sex each year, with around 35% affected by the age of 18 years.¹⁴ A smaller study with face-to-face questioning, also in South Africa, reported only 1.6% of girls experienced forced sex before the age of 15 years.¹⁵ A study among young women in Swaziland found that 35% of girls reported being 'touched sexually or forced to have sex' by the age of 18 years.¹⁶

Despite its importance as a public health problem and human rights violation, and its clear relevance to the HIV epidemic in southern Africa, there is little empirical data available on sexual violence against children in this region, especially data allowing comparisons between countries and over time. Internationally comparable surveys such as the Demographic and Health Survey do not collect information about sexual violence in this age group. Using data from nationally representative samples in eight southern African countries in 2003 and these same countries plus another two in 2007, we examined the frequency, changes over time and risk factors for experience of forced or coerced sex among school-going youth aged 11–16 years, as well as the frequency and risk factors of perpetration of forced sex in 2007. The surveys used the same instruments, training and data collection methods in the same settings on both occasions.

METHODS

Sample

In 2002/2003, we drew a stratified (urban/rural) random sample of census enumeration areas (EAs) in Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe, covering 25–30 EAs in each country. The schools' sample reported here comprised the schools serving these EAs that included grades 6–9 (students aged approximately 11–17 years). In 2007, we added South Africa and Tanzania to cover a total of 259 EAs and 445 schools across the 10 countries. Within each school, the field teams randomly selected one class per grade for the survey, in grades covering students aged 11 years and above. In a few schools, at the request of the head teacher, they covered all the two to three classes per grade.

Data collection

For both surveys, we standardised training in one country and then repeated this in each country, training

25–30 field workers in each country over 1 week. The training specifically covered methods of ensuring privacy of responses in a crowded classroom, asking about sensitive issues and how to handle students who might become upset or who might have questions or seek advice because of their participation in the survey. Field coordinators approached the head teacher of each sample school and explained the survey aims. They only rarely needed to share the actual questionnaire and then only shared it with the head teacher. Head teachers of many schools chose to send information to parents about the survey (without sending details of the contents); they did not seek opt-in consent from parents for their children to participate. In each classroom, with the teacher absent, the facilitator first explained that participation was entirely voluntary and that students could leave out any questions they did not want to answer or leave the questionnaire blank. He or she then advised students to use open exercise books to ensure privacy of their responses and read each question in turn, in the language of choice of the class, encouraging participants to wait until they *heard* each question before writing their answer on the scannable form. Most answers required respondents to fill in one or more bubbles for response options. In each class, at least one assistant (two or more in particularly big classes) checked that the privacy arrangements were working and alerted the facilitator if any students were having difficulty with the process. The whole session, including the explanations and instructions and collection of completed response forms, took <1 hour.

The questionnaire, translated into 27 languages, asked the respondent 'has anyone ever forced or persuaded you to have sex when you did not want to?' We counted as suffering sexual violence those who responded positively to this closed direct question. The questionnaire used exactly the same words in 2003 and 2007. The questionnaire also asked if the respondent had ever perpetrated sexual violence ('forced sex with someone without their consent').

The questionnaire also documented age and sex of the respondent, whether they drank alcohol, the degree of crowding in their homes and whether there was enough food in their house in the last week (as an indicator of serious poverty).

We derived several school-level variables from 2007 data, potentially related to the risk of experience of sexual violence. Based on the youth questionnaire responses, we categorised schools as having above or below the mean (for each country) proportion of students having experienced forced or coerced sex and having perpetrated forced sex and drinking alcohol. We also documented community-level variables: whether the community was urban or rural, whether it had tar road access and whether it had any active government HIV prevention programmes. Other community-level variables came from a household survey of adults which took place in the sample EAs served by the schools in late

2002 and 2007. Trained interviewers administered a questionnaire to adults aged 16–59 years present in households, covering 24 069 respondents across the 10 countries in 2007. Other publications describe the household survey in more detail.^{17 18} We categorised communities as having above or below the 2007 country mean in access by good tar road; active government HIV prevention programme; proportion of adults saying that “women sometimes deserve to be beaten”; proportion of adults saying it is “okay for an older man to have sex with teenagers”; proportion of adults saying “men have the right to sex with their girlfriends if they buy them gifts” and proportion of adults reporting intimate partner violence in the last year. We also coded school-level variables as above or below the national average: proportion of students reporting experience of sexual violence; proportion of students knowing of three child rights; proportion of students agreeing that boys and girls are equal; proportion of students reporting perpetration of sexual violence and proportion of students reporting drinking alcohol.

Analysis

Operators scanned self-administered questionnaires using Remark¹⁹ and analysis relied on CIETmap open-source software.²⁰ The analysis excluded students who did not answer the questions about sexual violence and those who did not give their age or who reported their age as ‘17 years or older’. We weighted individual country frequency estimates to account for any rural/urban disproportion in the sample compared with the population. In addition, we weighted regional frequency estimates in proportion to population of the countries; some countries were over-sampled and others under-sampled in relation to their population. To compare reported experience of forced or coerced sex between 2003 and 2007, we restricted the comparison to schools included in both surveys in eight countries, examined male and female changes separately and standardised on the age distribution of the Botswana male sample in 2007. Risk analysis of factors related to experience of forced or coerced sex reported in 2007 began by examining bivariate associations using the Mantel–Haenszel procedure.²¹ We adjusted these bivariate estimates of association by country and for clustering (at school level) using a method described by Lamothe^{22 23} based on a variance estimator to weight the Mantel–Haenszel OR for cluster-correlated data. We report the OR and cluster-adjusted CIs. Multivariate analysis of factors significant in bivariate analysis began with a saturated model, with backwards deletion excluding the weakest association, until only significant associations remained. For the multivariate analysis, we used a generalised linear mixed model (GLMM) to examine personal variables like age and sex, together with household variables like crowding and food sufficiency, community-level variables like high or low prevalence of intimate partner violence and negative attitudes about gender and gender violence and school-

level variables like high or low proportion of children who said they were victims or perpetrators of forced sex or drank alcohol. For GLMM, we used the R package lme4,²⁴ achieving a fit of fixed and random effects (country) by the Laplace approximation.²⁵

Ethical aspects

The accredited international ethical review board of CIET international approved the project in addition to an ethical review board in each country: the Health Research and Development Committee, Ministry of Health in Botswana; Research and Ethics Committee, Ministry of Health and Social Welfare in Lesotho; the National Health Sciences Research Committee, Ministry of Health in Malawi; the Comité Nacional de Bioética para a Saude, Ministerio da Saude in Mozambique; the Research Management Committee, Ministry of Health and Social Services in Namibia; the CIET Trust Research Ethics Committee in South Africa; the Scientific and Ethics Committee, Ministry of Health and Social Welfare in Swaziland; the Institutional Review Board, Ifakara Health Research and Development Centre in Tanzania; the Permanent Secretary, Ministry of Health, Zambia and the Medical Research Council of Zimbabwe. In each country, we also received written authority from the Ministry of Education to interview children in school. School head teachers gave consent to survey students in their school and contacted parents to inform them about the survey in general terms and give them the option to opt-out their child.

RESULTS

From 60 646 facilitated self-administered questionnaires in schools in the 10 countries in 2007, we obtained 59 986 usable records (1.1% did not complete or spoiled their questionnaires). We excluded 10 631 respondents (17.7%) who did not report their age or reported their age as ‘17 years or older’ (9623). Of 49 355 respondents aged 11–16 years, 48 586 (98.4%) answered the question about forced or coerced sex. In 2003, 28 896 students aged 11–16 years in eight of the countries completed the questionnaire and 27 772 (96.1%) of them answered the question about forced or coerced sex.

In 2007, some 27.5% (based on 13 216/47 102) of respondents lived in houses with more than three people per room and 13.6% (based on 8498/48 614) reported they had insufficient food in their households in the week before the survey. Some 29.2% (based on 14 178/49 355) correctly recognised three child rights (to go to school, to be safe and not to be abused). Based on direct observation and key informant responses, 46.4% (based on 17 202/42 028 for whom this information was available) lived in a community that could be accessed by good tar road and 67.7% (based on 30 953/44 661) lived near an active government HIV prevention programme.

Experience of forced sex

Weighting for country size and urban/rural proportions in each country, in 2007, 19.6% (based on 4432/25 840)

CSV in 10 southern African countries 2003 and 2007

of female youth and 21.1% (based on 4080/21 613) of male youth aged 11–16 years reported they had experienced forced or coerced sex. **Figure 1** shows the age- and sex-specific rates, each point representing the population weighted average across 10 countries, for ages 11–16 years and for male and female respondents. Up until the age of 14 years, male students reported higher rates than female students. **Table 1** shows the weighted percentages of male and female students aged 16 years who had ever experienced forced or coerced sex in each of the 10 countries. Across the 10 countries, 25.4% of male students and 28.8% of female students had experienced forced or coerced sex by the time they were 16. There was considerable variation between countries. Among males, the rates ranged from 11.9% in Botswana to 37.8% in Malawi, and in females, they ranged from 15.0% in Botswana to 43.2% in Tanzania.

Table 2 shows country-specific rates of the experience of forced or coerced sex in 2003 and 2007, separately for male and female respondents, age standardised on the age distribution in the Botswana 2007 male sample. The comparison is limited to those schools covered in the survey in eight countries in both 2003 and 2007. Among male respondents, age-standardised rates decreased significantly in two countries, increased significantly in two and did not change significantly in the other four. Among female respondents, in all but one country, there was a lower rate in 2007 than in 2003, but none of the changes on their own were significant.

Table 3 shows the bivariate associations, adjusted for country and clustering, between personal and cluster-level variables and experience of forced or coerced sex, among male and female students. The patterns were similar among the males and females: older youth were more likely to have experienced forced or coerced sex, as were those who did not have enough food in the house in the last week. Students attending schools where experience and perpetration of forced sex was more common

and where more students used alcohol were more likely to report experiencing forced or coerced sex.

Multilevel analysis (GLMM) treated country as a random effect (**table 4**). The final GLMM model for female youth included one personal factor (age over 13 years), a household factor (insufficient food in the last week), three school group factors (a higher proportion who experienced forced or coerced sex, a higher proportion who perpetrated forced sex and a lower proportion who knew about child rights) and two community factors (where more adults said a man could expect sex if he gave a gift to a woman and where more adults reported intimate partner violence in the last year). Among male youth, there was one household factor (insufficient food in the last week), three school group factors (a higher proportion who experienced forced or coerced sex, a higher proportion who perpetrated forced sex and a higher proportion who reported use of alcohol) and one community factor (where more adults said a man could expect sex if he gave a gift to a woman).

While the school group variables in **table 4** each had an effect in their own right, there was also evidence that the factors combined to increase the risk of sexual violence. Of female youth at schools where fewer people reported being a victim and fewer claimed to be perpetrators, 13.2% (1460/11 030) had suffered sexual violence; of those at schools where fewer than average were victims and more were perpetrators, 14.2% (359/2531) suffered sexual violence; of those with more victims and fewer perpetrators, 19.5% (838/4290) suffered sexual violence and of those at schools with more victims and more perpetrators, 22.2% (1775/7989) suffered sexual violence.

Perpetration of forced sex

In 2007, weighted for country population and urban/rural proportions in each country, 4.7% of female

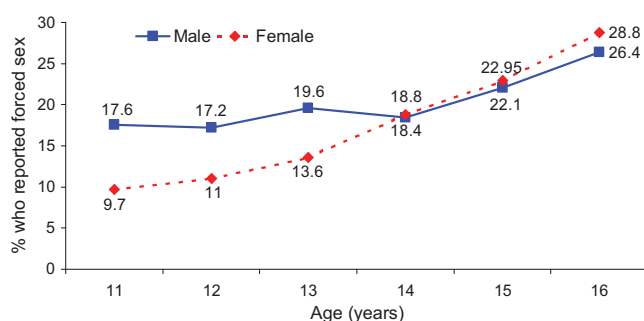


Figure 1 Proportions of male and female youth aged 11–16 years who reported forced or coerced sex. Each point represents the population-weighted average across the 10 countries. Female rates 11–16 years are based on 107/1064, 346/3026, 661/4986, 1039/6373, 1161/5837, 1118/4554, respectively. Male rates 11–16 years are based on 106/716, 339/2061, 692/3814, 876/5080, 974/5180, 1093/4762, respectively.

Table 1 Reported experience of forced or coerced sex among male and female students aged 16 years in 2007, by country

Country	Fraction (weighted %) who ever experienced forced or coerced sex	
	Male students	Female students
Botswana	48/408 (11.5)	44/299 (14.7)
Lesotho	127/587 (22.6)	174/790 (21.5)
Malawi	165/436 (37.8)	87/237 (36.9)
Mozambique	124/472 (27.0)	65/290 (21.5)
Namibia	80/334 (24.4)	93/330 (29.4)
South Africa	142/767 (17.7)	176/955 (18.3)
Swaziland	79/562 (13.9)	84/496 (17.2)
Tanzania	119/356 (32.0)	196/460 (42.6)
Zambia	152/572 (26.6)	159/491 (33.4)
Zimbabwe	45/219 (20.2)	23/140 (15.7)
All countries combined	1093/4762 (25.4)	1118/4554 (28.8)

Country	Male			Female			Age-standardised contrast 2007/2003, RR (95% CI)
	2003	2007	Age-standardised 2003, RR (95% CI)	2003	2007	Age-standardised 2003, RR (95% CI)	
	Cases/total	standardised rate*	Age-standardised rate*	Cases/total	standardised rate*	Age-standardised rate*	
Botswana	163/1006	0.164	0.0995	142/1215	0.113	0.099	0.88 (0.74 to 1.05)
Lesotho	352/1917	0.170	0.211	451/2805	0.156	0.137	0.88 (0.75 to 1.02)
Malawi	521/1829	0.258	0.246	479/1822	0.249	0.255	1.02 (0.89 to 1.17)
Mozambique	233/947	0.268	0.264	153/698	0.180	0.179	0.99 (0.77 to 1.28)
Namibia	325/1313	0.234	0.238	397/1736	0.219	0.209	0.95 (0.84 to 1.12)
Swaziland	259/2024	0.122	0.091	360/2792	0.121	0.116	0.96 (0.83 to 1.13)
Zambia	501/1807	0.241	0.236	526/1837	0.249	0.221	0.89 (0.75 to 1.03)
Zimbabwe	202/1247	0.109	0.183	326/1577	0.192	0.154	0.80 (0.53 to 1.20)

The 2007 study applied the same instrument in 10 countries within a period of 4 months, generating comparable data about coerced sex among youth of these 10 countries. This is the first school-based study of sexual violence using the same instrument at the same time across multiple countries in southern Africa. The anonymous self-administered questionnaire under carefully arranged conditions may have increased disclosure

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Table 3 Risk factors for lifetime experience of sexual violence in school-going male and female youth aged 11–16 years in 2007

Characteristics	Categories	Lifetime experience of sexual violence*			
		Male		Female	
		Proportions	OR (95% CI)†	Proportions	OR (95% CI)†
Individual and household variables					
Age group	11–13 years	1137/6591	1.13 (1.03 to 1.23)	1114/9076	1.71 (1.52 to 1.92)
	14–16 years	2943/15 022		3318/16 764	
Area of residence	Urban	1685/10 007	1.10 (0.98 to 1.25)	1840/12 237	1.09 (0.96 to 1.25)
	Rural	2395/11 606		2592/13 603	
Crowding in the house	1–3 per room	2710/14 840	0.96 (0.89 to 1.04)	3055/17 814	0.94 (0.86 to 1.02)
	4–10 per room	1154/5767		1206/7006	
Enough food in the house in the last week	Yes	3199/17 621	1.33 (1.20 to 1.46)	3409/21 041	1.51 (1.35 to 1.69)
	No	824/3724		952/4457	
Community-level variables					
Access by good tar road	Yes	1319/7405	0.93 (0.80 to 1.09)	1496/9190	1.03 (0.88 to 1.20)
	No	2260/11 190		2309/12 673	
Active government HIV prevention programme	Yes	2390/13 124	1.01 (0.86 to 1.17)	2524/15 361	1.01 (0.85 to 1.19)
	No	1185/5551		1196/6538	
Proportion of adults saying that “women sometimes deserve to be beaten”	Below average	1979/10 366	0.94 (0.83 to 1.07)	2139/12 442	0.91 (0.80 to 1.04)
	Above average	1884/10 104		2028/12 142	
Proportion of adults saying it is “okay for an older man to have sex with teenagers”	Below average	2582/13 517	0.98 (1.86 to 1.12)	2865/16 462	0.91 (0.80 to 1.03)
	Above average	1281/6953		1302/8122	
Proportion of adults saying “men have the right to sex with their girlfriends if they buy them gifts”	Below average	2213/11 879	1.06 (0.94 to 1.20)	2515/14 535	0.98 (0.85 to 1.13)
	Above average	1650/8591		1652/10 049	
Proportion of adults reporting intimate partner violence in last year	Below average	1654/8619	0.94 (0.83 to 1.07)	1785/10 435	1.01 (0.88 to 1.15)
	Above average	2209/11 851		2385/14 149	
School-level variables					
Proportion of students reporting experience of sexual violence	Below average	1540/10 909	1.94 (1.73 to 2.17)	1819/13 561	1.84 (1.61 to 2.11)
	Above average	2540/10 704		2613/12 279	
Proportion of students knowing of three child rights	Above average	1678/9588	1.11 (0.98 to 1.25)	2095/12 263	0.99 (0.87 to 1.13)
	Below average	2402/12 025		2337/13 577	
Proportion of students agreeing that boys and girls are equal	Above average	1851/10 491	1.13 (1.00 to 1.27)	2255/13 342	1.01 (0.90 to 1.14)
	Below average	2229/11 122		2177/12 498	
Proportion of students reporting perpetration of sexual violence	Below average	1939/12 293	1.60 (1.42 to 1.81)	2298/15 320	1.48 (1.29 to 1.70)
	Above average	2141/9320		2134/10 520	
Proportion of students reporting drinking alcohol	Below average	2182/12 700	1.34 (1.19 to 1.52)	2370/14 831	1.31 (1.15 to 1.49)
	Above average	1898/8913		2062/11 009	

Values in bold indicate associations significant at the 5% level.

*Defined as those who responded positively to the question: “Has anyone ever forced or persuaded you to have sex when you did not want to?”

†OR and 95% CI from bivariate analysis of group with characteristic compared with counterfactual group (eg, age 14–16 years compared with age 11–13 years), stratified by country and adjusted for clustering.

compared with face-to-face interviews, and this might help to explain the higher rates of forced sex than a study in South Africa that used face-to-face interviews.¹⁵ Our measure of sexual violence was limited specifically to coerced physical sex. This leads to lower estimates of sexual violence than studies that include unwanted touching and verbal abuse as well as forced sex.¹⁶

The school-based surveys probably underestimated the rates of forced and coerced sex among all children since we excluded children not in school, who may have a higher risk of experiencing sexual violence or who may have left school because they experienced sexual

violence. We have no details about enrolment and attendance other than on the day of the survey. The school-based surveys did not contact young women who were unable to attend school due to pregnancy, a possible result of sexual abuse. The percentage of female students illustrates their dropout with age: 60%, 59%, 57%, 55%, 53% and 49% with increasing age from 11 through to 16 years. If girls who experience forced or coerced sex leave school as a result, this could explain the apparently small gender gap or, in many country- and age-specific groups, more frequent reports of sexual violence among male than female respondents.

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Table 4 GLMM of factors associated with forced or coerced sex in male and female youth aged 11–16 years

Variables in final GLMM models	Adjusted OR (95% CI)	
	Males (n=22 098)	Females (n=26 292)
Age over 13 years		1.49 (1.38 to 1.61)
Insufficient food in the last week	1.22 (1.12 to 1.34)	1.40 (1.29 to 1.53)
Attending a school where there was a higher proportion of students who said they had suffered sexual violence	1.79 (1.65 to 1.95)	1.76 (1.62 to 1.90)
Attending a school where a lower proportion of students knew about child rights		1.15 (1.08 to 1.25)
Attending a school where there was a higher proportion of students who said they had perpetrated sexual violence	1.22 (1.12 to 1.33)	1.18 (1.09 to 1.28)
Attending a school where alcohol use was more common among students	1.11 (1.03 to 1.20)	
Living in a community where a higher proportion of adults said a man could expect sex if he gave a gift to a woman	1.16 (1.08 to 1.26)	1.16 (1.07 to 1.24)
Living in a community where a higher proportion of adults reported intimate partner violence in the last year		1.09 (1.01 to 1.17)

Country was treated as a random effect in the models. The initial saturated models for males and females included all the variables in [table 2](#). GLMM, generalised linear mixed model.

As with any self-reported experience, some students declined to answer questions and some may have given false answers. We recognise reasons not to report but we have no basis to expect respondents to fabricate a history of coerced sex; we expect this bias underestimated true rates. It is possible that under-reporting of forced or coerced sex was more marked among the female students. If so, this could explain our finding of a similar reported rate of forced sex between the sexes, even if the female youth actually experienced more forced sex.

There is a prevailing belief that child sexual abuse affects predominantly girls. Studies in Europe, the USA and Australia have generally reported higher rates of experience of sexual violence among female than male youth,^{26–31} although a recent study from Ireland

reported male rates of experience of sexual abuse in childhood not much lower than female rates.³² Few studies from Africa report both male and female rates of experience of child sexual abuse. Collings³³ reported that 29% of a small sample of male university students in South Africa had experienced contact or non-contact sexual abuse as children and later reported 35% of female students in the same university had experienced contact forms of sexual abuse as children.³⁴ Two studies from a province of South Africa found similar rates of experience of childhood sexual violence among male and female youth^{35 36} and a large study of school-going youth in South Africa found similar rates of experience of forced or coerced sex among males and females.^{14 37} The problem is much less studied among male youth,

Table 5 GLMM of factors associated with being a perpetrator of forced sex, among male and female youth aged 11–16 years

Variables in final GLMM models	Adjusted OR (95% CI)	
	Males (n=22 098)	Females (n=26 292)
Experienced forced or coerced sex	4.37 (3.96 to 4.82)	5.34 (4.66 to 6.13)
Insufficient food in the last week in household	1.30 (1.16 to 1.45)	
Attending a school where there was a higher proportion of students who said they had suffered sexual violence		1.51 (1.28 to 1.78)
Attending a school where a lower proportion of students knew about child rights	1.29 (1.16 to 1.43)	1.35 (1.16 to 1.57)
Attending a school where a higher proportion of students said they had perpetrated forced sex	2.23 (2.01 to 2.49)	2.13 (1.81 to 2.51)
Attending a school where a higher proportion of students drank alcohol	1.25 (1.13 to 1.38)	1.17 (1.01 to 1.36)
Living in a community that is not accessible by tar road	1.33 (1.20 to 1.48)	1.51 (1.30 to 1.75)
Living in a community where a higher proportion of adults said it is acceptable for an older man to have sex with a teenager		1.17 (1.01 to 1.35)
Living in a community where a higher proportion of adults reported intimate partner violence in the last year		1.23 (1.07 to 1.42)

Country was treated as a random effect in the models. GLMM, generalised linear mixed model.

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especially in Africa, with many enquiries limited to female youth.

By definition, sex with children is abuse whether or not the child 'consents'. The age of consent is complicated, with differing ages in different forms of legislation. The age of consent in the countries included in our study is generally 16 years and 18 years in Tanzania. Thus, nearly all coerced sex reported in our study was child sexual abuse as a matter of definition. The questionnaire asked those who reported forced or coerced sex how old they were when it first occurred. Of the 1,118 sixteen-year-old females who reported forced or coerced sex, 498 said this first occurred when they were aged 16 years or did not give an age when it occurred, similarly among the 1093 sixteen-year-old males reporting forced or coerced sex, 377 said it first occurred when they were aged 16 years or did not specify the age of first occurrence. A sensitivity analysis excluded these 875 youth; we could detect no shift in the pattern of risk factors.

The risk factors we included in the survey and analysis were based on evidence from other studies,^{12 26 27 33 34 38–40} and a belief that since sexual violence is a clustered phenomenon, factors at school and community level may be important. We recognise other risk factors for forced sex among children that this study did not measure.^{12 33 34}

Our findings on perpetration of forced sex are consistent with those reported elsewhere.¹² Male students were more likely to admit to forcing sex on someone else, but some female students also admitted to it. And being a victim of forced or coerced sex was a strong risk factor for being a perpetrator. In this cross-sectional study, we cannot say which came first, but the finding is compatible with the finding that many child perpetrators of rape have themselves been victims of sexual abuse.⁴¹

School-based group variables were strong risk factors for experience of forced or coerced sex and indeed perpetration of forced sex, illustrating the social nature of sexual violence. In this cross-sectional study, we cannot draw conclusions about which came first: personal experiences leading to school characteristics or the other way around. It seems plausible that some schools foster a culture of sexual violence, while others foster a culture of protection. If true, this could be key for school-based strategies to reduction of sexual violence among the students. Raghavan and colleagues⁴² showed that witnessing community violence influenced social support networks, and these in turn influenced gender violence. The counterpoint is that *not* witnessing community violence might also influence gender violence but in a positive way.

Sexual abuse in childhood is profoundly linked to the risk of HIV, largely through high-risk behaviours among survivors¹⁰; the high rates of forced and coerced sex we found among school students are a cause for serious concern. Increasing resources and developing

approaches for reducing sexual abuse of children in southern Africa, including randomised controlled trials of school-based interventions, should be a public health priority.

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Contributors NA designed the studies, provided oversight and training for fieldwork, conducted the analysis and wrote the present manuscript. SPS, DM, KO, NM and DL conducted the fieldwork and contributed to the writing. AC provided training and field supervision for the 2007 study and assisted with writing of the current manuscript. NA and AC are guarantors.

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Competing interests None.

Ethics approval Health Research and Development Committee, Ministry of Health in Botswana; Research and Ethics Committee, Ministry of Health and Social Welfare in Lesotho; the National Health Sciences Research Committee, Ministry of Health in Malawi; the Comité Nacional de Bioética para a Saude, Ministerio da Saude in Mozambique; the Research Management Committee, Ministry of Health and Social Services in Namibia; the CIET Trust Research Ethics Committee in South Africa; the Scientific and Ethics Committee, Ministry of Health and Social Welfare in Swaziland; the Institutional Review Board, Ifakara Health Research and Development Centre in Tanzania; the Permanent Secretary, Ministry of Health, Zambia and the Medical Research Council of Zimbabwe. In each country, we also received written authority from the Ministry of Education to interview children in school.

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Data sharing statement Data from this study are not in the public domain.

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Prevalence and risk factors for forced or coerced sex among school-going youth: national cross-sectional studies in 10 southern African countries in 2003 and 2007

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Paper 7.

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Risk factors for domestic violence: eight national cross-sectional household surveys in southern Africa.

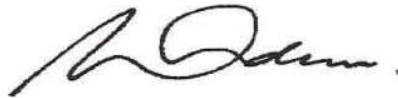
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The contribution of Neil Andersson included design of the study, participation in design of instruments, technical oversight of the survey, analysis of data, conceptualisation of the article, writing and final approval

Neil Andersson



Steven Mitchell



Research article

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Risk factors for domestic physical violence: national cross-sectional household surveys in eight southern African countries

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Abstract

Background: The baseline to assess impact of a mass education-entertainment programme offered an opportunity to identify risk factors for domestic physical violence.

Methods: In 2002, cross-sectional household surveys in a stratified urban/rural last-stage random sample of enumeration areas, based on latest national census in Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe. Working door to door, interviewers contacted all adults aged 16–60 years present on the day of the visit, without sub-sampling. 20,639 adults were interviewed. The questionnaire in 29 languages measured domestic physical violence by the question "In the last year, have you and your partner had violent arguments where your partner beat, kicked or slapped you?" There was no measure of severity or frequency of physical violence.

Results: 14% of men (weighted based on 1,294/8,113) and 18% of women (weighted based on 2,032/11,063) reported being a victim of partner physical violence in the last year. There was no convincing association with age, income, education, household size and remunerated occupation. Having multiple partners was strongly associated with partner physical violence. Other associations included the income gap within households, negative attitudes about sexuality (for example, men have the right to sex with their girlfriends if they buy them gifts) and negative attitudes about sexual violence (for example, forcing your partner to have sex is not rape). Particularly among men, experience of partner physical violence was associated with potentially dangerous attitudes to HIV infection.

Conclusion: Having multiple partners was the most consistent risk factor for domestic physical violence across all countries. This could be relevant to domestic violence prevention strategies.

Background

Domestic violence – also known as intimate partner

abuse, family violence, wife beating, battering, marital abuse, and partner abuse – is an international prob-

lem[1,2]. Domestic violence is not a single behaviour but a mix of assaulting and coercive physical, sexual, and psychological behaviours designed to manipulate and dominate the partner to achieve compliance and dependence. Women are more likely to experience physical injuries or psychological consequences[3,4].

Domestic violence is well documented in several African countries. In eastern Nigeria, a clinic-based survey of 300 women reported 40% had experienced violence in the previous year[5]. In one district of Uganda, 30% of 5,109 women attending a clinic had received threats or physical abuse. The majority of respondents viewed wife beating as justifiable in some circumstances[6]. In Durban, South Africa, more than one third of women from a low-income community had experienced domestic violence at some stage[7]. A South African study reported domestic violence associated with violence in childhood, education and multiple partners[8,9]. In southern Africa domestic violence is particularly important because of the multiple links between violence and HIV infection[10]. Links between domestic violence and HIV have been reported in Botswana[11], Ghana[12], Malawi[13], South Africa[14], Tanzania[15], Uganda[16,17], Democratic Republic of Congo[18] and Zambia[19].

This is a baseline assessment of attitudes and practices, from which we intend to measure the impact of mass media campaigns, launched since the baseline by Soul City. The survey content was thus geared to measure the impact of education-entertainment messages[20], rather than as a specific research hypothesis. One section of the questionnaire dealt with domestic violence – attitudes and subjective norms, collective efficacy, discussion of the issue and experience of physical domestic violence in the last year – and the results are reported here as a cross-sectional survey.

Methods

Design

In Botswana, Lesotho, Swaziland, Malawi, Mozambique, Namibia, Zambia and Zimbabwe we stratified the most

recent available census into rural, urban (not within the capital region), and urban capital sites. In each country, we drew a last stage random selection of enumeration areas, with probability proportional to the national population (Table 1).

Training and fieldwork

After training, coordinators translated, back-translated and piloted the common instruments in 29 languages: Afrikaans, Bemba, Changana, Chichewa, Chindali, Chitimbuka, Chona/Shona, Chope, English, Herero, Kalanga, Kaonde, Kwangali, Lozi, Luvale, Mucua, Ndau, Ndebele, Nyanja, Oshiwambo, Portuguese, Ronga, Sena, Sesotho, Seswati, Setswana, Shangaan, Xitshwa and Xitsonga. Each field team of seven or eight interviewers visited approximately 10 communities, one per day. Interviewers tried to cover all households in each enumeration area, without sub-sampling. In each household, they interviewed all adults aged 16–60 years present at the time of the visit.

Ethical considerations

An accredited international ethical review board evaluated the proposal, noting concerns that disclosure might place the respondent at risk and that the questions about sexuality probed confidential issues. Interviewers informed each respondent of their right to refuse to participate, and of their right to refuse to answer any question. Before starting the questionnaire, the interviewers requested verbal consent to proceed. They did not record names or other identifying feature, and took precautions that the interview was out of hearing of others.

Participants

Of the 17,377 households in 213 randomly selected enumeration areas, 20,639 adults participated from 16,707 households (96% initial acceptance) where 85,114 people lived. 58% (11,872/20,639) were female; 63% (13,017) were rural residents, 22.1% (4,563) urban and 14.8% (3,059) lived in the capital/metro area (Table 2).

Table 1: Sample weights in each country

	Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
Sample population	13689	16812	34488	9030	9898	14512	16189	12346	126964
% rural (sample population)	45%	83%	85.1%	51.6%	58.3%	74.5%	65.6%	63.6%	70.2%
Rural weight (Actual pop/sample pop)	1.016	0.971	1.005	1.316	1.032	1.033	1.046	1.047	1.007
% urban (sample population)	47%	4.7%	3.8%	37.2%	26.6%	18.5%	21.4%	17.3%	18.0%
Urban weight (Actual pop/sample pop)	0.923	2.034	1.304	0.693	0.892	0.909	0.835	1.003	1.019
% capital (sample population)	8.1%	12.2%	11.1%	11.2%	15.1%	7%	13.1%	19.2%	11.8%
Capital weight (Actual pop/sample pop)	1.356	0.799	0.855	0.564	1.067	0.890	1.039	0.840	0.927
% country (sample population)	10.8%	13.2%	27.2%	7.1%	7.8%	11.4%	12.8%	9.7%	100%
Country weight(Actual pop/sample pop)	0.298	0.254	0.708	4.160	0.407	0.158	1.343	2.315	1.000

Table 2: Characteristics of the sample population

		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
Number of adults interviewed	Adults	2526	2367	2863	2458	2649	1974	2963	2842	20639
% who had not completed primary school	Crude	322/2367	639/2183	1572/2827	1807/2425	497/2599	401/1827	803/2895	207/2772	6248/19895
	Weighted	12%	22%	43%	75%	17%	14%	22%	6%	42%
% female respondents	Crude	1495/2489	1488/2348	1683/2853	1471/2446	1465/2632	1122/1957	1605/2954	1543/2827	11872/20506
	Weighted	57%	66%	63%	61%	56%	56%	58%	54%	59%
% who said they did not have enough food in the last week	Crude	616/2216	734/2020	869/2180	705/1752	537/1799	672/1816	821/2175	815/2616	5769/16574
	Weighted	27%	31%	27%	42%	27%	23%	36%	29%	35%
% with no income	Crude	248/1900	419/1963	51/1983	66/1628	302/1727	230/1584	132/1890	155/2067	1603/14742
	Weighted	11%	17%	2%	4%	14%	8%	5%	6%	5%
Average HH size	Average	4.6	4.7	4.8	4.9	5.4	6.2	3.9	4.7	5.3

Outcome measures

We defined domestic physical violence by responses to the question: "In the last year, have you and your partner had violent arguments where your partner beat, kicked or slapped you?" To facilitate disclosure, interviewers asked this with the respondent alone. If this was not possible, they noted presence of a listener. Interviewers read questions without additional explanations, and recorded answers verbatim. Wherever possible, female researchers interviewed women and male researchers interviewed men. With the exception of one question about pregnancy, interviewers administered the same instrument to men and women.

We limited domestic violence to reports of physical abuse, and we had no measure of severity of the violence. We included items on attitudes to and subjective norms of domestic violence, collective efficacy to reduce domestic violence (Can your community do anything about violence against women?) and discussion of domestic violence (In the last year, how often did you talk with anyone about domestic violence? To whom did you speak most often about domestic violence?). In designing the evaluation of the impact of mass media, we anticipated that some effect might be measured in these intermediate outcomes before changing the actual occurrence of domestic physical violence.

The relevance of partner physical violence to HIV/AIDS risk came from answers to the questions "Do you think you are at risk of getting HIV?" and "If you found you were HIV positive, how would you change your sex life", considering "always use a condom" and "abstain from sex" as positive values. Negative values included "no change", "spread it intentionally", "same partner" and "sleep with virgin to cure".

Analysis

Data technicians manually digitised questionnaire data twice and eliminated keystroke errors by verifying discordant entries with the original questionnaires. We

weighted final estimates in line with the national populations and the eight-country estimates weighted national indicators by the population of each country (Table 1). In a univariate analysis, we stratified each association between partner physical violence and potential risk factors by each of the others in turn (List 1, see Appendix), initially ignoring multiple influences[21,22]. We adjusted for the multiple comparisons by requiring 99% confidence.

For risk factors not explained by any stratifying variable and those with multiple influences, a step down logistic regression model tested the effect of country, age, sex, education, income, food security, household size, occupation, and the factors in List 1 (see Appendix). The several items on attitudes to sexuality and violence showed collinearity, with no single variable attaining statistical significance in the preliminary logistic regression model. We included the variable from each group that showed the strongest association with the outcome in the model.

Results

Some 16% of men (weighted value based on 1,294/8,113) and 18% of women (weighted value based on 2,032/11,063) reported partner physical violence in the last year; 6.8% (809/11,872) of female respondents and 6.0% (521/8,634) of males declined to answer this question. The lowest rates of partner physical violence came from Mozambique (9%) and Malawi (9%) and the highest from Zambia (32%) (Tables 3 and 4). The 7.1% with someone else present at the time of the interview were more likely to report a violent altercation (OR 1.18, 95%CI 1.02–1.35; 285/1,459 compared with 2,974/17,381 alone at the time).

Personal and household factors**Sex**

The gender gap in reported domestic physical was negligible in Botswana, Lesotho, Namibia, Swaziland and Zimbabwe. Elsewhere, female respondents reported being the subjects of partner physical violence more frequently than

Table 3: MALE Experience of physical violence in the last year (beat, kicked or slapped), discussion about gender violence and participation in community action about violence against women

		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
% (number) who had, in the last year, had violent arguments where a partner beat, kicked or slapped the respondent, of those who answered	Crude	189/929	91/768	72/1109	70/930	168/1113	162/1261	337/1261	205/1231	1294/8113
	Weighted	21%	12%	6%	8%	15%	21%	27%	17%	16%
	Missing	65	92	61	45	54	63	88	53	521
% who said they had <u>not</u> spoken with anyone about gender violence in the last year	Crude	638/960	489/825	748/1167	657/964	679/1152	515/798	803/1329	590/1271	5119/8466
	Weighted	66%	57%	64%	69%	59%	65%	60%	46%	60%
	Missing	34	35	3	11	15	37	20	13	168
% who had participated in community activities in the last year	Crude	71/930	47/785	44/1159	64/964	64/1142	29/772	48/1328	118/1242	485/8322
	Weighted	8%	6%	4%	6%	6%	4%	4%	9%	6%
	Missing	64	75	11	11	25	63	21	42	312
% (number) who consider violence against women a serious problem in their community	Crude	758/928	796/1152	796/1152	613/952	791/1134	505/773	722/1298	580/1220	5242/8257
	Weighted	82%	60%	69%	64%	70%	65%	56%	47%	64%
	Missing	66	60	18	23	33	62	51	64	377
% (number) who said their community CAN do anything about violence against women	Crude	692/899	479/767	663/1150	508/903	626/1108	434/732	545/1255	582/1014	4529/7828
	Weighted	77%	64%	58%	56%	56%	59%	43%	57%	58%
	Missing	95	93	20	72	59	103	94	270	806

did male respondents: in Malawi, the population weighted rates were 7% and 11% for males and females respectively (based on 72/1,109 and 176/1,586); in Mozambique, 7% and 11% respectively (based on 70/930 and 148/1,374) and in Zambia, 27% and 36% (based on 337/1,261 and 538/1,509).

Age

Respondents aged 30–39 years reported violent altercations more commonly (20.4% unweighted, based on 908/4,478), with lower rates among older and younger respondents (16–19 years 11.4% 365/3,211; 20–29 years 19.3% 1,518/7,931; 40–49 years, 17.3% 376/2,196; 50–59 years 12.1% 135/1,118; and 60–66 years, 11.0% 26/235).

Home language

We found high reported rates of domestic physical violence in four of 29 interview languages. No less than 54% (82/152) of Lozi speakers (Zambia) reported partner physical violence in the last year. From the same country, 46% (99/197) of Tonga, 34% (339/995) of Bemba and 28% (206/744) Nyanja responders reported partner physical violence.

Education

Some 31% (6,248/19,895) of the respondents had completed primary school; 3.5% (744/20,639) declined to answer this question. At first glance, the average person who had not completed primary school seemed more

likely to report partner physical violence: OR 1.18 99%CI 1.05–1.32 (2,350/12,016 among those who had not completed primary education compared with 931/5,933 who had done so reported a violent altercation with a partner). This effect disappears entirely when stratifying by country; the levels of education combined with quite different rates of violent altercation seem to confound the measurement. In Zambia, the only country where education was associated with violent altercations, the average person who had not completed primary school was *less* likely to report a violent argument with a partner: argument with a partner: OR 0.82 95%CI 0.69–0.98 (600/1,979) among those who had not completed primary education compared with 266/768 who had done so reported a violent altercation with a partner).

Household size

We could find no obvious trend of violent altercation with increasing household size; missing data 6.6% (1,360/20,639). The average person living in a household with more than five members was *less* likely to report a violent altercation than one living in a household of 1–5 people (OR 0.88 99%CI 0.63–0.98; 1,295/7,887 in higher occupancy households compared with 2,049/11,383 in lower occupancy households reported a violent altercation).

Urban/rural residence

Most respondents lived in rural areas (63.1% or 13,017/20,639); a further 22.1% were urban (4,563/20,639) and 14.8% lived in the capital city (3,059/20,639). There was

Table 4: FEMALE Experience of physical violence in the last year (beat, kicked or slapped), discussion about gender violence and participation in community action about violence against women

		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
% (number) who had, in the last year, had violent arguments where a partner beat, kicked or slapped the respondent, of those who answered	Crude	257/1371	207/1309	176/1586	148/1374	233/1382	221/1034	538/1509	252/1498	2032/11063
	Weighted	19%	16%	11%	11%	17%	21%	36%	17%	19%
	Missing	124	179	97	97	83	88	96	45	809
% who said they had <u>not</u> spoken with anyone about gender violence in the last year	Crude	1011/1424	741/1433	1203/1671	1009/1458	795/1452	648/1076	948/1586	722/1523	7077/11623
	Weighted	71%	52%	72%	70%	55%	60%	60%	48%	61%
	Missing	71	55	12	13	13	46	19	20	249
% who had participated in community activities in the last year	Crude	99/1401	53/1388	29/1659	76/1451	67/1425	29/1051	41/1576	142/1507	536/11458
	Weighted	7%	4%	2%	5%	5%	3%	3%	9%	5%
	Missing	94	100	24	20	40	71	29	36	414
% (number) who consider violence against women a serious problem in their community	Crude	1110/1364	856/1393	1164/1659	872/1421	1034/1420	699/1027	934/1523	777/1451	7446/11257
	Weighted	81%	62%	70%	59%	73%	68%	61%	53%	66%
	Missing	131	95	24	51	45	95	82	92	615
% (number) who said their community CAN do anything about violence against women	Crude	1002/1339	479/767	663/1150	508/903	626/1108	434/732	545/1255	582/1014	4529/7828
	Weighted	75%	63%	45%	50%	58%	55%	45%	52%	55%
	Missing	156	172	34	123	59	182	136	325	1187

very little difference in partner physical violence: rural 17.8% (2,164/12,160), urban 17.2% (736/4,287) and capital 15.8% (447/2,837).

Total household income

One in every ten (1,940/18,370) reported no income in the last month (11% or 2,269/22,630 declined to answer this question). Stratifying by country, there was no convincing association of domestic physical violence with income (OR adjusted 1.08, 99%CI 0.85–1.53; 346/1,757 of those with no income and 27,017/15,458 of those with an income). There was no detectable gender difference in this effect.

Remunerated occupation

One in every ten did not register an occupation (3.7% 751/20,639 missing data). Housewives were most likely to report partner physical violence (25.6% based on 443/1,730), followed by those who described themselves as unemployed (19.5% based on 812/4,169). There was also no convincing association between remunerated occupation and partner physical violence (OR 0.95, 99%CI 0.8–1.1). We constructed a new variable to reflect the "income gap" between personal employment and total household income: overall, unemployed individuals in households with some income were more likely to report domestic physical violence (OR 1.43 99%CI 1.27–1.60; 901/4,111 with the income gap and 2,091/12,722 without it reported physical violence). On stratification by sex of respondent and country, however, it turned out

that this association is ascribed mostly to women in Namibia and Zambia.

Food security

One in every three respondents reported having insufficient food in the last week (34.5% unweighted, 7,070/20,475); 0.8% (164/20,639) declined to respond. As with personal income, the average person reporting insufficient food was slightly more likely to report partner physical violence (OR 1.22 99%CI 1.10–1.35; 1,271/2,679 with insufficient food reported, compared with 2,052/12,536 with sufficient food). We could not explain this effect by urban/rural residence, country, attitudes to sexuality or sexual violence or any the personal factors we documented.

Attitudes about sexuality and sexual violence

Tables 5, 6, 7, 8, 9, 10 show the variation from country to country in attitudes about sexuality and sexual violence. Several of these beliefs were associated with partner physical violence (Tables 11 and 12): the belief that men have the right to have sex with girlfriends if they buy them presents (OR 1.42 99%CI 1.25–1.60), it is okay for an older man to have sex with teenagers (OR1.38 99%CI 1.20–1.59), women do not have the right to refuse sex with husbands and boyfriends (OR1.18 99%CI 1.05–1.30) and a person has to have sex to show love (OR 1.44 99%CI 1.38–1.59). Beliefs about gender violence were also associated with violent altercations: forcing one's partner to have sex is not rape (OR 1.23 99%CI 1.10–

1.37) and women sometimes deserve to be beaten (OR1.56 99%CI 1.4–1.72). These associations were not explained by country, education, sex, remunerated occupation, income, multiple partners, household factors (like crowding, language, food security), or other attitudes and beliefs about sexuality or sexual violence.

Multiple partners

One in every four respondents (4,468/17,948) who answered the question reported having two or more sexual partners in the last year; 15.9% (3,276/20,639) declined to answer. The proportion reporting multiple partners, out of those who had partners in the last year, varied somewhat by country: Botswana 32.1% (566/1,760), Lesotho 43.9% (780/1,760), Malawi 12.5% (274/2,195), Mozambique 31.6% (706/2,212), Namibia 21.0% (440/2,062), Swaziland 35.1% (517/1,465), Zambia 26.0% (600/2,316) and Zimbabwe 26.8% (585/2,175).

Using two or more partners in the last 12 months as a definition of multiple partners, there was a strong association with partner physical violence: female respondents OR 1.87 99%CI 1.46–2.41 (450/1564 of those with two or more partners compared with 1479/8332 among those with one or no partners) and male respondents OR 2.00 99%CI 1.47–2.66 (627/2755 among those with two or more partners compared with 592/4616 among those with one or no partners).

In all age groups in all countries, having multiple partners was a risk factor for violent altercations. A logistic model taking into account country, food security, sex of respondent, income, education and employment accentuated the risk of violent altercations for people with multiple partners (unadjusted OR 1.75, adjusted OR 2.03 99%CI 1.65–

2.42, indicating underestimation of the unadjusted estimate).

Partner physical violence increased progressively with number of partners in the last 12 months: 234/1689 (13.9%) with no partners, 16.3% (1849/11324) with one partner, 22.7% (516/2269) with two partners, 25.4% (253/1034) with three partners, 29.2% (118/405) with four and 29.2% (185/633) with five or more partners reported domestic physical violence in the last year (χ^2 199.8, 5 df).

Community dynamics and collective efficacy

A large proportion of the sample (65%, 12760/19626) said that domestic violence was considered a serious issue in their community (4.9% missing data, 1004/20639). Yet two thirds (9944/15880) of those who did not report physical violence and one half of those reporting partner physical violence in the last year (1654/3336) had never spoken about it. Those who spoke about it did so most frequently with friends (50.0% 3754/7504) and family (24.2%, 1819/7504). One in every ten said they had discussed with a neighbour (720/7504) and another one in ten with a partner or spouse (745/7504). There were no remarkable differences between male and female respondents, or between those who reported violent altercations and those who had not done so.

Over one half of the respondents said that their community could do something about violence against women (unweighted 56.2% based on 10466/18617, missing data 2017/20639 or 9.7%). Male respondents were more likely to express collective efficacy (OR 1.12 99%CI 1.02–1.23, 4529/7828 male and 5879/10685 female respondents felt their communities could do something about violence against women). Collective efficacy was highest in Bot-

Table 5: Male attitudes about sex

		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
% (number) who said women do not have the right to refuse to have sex with their husbands or boyfriends.	Crude	383/981	393/829	568/1165	538/970	436/1151	369/824	681/1255	614/1258	3982/8433
	Weighted	39%	47%	49%	55%	38%	45%	54%	49%	47%
	Missing	13	31	5	5	16	11	94	26	201
% (number) who said a person has to have sex with their boyfriend or girlfriend to show that they love them	Crude	350/983	528/838	505/1166	523/971	446/1152	407/821	596/1336	318/1277	3673/8544
	Weighted	36%	62%	44%	57%	39%	50%	45%	25%	44%
	Missing	11	22	4	5	15	14	13	7	90
% (number) who said it is okay for an older man to have sex with teenagers.	Crude	75/985	162/820	62/1168	196/972	111/1158	84/826	129/1343	105/1280	924/8552
	Weighted	8%	21%	5%	21%	10%	10%	10%	8%	11%
	Missing	9	40	2	3	9	9	6	4	82
% (number) who said men have the right to have sex with their girlfriends if they buy them gifts	Crude	172/980	331/822	285/1166	491/969	365/1154	189/827	509/1342	266/1280	2608/8540
	Weighted	18%	39%	25%	53%	32%	23%	38%	21%	31%
	Missing	14	38	4	6	13	8	7	4	94

Table 6: Female attitudes about sex

		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
% (number) who said women do not have the right to refuse to have sex with their husbands or boyfriends.	Crude	480/1466	594/1447	812/1679	772/1458	448/1457	429/1099	856/1516	662/1513	5053/11635
	Weighted	32%	40%	49%	52%	31%	39%	57%	44%	43%
	Missing	29	41	4	13	8	23	89	30	237
% (number) who said a person has to have sex with their boyfriend or girlfriend to show that they love them	Crude	428/1464	843/1452	763/1671	743/1461	411/1458	449/1104	651/1590	266/1533	4554/11733
	Weighted	29%	58%	46%	54%	28%	41%	42%	17%	39%
	Missing	31	36	12	10	7	18	15	10	139
% (number) who said it is okay for an older man to have sex with teenagers.	Crude	79/1470	226/1433	104/1679	289/1461	97/1459	108/1112	126/1596	134/1539	1163/11749
	Weighted	5%	16%	6%	20%	7%	10%	8%	9%	10%
	Missing	25	55	4	10	6	10	9	4	123
% (number) who said men have the right to have sex with their girlfriends if they buy them gifts	Crude	236/1468	534/1426	467/1671	651/1462	286/1450	186/1105	513/1593	216/1531	3089/11706
	Weighted	16%	37%	28%	48%	20%	17%	33%	14%	27%
	Missing	27	62	12	9	15	17	12	12	166

swana (75.6% 1715/2268) and Lesotho (62%, 1299/2095) and lowest in Zambia (44.5%, 1215/2732).

Relevance of partner physical violence to HIV risk

People who reported partner physical violence (male or female) were significantly more likely to believe they were at risk of getting HIV (OR 1.51, 99%CI 1.37–1.68; 1615/3075 who reported partner physical violence and 6261/14832 who did not report partner physical violence said they were at risk of HIV infection). This was not explained by country, sex of the respondent or any of the factors we could test in this study.

The average male respondent who reported partner physical violence was significantly more likely to anticipate a negative reaction to knowing he was HIV positive (no

change, spread intentionally, sleep with virgin, etc) compared with one who had not suffered violence in the last year (OR 1.51, 99%CI 1.23–1.83, 286/1163 among those reporting and 1089/6142 not reporting partner physical violence). This association did not hold for female respondents, and among men it was not explained by country or any of the other variables we could test (List 1, see appendix).

Discussion

High rates of domestic physical violence in all eight countries were conspicuously independent of education, household size, household income and remunerated employment. After taking into account age, sex, country and other factors, domestic physical violence was strongly associated with income gradients (being unemployed in

Table 7: Male attitudes about violence

		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
% (number) who said women sometimes deserve to be beaten	Crude	357/978	345/818	348/1166	395/968	505/1159	415/822	715/1337	421/1278	3501/8526
	Weighted	37%	41%	30%	41%	44%	51%	53%	33%	41%
	Missing	16	42	4	7	8	13	12	6	108
% (number) who said if a woman gets raped it's her own fault	Crude	165/981	260/823	508/1162	452/970	209/1155	161/816	268/1337	178/1272	2201/8516
	Weighted	17%	31%	44%	49%	18%	20%	20%	14%	26%
	Missing	13	37	8	5	12	19	12	12	118
% (number) who said forcing sex with someone you know is not rape	Crude	242/982	302/824	299/1165	240/971	254/1158	84/821	346/1338	205/1281	1972/8540
	Weighted	25%	36%	26%	25%	22%	10%	26%	16%	23%
	Missing	12	36	5	4	9	14	11	3	94
% (number) who said Forcing your partner to have sex, is NOT rape	Crude	198/982	292/829	455/1166	309/971	401/1157	261/821	618/1340	395/1276	2929/8542
	Weighted	20%	35%	39%	33%	35%	32%	46%	31%	34%
	Missing	12	31	4	4	10	14	9	8	92
% (number) who said violence between a man and a woman is a private matter in which others shouldn't interfere	Crude	296/977	522/823	875/1165	546/970	497/1152	430/820	754/1335	628/1272	4548/8514
	Weighted	30%	63%	75%	58%	43%	53%	57%	50%	54%
	Missing	17	37	5	5	15	15	14	12	120

Table 8: Male attitudes about violence

		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
% (number) who said women sometimes deserve to be beaten	Crude	279/1459	426/1429	654/1677	539/1463	425/1454	436/1099	751/1592	368/1536	3878/11709
	Weighted	19%	30%	39%	38%	29%	40%	47%	24%	33%
	Missing	36	59	6	8	11	23	13	7	163
% (number) who said if a woman gets raped its her own fault	Crude	158/1463	339/1427	625/1673	544/1462	143/1458	120/1104	306/1591	171/1538	2406/11716
	Weighted	11%	24%	37%	39%	10%	11%	19%	11%	21%
	Missing	32	61	10	9	7	18	14	5	156
% (number) who said forcing sex with someone you know is not rape	Crude	324/1466	506/1428	437/1674	436/1462	259/1459	146/1108	448/1593	261/1535	2817/11725
	Weighted	22%	36%	26%	29%	18%	13%	28%	17%	24%
	Missing	29	60	9	9	6	14	12	8	147
% (number) who said Forcing your partner to have sex, is NOT rape	Crude	279/1467	509/1458	754/1676	536/1464	476/1457	371/1110	807/1592	515/1529	4247/11753
	Weighted	19%	35%	45%	36%	33%	34%	51%	34%	36%
	Missing	28	30	7	7	8	12	13	14	119
% (number) who said violence between a man and a woman is a private matter in which others shouldn't interfere	Crude	360/1458	809/1428	1335/1678	813/1461	556/1457	517/1102	831/1591	790/1523	6011/11698
	Weighted	24%	57%	80%	56%	38%	47%	52%	52%	51%
	Missing	37	60	5	10	8	20	14	20	174

the context of some household income) and home language in one country, and with multiple partners in the last year in all countries. Victims of partner physical violence were more likely to feel at risk of HIV infection and more likely to anticipate antisocial behaviour if they found they were HIV positive.

This is a cross-sectional household survey based on face-to-face interviews. This design limits conclusions about causality of, for example, multiple partners leading to physical violence or being the consequence of physical violence. It is likely that some respondents held back from expressing their true belief or experience. Even with the best field practices – including independent translation and back-translation of questionnaires, standardised training of local interviewers, in-country piloting and consultation with local community representatives, double-data entry and verification – measurement error is possible. The sample makes the results relevant to the eight countries, but not necessarily to other countries.

A major limitation is that we only considered domestic *physical* violence. This almost certainly underestimates the level of domestic violence. Other forms (verbal, sexual, economic and psychological) were beyond the scope of the study. In all countries we asked the same questions of men and women. We were able to examine several intermediate outcomes related to domestic violence – including attitudes, subjective norms, collective efficacy and discussion/socialisation – but most of these could be addressed only superficially through one or two items in the questionnaire.

We had no measure of *severity* or frequency of physical domestic violence, making it difficult to interpret the proportion of men and women who reported partner violence in the last year. Large studies in the UK and USA have reported similar proportions of partner violence for males and females, but found male on female violence to be more severe than female on male violence[23,24]. It is quite possible that the same is true for southern Africa.

Table 9: Male attitudes and subjective norms about sexual violence

% (number) who said		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
In my culture it is acceptable for a man to beat his wife	Crude	268/983	337/812	151/1163	317/965	327/1158	203/813	507/1329	382/1275	2492/8498
	Weighted	27%	41%	13%	33%	28%	25%	38%	30%	29%
	Missing	11	48	7	10	9	22	20	9	136
most people in our community feel women have a right to refuse sex with their partners	Crude	473/899	386/766	574/1142	461/957	741/1133	338/766	601/1251	505/1186	4079/8100
	Weighted	53%	52%	50%	49%	66%	44%	48%	43%	50%
	Missing	95	94	28	18	34	69	98	98	534
most people in our community feel forcing your partner to have sex is rape	Crude	650/943	509/777	616/1150	582/956	760/1138	491/801	602/1266	757/1212	4967/8243
	Weighted	69%	66%	54%	60%	67%	61%	47%	63%	60%
	Missing	51	83	20	19	29	34	83	72	391

Table 10: Female attitudes and subjective norms about sexual violence

% (number) who said		Botswana	Lesotho	Malawi	Mozambique	Namibia	Swaziland	Zambia	Zimbabwe	TOTAL
In my culture it is acceptable for a man to beat his wife	Crude	307/1449	495/1418	250/1674	441/1463	310/1451	183/1093	531/1587	425/1528	2942/11663
	Weighted	21%	35%	15%	32%	21%	17%	34%	28%	25%
	Missing	46	70	9	8	14	29	18	15	209
most people in our community feel women have a right to refuse sex with their partners	Crude	683/1317	682/1302	721/1647	675/1421	933/1423	528/1041	685/1444	685/1381	5592/10976
	Weighted	52%	54%	44%	49%	66%	50%	47%	50%	51%
	Missing	178	186	36	50	42	81	161	162	896
most people in our community feel forcing your partner to have sex is rape	Crude	912/1390	916/1351	793/1641	762/1423	926/1424	664/1064	673/1477	909/1440	6555/11210
	Weighted	66%	69%	48%	54%	65%	62%	45%	63%	59%
	Missing	105	137	42	48	41	58	128	103	662

The men we interviewed were at home during working hours and, in this respect at least, they may not be typical of all men in the eight countries. We also did not ask who initiated the altercation, so it is also possible these reports reflect women defending themselves from male-initiated violence. Even so, the finding is compatible with a degree of female agency in domestic physical violence and supports our conclusions from South Africa that initiatives against sexual violence should look beyond gender stereotypes of victims and villains[25].

There was no recognisable pattern of poverty and domestic violence between countries (Mozambique, the poorest country, reported the lowest rates while Zambia reported the highest). We also did not find significant associations between victims and their individual education or employment, and we could only address the income gradient between partners through a proxy variable. It is possible that in-household inequality in education and income could be more relevant to domestic violence than we were able to measure in this study[26]. There was no interpretable association between the Gini coefficient (measuring inequality in the country) and male or female reports of violence (Tables 3 and 4). The Gini coefficient used for Botswana and Lesotho was 0.63, Malawi 0.50, Mozambique 0.40, Namibia 0.74, Swaziland 0.61, Zambia 0.42 and Zimbabwe 0.61[27].

The occurrence of domestic physical violence in some parts of Zambia raises the question of something being done differently there, despite efforts to reproduce exactly the same survey in all countries. Whatever the reason for the higher rates of domestic physical violence detected in Zambia, it seems unlikely the same error lies behind the inability to demonstrate an association between violent altercations and education, overcrowding, income and age – consistent across all the countries.

Conclusion

If there is good news from this study, it is that multiple partners, attitudes and subjective norms are more in the

control of most individuals than are poverty, overcrowding and education – without detracting from the need for massive investment in these sectors.

An unanswered question is how to modify attitudes or multiple partners. There is also no guarantee that changing attitudes will, on its own, impact on behaviour. The study confirms the importance of moving beyond gender stereotypes of victims and villains. Men also report suffering partner physical violence, although our inability to measure severity could mask an important gender difference. The solutions to domestic violence lie with both men and women, and both have agency in this regard. There was also a prominent sense of collective efficacy, the majority expressing they could do something about domestic violence.

Although many thought their community could deal with violence against women, few victims and still fewer of the non-victims said they had discussed violence against women with anyone. Stimulating discussions about violence against women offers one direction for initiatives against partner physical violence. Wider discussion could influence social norms, in addition to targeting individual attitudes and supportive public policy.

Appendix

List 1. Variables tested sequentially, from which independent associations were included in logistic regression model

Individual and household characteristics

How many people live in the household

Age and sex of each one

Language spoken at home most of the time

Last grade of education respondent completed

Main occupation of respondent

Table 11: Male respondents: Associations with domestic physical violence (number of responses, Odds Ratio and 99%confidence interval)

	Botswana		Lesotho		Malawi		Mozambique		Namibia		Swaziland		Zambia		Zimbabwe		Overall		
	Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
Reported having multiple partners	Yes	85	222	57	307	26	174	40	382	65	225	101	256	144	280	109	282	627	2128
	No	86	398	23	249	45	810	30	466	96	654	40	233	181	598	91	616	592	4024
	OR(99%CI)	1.77 (1.13–2.77)	2.01 (1.03–3.90)	2.69 (1.41–5.14)	1.63 (0.86–3.09)	1.97 (1.25–3.10)	2.30 (1.36–3.89)	1.70 (1.21–2.39)	2.62 (1.75–3.91)	2.00 (1.70–2.35)									
Income gap	Yes	67	212	19	147	0	39	8	52	67	322	51	197	47	158	35	191	294	1318
	No	117	510	66	493	69	987	59	766	100	607	104	397	286	762	168	820	969	5342
	OR 99%	1.38 (0.88–2.15)	0.97 (0.47–1.97)	not calculated	2.00 (0.72–5.54)	1.26 (0.81–1.97)	0.99 (0.60–1.62)	0.79 (0.50–1.26)	0.89 (0.53–1.51)	1.23 (1.02–1.49)									
Negative attitudes about sex and violence	Yes	35	75	40	268	21	218	28	315	33	169	56	109	115	229	54	104	382	1487
	No	154	664	51	387	51	816	42	545	135	775	106	501	215	676	151	914	905	5278
	OR 99%	2.01 (1.14–3.55)	1.13 (0.63–2.03)	1.54 (0.77–3.08)	1.15 (0.60–2.22)	1.12 (0.65–1.94)	2.43 (1.48–3.99)	1.58 (1.11–2.25)	3.14 (1.96–5.03)	1.50 (1.26–1.78)									
Feels himself to be at risk of getting AIDS	Yes	120	428	38	245	33	321	42	381	49	292	83	249	137	298	83	248	585	2462
	No	56	262	37	358	38	691	27	420	106	607	59	314	192	597	98	675	613	3924
	OR 99%	1.31 (0.83–2.08)	1.50 (0.80–2.82)	1.87 (1.00–3.51)	1.71 (0.89–3.30)	0.96 (0.59–1.56)	1.77 (1.09–2.89)	1.43 (1.02–2.01)	2.31 (1.51–3.52)	1.52 (1.29–1.79)									
Negative attitudes to AIDS	Yes	16	24	14	69	7	64	3	77	10	39	11	19	46	61	16	25	123	378
	No	173	715	77	595	65	970	67	783	158	905	151	591	291	863	189	1000	1171	6422
	OR 99%	2.76 (1.20–6.31)	1.57 (0.70–3.53)	1.63 (0.56–4.75)	0.46 (0.10–2.07)	1.47 (0.58–3.74)	2.27 (0.85–6.04)	2.24 (1.33–3.77)	3.39 (1.51–7.57)	1.78 (1.35–2.35)									

Table 12: Female respondents: Associations with domestic physical violence (number of responses, Odds Ratio and 99%confidence interval)

	Botswana		Lesotho		Malawi		Mozambique		Namibia		Swaziland		Zambia		Zimbabwe		Overall		
	Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		Partner violence		
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	
Reported having multiple partners	Yes	75	171	96	267	10	54	36	227	41	102	53	103	82	77	57	113	450	1114
	No	159	755	86	599	164	1278	111	979	189	993	139	518	447	798	184	933	1479	6853
	OR 99% CI	2.08 (1.37–3.16)		2.50 (1.65–3.81)		1.44 (0.58–3.58)		1.40 (0.83–2.37)		2.11 (1.27–3.51)		1.92 (1.17–3.15)		1.90 (1.24–2.93)		2.56 1.62–4.03		1.87 (1.60–2.20)	
Income gap	Yes	123	558	110	502	4	58	19	171	129	524	114	382	357	575	98	516	954	3286
	No	128	538	91	564	171	1340	125	997	101	614	98	412	176	390	153	701	1043	5556
	OR 99% CI	0.93 (0.65–1.33)		1.36 (0.91–2.02)		0.54 (0.14–2.04)		0.89 (0.45–1.73)		1.50 (1.03–2.17)		1.25 (0.84–1.87)		1.38 (1.03–1.84)		0.87 (0.60–1.25)		1.55 (1.36–1.76)	
Negative attitudes to sex and violence	Yes	32	88	87	359	42	314	45	401	38	115	48	109	165	190	30	95	487	1671
	No	224	1024	120	727	134	1093	103	824	195	1031	172	696	363	762	222	1147	1533	7304
	OR 99% CI	1.66 (0.95–2.91)		1.47 (0.99–2.19)		1.09 (0.67–1.77)		0.90 (0.55–1.46)		1.75 (1.04–2.93)		1.78 (1.09–2.92)		1.82 (1.33–2.50)		1.63 (0.93–2.88)		1.39 (1.29–1.79)	
Feels herself to be at risk of AIDS	Yes	168	664	104	454	84	486	89	586	110	472	131	380	214	322	124	399	1024	3763
	No	66	385	63	530	89	874	51	563	103	591	68	348	298	614	95	696	833	4601
	OR 99% CI	1.48 (0.98–2.22)		1.93 (1.24–2.99)		1.70 (1.12–2.57)		1.68 (1.04–2.69)		1.34 (0.91–1.97)		1.76 (1.15–2.70)		1.37 (1.02–1.83)		2.28 (1.56–3.33)		1.50 (1.32–1.72)	
Negative attitudes to AIDS	Yes	8	15	13	84	14	96	10	86	6	21	15	14	46	39	6	28	118	383
	No	249	1098	194	1012	162	1314	138	1139	227	1127	206	799	492	932	246	1218	1914	8639
	OR 99% CI	2.35 (0.77–7.14)		0.81 (0.37–1.78)		1.18 (0.55–2.55)		0.96 (0.39–2.34)		1.42 (0.43–4.72)		4.16 (1.68–10.30)		2.23 (1.27–3.94)		1.06 (0.33–3.43)		1.39 (1.05–1.84)	

Total household income per month

Did household have enough food in the last week

Was the respondent alone or was someone listening

HIV risk

Do you think you are at risk of getting HIV

If you found you were HIV positive, how would you change your sex life

Sexual violence

If a woman gets raped its her own fault.

Forcing sex with someone you know is not rape.

Forcing your partner to have sex is rape.

Subjective norms about sexual violence

Do most people in your community feel forcing your partner to have sex is rape?

Do most people in your community feel women have a right to refuse sex with their partners?

Is violence against women considered a serious problem in this community?

Collective efficacy about sexual violence

Can your community do anything about violence against women?

Attitudes to domestic violence

Women have the right to refuse to have sex with partner

Violence between a man and a woman is a private matter
Women sometimes deserve to be beaten.

Subjective norms about domestic violence

Do most people in your community feel women sometimes deserve to be beaten?

Discussion about domestic violence

In the last year, how often did you talk with anyone about domestic violence? [never, seldom or often]

To whom did you speak most often?

Practices relating to domestic violence

What community activity about violence against women have you participated in?

In the last year, have you and your partner had violent arguments where someone was physically hurt?

Transactional sex

Men have the right to have sex with their girlfriends if they buy them gifts.

Its okay for an older man to have sex with teenagers

A person has to have sex with their boyfriend or girlfriend to show that they love them.

Do most of your friends feel men have the right to sex with their girlfriends if they buy them gifts?

Competing interests

All authors declare that there is no competing interest. Esca Scheepers and Sue Goldstein were employed by Soul City, which subcontracted the national education-entertainment programmes in the eight countries.

Authors' contributions

NA was involved in study and questionnaire design, statistical analysis, drafting manuscript. AHF was involved in statistical analysis, interpretation and drafting manuscript. SM was involved in study design, acquisition of data, drafting manuscript. ES and SG were involved in study and questionnaire design, analysis and interpretation, drafting manuscript, administration and technical support. NA, AHF, ES and SG had full access to all data and take responsibility for the integrity of the data and accuracy of data analysis. All authors read and approved the final manuscript.

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Paper 8.

Andersson N, Cockcroft A, Shea B.

Gender-based violence and HIV: relevance for HIV prevention in hyper-endemic countries of southern Africa.

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Gender-based violence and HIV: relevance for HIV prevention in hyperendemic countries of southern Africa

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Gender-based violence (GBV) is common in southern Africa. Here we use GBV to include sexual and non-sexual physical violence, emotional abuse, and forms of child sexual abuse. A sizeable literature now links GBV and HIV infection.

Sexual violence can lead to HIV infection directly, as trauma increases the risk of transmission. More importantly, GBV increases HIV risk indirectly. Victims of childhood sexual abuse are more likely to be HIV positive, and to have high risk behaviours.

GBV perpetrators are at risk of HIV infection, as their victims have often been victimised before and have a high risk of infection. Including perpetrators and victims, perhaps one third of the southern African population is involved in the GBV-HIV dynamic.

A randomised controlled trial of income enhancement and gender training reduced GBV and HIV risk behaviours, and a trial of a learning programme reported a non-significant reduction in HIV incidence and reduction of male risk behaviours (primary prevention). Interventions among survivors of GBV can reduce their HIV risk (secondary prevention). Various strategies can reduce spread of HIV from infected GBV survivors (tertiary prevention). Dealing with GBV could have an important effect on the HIV epidemic.

A policy shift is necessary. HIV prevention policy should recognise the direct and indirect implications of GBV for HIV prevention, the importance of perpetrator dynamics, and that reduction of GBV should be part of HIV prevention programmes. Effective interventions are likely to include a structural component, and a GBV awareness component.

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Introduction

There is no standard definition of gender-based violence (GBV) and different authors have used this and other terms to include different things. Terms such as ‘rape’, ‘forced sex’ and ‘sexual violence’ readily convey a physical dimension, with images of trauma, laceration and thus facilitated HIV infection. We argue in this paper, however, that the link between GBV and HIV risk goes beyond this physical dimension. Also relevant is sexual coercion of any kind, irrespective of whether this is ‘acceptable’ in the local culture. Of particular relevance is

child sexual abuse (CSA), including actual or attempted forced sex, sexual coercion, and emotional abuse. Non-sexual physical violence, and related forms of abuse based on gender are also a part of the whole picture. The commonly used terms ‘domestic violence’ and ‘intimate partner violence’ (IPV) are often used to cover sexual as well as non-sexual violence and other forms of abuse in this setting.

GBV is a complex phenomenon often including a combination of physical, sexual and emotional violence and deprivation or neglect. Authors of the papers cited

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here used different terms to cover different aspects of GBV; we have generally reported on their findings using their own terminology.

GBV is relevant to the HIV risk of young women and girls in more than one way. There is an obvious direct relevance when the trauma of forced sex of any kind – rape, dry sex or lack of readiness – with an infected partner increases the risk of transmission, but the fear and power differentials associated with GBV also limit the ability to negotiate safe sex. GBV increases gender inequalities and is an important cause of ‘choice disability’ [1]. This refers to the inability of those affected by GBV to make and implement prevention decisions.

A number of authors reported that survivors of different forms of GBV, particularly those who have survived repeated abuse, have a reduced sense of self worth that in turn can increase high-risk behaviour and the acceptance of high-risk practices. Any sexual coercion or the fear of it that disables HIV prevention choices could have a very direct meaning for HIV transmission. This is independent of subjective norms about sexual entitlement or ‘deserving victimhood’ [2]; it is very simply about the inability of people to implement their prevention decisions.

In this paper we explore the evidence for a causal association between GBV and HIV in the hyperendemic countries of southern Africa, and the implications of this for HIV prevention efforts. On the basis of the evidence, we argue that, mainly indirectly, GBV in many forms can influence HIV risk in a determining and potentially actionable way.

The extent of gender-based violence in southern Africa

GBV is common in HIV hyperendemic countries of southern Africa. In a 2002 survey across eight countries (Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe) we found that 18% of women aged 16–60 years had experienced IPV in the past 12 months [3]. In a repeat survey across the same countries in 2007, 18% of women had experienced IPV in the past 12 months; one in every five youths aged 12–17 years said they had been forced or coerced to have sex, and one in 10 said they had forced sex on someone else [Centro de Investigación de Enfermedades Tropicales (CIET) 10-Country Study 2007, unpublished data]. The inability to implement prevention choices (‘choice disability’) affects a greater proportion of the population. Some 40% of women across the 10 countries said they would have sex if their partner refused to use a condom, and a similar proportion did not think women have the right to refuse sex with their partner (CIET, unpublished data).

Other authors also report high rates of GBV among populations of women in southern Africa. Among women interviewed in three provinces of South Africa,

19–28% said they had experienced IPV and 5–7% had been raped [4]. An intercept survey (likely to underestimate occurrence) found 42% of women in a Cape Town township reported sexual assault [5]. In Rakai district in Uganda, one in every four women reported coercive sex with their regular partner [6]. The World Health Organization multicountry study on domestic violence included estimates from Namibia and Tanzania. The proportion of women who had ever experienced physical or sexual violence was 36% in Namibia (capital), 41% in Tanzania (capital), and 56% in Tanzania (district) [7]. A recent study among young women aged 13–24 years in Swaziland reported that one in three had experienced some form of sexual violence (including forced sex, coerced sex, and attempted unwanted sex) as a child; one in four had experienced physical violence; and three in 10 had experienced emotional abuse [8].

These high rates of GBV among both adults and children in southern Africa are in the context of a culture of violence in the region, with extremely high rates of violence overall [9].

Methods of literature search

This review makes use of the evidence gathered using a standard systematic review methodology. We searched databases Ovid MEDLINE (1966 to April 2008), preMEDLINE (to April 2008), EMBASE (1980 to April 2008), PsychINFO, CINHALL and NLM gateway (to April 2008) and the Cochrane Database of Systematic Review, May 2007, for articles about GBV and HIV. We improved the sensitivity by including text and key words from relevant studies accessed by the authors that were not detected by earlier searches. We searched for additional studies in the bibliographies of the eligible studies. We also identified articles that had referred to key tracer articles using Google Scholar. We contacted content experts in the field, for key articles and additional publications this is area.

Two reviewers (NA, BS) independently screened 1288 titles from the electronic search results. Two abstract reviewers then screened all abstracts selected by either title reviewer. Two article reviewers independently assessed the full articles and agreed on inclusion, using a standardized form for data abstraction. Study characteristics and outcomes extracted included: contexts of study setting, incidence of HIV/AIDS or sexually transmitted infections (STI), and prevalence of HIV/AIDS or STI; characteristics of populations involved; type of intervention; outcome measures; and study quality. Two reviewers independently assessed methodological quality before analysis.

The papers cited are those of sufficient quality to allow defensible conclusions. We used published evidence to examine the links between GBV and HIV, to look at the

possible mechanisms for the links, and to evaluate the evidence for effectiveness of the reduction of GBV and its effects as a strategy for reducing HIV risk. We tried to refer primarily to evidence from southern Africa or at least to countries with a high prevalence of HIV. When there was no evidence from the region, we relied on evidence from other places, most of it from north America. Although there can be problems in extrapolating this evidence to southern Africa (see Limitations of the evidence, below), it could offer useful insights into relationships between forms of GBV and HIV risks.

Results

Causal association between gender-based violence and HIV?

There is now a sizeable body of research on the associations between GBV and HIV risk. Many of the studies come from the United States but some are from southern Africa and elsewhere. The main focus is on the link between GBV and HIV in women, but some studies have covered gay men. At least a dozen literature reviews, mostly within the past 5 years, cover several hundred articles on the subject [10–22]. The literature covers different aspects of the association and different forms of GBV, offering cumulative evidence on the link between GBV and HIV infection. All these reviews focus on HIV risk in women; four are from Africa, five from the United States, and four are international.

Many studies show higher HIV risks among people with a history of GBV [23–26] (these four studies are among women, three from Africa and one from the United States) and higher rates of GBV among those who are HIV positive [27–33] (five of these studies are among women, one among gay men and one among women and gay men; one is from Africa and the others from the United States). Mostly cross-sectional designs, these studies do not tell us what comes first, GBV or HIV. This underlies the pivotal question in this paper: if we reduce GBV in HIV hyper-endemic countries in southern Africa, will that reduce the HIV risk, particularly of young women and girls?

Several specific types of evidence contribute to the case for GBV as an actionable predictor of HIV infection: (1) Prospective (follow-up) studies show previously HIV-negative victims, after being raped, have a considerable risk of becoming HIV positive [34–37] (three of these four studies among women were from the United States, one was from Africa). This demonstrates a direct mechanism for GBV causing HIV infection [38]. (2) Cohort studies in Africa of HIV-discordant partners (one partner HIV positive and the other HIV negative) show an increased risk of infection among partners who report GBV [39–41]. GBV can be more common in HIV-discordant couples; for example, Cohen *et al.* [42] reported a 12-fold increase risk of domestic violence

among HIV-positive women in the United States. (3) Several studies report an association between CSA and HIV risk in later life [42–47] (five of these studies are from the United States, one is from Africa; two are concerned with gay men). As the exposure is in childhood when HIV risk is low, the sexual abuse can reasonably be said to precede HIV infection. Some may have been infected directly in childhood, or the experience of CSA may increase HIV risk indirectly, by disabling prevention choices or increasing high-risk behaviour (see below). (4) Coerced first intercourse at any age can establish the survivor in a victimhood role that can last a lifetime [18,48]. This can have indirect consequences on HIV risk. Ugandan women who reported coerced first intercourse were significantly less likely to report current contraceptive use, condom use at last sex, or consistent condom use in the past 6 months [48]. (5) Supportive evidence comes from one author who reported a gradient of HIV risk with increasing frequency of IPV among women in Soweto, South Africa [49].

Taken as a whole, the literature provides compelling evidence that the link between GBV of various sorts and HIV may be actionable for prevention. The paradox of forced passivity of GBV survivors is that this disenfranchised group actually becomes a driver of the epidemic. In addition to their own risk, inability of the choice-disabled to protect themselves increases the risk for their offspring and for everyone who has sexual contact with them.

Published research also offers insights into the mechanisms by which reduced GBV might reduce HIV risk, the context of vulnerability that would need to be taken into account in prevention, and the evidence of the impact of interventions to reduce GBV.

Association between gender-based violence and high-risk behaviours

Several dynamics have been postulated for an indirect link between GBV and HIV risk. These include choice disability in relation to prevention decisions [1], reduced self-esteem [23], sexual adjustment, drug use as a method of coping, or psychopathology such as depression [50]. These factors associated with or resulting from GBV increase the risk of HIV by increasing the likelihood of high-risk behaviours. The evidence suggests that these indirect effects of GBV produce a greater impact than the direct effects of the trauma of sexual violence. There is evidence of the link between GBV and high-risk behaviours from Africa, from the United States and elsewhere. Much of the evidence is concerned with risk behaviours in women, but some studies have reported on behaviours in heterosexual and gay men.

Overall risk behaviour

Several studies have reported an increase in risk behaviours among people who report sexual coercion, IPV, or sexual assault [5,51–53] (four of these studies were

from Africa, mainly concerned with women). Choi *et al.* [54] measured types of violence and HIV risk factors and found that sexually harassed men (but not women) and sexually coerced women (but not men) in the United States reported more HIV risk factors than their non-harassed or coerced counterparts.

High-risk attitudes

Kalichman and colleagues [55] reported that South African men with a history of sexual assault were more likely to endorse hostile attitudes towards women and were more likely to accept violence against women. A youth culture has emerged in South Africa in which young people who suspect they may be infected with HIV will avoid a definite diagnosis while at the same time seeking to spread the infection as widely as possible [56]. A 2002 national school-based youth study in South Africa reported one in every 10 young people saying they would deliberately spread the infection; this was much more common among youth who reported they had had forced sex. That study reported that childhood GBV survivors were more likely to say they had forced someone else to have sex and were more likely to believe that condoms do not protect against HIV [57].

Multiple partners

Higher rates of multiple partners are consistently associated with GBV. Many studies found that those who reported IPV, rape, childhood sexual molestation, were sexually harassed or experienced violence, or who reported that their first sex was coerced, were more likely to report having multiple partners [18,24,58,59] (most of these studies were from the United States). Champion *et al.* [60] found that minority women in the United States who were sexually abused reported significantly higher rates of sexual partner contact (changes) at 1 month, 3 months and 12 months. Adults in the United States who reported being abused compared with those non-abused had higher numbers of lifetime partners [59].

Transactional sex

Situations in which sex is based on material exchange often involve sizeable power differentials; sex work is an archetypically high-risk occupation for both GBV and HIV [61–63] (these studies were from the United States, India, and Australia). Many people who engage in 'survival sex' in southern Africa do not consider themselves sex workers [64]. Food insecurity in southern Africa is strongly linked with the acceptance of high-risk behaviours, after taking account of other aspects of poverty [65]. In the southern part of South Africa, approximately one in six men reported the transfer of material resources or money to both casual and main partners [66]. In Soweto, 21% of women said they had had sex with a non-primary partner based on material exchange [49]. Also in South Africa, women sex workers who reported having experienced sexual violence were significantly less likely to use a condom with paying

partners than women who had not experienced sexual violence [67]. In a US based study, people who reported unwanted sexual activity in childhood were significantly more likely to have problems with alcohol, to use drugs, to receive money or drugs in exchange for sex, to have unwanted sex, and to use mental health services [68]. In their meta-analysis of three longitudinal and 13 cross-sectional studies, Arriola and colleagues [18] found a very strong relationship between CSA and 'sex trading'.

Unprotected sex

Many women are in a situation in which they cannot insist on condom use [69]. Several studies have shown that GBV in childhood [18] or adulthood [58,70,71] (studies from the United States) is related to inconsistent use of condoms. Heintz and Melendez [72] found that among lesbian, gay, bisexual, and transgender individuals in the United States those who reported that they had been forced to have sex with their partner were 10 times more likely than others to report not using protection – they feared their partner's response to safer sex. Women in the United States who reported rape were significantly more likely to report previous unprotected anal intercourse than women who had not been raped [58]. Wu *et al.* [24] found that urban minority women in the United States who reported IPV used condoms less often than women who had not experienced IPV.

Reduced testing or disclosure of status

HIV-testing and disclosure of status after testing may be influenced by GBV [73–75] (studies from the United States). Fear of violence reduces disclosure of HIV status [76] (study from the United States). A study in Botswana in 2005 found that 14% expected changes in the HIV testing policy to increase GBV [77]. A 2006 study in the same country, however, found no significant association between having had an HIV test and the experience of IPV among either men or women, although those who had experienced IPV were more likely to think themselves at risk of HIV [78]. HIV-seropositive women were five times more likely to report domestic violence after notifying partners of results compared with HIV-seronegative women in a US-based study [26].

Sexually transmitted infections

STI are important predictors of HIV infection as they usually indicate high-risk sex; the damaged mucosa is also an important facilitator of HIV transmission. Several studies in the United States and South Africa measuring STI incidence found that individuals reporting abuse have a much higher rate of STI than those not reporting abuse [24,60,67].

Reception of awareness programmes and education

People who have experienced GBV apparently do not interpret awareness programmes and education messages in the same way as those without such a history. Women slum-dwellers in India who had experienced GBV chose to

continue with unsafe practices for HIV infection rather than face the immediate threat of violence from their partners [79]. There is evidence from Kenya that a history of GBV reduces the likelihood of partner participation in programmes for the prevention of mother to child transmission [26].

Perpetrators of gender-based violence

An unlikely but crucially vulnerable group are GBV perpetrators, many of whom live in wider contexts of risk, such as substance abuse [80,81] (studies from the United States and South Africa). The notion that perpetrators have themselves been victims of sexual abuse is not new [82], and it is well established that people who have been sexually abused as children are more likely to become abusers themselves [83–85] (studies from South Africa and the United States). Several studies of South African men found that those who had forced sex with their partners were also more likely to force others and to indulge in transactional sex [86,87]. A study of rural young men in South Africa reported that 8% had raped a partner and 16% had raped a non-partner [81]. A study from the Eastern Cape Province of South Africa reported that 32% of young men had perpetrated some form of sexual violence against their main partner; those who had perpetrated violence were more likely to engage in HIV risk behaviour [86]. A further study of men in South Africa reported that 23% admitted to sexually assaulting women [87]. One in five men in a Cape Town settlement had perpetrated sexual assault [55].

As described above, GBV survivors are more likely than others to be HIV positive. As abusers tend to pick on people who have already been abused [88] (study from South Africa), perpetrators of GBV put themselves at special risk of HIV infection. The disdain that perpetrators of sexual violence have for the rights of other people – non-disclosure of their own HIV status, refusal to use condoms, and forced sex – rapidly converts their acquired infections into risks for future victims.

The context of vulnerability

Contextual vulnerability can multiply HIV risks, with both GBV victims and their abusers having elevated infection rates.

Living with violence

Childhood exposure to family violence is an important vulnerability context [89,90] (studies from the United States). Studies from Africa and elsewhere suggest that people living with physical disability may be at special risk [91,92]. Arriola and colleagues [18] reported 21 studies (20 956 participants) showing CSA was strongly associated with adult revictimization (meaning experiencing further sexual violence as adults). This compounds the direct and indirect linkages between GBV and HIV.

The violence of war in Africa is another context in which HIV and its prevention confront a special reality [93,94].

Factors associated with war include weak health systems for treating STI, illiteracy that diminishes the utility of educational pamphlets, rape and sexual bartering by soldiers, battlefield transfusions, tattooing [95]. The extremely high levels of violence in South Africa and other countries in the region could have similarities to a war situation [9].

Unequal gender power relations

Unequal gender power relations are a fertile substrate for HIV and GBV, as reported from South Africa [96]. A particular moment of vulnerability to unequal power relations is pregnancy [75]. Other important dynamics of unequal power are intergenerational sex and transactional sex. Many authors have considered the relationship between low economic status and HIV. Global evidence suggests that the relationship between poverty and HIV risk is complex, and that poverty on its own cannot be viewed simplistically as a driver of the HIV epidemic [97]. Although studies have indicated a link between socio-economic status and GBV [98–100], GBV is by no means confined to people living in poverty. Incarceration [101], minority [24,52,60,102] and migrant [103] status or relocation [104] are similarly linked, as is substance abuse [105,106], or a co-occurrence of these contexts [107–109]. Almost all of these studies are from the United States. The common denominator in these settings is choice disability and the context can exaggerate its impact on HIV.

Dangerous myths and gender-based violence

Reconstructed traditionalism in several southern African settings can be accompanied by distorted ideas of personal power that increase the risks of children and women for GBV and hence HIV [110,111]. Mistaken beliefs about HIV and AIDS persist, including the now much publicized idea that sex with a virgin can help to treat HIV or AIDS [112–115].

Alcohol abuse

Heavy alcohol use and in particular binge drinking are common in southern Africa. Both GBV and HIV risk behaviours have been linked to alcohol use, among women as well as men in South Africa [116].

Legal systems

Legal systems currently generate little disincentive to spread HIV – or, in many countries, even to rape [117]. Some southern African countries do not have free antiretroviral post-exposure prophylaxis available for victims of rape [16]. Women and children remain vulnerable because of legal systems that do not take the issue of violence seriously or that discriminate against women reporting violence or rape.

Programme exposure

All eight hyperendemic countries have an AIDS prevention programme of some kind. These programmes comprise multiple elements, some of which may be

conflicting. Messages about condoms might cancel out messages about abstinence. Campaigns promoting male circumcision might reduce the impact of discussions about equity and respect. A US study suggested that sexual abuse may affect the way survivors interpret HIV risk education [118].

Evidence of impact of interventions to reduce gender-based violence

Non-randomized intervention studies

There are published reports of formal non-randomized before–after comparisons, for example, one on peer educators that declared increased knowledge of HIV prevention as a result [119]. A review of nine non-randomized north American GBV prevention initiatives [120] found only one, of increased use of community resources by pregnant Hispanic women [121], to be of acceptable methodological quality. Three others were of adequate quality. Foshee and colleagues [122] looked at a school intervention (including curriculum sessions, a theatre production and a poster competition) to reduce victimization, acceptance of dating violence norms, gender stereotyping and conflict management. Macgowan [123] reported on a five-session curriculum programme and Weisz and Black [124] reported on a programme of 12 after-school sessions, including role play and discussions; both interventions aimed to increase awareness of IPV and how to deal with it among high school students.

A non-randomized intervention between 1997 and 2003 targeted hawkers and apprentices in motor parks and work shops in Nigeria. Interventions included education materials and training programmes for the police, judiciary, instructors, drivers, traders and apprentices/hawkers, including microcredit facilities. The authors claim this made a difference, protecting this group from the dual risks of GBV and HIV/AIDS infection [125,126].

A small but potentially misleading literature on interventions to reduce GBV claims that spontaneous resolution will arise in South Africa, based on an idea of cultural regeneration [14].

Primary prevention randomized controlled trials

A randomized controlled trial (RCT) in South Africa's Limpopo province tested an intervention based on participatory learning principles, a 12–15-month training curriculum called Sisters for Life, together with a microfinance programme. The training, during loan centre meetings, started with 10 1-h training sessions. It covered topics including gender roles, cultural beliefs, relationships, communication, IPV and HIV, and aimed to strengthen communication skills, critical thinking and leadership. It then encouraged wider community mobilization to engage young people and men in the intervention communities. Key women selected by their

centres attended a further week of leadership training and subsequently worked with their centres to mobilize around priority issues including HIV and IPV. In parallel, each loan centre continued the microfinance intervention. The combined intervention reduced IPV by 55% (based on the complement of the adjusted risk ratio). The measured risk difference (7.3%) implies that 14 women would need to be included in the programme to prevent one case of IPV [127,128].

The Limpopo study also showed an impact on unprotected sex among the women participants [97]. It did not show an impact on HIV status, which requires close scrutiny, as this is one of few published RCTs that might have shown a reduction of HIV by reducing GBV. The authors estimated HIV incidence from a random sample of all community members where the 421 intervention women lived. The microfinance participants themselves were generally older women (median age 42 years) and outside the high-risk age group for HIV infection. A positive result for HIV incidence as measured in this study would have required the benefits of the structural and educational intervention for these women to spread across the whole community within 2 years, to affect younger women and men not involved in the intervention.

Another trial of primary prevention of GBV and HIV took place in South Africa's Eastern Cape Province [129]. In this cluster randomized trial, young women and men aged 15–26 years in the intervention communities were recruited to attend the Stepping Stones participatory learning programme of 13 3-h sessions and three peer group meetings, covering issues of sex, GBV and HIV prevention. The programme was compared with a 3-h session on safer sex and HIV in the control communities. Two years after the baseline assessment, the authors reported that women who had participated in the Stepping Stones programme had 15% fewer new HIV infections than those in the control arm [incidence rate ratio (IRR) 0.85; 95% confidence interval (CI) 0.60–1.20] and 31% fewer herpes simplex virus type 2 (HSV-2) infections (IRR 0.69; 95% CI 0.47–1.03). Among men, HIV incidence was very low and no difference was detected between intervention and control communities; Stepping Stones men had 28% fewer HSV-2 infections (IRR 0.76; 95% CI 0.36–1.46). Although these early results for HIV and HSV-2 infections can be explained by chance (5% level), 2 years is a short period to see a reduction in HIV incidence, and they do suggest the intervention may eventually have a significant impact on sexual behaviour and HIV rates [130].

Among the women participants, the authors found no differences in sexual behaviours compared with the control group, but Stepping Stones men reported significantly fewer sexual partners and were significantly more likely to report the correct use of condoms.

Significantly fewer Stepping Stones men reported perpetrating IPV, but there was no difference in reported IPV among Stepping Stones women.

Two further trials are under way, one in Limpopo and Eastern Cape Province, involving the training of female elders [131]. A pragmatic RCT in Botswana, Namibia and Swaziland is currently testing the interface between a structural intervention, a GBV awareness intervention and a service delivery intervention focussed on the choice disabled [132].

Secondary prevention randomized controlled trials

Most HIV prevention strategies are aimed at people who already have risk factors. Some of these could be relevant to GBV survivors. The evidence cited in this section comes mainly from the United States. Although recognizing the very different context from southern Africa, these studies can nevertheless suggest that various interventions with GBV survivors can help reduce the effect of GBV on subsequent HIV risks, and can provide pointers for prevention research with GBV survivors in southern Africa. The form of support programmes for GBV survivors in southern Africa would need to be tailored to the context and may be different from those used in the United States.

Recovery from GBV could be a mainstay of secondary prevention – people who experienced GBV but who are not yet HIV positive. One study in the United States examined how resiliency (represented by optimism, social support, religiosity, and finding growth and meaning) was linked to perspectives on addressing trauma among individuals with CSA [133].

Negotiating skills RCT subgroup analysis of 152 GBV survivors tested the impact of an eight-session ‘psycho-educational’ intervention, designed to be fun as well as action oriented. Role-playing, problem solving, letter writing, attitude confrontation, story telling, and modelling were among the interactive techniques employed. The sessions covered: (1) Why should I care about getting STD and HIV? (2) How do I avoid partners who don’t care? (3) What’s the best way to protect myself? (4) How can I find out if we are infected? (5) How do I ask my partner to use protection? (6) How do I influence my partner to use protection? (7) How do I refuse sex or unprotected sex? (8) How do I continue protecting myself and others? The intervention decreased the number of unprotected sex episodes and increased the use of alternative strategies (like refusal, ‘outer course’ or mutual testing). The intervention did not decrease subsequent GBV but shows the potential for improved negotiating skills to interrupt the link between GBV and HIV [134].

Condoms There is considerable evidence of the impact of programmes that seek to increase condom uptake with regular partners. Another US-based RCT performed a

subgroup analysis of GBV survivors. The education/awareness intervention emphasized ethnic and gender pride, HIV knowledge, condom attitudes, healthy relationships, communication, and condom use skills. The intervention group reported using condoms more consistently, had fewer episodes of unprotected vaginal sex, engaged in more protected intercourse acts, were more likely to have used a condom during their most recent intercourse, were less likely to have a sexually transmitted disease, and demonstrated more proficient condom skills [135]. The impact on use with casual partners, in which most risk is located, and on HIV rates was less impressive [136].

Other prevention approaches Male circumcision could arguably be considered ‘long term’ secondary prevention, as this could protect male GBV perpetrators from infection by their victims, and thus reduce the cycle of infection.

Tertiary prevention randomized controlled trials

The mainstay of tertiary prevention is encouraging HIV medication adherence among GBV victims with AIDS, the recovery from the trauma of the experience and barriers to further transmission. Again, the trial evidence around tertiary prevention among survivors of GBV with HIV infection comes mainly from the United States. Direct extrapolation to the context of southern Africa is difficult, but the evidence indicates possible research and future policy directions in southern Africa.

In an RCT in the United States, Wyatt and colleagues [137] found that women who attended eight or more sessions of a ‘psycho-educational’ programme reported greater medication adherence than control women.

The RCT of Sikkema and colleagues [138] found that a 15-session coping group intervention (compared with a 15-session support group and a waiting list group) produced improvement in traumatic stress symptoms and behavioural difficulties among HIV-positive individuals [44].

Another US-based RCT subgroup study of GBV survivors among women with AIDS looked at the acceptability of barrier products (male and female condoms and spermicides) supplied with three training sessions. The intervention increased the use of spermicides at 3 months [139].

Discussion

Limitations of the evidence

The complexity of the phenomenon of GBV, the different and overlapping terminology used by authors, and the frequent co-existence of different forms of GBV mean that it is not possible to link only one or more forms

of GBV (such as specifically sexual violence) to HIV, or to conclude that other forms of GBV (such as emotional abuse) are not linked significantly to HIV risk. There are also several limitations of our review.

Scope

We limited the review to empirical and published research. This excludes much individual and qualitative experience and many small-scale successes or failures in dealing with GBV and HIV. It was beyond the scope of this paper to consider the evidence for factors causally related to GBV; there are many published reviews on this topic. We did not review or evaluate existing policies and programmes for GBV and HIV prevention in the HIV hyperendemic countries of southern Africa, although we refer to them in general terms.

We believe our literature search approach identified most if not all the published papers covering the link between the forms of GBV and HIV, covering relevant prevention trials for HIV by tackling GBV. We have not conducted a review of the research strategies and programmes by universities and other bodies in the region, although it would be interesting to do so if resources were available for this. The South African Development Community HIV Research Unit has recently published a research agenda for HIV, following extensive consultation [140].

Source of evidence

When possible, we looked primarily for evidence from southern Africa or at least from Africa or other developing countries with a high prevalence of HIV. In some cases there was limited or no evidence from within the region so we referred to evidence from elsewhere, particularly north America. This evidence must be interpreted with caution for its relevance to the region, because of the very different context for GBV, HIV and access to services.

Quality of evidence

Although there has been an explosion of the literature in the past few years, the quality of much of it is low, and several pieces of evidence are conspicuously missing. We attempted to assess the quality of the non-randomized studies using a well-known validated instrument (Newcastle–Ottawa Scale); the quality was really low. A number of studies did not report quantitative results; conclusions often did not match the statistical result. We still do not have experimental evidence from RCT, in which an intervention that reduced GBV also significantly reduced HIV risk.

Observational studies

The recognized problem of non-experimental studies, of course, is to separate between shared risk factors for GBV and HIV infection, and the aetiological role of GBV in a linear concept of HIV infection. Most of the evidence for the association comes from cross-sectional studies, linking a report of GBV and a report of HIV. These cross-

sectional studies present the well-known conundrum about the direction of causality. It is hard to tell from this design if people who experience GBV actually do go on, as a consequence, to contract HIV. Two types of study help to break this deadlock. First, follow-up studies find that many GBV survivors become HIV positive. Second, several cross-sectional studies consider sexual abuse in childhood as an HIV risk factor.

Reporting gender-based violence

The underreporting of GBV is a serious problem in surveys [141]. As reporting rates might vary in relation to risk factors, it can be a source of bias. A major determinant of GBV reporting in surveys is the quality of training of the fieldworkers [142]. A study in Lesotho showed that other contexts were also important: women living in GBV awareness project areas, presumably reflecting increased awareness, were more likely to report a history of sexual violence [143].

Non-supportive studies

Some studies found only weak associations between childhood abuse and HIV status [42,144]. Several others found only weak differences between HIV-positive and HIV-negative groups in reporting non-partner violence [29,49,53,100]. Cohen and colleagues [42] reported no difference in 'lifetime prevalence of domestic violence' between women with HIV and those without, although they reported a strong relationship between CSA and HIV high-risk behaviours. Koenig *et al.* [75] found that the proportion of pregnant women reporting violence was no higher among HIV-positive women than among HIV-negative women.

Future research

Further high-level operational research is needed. The way to demonstrate the size of impact of reduced GBV on HIV is with a series of RCT [145]. Beyond the need to clarify the direction of association between HIV and GBV, these trials would assess the dynamics and gain directly from a reduction of GBV, indirectly by reducing the number of choice-disabled or indirectly by intervening in one or more of the behavioural implications of GBV. They would also provide crucial information on the feasibility and cost implications of preventing GBV or its consequences for HIV.

The scope and types of studies we believe are needed are outlined below. Studies along these lines may already be underway in universities and other bodies in the region. (1) Subgroup analysis in ongoing trials: As there are already several well-designed trials of HIV prevention interventions currently underway that are not specifically addressing GBV, it makes sense to do subgroup analysis of these trials to examine the impact of the interventions among GBV survivors. This can provide useful information with very little investment. (2) Cluster interventions and measurement: Almost all HIV prevention

research focuses on individuals and ignores the powerful influence of communities and networks. A non-randomized intervention study [122] and one randomized intervention [127] provide examples of community and network interventions. (3) Complex interventions: Most RCT on AIDS prevention focus on the impact of single interventions rather than a calculated mix of synergistic actions. In reality, all southern African countries implement complex interventions to combat AIDS and the question one has to answer concerns the added value of each intervention, or its impact in the face of all else that is going on. (4) Economic analysis should accompany these studies. This is relevant not only in relation to implementation costs, but because economic empowerment is a major aspect of prevention.

Several areas of research focus are likely to be important: (1) Choice-disability: few current HIV prevention programmes address the needs of the choice-disabled, those who have no agency to implement prevention decisions or access to health services when they need them [146]. This seems to be the major dynamic underwriting the association between GBV and HIV. Revictimization compounds this dynamic. The results could be relevant to health policy in many other settings [147]. This could be included with other research – asking, for example, how to increase the relevance of condom promotion or male circumcision for the choice disabled. (2) A second promising focus would be with HIV-discordant couples, when these cohorts are available. Reduction of GBV in this extremely high-risk group could provide evidence of much wider relevance but, because of the very high seroconversion rate, studies could be of modest size. (3) The interaction between prevention initiatives is also important. There is currently investment in HIV prevention by government health services, schools, non-governmental organizations, traditional healers, churches and international aid groups. They nearly all miss the same group – survivors of GBV. There are also widely used interventions that could have negative GBV outcomes. Fear-based messages, for example, against multiple partners, can increase the stigma associated with HIV/AIDS, with far-reaching consequences for testing, disclosure and indeed GBV. Male circumcision does not address the issue of GBV. In the context of widespread GBV, it is imperative to question the assumption that HIV risk education can only have a positive effect. (4) Research on access to treatment: there is a sparse literature on the effects of GBV and treatment and presumptive treatment in cases of rape [148]. Just as the choice-disabled are unable to implement their decisions about primary and secondary prevention, they are unable to obtain access to antiretroviral therapy. (5) Research on GBV affecting men: the stereotype that women are the victims and men the villains [149,150] offers a poor summary of GBV. In southern Africa, at least up to the age of 14 years, boys experience as much sexual violence as their female counterparts [57]. Male abuse of

men is more common than female abuse of men and, because of the trauma of forced anal sex, carries a higher HIV risk. Female violence, including sexual violence, against men is recognized in all southern African countries. If it is true that the greater GBV impact on HIV is through indirect mechanisms – choice disability and self esteem – then female perpetrated GBV could be important in the epidemic. (6) Research on perpetrators: more studies targeting perpetrators are needed to understand the relationship and dynamics, with a view to understanding intervention spaces, between perpetrators and HIV. On the other side of the GBV coin are the perpetrators whose proclivities put them at special risk and make them key drivers of the epidemic. It is possible that perpetrators understanding better their own HIV risks could help to motivate a reduction in sexual violence.

Building African skills in gender-based violence–HIV planning and research

Most GBV research comes from north America. This review faced problems identifying studies from southern Africa, particularly RCT. A recent systematic review of RCT on HIV and AIDS prevention in Africa concluded that the small number of trials in Africa is not commensurate with the burden of disease there [151]. There is an urgent need for African skill development in RCT. Several non-governmental organization and university-based initiatives are under way; this needs full government, regional and international commitment. Relevant beyond GBV to a wide range of HIV prevention issues, skill development can be a focus at several levels: (1) Policy and political: appreciation of the value of and the way to use local high quality evidence related to GBV and its role in the epidemic can be transferred in brief executive retreats, which could be regional or national. (2) Officers in national AIDS commissions and Ministries of Health need more detailed knowledge of research protocols and options, to engage with externally motivated research that should be adapted to local conditions. Short courses can transfer the skills needed for detailed interaction on AIDS prevention research, with a special focus on GBV. A national or regional consensus team established to standardize instruments and to define and refine structured outcomes can build local skills as well as match externally motivated research to national needs. (3) Prevention implementation research: reduction of GBV is measurable; so too are many of its indirect effects. Increasing the proportion of the population that can choose existing prevention options can be measured in terms of abstinence, condom use or reduced concurrency. It is essential that Africans gain experience and expertise in researching prevention initiatives. There is no reason why southern African scientists should not be the world leaders in AIDS prevention implementation research: a combination of in-service internships, degree courses and fully funded research posts could help to bring this to pass. A

permanent university research chair in GBV–HIV in each one of the eight hyperendemic countries could cost less than US\$10 million all told. (4) Community readiness and engagement is a crucial capacity for AIDS prevention. Collective and cluster interventions can be less expensive, easier to measure and easier to interpret. A spin-off of this research approach is the increased readiness of communities for serious integrated AIDS prevention. (5) Media sensitization and training: much has been done in the region to use mass media for ‘edutainment’ and awareness programmes. There is also room for awareness in the media community of the GBV dimensions of HIV and AIDS.

Policy and programme actions

A detailed review of the relevant current policies and programmes in the HIV hyperendemic countries of southern Africa would require a separate paper of equal length to this one. In general, one may say that there is increasing recognition of GBV as a public health problem in the region. In a number of the hyperendemic countries, national policies already cover aspects of the prevention of GBV, although programme implementation often lags behind. There is much less recognition of GBV as a key area for prevention as part of national government HIV programmes: the two issues of GBV and HIV are mostly seen as separate and are handled separately.

Policy and policy discourse

The entry point is to recognize that GBV increases HIV risk directly, through trauma, but also indirectly through increasing high-risk practices. GBV survivors are at high risk, but so are GBV perpetrators who often pick on survivors of previous GBV, who are much more likely to be infected. We need to address the issues of both victims and perpetrators. GBV is actionable as a risk factor for HIV – the policy paradigm must address primary prevention (stopping the risk by reducing GBV), secondary prevention (stopping GBV, when this occurs, leading to HIV) and tertiary prevention (reducing the consequences of HIV). (1) Legal review: policies in all the hyperendemic countries should ensure that laws cover forms of GBV including rape and CSA, and failure to disclose HIV status. This would provide a supportive environment for a reduction of GBV and choice disability. (2) Policy review: the HIV and AIDS prevention policies of each country should be reviewed to clarify their position on GBV–HIV. Key questions include: does the policy recognize the role of GBV on the HIV risk of victims; does it recognize the special HIV risk and subsequent role of GBV perpetrators; does it deal adequately with issues of primary prevention of GBV and HIV. Prevention of GBV should be promoted as a national and regional HIV prevention issue. (3) GBV and HIV prevention bodies in the United Nations and in national governments are usually quite separate at present. These ‘silos’ are unhelpful and partly to blame for the low position of GBV–HIV on policy agendas. Concerting of

these forces could have a positive effect on the prevention of both GBV and HIV. (4) At present, much AIDS prevention in southern Africa is driven by international donors. GBV reduction and the amelioration of its indirect effects on the epidemic are not manageable as a vertical programme, although vertical programmes are attractive to some local and donor decision-makers. It is necessary to engage with the advocates of prevention to increase their understanding of GBV and its role in the epidemic. Asking policy questions about the relevance of campaigns or prevention programmes for the choice-disabled can reduce the current trend of donors to invest mainly in prevention exclusively for the choice-enabled, those who can implement their prevention decisions.

Programmes

Each country should commit resources to socializing (communicating) the available information on GBV and HIV among prevention stakeholders. The exact cultural underpinning of the GBV–HIV dynamic may be different in different parts of the region, and there is an urgent need for country-specific information on what it takes to effectively tackle GBV or to reduce its effects on HIV. Effective GBV prevention is likely to include a structural component such as access to credit or earnings, and a GBV awareness component covering GBV survivors, potential GBV victims and GBV perpetrators.

Legal reform

Countries where the legal framework is out of step with what is needed for GBV prevention and dealing with cases of GBV will need to promulgate new laws, to provide training for service providers (including police and health workers), and to implement knowledge translation programmes to involve the public in the legal reform. Sharing of experience within the region is important.

Scaled-up primary prevention programmes are needed, to focus on reducing risk factors for GBV and consequent HIV risk. Programmes should be implemented in collaboration with bodies already working on GBV prevention. They should include structural and awareness/education elements, programmes in schools, a focus on men (as perpetrators and as victims of CSA), emphasis on resilience, and positive role models.

Secondary prevention programmes hinge on recovery from GBV – interventions can increase the resilience of people who experienced GBV but who are not yet HIV positive. Psycho-educational interventions can also improve the negotiating skills of those at risk of GBV. Longer term prevention strategies for the reduction of HIV infection independent of any reduction in GBV, such as male circumcision, could play a role.

Tertiary prevention of GBV includes making it easier to report abuse, to get support once abused and to increase deterrents for perpetrators. Given the sad reality that only

one in five cases might be reported, one in four of those go to court, and of those only a minority of perpetrators are convicted, judicial processes are unlikely to play a role in decreasing overall GBV. Some advocate zero tolerance for CSA in schools, with the suspension of teachers accused of CSA and the sacking of those convicted; but the potential for false accusations needs fuller consideration.

Programmes focused on perpetrators could increase their awareness of their own safety and, perhaps in time, reduce the distain for the safety of others that is often part of GBV and transactional sex.

In conclusion, there is now convincing evidence that GBV is an important cause of HIV infection, largely indirectly through choice disability and increased risk activities. GBV is an important part of the reason for the shape of the epidemic in southern Africa and the high rates of HIV infection in young women and girls. GBV is actionable and evidence is emerging that GBV reduction can reduce HIV incidence among women. Further research can identify the most effective methods to reduce both GBV and HIV. Meanwhile, existing evidence indicates policy review and programme actions that should be taken now.

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Paper 9.

Andersson N.

Prevention for those who have freedom of choice or among the choice-disabled:

Confronting equity in the AIDS epidemic.

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The contribution of Neil Andersson included conceptualisation and writing of this article

A handwritten signature in black ink, appearing to read 'N. Andersson', followed by a period.

Methodology

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Prevention for those who have freedom of choice – or among the choice-disabled: confronting equity in the AIDS epidemic

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Abstract

With the exception of post-exposure prophylaxis for reported rape, no preventive strategy addresses the choice disabled – those who might like to benefit from AIDS prevention but who are unable to do so because they do not have the power to make and to act on prevention decisions. In southern African countries, where one in every three has been forced to have sex by the age of 18 years, a very large proportion of the population is choice disabled. This group is at higher risk of HIV infection and unable to respond to AIDS prevention programmes; they represent a reservoir of infection. Reduction of sexual violence would probably decrease HIV transmission directly, but also indirectly as more people can respond to existing AIDS prevention programmes.

Background

AIDS prevention in southern Africa serves those who can choose their HIV risks. Promoting abstinence [1], male or female condom use [2,3], microbicides [4] or reduced concurrency [5,6] all presume that beneficiaries will be choice-enabled. Male circumcision [7], quintessentially for choice-enabled males, does not address prevention for those who are coerced to have sex, female or male.

Victims of sexual abuse make up a big part of the southern Africa population. One in every ten – males and females – is sexually abused every year and one in every three has suffered sexual abuse by the age of 18 years [8]. With the exception of post-exposure prophylaxis for reported rape, no preventive strategy addresses these, the choice disabled, who might like to benefit from prevention but who are unable to do so because they do not have the power to make and to act on prevention decisions.

Reservoir of infection

If the shortage of prevention approaches for the choice disabled is an equity oversight, it is a singularly dangerous one. The physical risk of HIV infection to victims is increased by lack of lubrication and trauma [9,10]. Champion reported an STI rate of 47% among sexual violence victims compared with 30% in the rest of the population from which they were drawn [11]. HIV prevalence rates are much higher among young women than men: 16% compared with 5% in one South African study [12]. In another, intimate partner violence and high levels of male control in a woman's current relationship were significantly associated with HIV infection [13]. In fact dozens of studies have found HIV risk factors associated with sexual coercion and that HIV-infected people experience more sexual coercion than those who are HIV-negative [14]. But these are nearly all cross sectional studies, making it impossible to conclude that sexual violence causes HIV infection.

Even so, however one looks at it, victims of sexual violence are a reservoir for infection that is not reached by existing prevention initiatives.

Culture of sexual violence

The world view that goes with forced sex – inherently disdainful of others and their rights – contributes to the AIDS epidemic in other ways, like not disclosing one's HIV status to a sexual partner or refusing to negotiate condom use.

Our national survey of South African schools produced worrying findings about the culture associated with sexual violence. Children who suffered forced sex were very much more likely to believe they were HIV positive and less likely to be willing to go for testing. And children who had endured sexual abuse or who believed they were HIV positive were more likely to say they would spread HIV intentionally (20% among those who believed they were infected compared with 13% who did not believe so⁸).

Sexual abuse also affects the way survivors interpret education that attempts to reduce their risks [15].

Downstream and side effects

AIDS prevention has downstream effects on HIV infection and negative secondary effects for the choice disabled. The only published RCT of male circumcision reported significantly more sexual contacts in the intervention group [7]. This could mean an increased risk of other STIs, including hepatitis. In a climate where millions of people are desperate for a solution to AIDS, protecting only choice enabled men gives out an unhelpful message.

Voluntary counselling and testing seems to produce irresponsible behaviour for some who test HIV-negative, despite protective effects behaviour change of those who test positive [16].

Inefficient prevention investment

AIDS prevention limited to the choice enabled wastes investment. For example, the Gauteng provincial government in South Africa distributes around 100 million free condoms every year. For victims of sexual violence, however, condoms are not usually an option. The main impact of an apparently protective intervention, like male circumcision, will be for HIV-negative young men who are *not* victims of forced sex. If two in every ten are already HIV-positive and three in ten have been victims of sexual violence, this limits drastically the pool who can gain from male circumcision.

Foundation for an epidemic

Forced sex is not the only factor in HIV infection but it is a factor we must deal with.

What would it take to prove that reducing sexual violence would reduce HIV infection – at least in a way that draws governments and donors to invest in this preventive strategy? It is impossible to monitor the sexual encounter where infection occurs. Cross sectional and even longitudinal studies cannot make the case. The only way to prove that reducing sexual violence reduces the risk of HIV infection is through randomised controlled trial where the intervention is to reduce sexual violence.

Even if reducing forced sex does not reduce HIV risks, the gain would still be considerable [17]. In the best of cases, we might reduce *both* forced sex and HIV risk.

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Paper 10.

Andersson N, Cockcroft A.

Choice disability and HIV status: evidence from a cross-sectional study in Botswana, Namibia and Swaziland.

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The contribution of Neil Andersson included design of the study, participation in design of instruments, technical oversight of the survey, analysis of data, conceptualisation of the article, writing and final approval

Neil Andersson



Anne Cockcroft



Choice-Disability and HIV Infection: A Cross Sectional Study of HIV Status in Botswana, Namibia and Swaziland

Neil Andersson · Anne Cockcroft

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Abstract Interpersonal power gradients may prevent people implementing HIV prevention decisions. Among 7,464 youth aged 15–29 years in Botswana, Namibia and Swaziland we documented indicators of choice-disability (low education, educational disparity with partner, experience of sexual violence, experience of intimate partner violence (IPV), poverty, partner income disparity, willingness to have sex without a condom despite believing partner at risk of HIV), and risk behaviours like inconsistent use of condoms and multiple partners. In Botswana, Namibia and Swaziland, 22.9, 9.1, and 26.1% women, and 8.3, 2.8, and 9.3% men, were HIV positive. Among both women and men, experience of IPV, IPV interacted with age, and partner income disparity interacted with age were associated with HIV positivity in multivariate analysis. Additional factors were low education (for women) and poverty (for men). Choice disability may be an important driver of the AIDS epidemic. New strategies are needed that favour the choice-disabled.

Resumen La asimetría de poder en las relaciones íntimas puede impedir que las personas más débiles en las parejas se protejan contra el HIV. En un estudio realizado en Botsuana, Namibia y Suazilandia documentamos indicadores de incapacidad para elegir conductas preventivas [*choice disabled*] en una muestra de 7,464 jóvenes de 15 a 29 años. Estos indicadores incluyen pobreza, bajo nivel de

educación formal, desigualdad educativa y de ingresos respecto de la pareja, antecedentes de violencia sexual, experiencia de violencia por parte de la pareja, y estar dispuesto a no usar condón aun cuando se piense que la pareja tiene una vida sexual que la expone al VIH. También documentamos conductas de riesgo relacionadas a VIH, como no usar condón de manera responsable y tener múltiples parejas. En Botsuana, Namibia y Suazilandia, respectivamente, el 22,9%, el 9,1% y el 26,1% de las mujeres, así como el 3%, el 2,8% y el 9,3% de los hombres resultaron VIH positivos. Mediante el análisis multivariado, hallamos que las relaciones entre la violencia íntima y la edad, y entre ésta y la disparidad de ingresos en la pareja, se vinculaban de manera independiente con el HIV, tanto en hombres como en mujeres. También fueron factores de riesgo la pobreza para los hombres y el bajo nivel educativo para las mujeres. De estos resultados se desprende que la incapacidad para elegir conductas preventivas puede contribuir a la epidemia del SIDA. Por lo tanto, se necesitan nuevas estrategias dirigidas a esta capacidad de elección.

Keywords HIV · Choice-disability · Risk factors · Intimate partner violence

Introduction

AIDS prevention programmes in southern Africa have had limited success in controlling the epidemic and we need to examine why this is so. Conventional prevention approaches urge people to make safer choices to protect themselves [1, 2]. But abstinence [3, 4] protects only those able to choose when and with whom to have sex. Not everyone can afford to give up multiple partners [5, 6] or insist on

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condom use [7, 8]. For these choice-disabled, urging safer choices has muted relevance.

Perhaps the easiest type of choice disability to envisage is sexual violence. This increases HIV risk directly, for example when trauma leads to sero-conversion of rape victims [9–12]. Coerced first intercourse can also establish the survivor in a victim role with indirect consequences on HIV risk [13, 14]. Many studies show a history of childhood sexual abuse linked with high risk behaviours for HIV in later life [15–20].

Other power gradients have a similar effect, disabling choices of a large population segment. Intimate partner violence (IPV) is one such power gradient that is common in southern Africa: one in every seven household respondents in southern Africa reported IPV in the previous year [21]. A recently published longitudinal study found significantly higher rates of HIV infection among women who experienced more than one episode of IPV, compared with those who reported one or no episode [22]. Cohort studies of HIV discordant partners also show increased risk of infection among partners who report domestic violence [23, 24]. IPV may increase HIV risk by increasing risky behaviours (multiple partners, non-use of condoms) [25, 26].

Transactional sex, the exchange of sex for materials or opportunities, is characterised in southern Africa by steep power inequalities [27, 28]. While some transactional sex is a discretionary economic opportunity [29], for those in absolute poverty without sufficient food, survival options are limited. The longer term costs of transactional sex with someone who might be HIV-positive may be outweighed by the risk of immediate hunger [30]. Other sexualized power gradients, like income differentials between partners [31] and inter-generational sex [32], also reduce choices.

Choice disability may also affect access to treatment among the HIV infected. The incomplete uptake of anti-retroviral therapy (ART), including as part of prevention of maternal to child transmission (PMTCT), is an increasing international concern [33, 34] as ART becomes more available in southern Africa. Choice disabled people may be less likely to access ART, perhaps mediated through low self-esteem or depression [35, 36]. There is a lack of direct evidence about this, and inconsistent evidence about whether socio economic status influences adherence to ART [37]. If the current “test and treat” mood [38] takes hold in the region, an inability to implement therapeutic choice could undermine the strategy.

We hypothesized that people who are choice disabled will have higher HIV infection rates than others. This could be either because choice disability increases HIV risk, or because HIV infection leads to some forms of choice disability, or both. The 2008 baseline survey for an ongoing randomised controlled cluster trial (RCCT) [39] in

Botswana, Namibia, and Swaziland provided an opportunity to examine the association between aspects of choice disability and HIV status among young men and women, and is the basis for this article. The principal outcome studied in the RCCT is HIV status in women aged 15–29 years, since the incidence of new infections is particularly high in this group. In a factorial design the trial tests interventions in favour of the choice-disabled, alone and in combination: an awareness raising programme focussed on transactional and trans-generational sex; concerting of prevention initiatives in favour of the choice disabled; and a structural intervention intended to increase skills and employability of young women. All three countries have a generalised AIDS epidemic. Botswana and Swaziland have among the highest rates of HIV in the world; the prevalence in Namibia is somewhat lower [40]. All three countries promote ABC, encourage HIV testing, and provide ART. Swaziland at the time of the survey was starting to roll out a mass male circumcision programme.

Methods

For the cross-sectional cluster survey we drew a nationally representative random sample of census enumeration areas in each country, stratified into capital, urban, and rural communities. The sample comprised 78 clusters, 25 each in Botswana and Swaziland and 28 in Namibia.

Potential interviewers, identified by word of mouth, included recent university graduates and people working with non-government and community-based organisations. A 1 week intensive training included classroom and practical sessions in non-sample sites, and covered informed consent and confidentiality procedures, administration of the questionnaire, and obtaining finger prick blood samples and preparing dried blood spots safely. Only those who reached the required standard were selected for the field teams. In November and December of 2008, interviewers visited all households in each cluster and invited all young men and women aged 15–29 years present at the time of the visit to be interviewed and give a finger-prick blood sample for anonymous HIV testing. They only interviewed those who consented to give a blood sample and took precautions to ensure privacy for each interview. We did not provide any monetary or other incentives for participants. Prior to the survey, community leaders gave consent for their community to participate in the trial and the survey. They informed their community when the field teams were coming and in some areas this information was broadcast on local radio.

The face-to-face interview included questions about self-reported age, education level, occupation, number of sexual partners in the last month and last 12 months,

marital status, income relative to the partner, education relative to the partner, absolute poverty (insufficient food in the last week), experience of physical intimate partner violence (IPV) in the previous 12 months, lifetime history of forced sex, consistency of condom use with a non-regular partner, willingness to have sex if their partner refused to use a condom, and perception about their own and their partner's risk of HIV. It also asked if the respondent had been tested for HIV in the last 12 months and whether he or she intended to be tested. It did not ask respondents about their HIV status.

Interviewers collected drops of blood on dried blood spot (DBS) cards using a safety auto-retracting lancet. A bar code linked the sample and anonymous questionnaire. The National HIV Laboratory at the South African National Institute for Communicable Disease (NICD) in Johannesburg undertook HIV testing of the DBS specimens, with confirmatory ELISA testing (Veronostika) of specimens positive on the initial screening ELISA test (Genscreen).

Analysis

Operators entered data twice with validation using Epi Info; analysis relied on CIETmap open-source software [41] which is a user friendly interface for the standard open source R, loading established analysis modules as needed. We examined associations between HIV status and potential risk factors in bivariate then multivariate analysis using the Mantel–Haenszel procedure [42] with an adjustment for clustering described by Gilles Lamothe based on a variance estimator to weight the Mantel–Haenszel odds ratio for cluster-correlated data [43, 44]. Finding significant heterogeneity between age and sex categories, we used age as an interaction term (see below) and developed separate models for females and males.

Prior to the survey, we defined several indicators that could be relevant to choice-disability: lower educational level (no secondary education); extreme poverty (insufficient food in the last week); lower education than partner; earning less than partner; experience of IPV in last 12 months; lifetime experience of forced sex; and risk intention (would have sex if partner refused to use a condom and (separate question) believed partner at risk of HIV). As there is no single word with the equivalent meaning of the English word “rape” in most of the interview languages, we used the phrase “forced sex without consent” which could be rendered in all languages. Rather than restricting the analysis to those with partners, thus reducing the overall population relevance of the study, we handled having a partner as an interaction term with educational disparity, earning disparity, IPV, and inconsistent condom use. Our risk categories were “having a partner

and having lower education than that partner”, “having a partner and earning less than that partner”, “having a partner and experiencing IPV from that partner”, “having a non-regular sexual partner and not always using a condom with that partner”, and “having a regular sexual partner and not always using a condom with that partner”. Thus those without partners were included in the group without the interaction risk factor. Occupation grouped students and volunteers with the employed group. Partner earning disparity grouped those “with a partner and earning less than that partner” in contrast with those with no partner and those with partners earning the same or more than the partner.

Because age interacted with IPV and income disparity for men and with education disparity and income disparity for women, we included these as fully interacted variables in both male and female models, in addition to IPV, education and income differentials on their own.

Each model was initially saturated with the defined choice-disability indicators and other potential risk factors for HIV: country, urban/rural residence, marital status, multiple partners in the last 12 months, multiple partners in the last month, inconsistent condom use with non-regular partners, inconsistent condom use with regular partners, perception of being at risk of HIV, and circumcision status (for males). Using backward elimination, we excluded the weakest association on each run until only significant associations remained. We report on the final male and female models separately, with the adjusted Odds Ratio (ORa) and cluster-adjusted confidence intervals (CIca).

Given that some choice disability factors like partner violence are clustered, and there was a high degree of heterogeneity between clusters, we repeated the analysis using generalised estimating equation (GEE) in the R package Zelig [45] in an exchangeable correlation structure (logit.gee model, 1000 simulations, robust 95%CI). GEE is a recognised method for analysing clustered data when there is heterogeneity between clusters and provided a means of validating our cluster adjustment.

Ethical Issues

The ongoing randomised controlled trial including the baseline survey described here was approved in Botswana by the Health Research and Development, Ministry of Health (PPME-13/18/1 Vol IV(4), 26 August 2008), in Namibia by the Ministry of Health and Social Services (17/3/3/AP, 22 July 2008), and in Swaziland by the Scientific and Ethics Committee, Ministry of Health and Social Welfare (MH/599B, 26 August 2008). All participants gave written, informed consent to provide a finger prick blood sample to be tested for HIV; for those under 18 years the parent or guardian gave written consent. The participants

understood that the HIV testing was anonymous, that they would not receive the result of their test, and that they should not assume not receiving a result meant they had tested negative. Interviewers did not provide any HIV pre-test counselling. Free HIV counselling and testing is provided by government facilities and encouraged in all three countries and interviewers informed all participants of this service and its nearest venue. The interviewers did not provide counselling for any participants who reported having experienced gender based violence. They gave participants contact information about available counselling and support services.

Results

In the 78 clusters, 7,464 respondents (4549, 60.9% female) completed the interview and agreed to provide a blood sample. Of the 12441 identified as eligible to participate in the households, 20% (2518) were absent at the time of the survey, and 20% (2459) declined to give a finger prick blood sample for HIV testing and were not interviewed. Fieldworkers obtained 7,303 usable finger prick samples (97.8% of interviewed participants). The shortfall was due to failed linkage between sample and questionnaire, or an inadequate blood sample.

Figure 1 shows the age and sex specific HIV prevalence rates in the three countries together.

Table 1 shows the HIV prevalence rates in relation to sample characteristics. HIV rates were higher in Botswana and Swaziland than in Namibia. In all countries the HIV rates were higher among women and higher in the older (20–29 years) age range. Thus, in those aged 20–29 years, among women the proportions HIV positive in Botswana, Namibia and Swaziland were: 28.1, 15.3, and 35.2%, and among men these proportions were 11.1, 4.8, and 15.8%. Several factors were significantly associated with HIV status in a bivariate analysis. Age and sex were the

strongest factors, interacting statistically with most other factors.

Table 2 shows the final multivariate models for HIV status. Taking choice disability indicators into account, neither final model included the conventional HIV risk factors of multiple partners or inconsistent condom use. Country was a factor for both men and women. Three choice-disability indicators were associated with HIV status in women: lower education (ORa 1.87, 95%CI 1.38–2.53), experience of IPV (ORa 1.44, 1.15–1.8), experience of IPV interacted with age (ORa 2.95, 95%CI 2.25–3.87) and partner income disparity interacted with age (OR 2.89, 95%CI 1.97–4.22). For men, the factors were insufficient food (ORa 1.63, 95%CI 1.11–2.40), experience of IPV (ORa 2.15, 1.22–3.8), experience of IPV interacted with age (ORa 6.6, 95%CI 2.18–20.1) and partner income disparity interacted with age (OR 2.68, 95%CI 1.67–4.30).

The repeat analysis using GEE, exchangeable correlation matrix, produced very similar results (Table 2).

In a generalised model of cumulative HIV risk, we included all four choice-disability factors significantly associated with HIV status (education, IPV, income disparity and food insufficiency) in the models for both males and females (Table 3 and Fig. 2). Among women, with each factor added, an additional 10% of the subgroup were HIV-positive, levelling off after three factors (χ^2 for trend 205.4, 4df). For men, starting at a lower level of risk, the increase in risk showed a similar trend (χ^2 for trend 52.2, 4df).

Discussion

This study confirmed an association between choice-disability indicators and HIV infection. For women, partner income disparity, experience of IPV and lower education were all independently associated with positive HIV status, while for men, serious poverty (food insufficiency), partner income disparity, and experience of IPV were associated with HIV status. This supports the idea that choice-disability is not just a women's issue. For both men and women, taking choice-disability indicators into account eliminated the association between HIV status and the conventional risk factors of multiple partners [46] and inconsistent condom use [47, 48]. There is extensive evidence in the literature of a link between the experience of IPV and HIV infection [25, 49]. Particularly in women, more education has been shown in a number of studies to be associated with lower rates of HIV [50].

Although the primary intention of our analysis was not to estimate absolute HIV infection rates, the age and sex distribution of infection (Fig. 1) illustrates the well-known

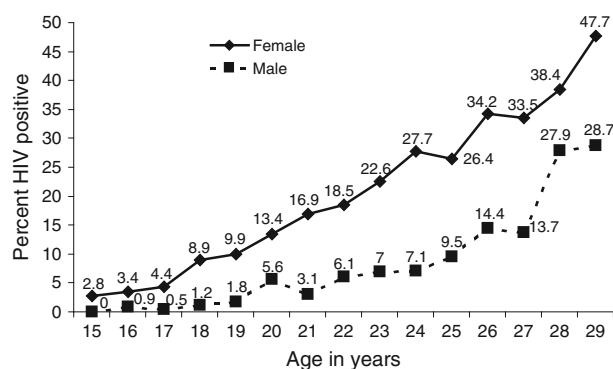


Fig. 1 HIV seroprevalence by age among men and women aged 15–29 years in Botswana, Namibia and Swaziland

Table 1 HIV status by sample characteristics and country in youth aged 15–29, and country-and cluster-adjusted odds of being HIV positive

Characteristic	Percent (fraction) HIV positive				OR adjusted ^a (95%CI)
	Botswana	Namibia	Swaziland	All countries	
Whole sample	17.8 (443/2488)	6.6 (174/2619)	18.8 (412/2196)	14.1 (1029/7303)	
Age					
15–19 years	5.1 (33/650)	2.2 (29/1346)	6.5 (58/898)	4.1 (120/2894)	5.50
20–29 years	22.3 (410/1838)	11.4 (145/1273)	27.3 (374/1298)	20.6 (909/4409)	(4.22–7.17)
Sex					
Male	8.3 (72/871)	2.8 (28/1014)	9.3 (89/959)	6.6 (189/2844)	3.41
Female	22.9 (371/1617)	9.1 (146/1605)	26.1 (323/1237)	18.8 (840/4459)	(2.78–4.17)
Marital status					
Single, divorced, widowed	15.3 (303/1977)	5.5 (121/2214)	14.1 (243/1721)	11.3 (667/5912)	2.64
Married or cohabiting	27.4 (138/504)	13.2 (53/402)	35.9 (165/459)	26.1 (356/1365)	(2.06–3.39)
Education					
Secondary or more	17.1 (369/2156)	6.0 (129/2139)	17.9 (282/1574)	13.3 (780/5869)	1.38
Primary complete or less	22.5 (73/324)	9.0 (42/469)	22.2 (127/571)	17.7 (242/1364)	(1.10–1.74)
Partner education disparity					
Edn same/higher/no partner	15.6 (260/1667)	5.0 (100/1990)	15.4 (218/1415)	11.4 (578/5072)	1.73
Edn lower than partner	22.2 (160/722)	10.5 (55/525)	24.5 (163/664)	19.8 (378/1911)	(1.44–2.09)
Occupation					
Income earning	13.8 (140/1014)	4.1 (62/1505)	13.0 (146/1120)	9.6 (348/3639)	2.00
Unemployed/housewife	20.4 (300/1467)	10.2 (112/1103)	25.0 (261/1045)	18.6 (673/3615)	(1.70–2.36)
Partner income disparity					
Earns same/more/no partner	11.1 (137/1229)	4.5 (83/1843)	12.0 (128/1064)	8.4 (348/4136)	2.80
Respondent earns less	24.6 (303/1231)	12.0 (91/757)	29.0 (259/893)	22.7 (653/2881)	(2.30–3.40)
Area					
Capital	17.6 (54/307)	3.3 (12/364)	24.2 (44/182)	12.9 (110/853)	C + U vs R
Urban	17.4 (192/1102)	9.8 (86/878)	28.7 (100/348)	16.2 (378/2328)	1.32
Rural	18.3 (197/1079)	5.5 (76/1377)	16.1 (268/1666)	13.1 (541/4122)	(0.99–1.76)
Food sufficiency					
Sufficient food last week	15.9 (280/1759)	6.0 (132/2193)	16.9 (257/1524)	12.2 (669/5476)	1.55
Insufficient food	22.4 (161/720)	10.0 (42/422)	23.5 (153/651)	19.9 (356/1793)	(1.31–1.83)
Risk intention ^b					
No risk intention	16.9 (392/2317)	5.8 (140/2403)	17.5 (338/1936)	13.1 (870/6656)	2.13
Risk intention	28.5 (47/165)	15.4 (32/208)	29.3 (73/249)	24.4 (152/622)	(1.63–2.78)
Intimate partner violence					
No IPV in previous year	14.6 (291/1991)	6.1 (141/2320)	15.9 (301/1888)	11.8 (733/6199)	2.63
IPV in previous year	30.6 (151/494)	10.8 (32/295)	37.2 (111/298)	27.0 (294/1087)	(1.98–3.49)
History of sexual violence					
Never experienced SV	16.9 (364/2156)	6.3 (145/2320)	18.3 (354/1933)	13.5 (863/6409)	1.45
Ever experienced SV	23.7 (78/329)	9.8 (29/297)	22.4 (57/255)	18.6 (164/881)	(1.17–1.80)
Multiple partners in last year					
No partner or one partner	16.8 (304/1810)	6.9 (145/2105)	18.7 (332/1774)	13.7 (781/5689)	1.10
More than one partner	20.4 (137/671)	5.5 (28/506)	19.4 (77/396)	15.4 (242/1573)	(0.93–1.31)
Multiple partners in last month					
No partner or one partner	17.5 (396/2259)	7.0 (166/2363)	18.9 (380/2015)	14.2 (942/6637)	0.93
More than one partner	20.2 (45/223)	3.1 (8/255)	18.2 (30/165)	12.9 (83/643)	(0.76–1.15)
Condom use non-regular partner					
Always use/no non-regular	17.9 (432/2407)	6.9 (170/2447)	20.1 (393/1953)	14.6 (995/6807)	0.89
Do not always use	23.8 (10/42)	1.4 (1/74)	18.8 (15/80)	13.3 (26/196)	(0.59–1.33)

Table 1 continued

Characteristic	Percent (fraction) HIV positive				OR adjusted ^a (95%CI)
	Botswana	Namibia	Swaziland	All countries	
Condom use with regular partner					
Always use or no regular partner	16.4 (300/1831)	5.2 (90/1721)	17.6 (215/1223)	12.7 (605/4775)	1.75
Do not always use	24.4 (141/578)	10.9 (82/750)	26.0 (192/739)	20.1 (415/2067)	(1.46–2.09)
Perceived personal risk of HIV					
Do not think at risk	10.6 (141/1329)	3.9 (60/1536)	10.3 (117/1131)	8.0 (318/3996)	3.01
Think at risk	25.8 (283/1096)	9.9 (99/1001)	27.3 (268/980)	21.1 (650/3077)	(2.43–3.72)
Circumcision (males only)					
Circumcised	9.3 (9/97)	2.6 (7/265)	7.6 (6/79)	5.0 (22/441)	1.04
Not circumcised	8.2 (63/771)	2.8 (21/741)	9.4 (82/872)	7.0 (166/2384)	(0.60–1.81)

^a Cluster adjusted odds ratio from bivariate analysis of group with characteristic, compared with counterfactual group (for example, age 20–29 compared with age 15–19); the odds ratio is also adjusted for country, by stratification

^b Risk intention: Would have sex with a partner who refused a condom when (separate question) partner is thought to be at HIV risk

Table 2 Multivariate analysis of HIV risk factors for men and women aged 15–29 years

	OR un-adjusted	Mantel–Haenszel analysis with cluster adjustment		GEE with exchangeable correlation matrix	
		OR adjusted ^a	Cluster adjusted 95%CI	OR ^b	Robust 95%CI
Female		<i>n</i> = 4376		<i>n</i> = 4549	
Primary or less education	1.71	1.87	1.38–2.53	1.91	1.47–2.48
Experienced IPV	1.61	1.44	1.15–1.80	1.43	1.17–1.74
Experienced IPV*age ^c	2.92	2.95	2.25–3.87	2.76	2.05–3.71
Income disparity*age ^c	7.75	2.89	1.97–4.22	2.81	1.95–4.06
Country ^d	3.29	2.44	1.73–3.55	2.49	1.75–3.55
Male		<i>n</i> = 2708		<i>n</i> = 2915	
Poverty (insufficient food)	2.13	1.63	1.11–2.40	1.64	1.17–2.31
Experienced IPV	2.15	2.15	1.22–3.79	1.98	1.28–3.04
Experienced IPV*age ^c	6.23	6.6	2.18–20.05	2.16	1.21–3.87
Income disparity*age ^c	18.37	13.69	3.49–53.68	4.96	2.77–8.89
Country ^d	3.47	2.68	1.67–4.30	2.67	1.66–4.30

^a Adjusted Odds Ratio from multivariate analysis of group with characteristic, adjusted for all other factors in the model. Details of the initial model are provided in the text

^b An identical modelling process served for GEE

^c Interacted variable with age 15–19 and 20–29 years

^d Country contrasts Botswana and Swaziland, which share many of the same characteristics, with Namibia

epidemiology of the HIV epidemic in southern Africa [51]. Infection rates increase rapidly in young women from 15 years of age onwards, probably related to intergenerational, transactional and forced sex by older HIV-positive males. The rates in young men only take off in their late twenties, probably reflecting unprotected sex with infected women of similar age.

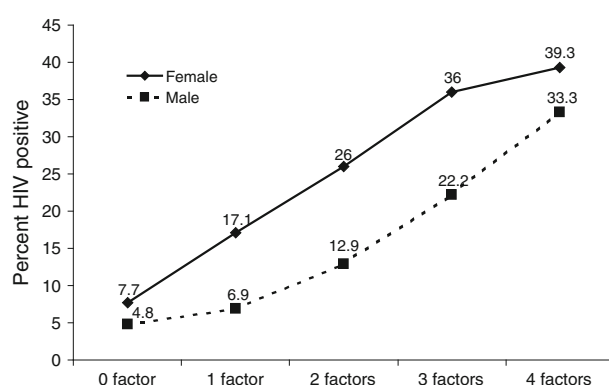
Recognising that causality could be in both directions, a generalised model of cumulative choice disability and HIV risk (Fig. 2) shows the associations in men and women. Without any choice disability factors, men have lower HIV

risk than do women. Each additional factor is associated with increased HIV rates (around 10% per factor) for men and women. We recognise that the relative importance of different choice disability factors in relation to the risk of HIV is likely to vary in different contexts.

Whatever the direction of causality, there is good reason to consider the choice-disabled a possible reservoir of HIV infection. Backed into a corner by poverty, partner income disparity, intimate partner violence and lack of education, women might not have recourse to or perhaps motivation for monogamy or protected sex [52, 53]. Insofar as HIV

Table 3 Proportions HIV negative and HIV positive among men and women with increasing numbers of choice-disability factors related to HIV infection in sex stratified models

	Percentage (number)					
	No factors	1 factor	2 factors	3 factors	4 factors	Subtotals
Male						
HIV-negative	95.2 (1378)	93.1 (855)	87.1 (283)	77.8 (42)	66.7 (2)	2560
HIV-positive	4.8 (69)	6.9 (63)	12.9 (42)	22.2 (12)	33.3 (1)	187
						$\chi^2 = 52.2, 4df$
Female						
HIV-negative	92.3 (947)	82.9 (1526)	74.0 (812)	64.0 (220)	60.7 (34)	3539
HIV-positive	7.7 (79)	17.1 (315)	26.0 (286)	36.0 (124)	39.3 (22)	826
						$\chi^2 = 205.4, 4df$

**Fig. 2** Proportions of men and women HIV positive among those with 0, 1, 2, 3, or 4 choice disability factors, based on final models of sex-stratified multivariate analyses

infection accentuates choice disability, their disadvantage is amplified. Whether HIV leads to choice disability or choice disability leads to HIV infection, once they have the infection they go on to infect spouses, casual partners or perpetrators of forced sex.

The strong association of male-reported experience of IPV with HIV (Table 2)—especially in the context of age—raises an issue of interpretation. Although female initiation of IPV in general is well recognised in southern Africa [54, 55], we do not consider the male reported experience of IPV necessarily clarifies who initiated the recent episodes. We did not ask who initiated the episode and we do not have any measure of who was more harmed during any physical altercation between partners.

There is continuing debate about the role of poverty in HIV infection. Our finding of an association between serious poverty (insufficient food in the last week) and HIV infection is in line with the finding in a cross-sectional study in Botswana and Swaziland that women who reported insufficient food were also more likely to report risky sexual behaviours such as inconsistent condom use, transactional sex, and intergenerational sex [56], but at first

glance contrasts with the finding from DHS surveys in sub-Saharan Africa that HIV prevalence was higher in wealthier households [57]. A small study in Botswana found economic independence to be strongly associated with negotiating power and condom use, whereas education was not a crucial factor [58]. Among those who had remunerated employment in our study, people with higher earning employment were at higher risk; this factor dropped out of the multivariate model including extreme poverty.

Two a priori choice-disability factors (lifetime history of sexual violence and condom related choice-disability) were not “active” in the multivariate models. There was an overlap between people who reported lifetime experience of sexual violence and people who reported physical IPV, which did remain in the multivariate models for both men and women. This overlap, with the well recognised association between IPV and HIV [59, 60], could explain why a history of sexual violence did not stay in the multivariate model. Our classification of people as having condom-related risk intention may have included volitional risk-takers; we nevertheless expected an association between this intention to take a risk and HIV status.

Limitations

The sample represents only those present in the households when the interviewers visited. Young men and women in the target age group may have been absent due to work outside the cluster or not near their homes. This could have biased the sample towards those without remunerated employment, who could also be those with lower levels of education.

Around 20% of eligible people declined to participate, a rate similar to that reported in other surveys in the region that included HIV testing [61–63]. Some may have refused because they knew or feared themselves to be HIV infected. It is also possible that those who declined to participate

were different to those who did participate in respect of choice disability. Evidence from Malawi suggests that people who know their HIV-positive status are less likely to accede to testing in a survey and that this may lead to underestimates of HIV prevalence in surveys [64]. In the follow-up impact assessment of our RCCT [39], we will attempt to interview all those who decline to provide a blood sample, in an effort to understand how they are different from those who agree to provide a sample.

Around one half of participants said they had been tested (61.5% in Botswana, 40.5% in Namibia and 37.1% in Swaziland), broadly similar to the proportions reported from other recent surveys in the region [61, 65, 66]. Thus some of those who were HIV positive will have known their status. Knowing they were HIV positive could possibly have influenced the responses among this group. We did not ask respondents if they knew their HIV status, but we did ask if they intended to have a test in the future. Assuming that those who intended to have a test did not know they were HIV positive, we did a subgroup analysis on those who said they intended to take an HIV test. In Botswana, Namibia and Swaziland, 95.2% (837/879), 83.6% (867/1037) and 78.6% (774/985) of male respondents respectively said they intended to take a test; and 97.9% (1591/1625), 91.1% (1481/1626) and 86.1% (1105/1283) of women respectively said this. The subgroup analysis of factors related to HIV status among those who said they intended to have an HIV test produced very much the same results as among the whole group.

Some choice disability factors, like IPV, are notoriously clustered, as is HIV occurrence. We adjusted for the effect this clustering had on our confidence intervals. It is possible, however, that the clustering had an effect on the measured relative risk. We conducted an alternative analysis to focus on the in-cluster dynamics: GEE (exchangeable correlation matrix). This produced almost identical results to the Mantel–Haenszel procedure, possibly because of the fairly large number (78) of fairly large clusters [67].

The evidence of association in this cross-sectional study does not necessarily mean that HIV infection is a consequence of choice disability. Causality is possible and indeed likely in both directions. For those who know and who disclose their HIV status, the infection could affect partner relations; and as the longer term debilitating consequences of the infection come into play, loss of income could affect food security and income parity. There is also a compelling argument that choice disability might lead to HIV infection: people who have experienced IPV are more likely to have risky sexual behaviours [25]; and people who are at material disadvantage to their spouses and the rest of their community are probably less able to implement choices to protect themselves from HIV, such as insisting on a condom or limiting their number of partners.

Conclusion

In an analysis that took into account conventional risk factors like multiple partners and inconsistent condom use, the prominence of choice disability factors suggests that this group of factors could be important in the HIV/AIDS epidemic.

Choice disability is not the same as vulnerability to HIV infection: choice disabled people are likely to be vulnerable to infection, but not all those vulnerable to infection are choice disabled. For example, rape victims are vulnerable and, clearly, choice disabled. Sex workers and men who have sex with men (MSM) may be vulnerable to HIV infection, but they are not necessarily choice disabled. There is an overlap between vulnerability and choice disability, just as the distinctions between sex work, survival sex, and transactional sex are often unclear.

Prevention messages in mass media and individual counselling often start from the premise that everyone is empowered to implement their prevention choice. By developing a unifying construct for people at the weaker end of steep interpersonal power gradients, we hope that a clearer focus on their plight might help to shift the prevention discourse in their favour. Choice disability may be a common mechanism of otherwise daunting or even unassailable dynamics of HIV transmission: extreme poverty, lack of education and IPV. While elimination of these dynamics is beyond HIV prevention budgets of most countries, understanding how they affect the ability to make protective choices and eventually how to mitigate choice disability may help to interrupt the transmission of HIV among these people.

Forced passivity implicit in choice disability could paradoxically drive the epidemic—both through choice disability increasing HIV risk and HIV infection increasing choice disability. Reducing this blind spot in HIV prevention could have compound benefits. If programmes could take into account the choice disabled, more people would implement their prevention and treatment choices, increasing the uptake of investment currently geared for the choice enabled.

Prevention research should focus on interventions that reduce choice-disability. At least three randomised trials in southern Africa have addressed or are addressing this through structural interventions [68], education [69], and a combination of a structural intervention, education and concerting prevention efforts in favour of the choice disabled [39].

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Paper 11.

Andersson N, Omer K, Caldwell D, Dambam MM, Yahya-Maikudi A, Effiong B, Ikpi E, Udofia E, Khan A, Ansari U, Ansari N, Hamel C.

Male responsibility and maternal morbidity: a cross-sectional study in two Nigerian states.

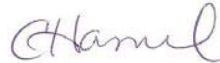
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The contribution of Neil Andersson included design of the study, participation in design of instruments, technical oversight of the survey, analysis of data, conceptualisation of the article, writing and final approval

Neil Andersson



Candyce Hamel

RESEARCH ARTICLE

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Male responsibility and maternal morbidity: a cross-sectional study in two Nigerian states

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Abstract

Background: Nigeria continues to have high rates of maternal morbidity and mortality. This is partly associated with lack of adequate obstetric care, partly with high risks in pregnancy, including heavy work. We examined actionable risk factors and underlying determinants at community level in Bauchi and Cross River States of Nigeria, including several related to male responsibility in pregnancy.

Method: In 2009, field teams visited a stratified (urban/rural) last stage random sample of 180 enumeration areas drawn from the most recent censuses in each of Bauchi and Cross River states. A structured questionnaire administered in face-to-face interviews with women aged 15-49 years documented education, income, recent birth history, knowledge and attitudes related to safe birth, and deliveries in the last three years. Closed questions covered female genital mutilation, intimate partner violence (IPV) in the last year, IPV during the last pregnancy, work during the last pregnancy, and support during pregnancy. The outcome was complications in pregnancy and delivery (eclampsia, sepsis, bleeding) among survivors of childbirth in the last three years. We adjusted bivariate and multivariate analysis for clustering.

Findings: The most consistent and prominent of 28 candidate risk factors and underlying determinants for non-fatal maternal morbidity was intimate partner violence (IPV) during pregnancy (ORa 2.15, 95%CIca 1.43-3.24 in Bauchi and ORa 1.5, 95%CI 1.20-2.03 in Cross River). Other spouse-related factors in the multivariate model included not discussing pregnancy with the spouse and, independently, IPV in the last year. Shortage of food in the last week was a factor in both Bauchi (ORa 1.66, 95%CIca 1.22-2.26) and Cross River (ORa 1.32, 95%CIca 1.15-1.53). Female genital mutilation was a factor among less well to do Bauchi women (ORa 2.1, 95%CIca 1.39-3.17) and all Cross River women (ORa 1.23, 95%CIca 1.1-1.5).

Interpretation: Enhancing clinical protocols and skills can only benefit women in Nigeria and elsewhere. But the violence women experience throughout their lives – genital mutilation, domestic violence, and steep power gradients – is accentuated through pregnancy and childbirth, when women are most vulnerable. IPV especially in pregnancy, women's fear of husbands or partners and not discussing pregnancy are all within men's capacity to change.

Background

Reputedly one of the highest in the world [1,2], maternal mortality in Nigeria rests on two problems not peculiar to Nigeria, that are easy to state but hard to change. First, as in many countries, maternal health services do not work well. Second, also not specific to Nigeria, maternal

deaths follow a life course that puts women at high risk at the time of delivery.

One out of every ten women who attended the Bauchi central referral hospital between 2000-2005 died in relation to childbirth [3]. A review of births over 17 years in neighbouring Plateau State produced much the same figures, indicating the phenomenon is not local [4].

High rates of maternal morbidity and mortality in northern states led some authors to speculate that undervaluing women combines dangerously with harmful traditional medical practices [5]. But studies from the south

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show very similar pictures of late presentation of morbidity at weak emergency services [6-10]. North and south, the common morbidities are puerperal sepsis, haemorrhage, abortion complications, eclampsia and prolonged obstructed labour. Several studies have focussed on factors underlying these problems. "Poverty" receives several mentions [11-13]; although antenatal and delivery services are officially free at government facilities, in practice almost everyone has some expenditure [14,15]. A study of maternity staff knowledge in two south-western states of Nigeria showed many maternity unit operatives lack knowledge and skills of emergency management [16].

Bauchi in the north of Nigeria is predominantly Islamic; polygamy is common. Cross River is the south-eastern corner of the country, and the main religion is Christian (Evangelical and Catholic). As part of the five-year Nigeria Evidence-based Health System Initiative (NEHSI) [17], the state governments of Bauchi and Cross River nominated maternal outcomes as their first health priority for study. This article results from a bigger process of building evidence-based planning capacity in the health sector, to improve the public health. This analysis examined actionable risk factors and underlying determinants for reduction of maternal morbidity and, as a result, mortality in these two states.

Methods

A cross-sectional survey in 180 sites in a stratified last stage random sample of the recent census enumeration areas (EAs) in Bauchi and Cross River states. In each state, a panel of 60 sites provided state level representation; in addition, 10 sites in each of three randomly selected focus local government authorities (LGA) in each state provided increased sensitivity of local analysis. Local interviewers identified women who had been pregnant in the previous three years and administered a questionnaire in their language of choice. There was no sub-sampling within the enumeration area, or within households.

State planners chose the focus of the survey, and participated in review of existing data, design of instruments, training of fieldworkers, supervision of fieldwork, analysis and development of emerging policy implications.

A household interview provided household characteristics and a questionnaire for women asked if respondents had given birth in the last three years. For those that had done so, we obtained information on the pregnancy and its outcome, surgical intervention during the delivery and the state of the child. We asked simple direct questions about occurrence of complications: During this last pregnancy did you have fits or convulsions? Did the wound open up afterwards or become infected? Did you develop high fever within six weeks after this delivery? Did you develop foul-smelling discharge from vagina within six weeks after this delivery?

The principal analysis addressed all these complications together, under the hypothesis that positive spouse involvement in the pregnancy would be associated with fewer complications. We repeated the analysis separately for specific morbidities: pre-eclampsia and sepsis. We defined pre-eclampsia as two or more of the following during pregnancy: raised blood pressure, swelling of face or hands, fits/convulsions, or upon testing of their urine, they received information that something was wrong.

Table 1 lists the potential risk factors and underlying determinants covered as direct closed questions. Interviewers asked women about female genital mutilation (FGM) in two questions, one specifically about circumcision and another about removal of genital flesh. They asked women about physical intimate partner violence (IPV) in the last year and, separately, during the last pregnancy (In the last year, have you had violent arguments where your partner beat, kicked or slapped you? During the pregnancy, did your partner beat, kick or slap you?).

The survey occurred from May to November 2009. In each state we standardized training in non-sample sites, training 20-30 fieldworkers over one week. Some 140 interviewers aged 20-35 years worked in 12 teams (one man and two women per team), conducting a general household interview (female interviewer), a husband/spouse interview (male interviewer), and an interview with women who had been pregnant in the last three years (female interviewer).

Teams covered each enumeration area moving radially outwards, excluding no households or women in the households. In a second visit, a smaller team conducted focus group discussions separately with women and men, and visited the government health facilities mentioned by household respondents. There were 180 male and 180 female focus groups; each with 7-10 members with a total participation of 1434 men and 1544 women. The team also reviewed government prenatal and delivery services nearest to each cluster, including issues like access to water, privacy and qualifications of health workers.

Preliminary results provided a template for gender-stratified focus group discussions in each of the 180 clusters. Facilitators asked questions and used standardized prompts and monitors recorded male and female discussions about work during pregnancy, safe pregnancy and safe birth, IPV and FGM.

Statistical methods

Different operators entered the data twice with validation to minimize keystroke errors. Analysis relied on CIET-map open-source software [18] that offers a user-friendly interface with the now standard statistical programming language R. We weighted all estimates proportional to population within each state, down-weighting the additional sites in the six focus LGAs.

Table 1 Study population and frequency of maternal knowledge and attitudes in Bauchi and Cross River

	<i>Bauchi State</i>		<i>Cross River State</i>	
All women interviewed	11486		14268	
Women with pregnancy in the last three years	7870		7759	
Urban	18.2% 1246/7870		30.3% 2617/7759	
Any formal education	22.1% 1719/7834		93.6% 7200/7720	
Married	97.3% 7653/7860		81.0% 6303/7749	
Sufficient food in the last week	89.8% 7072/7845		81.9% 6303/7743	
Remunerated employment	48.1% 3746/7809		59.4% 4544/7749	
Younger age (lower risk for pregnancy)	82.7% 6577/7854		87.0% 6760/7753	
Number of pregnancies (1-3)	48.1% 3786/7749		62.1% 4609/7468	
Female headed household	0.6% 61/6975		10.3% 676/6574	
Non-crowded household (up to two per room)	34.9% 2547/7428		39.4% 3041/7715	
KNOWLEDGE AND ATTITUDES	Weighted	Unweighted	Weighted	Unweighted
Know any danger in pregnancy (1)	53.5%	53.7% 4174/7775	62.8%	63.4% 4909/7746
Know danger signs in childbirth (2)	52.9%	53.6% 4158/7753	47.3%	47.3% 3661/7742
Women should give up heavy work in pregnancy	42.7%	39.0% 3063/7855	37.7%	38.0% 2946/7756
Believe its not okay for pregnant women to smoke cigarettes	80.1%	79.7% 6257/7854	90.2%	89.4% 6924/7746
Believe women without birth problems still need to deliver at a health facility	34.0%	35.9% 2822/7858	71.6%	71.3% 5523/7745
If pregnant next year, would give up heavy work	36.7%	39.1% 2905/7440	48.7%	48.7% 3771/7747
If pregnant next year, would not smoke cigarettes	98.1%	98.2% 7707/7847	99.5%	99.5% 7707/7748
Involved in decisions regarding pregnancy/ childbirth	0.5%	0.5% 41/7821	25.1%	25.6% 1982/7735
Say they were never beaten	95.7%	95.9% 7493/7817	79.7%	80.1% 6145/7673
Say they were not afraid of their husbands	65.9%	65.7% 5137/7821	67.7%	67.5% 5180/7673
No female circumcision or mutilation	90.8%	89.1% 6265/7028	61.7%	61.0% 4702/7707
ABOUT THE LAST PREGNANCY (last three years)	Weighted	Unweighted	Weighted	Unweighted
Spoke about pregnancy primarily with husband	55.4%	56.1% 4151/7399	32.4%	32.9% 2491/7567
Say they were not beaten in pregnancy	97.4%	97.5% 7406/7600	88.8%	89.1% 6558/7358
Reduced workload before 3 rd trimester	19.2%	19.1% 1467/7701	52.0%	52.2% 3524/6754
Four or more antenatal checkups	40.4%	40.5% 3012/7446	45.4%	46.4% 3273/7057
Took iron/folate at least one trimester	30.5%	32.6% 2434/7475	44.3%	44.7% 2967/6644
Urine checked at antenatal care	41.9%	39.8% 2955/7432	59.8%	61.8% 4564/7381
Blood pressure checked at antenatal care	59.7%	58.7% 4389/7479	71.0%	73.0% 5382/7372
A qualified person delivered the baby in a health facility	16.4%	15.4% 1170/7590	44.8%	45.0% 3198/7107

1. Any of the following responses: pre-eclampsia, eclampsia, fever, bleeding, lap pain, high blood pressure, cord appears, breech/wrong presentation of baby, vomiting, fits/convulsions, uncontrolled urination, baby movements not felt, weakness, anaemia, jaundice, water coming out, malaria

2. Any of the following responses: malposition, premature labour, prolapse, retained placenta, uncontrolled urine, stillbirth, prolonged/obstructed labour, anaemia, weakness, low blood pressure, sepsis, fever, vaginal cut

Sequential bivariate analysis allowed examination of the association of each potential risk factor and underlying determinant in turn with maternal morbidity. To verify that associations of risk factors with maternal morbidity could not be explained by any of the general factors (age, sex, crowding, food security, urban/rural or country) we saturated initial multivariate models with the potential risk factors, then stepped down one variable at a time until only significant associations remained. We followed the same procedure for the Mantel Haenszel procedure and for GEE which accessed Zelig [19], applying an exchangeable correlation structure (logit.gee model, 1000 simulations). We report the adjusted Odds Ratio (ORa) and cluster-adjusted confidence intervals (CIca) using a robust variance estimator to weight the confidence

interval around the Mantel Haenszel Odds Ratio for cluster-correlated data [20,21].

The sample represents only those present at the time of the fieldwork; we have no information on why others were absent. Very few women declined to take the survey and we made no effort to persuade them to do so. More women in Bauchi than in Cross River declined to answer questions about genital mutilation and domestic violence. Clustering effects were different in Bauchi, where polygamy is more widespread and it was more common to have multiple women who gave birth in a single household.

Ethics

In Bauchi, the Ethics Review Committee of the State Ministry of Health provided general approval in April

2009. The Cross River State Research Ethics Committee approved the methods and survey instruments on 28 August 2009, and the qualitative procedures in January 2010.

Results

Female interviewers administered questionnaires to 25,745 women of a possible 30,918 in the two states; 1.2% declined the interview (345 or 1.8% in Cross River and 37 or 0.3% in Bauchi); a further 15% were not available at the time of the visit (4,213 or 22.2% in Cross River, where more women have formal employment, and 429 or 3.6% in Bauchi). A total of 15,621 women had given birth (7,759 in Cross River and 7,862 in Bauchi) in the last three years.

Table 1 lists the frequency of household characteristics, male knowledge and attitudes, antenatal care, work during pregnancy, IPV and FGM, and female knowledge, attitudes, intentions, and agency. One third lived in urban areas in Cross River, one half of that proportion in Bauchi. Nearly all Cross River women had formal education compared with one in every four Bauchi women.

Reports of pre-eclampsia and eclampsia were comparable in Bauchi (10.3% weighted value of 842/7684) and Cross River (13.0% weighted value of 973/7178). However, post-partum sepsis was much more common in Cross River (30.6% weighted value of 2223/7176), compared with 5.6% (weighted value of 473/7724 in Bauchi). The principal analysis combined pre-eclampsia, sepsis and other complications including excessive bleeding and convulsions as maternal morbidity related to pregnancy, delivery or post delivery: 17.8% of women in Bauchi and 43.9% in Cross River reported one of these.

Table 2 shows the bivariate associations between all potential risk factors and underlying determinants studied and maternal morbidity, indicating a number of promising associations. In addition, in both states, postnatal visits were more common among women who reduced work before the third trimester of pregnancy, who had more antenatal check-ups, who delivered at the health centre, who had healthy attitudes to smoking in pregnancy and who were more likely to know of danger signs in pregnancy. In general, women receiving postnatal visits were better off: they were more likely to have some education, less likely to complain of food insecurity and less likely to live in crowded households.

Table 3 shows the final multivariate models for all complications combined. In Bauchi, initial analysis of non-fatal maternal morbidity (pre-eclampsia, sepsis, excessive haemorrhage) showed marked heterogeneity between the minority of women who had a health check up after delivery and the majority who did not. Among those who received a check up, two factors remained in the final model: FGM (ORa 2.10 95%CIca 1.39-3.17) and

four or more pregnancies (ORa 1.48, 95%CIca 1.15-1.90). FGM remained in both models in Cross River.

Physical IPV during pregnancy showed the strongest association with maternal morbidity in all multivariate models except the small group of Bauchi women who had home visits after delivery. This prominent role remained unchanged when we repeated the analysis using GEE.

Among women who had no home visit after delivery, those who had an unqualified birth attendant (most often to a traditional midwife without government approved training, less often to a neighbour or a family member) were more likely to have complications in both states.

We constructed a compound variable of factors related to the role of a husband or partner in the final model: IPV in pregnancy, IPV in the last year, and report that women had not discussed pregnancy with their husband or partner. Women with all three directly husband-related factors were much more likely to report a pregnancy or birth complication than women who had none, one or two of these factors (ORa 2.39, 95%CIca 1.96-2.92, RD 0.207, 222/432 women with all three and 4,397/14,335 who did not). This association was not explained by any of the factors we could take into account in this study.

Table 4 shows the final models for risk factors for pre-eclampsia and sepsis. Both initial models included the risk factors shown in Table 2. As associations with pre-eclampsia were not significantly different in Bauchi and Cross River, we combined the states for analysis of pre-eclampsia. Four variables showed independent associations after adjusting for the others: IPV in the last year, IPV during the pregnancy in question, rural residence and FGM.

In the case of sepsis, the variable "state" modified most bivariate measured associations, so we developed a separate multivariate model for Bauchi and Cross River. In Bauchi, sepsis was independently associated with IPV in the last year, IPV in the last pregnancy, perception of being cared for in pregnancy, age of the mother (younger women more likely to suffer sepsis) and FGM (Table 4). In Cross River, only two variables remained in the final model, IPV in the last year and perception of being cared for during the pregnancy.

Table 5 shows the low levels of male knowledge of pregnancy and delivery, and the high level of good intentions about maternal risks.

Male focus groups discussed what men consider when deciding where a woman should deliver her child. Almost all groups recognized a need for skilled birth attendance, and almost all raised economic considerations in taking advantage of this where it was available. "The man considers the weight of his pocket before deciding where to take the woman for delivery".

Few of the 180 male focus groups saw men as the cause of IPV; nearly all concluded that IPV could be avoided if women prayed, were obedient and patient,

Table 2 Bivariate associations between maternal morbidity and potential risk factors

Variable	Bauchi			Gross River		
	With problem with factor	With problem without factor	OR (95% CI)a	With problem with factor	With problem without factor	OR (95% CI)a
Urban	22.5% 274/1219	18.1% 1155/6378	1.31 (1.00-1.72)	45.7% 1093/2393	43.9% 2097/4777	1.07 (0.90-1.28)
Any formal education	22.5% 374/1660	17.7% 1046/5903	1.35 (1.10-1.66)	44.8% 2971/6637	41.5% 290/496	1.14 (0.94-1.39)
Married	18.7% 1382/7393	22.6% 44/195	0.79 (0.57-1.09)	44.2% 2608/5896	45.6% 577/1264	0.94 (0.82-1.09)
Food security in last week	18.2% 1239/6824	24.8% 186/749	0.67 (0.55-0.81)	42.9% 2502/5835	51.6% 682/1321	0.70 (0.63-0.78)
Remunerated employment	20.7% 753/3629	17.1% 668/3909	1.27 (1.08-1.50)	45.9% 1931/4207	42.5% 1254/2954	1.15 (1.02-1.30)
Low risk age for pregnancy (18-35 yrs)	18.7% 1186/6356	19.7% 242/1226	0.93 (0.79-1.10)	45.1% 2832/6274	40.0% 356/890	1.23 (1.06-1.43)
Times pregnant (1-3 pregnancies)	16.5% 605/3658	20.9% 798/3827	0.75 (0.65-0.87)	44.4% 1945/4385	44.7% 1233/2761	0.99 (0.90-1.08)
Female headed household	25.4% 15/59	18.8% 1251/6672	1.48 (0.73-3.00)	50.6% 159/314	48% 1479/3079	1.16 (0.94-1.42)
Non-crowded households (2/room or less)	19.9% 487/2451	18.4% 870/4719	1.10 (0.94-1.28)	46.7% 652/1395	49.1% 1229/2501	0.86 (0.76-0.97)
Know any danger in pregnancy	20.1% 817/4065	17.3% 596/3441	1.20 (1.06-1.36)	44.5% 2035/4577	44.6% 1151/2583	1.00 (0.90-1.10)
Know danger signs in childbirth	20.2% 817/4042	17.2% 592/3445	1.22 (1.07-1.39)	47.2% 1600/3389	42.0% 1583/3765	1.23 (1.10-1.38)
Believe women should give up heavy work in pregnancy	17.4% 511/2938	19.7% 914/4646	0.86 (0.75-0.98)	44.7% 1217/2720	44.3% 2476/4448	1.02 (0.91-1.14)
Believe it's not okay for pregnant women to smoke cigarettes	18.2% 1100/6046	21.2% 326/1536	0.83 (0.70-0.98)	45.8% 3467/6393	34.1% 261/765	1.63 (1.36-1.95)
Believe women without birth problems still need to deliver at a health facility	19.2% 526/2742	18.6% 899/4843	1.04 (0.89-1.21)	45.2% 2305/5105	42.8% 879/2052	1.10 (0.99-1.22)
Intention: If pregnant next year, would give up heavy work	18.4% 515/2800	19.4% 849/4381	0.94 (0.83-1.06)	45.2% 1573/3477	43.8% 1614/3681	1.06 (0.94-1.19)
Intention: If pregnant next year, would not smoke cigarettes	18.6% 1387/7443	26.3% 35/133	0.64 (0.38-1.07)	44.5% 3170/7120	33.3% (26/39)	1.61 (0.77-3.33)
Involved in decisions regarding pregnancy/childbirth	45.0% 18/40	18.7% 1404/7514	3.56 (1.98-6.39)	46.9% 849/1811	43.7% 2335/5340	1.14 (1.00-1.28)
Spoke about pregnancy primarily with husband	20.1% 802/3956	17.3% 546/3156	1.20 (1.06-1.37)	42.8% 1006/2349	45.4% 2115/4654	0.90 (0.80-1.01)
Say they were not ever beaten	18.4% 1332/7236	28.2% 89/316	0.58 (0.41-0.81)	42.4% 2414/5695	53.1% 745/1403	0.65 (0.58-0.73)
Say they were not beaten in pregnancy	18.9% 1357/7183	24.6% 46/187	0.71 (0.48-1.07)	43.3% 2732/6307	53.8% 415/772	0.66 (0.56-0.77)

Table 2 Bivariate associations between maternal morbidity and potential risk factors (Continued)

Say they were not afraid of their husbands	18.6% 933/5018	19.1% 486/2538	0.96 (0.81-1.15)	43.0% 2062/4795	47.6% 1096/2304	0.83 (0.73-0.94)
Reduced workload before third trimester	22.5% 318/1416	18.0% 1084/6023	1.32 (1.10-1.58)	42.7% 1424/3334	45.9% 1444/3149	0.88 (0.79-0.98)
Had four or more antenatal check-ups	22.0% 650/2952	16.9% 726/4300	1.39 (1.19-1.62)	44.1% 1418/3218	45.4% 1628/3582	0.95 (0.84-1.06)
Took iron-folate at least one trimester	20.8% 496/2385	17.5% 850/4847	1.23 (1.06-1.44)	44.8% 1300/2904	44.8% 1155/3470	1.00 (0.90-1.11)
Urine checked at antenatal clinic	21.4% 619/2891	17.5% 758/4324	1.28 (1.07-1.54)	43.0% 1890/4400	47.1% 1271/2700	0.85 (0.74-0.96)
Blood pressure checked at antenatal clinic	20.8% 892/4294	16.6% 492/2965	1.32 (1.09-1.60)	43.4% 2256/5204	47.6% 898/1885	0.84 (0.72-0.98)
Qualified person at delivery at health facility	28.0% 321/1147	16.8% 1046/6211	1.92 (1.59-2.31)	41.8% 1322/3162	46.8% 1816/3882	0.82 (0.72-0.93)
Did not experience female circumcision	18.5% 1121/6074	23.8% 176/741	0.73 (0.58-0.90)	42.6% 1851/4346	47.6% 1323/2779	0.82 (0.73-0.91)

Table 3 Multivariate analysis of non-fatal maternal morbidity risk factors

	OR unadjusted	Mantel Haenszel analysis with cluster adjustment		GEE with exchangeable correlation matrix	
		OR ¹ adjusted	Cluster adjusted 95%CI	OR ²	Robust 95%CI
Bauchi					
<u>With check-up after delivery</u>		n=1137		n=1307	
FGM	2.13	2.1	1.39-3.17	1.93	1.35-2.77
4+ pregnancies	1.49	1.48	1.15-1.90	1.46	1.14-1.87
<u>No check-up after delivery</u>		n=5196		n=6005	
Did not speak primarily with husband	1.35	1.41	1.21-1.67	ns	
Physical IPV in pregnancy	2.15	2.15	1.43-3.24	2.12	1.41-3.18
Unqualified birth attendant	1.59	1.61	1.23-2.13	1.48	1.17-1.86
Insufficient food last week	1.68	1.66	1.22-2.26	1.46	1.14-1.86
4+ pregnancies	1.26	1.24	1.05-1.48	1.28	1.08-1.51
Less than 4 ANC check-ups	1.24	ns	ns	1.24	1.05-1.46
Cross River					
<u>With check-up after delivery</u>		n=2201		n=2307	
IPV last year	1.6	1.56	1.20-2.03	1.58	1.24-2.02
FGM	1.28	1.29	1.10-1.51	1.3	1.12-1.50
Did not speak primarily with husband	1.28	1.31	1.11-1.55	1.25	1.07-1.48
Crowded home (>2/room)	1.27	1.27	1.07-1.51	1.27	1.07-1.51
Formal employment	1.25	1.22	1.01-1.49	ns	ns
<u>No check-up after delivery</u>		n=4221		n=4856	
IPV last year	1.5	1.43	1.24-1.65	1.3	1.10-1.54
FGM	1.2	1.19	1.03-1.37	ns	ns
Physical IPV in pregnancy		ns	ns	1.37	1.09-1.74
Unqualified birth attendant	1.33	1.22	1.05-1.41	ns	ns
Insufficient food last week	1.42	1.32	1.15-1.53	1.28	1.10-1.48
Aged 18-35 years	1.32	1.3	1.06-1.59	1.39	1.14-1.71
Did not reduce workload	1.26	1.21	1.08-1.35	1.14	1.02-1.27

¹Odds Ratio for the association between the variable and maternal morbidity, adjusted for all other variables in the final multivariate model. The initial model was based on the covariates in Table 2

²An identical modelling process served for GEE

ns = not statistically significant at the 5% level

Table 4 Multivariate analysis of risk factors for pre-eclampsia and sepsis

	Cross River			
	OR ¹ adjusted	Cluster adjusted 95%CI	OR ¹ adjusted	Cluster adjusted 95%CI
Pre-eclampsia				
Bauchi and Cross River				
IPV last year	1.39	1.17-1.65		
IPV during this pregnancy	1.27	1.01-1.58		
Rural residence	1.38	1.17-1.62		
FGM	1.15	1.02-1.29		
Sepsis				
Bauchi n=6992				
IPV in last year	1.4	1.22-1.61	2.29	1.42-3.68
IPV in last pregnancy	1.27	1.06-1.53		
Did not feel cared for during pregnancy	1.35	1.15-1.59	1.65	1.21-2.24
Age over 30 years	1.18	1.03-1.34		
FGM	1.21	1.08-1.40		

¹ Odds Ratio for the association between the variable and maternal morbidity, adjusted for all other variables in the final multivariate model. The initial model was based on the covariates in Table 2

Table 5 Male knowledge and attitudes about pregnancy and childbirth in Bauchi and Cross River States, Nigeria

	Bauchi State		Cross River State	
	2433	2623	2433	2623
Men interviewed				
Know any danger in pregnancy (1)	31.1%	31.0% 706/2276	37.1%	35.9% 874/2432
Know danger signs in childbirth (2)	44.7%	41.7% 947/2273	38.1%	37.8% 921/2435
Agree male health workers can do antenatal checkups	28.6%	30.4% 714/2352	82.2%	82.1% 2033/2477
Agree male health worker can do deliveries	21.9%	23.6% 554/2351	76.1%	76.1% 1886/2477
Agree it's good pregnant women get together to talk	94.2%	95.5% 2243/2350	94.3%	94.4% 2331/2469
Agree that women should give up heavy work in pregnancy	45.1%	40.2% 944/2351	44.4%	44.3% 1099/2479
Agree it's not okay for pregnant women to smoke cigarettes	77.8%	80.3% 1888/2352	90.6%	90.7% 2249/2480
Agree women with birth complications should deliver at a health facility	98.3%	98.5% 2313/2348	99.0%	98.9% 2451/2478
Believe women sometimes deserve to be beaten	9.8%	8.8% 205/2339	29.3%	29.2% 723/2475
Believe "in my culture, it is acceptable for a man to beat his wife"	7.5%	6.9% 161/2342	20.8%	20.5% 506/2472
Believe violence between a man and a woman is private and others should not interfere	46.3%	45.6% 1069/2344	73.9%	74.8% 1852/2475
Willing to take time to accompany wife if she had danger in childbirth	70.3%	68.8% 1531/2226	97.6%	97.4% 2321/2382
Willing to spend on transport for wife if she had danger in childbirth	96.6%	96.6% 2209/2288	86.1%	87.2% 2118/2429
In future, if wife had danger in childbirth, would take her to health facility	96.2%	96.9% 2203/2273	92.7%	93.5% 2279/2438
Main source of information on pregnancy and childbirth				
Don't get any	4.1%	4.2% 96/2316	2.4%	2.6% 63/2468
Family/friends	26.5%	26.3% 610/2316	23.6%	24.2% 596/2468
Media	43.3%	39.1% 905/2316	17.0%	16.9% 417/2468
Health worker	26.0%	30.3% 702/2316	55.3%	54.5% 1344/2468

1. Any of the following responses: pre-eclampsia, eclampsia, fever, bleeding, lap pain, high blood pressure, cord appears, breech/wrong presentation of baby, vomiting, fits/convulsions, uncontrolled urination, baby movements not felt, weakness, anaemia, jaundice, water coming out, malaria

2. Any of the following responses: malposition, premature labour, prolapse, retained placenta, uncontrolled urine, stillbirth, prolonged/obstructed labour, anaemia, weakness, low blood pressure, sepsis, fever, vaginal cut

and never refused sex. Asked how IPV could be avoided, several groups suggested increasing women's incomes. The focus groups were uniform in the belief that IPV is a private matter, reporting of IPV bringing shame, disgrace and "greater divisions". In Cross River, men quoted the Bible ("What God has joined together, let no man put asunder") as the reason for not reporting IPV. In both states, men gave prominence to community leaders and religious leaders to stop the violence. Despite the strong and uniform belief that IPV is a private matter, many male groups were in favour of locally administered punitive schemes, typically a fine for beating one's wife being a goat, or cash ranging from N500 to N10,000 (US\$4-70). Asked what men could do themselves, most groups felt they had the power to stop IPV, "As heads of the households, we can do it".

A clear theme in the 180 female focus groups was self-blame for the IPV ("strong mouth", disobedient, demanding or refusing sex). Some concluded that men were "naturally violent so there is nothing you can do". Others said pregnancy was a cause of violence as it made women irritable and too tired to have sex. They saw marital infidelity as a common cause, whether the woman or man was cheating. Across all regions of both states, women saw money as a major cause. According to women in Cross River, "the Bible says that the wife does not have rights over her body, so we should submit our body to our husbands..." and "the Bible says that God created the woman out of Adam's rib, the woman should be under the man and should be humble to the man's relatives to avoid being beaten by the man." In Cross River, women saw IPV as a family matter, to be resolved at home. In clear contrast, no women's focus group in Bauchi reported this view.

Discussion

Within the constraints of a cross-sectional survey of childbirth survivors, IPV during pregnancy and history of IPV in the last year were the most prominent risk factors or underlying determinants for maternal morbidity in both Bauchi and Cross River.

This study relies on self-reporting of morbidity by survivors of childbirth. Reports of morbidity were quite different between the two states, compatible with different levels of health literacy and the marked differences in women's education between the states. We reduced the effect of this by analysing the two states separately and combining types of maternal morbidity. Despite this reporting difference, spouse-related factors (IPV in the last year, IPV in pregnancy, did not discuss pregnancy primarily with husband) were prominent in both states.

Analysis of individual morbidities (pre-eclampsia and sepsis) showed very much the same picture.

We were initially surprised that women in Cross River reported more delivery complications than women in Bauchi, although many more in River Cross benefited from institutional deliveries. Women in Cross River were also more likely to report IPV and FGM. We do not interpret this to mean these risks are actually higher in Cross River, rather that those women who suffered them were less likely to report them if they were less educated and had less contact with health services. Female education levels were much lower and far fewer women had institutional deliveries in Bauchi than in Cross River. Although we have no detailed information on this from the questionnaires, it is plausible that less educated women considered these problems normal or, having survived, inconsequential. There may also be different social imperatives, interpretations of family pride, between Cross River and Bauchi. This likely under-reporting of complications among women who are at highest risk invalidates unstratified comparison of rates in Bauchi and Cross River. However, it is difficult to compare rates among educated women who have access to care, because there are so few such women in Bauchi.

Associations with maternal morbidity differed between the advantaged women receiving a postnatal home visit, and the majority of women who did not. We offset this by analyzing the groups separately. In both states, those who received a home visit were evidently better off and more engaged with the health services; their risk factors in Bauchi were physical, FGM and multiple (four or more) pregnancies. In all other groups, IPV and socio-economic factors were prominent.

This was a cross-sectional study, with all the usual issues of direction of causality of even the strongest associations. Some spouse-related factors not specific to the pregnancy (IPV in the last year) might be causally related to maternal outcomes or they might result from the maternal outcome or something else shared with the maternal outcome that we neglected to study. It seems likely that the IPV reported during pregnancy preceded the maternal morbidity; it is also possible that women who suffered complications remembered violence differently. Either way, the associations are a cause for concern for pregnant women.

Husband related risk factors and underlying determinants affect many women. Some 45% of women in Bauchi and 68% in Cross River did not say they discussed their pregnancy primarily with their husbands or partners. Only one in five women in Bauchi and one half in Cross River reduced their workload before the third trimester (Table 1). Related to patriarchy though not narrowly to the behaviour of the husband during pregnancy [22], at least one in every ten Bauchi women and four in ten Cross River women entered reproductive life with mutilated genitals.

The protective association between maternal morbidity and the birth attendance by a qualified midwife in both Bauchi and Cross River (Tables 3 and 4) is especially important given the low level of participation of women in decisions about where the birth should be attended. In Bauchi, only 15.6% of women we interviewed had delivered in a health facility. Although the household survey showed good intentions if little knowledge among male respondents (Table 5), focus groups with men showed a prominent belief that maternal outcomes were a question for health services.

The levels of IPV we detected in the two states are within the range of other studies of IPV in pregnancy in Nigeria [23-25]. Associations of maternal morbidity with IPV are well documented in eclampsia [26,27], pre-term delivery [28,29], mental health [30,31], alcohol and tobacco use [32], and health seeking behaviour [33-35]. Little is known of the mechanisms underlying these associations with IPV, and our study is not the design to add major insights. Depression [31,36] and stress [30] are plausible intermediaries. Whatever the mechanism, it is clear that men play an important if not pivotal role – and it is a role they can change. The few calls for men to play a role in favour of prevention of maternal mortality [37-39] have not been accompanied by larger scale programmes that address maternal morbidity through working with men.

Conclusions

In this study as in others in other places, violence against women is strongly associated with maternal morbidity. Reduction of these risk factors and underlying determinants involves spouses, independent of the health services. The sample represents the northern Bauchi state and Cross River in the south east of Nigeria. High levels of FGM, maternal mortality and pregnancy complications in the predominantly Christian south contradict any notion that these are limited to the predominantly Muslim north. Across these widely different settings and consistent with existing literature, male responsibility is important in maternal mortality.

Our focus on men in prevention of maternal morbidity does not detract from the good reasons to increase coverage with antenatal care and access to health facilities. Enhancing the clinical protocols and skills of health workers can only be of benefit to women in Nigeria and elsewhere. But, with prominence of men in the strongest risk factors for and underlying determinants of maternal morbidity, efforts to increase coverage and quality of obstetric care should take care not to bolster the male belief that maternal health is not their responsibility.

Our study opens another arena for reduction of maternal morbidity, with men as possible agents for change. The violence women experience throughout their lives – genital mutilation, domestic violence, and steep power

gradients – is accentuated through pregnancy and childbirth, when women are most vulnerable. IPV especially in pregnancy, women's fear of husbands or partners and being able to discuss pregnancy with their husbands or partners are all within the male domain.

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Competing interests

The authors declare they have no competing interests.

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Appendices

Appendix 1. 75 recent studies of intimate partner violence

Appendix 2. Missing data in 75 recent studies of intimate partner violence

Appendix 3. Risk factors identified and analytical approach of 75 recent studies of intimate partner violence

Appendix 1. Recent studies of intimate partner violence (IPV)

Study	Country	Study Sample	% reporting physical IPV
Experimental Studies			
Abrahams et al. 2010 [cited by 2]	South Africa	Rape survivors in the Western and Eastern Cape	Baseline: 100% experienced sexual violence (eligibility requirement)
Bair-Merritt et al. 2010 [cited by 4]	USA	Families with an infant at high-risk for child maltreatment	Baseline: 4.2 mean IPV victimizations and 10.5 perpetrations in past year (intervention); 5.7 means IPV victimizations and 10.4 perpetrations in past year (control) Victimizations at 1 yr: 45% (intervention), 44% (control)
Beattie et al. 2010 [cited by 3]	India	Female sex workers in Karnataka state	Baseline: 413/3852 (11.0%) FSWs in face-to-face interviews and 26.4% of FSWs in an-anonymous questionnaire reported being beaten or raped in the past year
Jewkes et al. 2008 [cited by 85]	South Africa	Men and women aged 15-26 yrs	Baseline: Women: 177/715 or 24.7% (intervention); 157/701 or 22.4% (control) Men: 100/694 or 14.5% (intervention); 96/666 or 14.5% (control)
Kalichman et al. 2009 [cited by 13]	South Africa	Xhosa men in Capetown	Baseline: 135/242 or 56% (intervention) and 109/233 or 47% (control) had hit/pushed a sex partner; 47/242 or 20% (intervention) and 40/233 or 17% (control) had used force to obtain sex
Kiely et al. 2010 [cited by 4]	USA	Pregnant minority women aged 18 + yrs attending prenatal care sites	Baseline: 169/521 or 32% (intervention) and 167/523 or 32% (control) experienced IPV victimization (physical and/or sexual) in past year
Kim et al. 2009 [cited by 13]	South Africa	Cases in hospital rape registry in rural South Africa	Baseline: 100% (eligibility requirement)
MacGowan 1997 [cited by 57]	USA	Middle school students in Miami	n/a (question not asked)
McFarlane et al. 2000 [cited by 2000]	USA	Pregnant, physically abused Hispanic women	Baseline: 100% (eligibility requirement)
McFarlane et al. 2006 [cited by 67]	USA	Abused women attending primary care public health and Women, Infants & Children (WIC) clinics	Baseline: 100% (eligibility requirement)
Melendez et al. 2003 [cited by 32]	USA	Women aged 18-30 yrs attending family planning clinic in Brooklyn, NY with unknown/neg HIV status	Baseline: 152/360 (42%) of all participants experienced physical IPV in past yr
Pronyk et al. 2006 [cited by 190] and Kim et al. 2007 [cited by 68]	South Africa	Rural villages (poor women)	Baseline: 22/193 or 11% (Intervention groups), 16/177 or 9% (Control groups)
Rau et al. 2010 [cited by 1]	USA	Male Navy personnel	Baseline: 20% reported engaging in some form of coercive sexual behavior and 4% admitted prior rape of a woman
Surratt et al. 2010 [cited by 1]	USA	Drug-using female sex workers aged 18-50 yrs in Miami	Baseline: 104/410 or 25% (intervention) and 83/396 or 21% (control) experienced physical victimization in past 90 days; 81/410 or 20% (intervention) and 58/396 or 15% (control) experience sexual victimization in past 90 days
Taft et al. 2011 [cited by 5]	Australia	Women 16+ yrs pregnant and/or with children under five whom GPs or MCH nurses identify as abused or at risk	Baseline CAS(IPV) score 7+: 71/90 or 79% (intervention); 32/43 or 74% (control)

Study	Country	Study Sample	% reporting physical IPV
Taylor et al. 2010 [cited by 1]	USA	Middle school students in Cleveland, Ohio	Baseline: 445/1592 (28%) experienced lifetime dating violence; 334/1592 (21%) perpetrated lifetime dating violence
Tiwari et al. 2005 [cited by 45]	China	Pregnant women with a history of IPV in Hong Kong	Baseline: 32/55 or 58% (intervention) and 35/55 or 64% (control) experienced psychological IPV; 23/55 or 42% (intervention) and 20/55 or 36% (control) physical IPV; 4/55 or 7.4% (intervention) and 8/55 or 15% (control) sexual IPV
Wechsberg et al. 2006 [cited by 45]	South Africa	Female sex workers in Pretoria	Baseline: 32% had been physically abused and 55% had been sexually abused before age 17
Weir et al. 2009 [cited by 4]	USA	Women involved in criminal justice system at risk for HIV	Baseline: 27% (control group); 32% (intervention group)
Wolfe et al. 2009 [cited by 14]	Canada	Schools with grade 9 health classes in Ontario	Baseline: 10/967 or 1% students (intervention) 8/754 or 1.1% students (control) experienced physical dating violence in past yr; 261/967 or 27% students (intervention) and 173/754 or 23% students (control) experienced peer violence in past 3 mo
Weisz et al. 2001 [cited by 39]	USA	African American youth at inner-city school	Not reported
Yeater et al. [cited by 6]	USA	College undergraduate women	Baseline (Time 1): 62% (intervention) and 56% (control) had ever experienced SV Time 2: 12/53 or 23% (intervention) and 10/57 or 18% (control) experienced sexual victimization between time 1 and 2 Time 3: 6/53 or 11% (intervention) and 10/57 or 18% (control) experience SV between time 2 and 3
Longitudinal Studies			
Cohen et al. 2000 [cited by 206]	USA	Women aged 13+ yrs with HIV or at risk for HIV	66% HIV+ and 67% HIV- experienced lifetime DV; 31% HIV+ and 27% HIV- experienced childhood sexual abuse
Gilbert et al. 2007 [cited by 12]	USA	Men aged 18 yrs using methadone	Baseline: 28% perpetrated physical or injurious IPV
Gruskin et al. 2002 [cited by 17]	USA	HIV+ and HIV- women in US cities	Baseline: 458 or 64% HIV+ and 222 or 67% HIV- were ever physically abused as an adult; 312 or 44% HIV+ and 158 or 48% HIV- ever sexually abused as adult
Jewkes et al. 2010 [cited by 22]	South Africa	HIV- men and women 15-26 yrs	417/1099 (37.9%) reported violence and 682/1099 reported no violence
Martinez-Torteya et al. 2009 [cited by 12]	USA	Mother-child (2-4 yrs old) dyads	Analysis of larger cohort study to explore effects of DV on women and their children*190 mother-child pairs selected from original sample of 206* 113/190 exposed to DV (note: study oversampled for DV exposure) and 77 not exposed
Olowookere et al. 2010 [cited by 1]	Nigeria	Clients given PEP at hospital's ARV clinic	50% clients received PEP as result of rape
Wingwood et al. 2009 [cited by 2]	USA	Unmarried sexually active African American women aged 18-29 yrs	95/424 or 22.4% reported recent sexual abuse
Zablotska et al. 2009 [cited by 21]	Uganda	Young women aged 15-24 yrs in Rakai	Baseline: 50.2% reported physical IPV in past and 26.9% in previous year; 22.4% had experienced sexual coercion in past and 13.4% in previous year; 409 (12.0%) reported both physical violence and sexual coercion in previous year

Study	Country	Study Sample	% reporting physical IPV
Cross-sectional Studies			
Abramsky 2011 [not yet cited]	WHO multi-country (Bangladesh, Brazil, Ethiopia, Japan, Namibia, Peru, Republic of Tanzania, Samoa, Serbia and Montenegro, and Thailand)	Women aged 15-49 yrs who were currently or previously partnered	24097 women 15-49 yrs in 10 countries completed interviews*19517 were ever-partnered*included 15207 in 'prior to relationship' analysis and 15058 in 'current situation' analysis*do not provide prevalence of IPV
Akmatov et al. 2008 [cited by 1]	Egypt	Female DHS participants	Use data from 1995 and 2005 DHS surveys) 1995: 17.5% of 7122 women experienced wife beating in the last 12 months 2005: 18.9% of 5612 women experienced wife beating in the last 12 months
Amowitz et al. 2004 [cited by 40]	Iraq	Men and women 18 yrs and older	930/1991 (47%) households reported 1 or more abuses
Amowitz et al. 2002 [cited by 97]	Sierra Leone	Internally displaced women and their household members in IDP camps and 1 town in Sierra Leone	12.6 (1157/9166) reported incidents of specific war-related human rights abuses (beaten, shot, killed, tortures, seriously injured, sexually assaulted, raped, abducted, violence amputations, forced labour by combatants)
Anastario 2009 [cited by 1]	Mississippi USA	Internally displaced people living in trailer parks in Mississippi post-Katrina	Total (2006+2007): 29.2% (122/418) lifetime IPV; 6.2% (26/418) recent IPV; 27.2% (112/412) lifetime sexual violence; 1.5% (6/412) recent SV; 41.9% (175/418) lifetime GBV; 6.7% (28/418) recent GBV
Andersson et al. 2007 [cited by 20]	Southern Africa (8 countries)	Men and women in Southern Africa	16% of men and 18% of women reported partner physical violence in the last year (weighted)
	Botswana		Males: 189/929 (crude); 21% (weighted) Females: 257/1371 (crude); 19% (weighted)
	Lesotho		Males: 91/768 (crude); 12% (weighted) Females: 207/1309 (crude); 16% (weighted)
	Malawi		Males: 92/1109 (crude); 6% (weighted) Females: 176/1586 (crude); 11% (weighted)
	Mozambique		Males: 70/930 (crude); 6% (weighted) Females: 148/1374 (crude); 11% (weighted)
	Namibia		Males: 168/1113 (crude); 15% (weighted) Females: 233/1382 (crude); 17% (weighted)
	Swaziland		Males: 162/1261 (crude); 21% (weighted) Females: 221/1034 (crude); 21% (weighted)
	Zambia		Males: 337/1261 (crude); 27% (weighted) Females: 538/1509 (crude); 36% (weighted)
	Zimbabwe		Males: 205/1231 (crude); 17% (weighted) Females: 252/1498 (crude); 17% (weighted)
Andersson et al. 2009 [cited by 10], 2010 [not yet cited]	Pakistan	Women >14 yrs in Pakistan (national survey)	2/3 women experienced one or more forms of abuse (verbal, emotional, restrictions, physical abuse, sexual abuse); 30 % (7897/23408) disclosed they had suffered beatings
Antai 2011 [not yet cited]	Nigeria	Women aged 15-49 yrs currently or formerly married or cohabitating with male partner	15% lifetime physical violence; 3% lifetime sexual violence
Da Silva et al. 2010 [not yet cited]	Brazil	Women aged 19 or older who were not pregnant, receiving care at gynecology outpatient clinic in city of Recife, Brazil	619 women 19 yrs+ participated*29/619 (4.7%) reported having been subjected to physical aggression
Decker et al. 2010 [cited by 4]	Thailand	Female sex workers	(14.6%) reported being the target of physical or sexual violence in the context of sex work in the week before the survey

Study	Country	Study Sample	% reporting physical IPV
Djikanovic B 2010 [not yet cited]	Serbia	Women aged 15-49 yrs who were ever cohabited with their male intimate partner	26.2% (259/988) women aged 15-49 yrs reported lifetime violence ('yes' any of six acts of physical violence or one of three acts of sexual violence)
Dunkle et al. 2004 [cited by 411]	South Africa	Women attending antenatal care clinics in Soweto	756/1375 (55%) reported a history of physical or sexual assault from a male partner
Ellsberg 2008 [cited by 75]; Garcia et al. 2006 [cited by 224]	WHO multi-country Bangladesh, Brazil, Ethiopia, Japan, Namibia, Peru, Republic of Tanzania, Samoa, Serbia Montenegro, and Thailand)	Women aged 15-49 yrs who were ever partnered	24097 women 15-49 yrs in 10 countries completed interviews*19568 were ever-partnered*15-71 % of ever-partnered women reported that they had experienced physical or sexual violence, or both, ever, by a current or former partner.
Foluso et al. 2011 [not yet cited]	Nigeria	Widows aged 20-60 yrs across Nigeria	19% experience severe or very severe sexual abuse; 72% experience very severe cultural abuse; 71% experience very severe psychological trauma
Francisco 2010 [not yet cited]	Uganda	Men and women 18-49 yrs in Kampala	<u>Men:</u> 337/581 (58%) perpetrated psychological/physical/sexual IPV; 142/581 (24%) perpetrated physical or sexual IPV <u>Women with current sexual partner:</u> 395/512 (77%) experienced psychological/physical/sexual IPV; 40/512 (8%) experienced physical and sexual IPV
Gass et al. 2010 [cited by 1]	South Africa	Married and cohabiting women 18 or older	Analysis of South Africa Stress and Health (SASH) study dataset, a cross-sectional study of 4151 adult South Africans age 18+ yrs*Used subset of 1229 women who were currently married or in a cohabiting relationship*31% reported IPV in their most recent relationship
Go et al. 2011	India	Female wine shop-centered sex workers in Chennai	331/522 (63%) reported having forced sex with at least one partner in last 3 mos.
Helweg-Larsen 2011 [note yet cited]	Denmark	Men and women in Denmark	727/13383 (5.4%) participants (men and women) answered affirmatively to at least one question on violence
Jeyaseelan 2007 [cited by 20]	India	Women aged 15-49 yrs living with a child less than 18 yrs	26% (2593/9938) reported any physical violence (hit, kick, beat) in their lifetime of marriage
Johnson et al. 2008 [cited by 27]	Liberia	Adults (men and women) aged 18 yrs or older in Liberia	1696 target households*1666 participants*549 former combatants (367 male, 182 female)*32.2% (118/367) male and 44.0% (80/182) female combatants experienced lifetime sexual violence
Johnson et al. 2010 [cited by 27]	DRC	Adults (men and women) aged 18 yrs or older in DRC	169/559 (30.2%) women, 68/362 (51.5%) men, 237/921 (25.7%) total experienced IPV
Johnson et al. 2011 [not yet cited]	USA	HIV- sexually active substance using women 18 yrs+ reporting history of a PTSD event	457/732 (67%) experienced rape (vs. other non-sexual PTSD events)
Kapadia et al. 2010 [not yet cited]	Pakistan	Pregnant women 15-49 yrs delivering at tertiary hospitals ever married and residing with their husband for at least past 1 yr in	500women were eligible and interviewed*104/500 (21%) reported being sexually abused in their marital life by intimate partner

Study	Country	Study Sample	% reporting physical IPV
		Karachi, Pakistan	
Maman et al. 2010 [cited by 41]	Tanzania	Men 16-24 yrs in Dar es Salaam who had had sex in the last 6 mos.	29.2% had been physically violent at least once with intimate partner; 11.6% had ever used physical violence to make a partner have sex against her will; 8.3% had reacted violently to a partner who refused sex.
Nada et al. 2010 [cited by 1]	Egypt	Male and female youth aged 12-17 yrs living on the street in Cairo	385/857 (45%) reported physical violence/abuse; 100/857 (12%) reported sexual abuse
Nayak et al. 2010 [cited by 4]	India	Women aged 18-49 yrs in rural and urban North Goa, India	Subset of 821 partnered women 18-49 yrs selected from broader sample of 938* 77/791 (4.2%) reported violence by male partner
Nguyen 2008 [cited by 11]	Vietnam	Married or partnered women aged 17-60 yrs in rural Ha Tay province, Vietnam	30.9% (273/883) any violence (physical, psychological, sexual) in lifetime
Paredes-Solis et al. 2005 [cited by 8]	Mexico	Women aged 15-49 years in Ometepepec, Mexico that have had at least 1 pregnancy in the last three years	21% (109/523) reported history of physical abuse and 5.6% reported physical abuse during the last pregnancy
Ravi et al. 2007 [cited by 10]	USA	Incarcerated women in Connecticut	1017/1565 or 65% of sample experienced physical or sexual violence
Rico et al. 2011 [not yet cited]	Egypt, Honduras, Kenya Malawi Rwanda	Ever-partnered women with birth recorded from DHS	Analysis of data from DHS surveys in various countries*selected ever partnered women included in IPV module of DHS (IPV statistics not reported)
Sarkar et al. 2008	India	Brothel-based female sex workers in West Bengal	166/580 (28.6%) reported physical or sexual violence in the early phase of their profession; 15% reported physical violence; 55% reported sexual violence; 30% reported both physical and sexual violence
Schnitzer 2010 [cited by 7]	9 European countries	Nightlife male and female users 16-34 yrs	No raw data but estimate 77.3% (1035.82/1340) participants (men and women 16-35 yrs) were involved in a physical fight in a nightlife environment in the past 12 months
Silverman et al. 2008 [cited by 43]	India	Currently married female participants	28139 of 124385 were eligible and included in analysis*35.49% reported experiencing physical violence with or without sexual violence from their husbands
Smith et al. 2008 [cited by 12]	USA	BRFSS participants (men and women) in USA	219911 women in dataset, 49756 women identified themselves as having an activity limitation or disability (occurrence of IPV not reported)
Solomon et al. 2009 [cited by 3]	India	Low income women in Chennai	1948/1974 (98.7%) lifetime verbal abuse; 1963/1974 (99.4%) lifetime physical abuse; 1478/1974 (74.9%) lifetime forced sex
Speizer et al. 2009 [cited by 8]	South Africa	Sexually active unmarried female youth	11% had ever been threatened or forced to have sex
Swain et al. 2011 [not yet cited]	India	Mobile female sex workers	1676/5498 (30.5%) experienced violence at least once in past year; 11% experienced physical violence; 19.5% experienced sexual violence
Tanha et al. 2010 [cited by 2]	USA	Matched sample of divorcing couples participating in divorce mediation	1015 couples (2030 individuals) going through divorce remediation given RBRS (Relationship Behaviour Rating Scale)*762 couples completed all items in RBRS (No raw data or descriptive statistics, only stratified analysis; occurrence of violence not reported)
Townsend et al. 2011 [cited by 4]	South Africa	Men who have multiple concurrent female sexual	46.2% reported physical IPV; 18.9% reported sexual IPV; 41.5% reported perpetrating any IPV in the past 12 months; 27.6% reported

Study	Country	Study Sample	% reporting physical IPV
		partners in Capetown	multiple episodes of any IPV in the past 12 months
Uthman et al. 2009 [cited by 3]	17 sub-Saharan countries	DHS participants (men and women)	Key indicator was 'justifies intimate partner violence against women.' Only graphs provided so can't calculate % that justified violence.
Wubs 2009 [cited by 2]	Tanzania and South Africa	Students previously or currently in a relationship in Capetown, Dar es Salaam, and Mankweng	977/6979 or 14% (571 male, 406 female) had a boy/girlfriend who beat them up
Zorrilla 2010 [cited by 1]	Spain	Women aged 18-70 yrs living in the Madrid region for a period of 12 months or more who had a partner or were in contact with a previous partner in the preceding year	10.1% experienced some type of IPV in the previous year

Appendix 2. Missing Data in 75 recent studies of intimate partner violence

Study	Country	Estimates available	Missing data	Handling of missing data for specific DV question	Implications for estimation of DV rate
Experimental Studies					
Abrahams et al. 2010	South Africa	n/a	Did not participate: 31/305 (10%) refused at baseline; 7.3% (control) and 8.1% (intervention) lost to follow-up Skipped IPV question: n/a (SV experience eligibility requirement)	n/a (not measured after enrollment)	n/a
Bair-Merritt et al. 2010	USA	Yes (for yr 1)	Did not participate: 6% (intervention) and 7% (control) at baseline; 9% (intervention) and 14% (control) at follow-up Skipped IPV question (victimization): 44/270 or 16% (control), 45/373 or 12% (intervention) at yr 1	Missing data were imputed with 20 imputations using multiple imputation by chained equations and each missing variable was regressed on all other variables	-Assumes IPV data MAR
Beattie et al. 2010	India	No	Did not participate: ~10% Skipped IPV question: data not available	Estimates weighted to account for differential non-response rates	-Assumes MAR -Assumes non-response=no violence
Jewkes et al. 2008	South Africa	No	Did not participate: 314/1409 or 22% (intervention) and 318/1367 or 23% (control) at baseline; 366/1409 or 26% (intervention) and 341/1367 or 25% (control) at follow-up Skipped IPV question: data not reported	Exclude those with missing HIV data (handling of missing IPV not specified)	-Assumes MAR -Assumes non-response=no violence
Kalichman et al. 2009	South Africa	No	Did not participate: 1/242 or 0.4% (intervention) and 0/233 or 0% (control) at baseline; 13/242 or 5% (intervention) and 3/233 or 13% (control) at 6 mo follow-up Skipped GBV question: data not reported	-Compared lost to follow up to those retained to test for differential attrition	-Assumes MAR -Assumes non-response=no violence
Kiely et al. 2010	USA	No	Did not participate: 328/1398 or 23% (baseline) Skipped IPV question: data unavailable	Excluded those with incomplete baseline data	-Assumes MAR -Assumes non-response=no violence
Kim et al. 2009	USA	n/a	Did not participate: 75/409 (18%) eligible cases not enrolled; 86/195 (44%) enrolled cases not successfully interviewed Skipped IPV question: n/a (IPV experience eligibility requirement)	n/a (IPV rate not measured)	n/a
McGowan 1997	USA	No	Did not participate: baseline response rate unavailable; 44% females and 56% males not retained (did not respond to at least 19/22 measures) Skipped violence question: question not asked	Excluded those that did not respond to at least 19 of 22 measures	n/a (occurrence of violence not studied)
McFarlane et al. 2000	USA	No	Did not participate: 13/342 or 4% (baseline), 21% (follow-up) Skipped IPV question: data unavailable	Oversampled intervention group to account for possible attrition	-Assumes MAR -Assumes non-response=no violence
McFarlane et al. 2006	USA	No	Did not participate: 73/433 (17%) at baseline; 11-12% dropout Skipped IPV question: data unavailable	Unspecified	-Assumes MAR -Assumes non-response=no violence
Melendez et al. 2003	USA	No	Did not participate: 1682/2042 (82%) at baseline; 3-10% dropped out by 1 yr Skipped IPV question: unavailable (only included those with IPV experience in analysis)	Excluded those with no IPV experience or missing data	-Assumes IPV data MAR -Assumes non-response=no violence
Pronyk et al. 2006	South Africa	Yes	Did not participate: 2-26% (baseline); 16-29% (2 yr follow-up); 37-42% (3 yr follow-up)	Added missing value category for missing baseline data	-Assumes IPV data MAR

\Study	Country	Estimates available	Missing data	Handling of missing data for specific DV question	Implications for estimation of DV rate
and Kim et al. 2007			Skipped IPV question: 233/426 or 55% (intervention), 240/417 or 58% (control)		-Assumes non-response=no violence
Rau et al. 2010	USA	No	Did not participate: 41/1546 (3%) declined to participate at baseline; 4% intervention and 1% control lost to follow-up Skipped IPV question: data not available	Unspecified	-Assumes IPV data MAR -Assumes non-response=no violence
Surratt et al. 2010	USA	No	Did not participate: data not available Skipped IPV question: data not available	-Compared baseline characteristics of 3 and 6 month follow-up completers to those lost to follow-up	-Assumes IPV data MAR -Assumes non-response=no violence
Taft et al. 2011	Australia	No	Did not participate: 18% (41/215) at baseline; 38% (133/215) at 1 yr follow up Skipped IPV questions: data not available	-Compared baseline characteristics between those retained and those lost to follow up -Multiple imputation	-Assumes IPV data MAR
Taylor et al. 2010	USA	No	Did not participate: ~25% (baseline); ~70% follow-up Skipped violence question: data not available	-Multiple imputation	-Assumes IPV data MAR
Tiwari et al. 2005	China	No	Did not participate: 7/117 or 6% (intervention+control at baseline); 4/55 or 7% (intervention) and 0/55 (control) at follow-up Skipped IPV question: data not available	-Values missing at follow-up replaced by the pre-test observations	-Assumes IPV data MAR -Assumes non-response=no change in violence
Wechsberg et al. 2006	South Africa	No	Did not participate: data not available at baseline; 14% at follow-up Skipped IPV question: data not available	None	-Assumes IPV data MAR -Assumes non-response=no change in violence
Weir et al. 2009	USA	No	Did not participate: ~28% Skipped IPV question: data not available	None	-Assumes MAR
Wolfe et al. 2009	Canada	No	Did not participate: 521/2243 or 23% of potentially eligible students at baseline; 12% of participating students lost to follow up Skipped PDV (physical dating violence) question: data not available	-Missing outcome values assigned value of 0 -Students with missing data on baseline measures were omitted from models -Sensitivity analyses to determine robustness of findings relative to missing data	-Assumes PDV data MAR -Assumes non-response=no violence
Weisz et al. 2001	USA	No	Did not participate: unreported for baseline; 29/46 or 63% intervention students and 11/20 or 55% controls lost to follow up Skipped violence question: unspecified	-Excluded those with incomplete measurements -Compared those lost to follow up to those with retained	-Assumes IPV data MAR -Assumes non-response=no violence
Yeater et al. 2004	USA	Yes	Did not participate: data not available Skipped IPV question: data n/a for baseline; 3.5-7.5% at time 2; 19-25% at time 3.	-Chi-square analyses to test relationship between assigned condition and attrition at Time 3, and victimization experiences at Time 2 and attrition at Time 3	-Assumes SV data MAR -Assumes non-response=no violence

\Study	Country	Estimates available	Missing data	Handling of missing data for specific DV question	Implications for estimation of DV rate
Longitudinal Studies					
Cohen et al. 2000	USA	No	Did not participate: not reported Skipped IPV question: data not available	Not specified	-Assumes IPV data MAR -Assumes non-response=no violence
Gilbert et al. 2007	USA	No	Did not participate: 418/774 or 54% at baseline; 69/356 or 19% at 6 mo; 78/356 or 22% at 12 mo. Skipped violence question: data not available	Multiple imputation	-Assumes MAR
Gruskin et al. 2002	USA	Yes	Did not participate: response rate not reported; 115 (8.7%) not seen after baseline Skipped IPV question: ~28/741 HIV+ and ~15/346 HIV- (physical abuse question); ~29/741 HIV+ and ~15/346 HIV- (SV question)	Compared characteristics of those retained to those lost of follow-up; baseline prevalence excludes those with missing data	-Assumes IPV data MAR -Assumes non-response=no violence
Jewkes et al. 2010.	South Africa	Yes	Did not participate: unknown Skipped IPV question: 0.1% (1/1100)	Excluded respondents (n=1) with missing data or lost to follow up from analysis; compared characteristics of those followed up and those lost to follow-up, sensitivity analysis with inverse probability weighting to investigate robustness to missing data and found that the potential effect of missing data was negligible	-Assumes IPV data MAR -Assumes non-response=no violence
Martinez-Torteya et al. 2009	USA	No	Did not participate: unknown Skipped IPV question: unknown	Missing data imputed using Hot Deck 'expectation-maximization algorithm'; Correlations between missingness dichotomous variables and the original variables were small, indicating a non-systematic pattern of attrition. Participants classified 'complete data' vs 'missing data' groups, there were no significant differences in total DV exposure, maternal depression, or income at pregnancy. Used imputed data set for all analyses.	-Assumes MAR
Olowookere et al. 2010	Nigeria	No	Did not participate: n/a (no consent sought; review of medical records) Skipped violence question: n/a (review of medical records)	Unspecified	n/a
Wingwood et al. 2006	USA	Yes	Did not participate: not reported Skipped IPV question: 241/665 (36%)	Unspecified	-Assumes MAR -Assumes non-response=no violence
Zablotska et al. 2009	Uganda	Yes	Did not participate: 9.6% at baseline; follow-up data not provided Skipped IPV question: 0/3422	n/a (apparently no missing IPV data)	n/a (apparently no missing IPV data)

\Study	Country	Estimates available	Missing data	Handling of missing data for specific DV question	Implications for estimation of DV rate
Cross-sectional Studies					
Abramsky 2011	WHO multi-country	No	Did not participate: unknown Skipped IPV question: unknown	Provide missing data for most variables but not for IPV; excluded those with missing data for key variables	-Assumes MAR -Assumes non-response=no violence
Akmatov et al. 2008	Egypt	No	Did not participate: ~1% overall Skipped IPV question: unknown	n/a	-Assumes MAR -Assumes non-response=no violence
Amowitz et al. 2002	Sierra Leone	No	Did not participate: 5.4% (57/1048) of households; experiences of 9166 household members represented Skipped IPV question: unknown	Documented reasons for non-participation	-Assumes MAR -Assumes non-response=no violence
Amowitz et al. 2004	Iraq	No	Did not participate: 13.3% (305/2296) of households Skipped IPV question: unknown	n/a	-Assumes MAR -Assumes non-response=no violence
Anastario et al. 2009	Mississippi USA	Yes	Did not participate: 63% (180/286 in 2006; authors report 37.5%); 56% (400/714 in 2007; authors report 17.8%); 420 total participants Skipped IPV question: 0.5% (2/420) for IPV and GBV; 1.9% (8/420) for sexual violence	Documented reasons for non-participation	-Assumes MAR -Assumes non-response=no violence
Andersson et al. 2007	Southern Africa (8 countries)	Yes	Did not participate: 3.9% (670/17377) households Skipped IPV question: 6.8% (809/11872) females; 6.0% (521/8634) males		
	Botswana	Yes	Skipped IPV question: 9.0% (124/1371) females; 10.3% (65/929) males	Explicitly state number of missing (male and female) for violence question; Stratified responses re: violence by whether or not someone else was present at the time of the interview (found participants were more likely to report violence if someone else was present)	-Assumes MAR -Assumes non-response=no violence
	Lesotho	Yes	Skipped IPV question: 13.7% (179/1309) females; 12.0% (92/768) males		
	Malawi	Yes	Skipped IPV question: 6.1% (97/1586) females; 5.5% (61/1109) males		
	Mozambique	Yes	Skipped IPV question: 7.1% (97/1374) females; 4.8% (45/930) males		
	Namibia	Yes	Skipped IPV question: 6.0% (83/1382) females; 4.9% (54/1113) males		
	Swaziland	Yes	Skipped IPV question: 8.5% (88/1034) females; 5.0% (63/1261) males		
	Zambia	Yes	Skipped IPV question: 6.4% (96/1509) females; 7.0% (88/1261) males		
	Zimbabwe	Yes	Skipped IPV question: 3.0% (45/1498) females; 4.3% (53/1231) males		
Andersson et al. 2009, 2010	Pakistan	Yes	Did not participate: 25.4% (7977/31407) Skipped IPV question: 0.1% (22/23430)	Documented reasons and stats for non-participation; Held post-survey focus groups to discuss reasons for not reporting violence (outside of the study); Compared women who did report to those who did not report violence (outside of the study, to family, friends, authorities, etc)	-Assumes MAR -Assumes non-response=no violence

\Study	Country	Estimates available	Missing data	Handling of missing data for specific DV question	Implications for estimation of DV rate
Antai 2011	Nigeria	No	Did not participate: not reported Skipped IPV question: not reported	Missing data excluded from analysis	-Assumes MAR
Da Silva et al. 2010	Brazil	No	Did not participate: unknown Skipped IPV question: unknown	Unspecified	-Assumes MAR, non-response=no violence
Decker et al. 2010	Thailand	No	Did not participate: 20.5% Skipped IPV question: data not available	Unspecified	-Assumes MAR, non-response=no violence
Djikanovic B 2010	Serbia	No	Did not participate: 40.2% Skipped IPV question: unknown	Document some characteristics of non-respondents	-Assumes MAR, non-response=no violence
Dunkle et al. 2004	South Africa	Yes?	Did not participate: 72/1467 (5%) Skipped IPV question: ~20/1395	Missing data excluded	-Assumes MAR, non-response=no violence
Ellsberg 2008; Garcia 2006	WHO multi-country	Yes	Did not participate: 3% Skipped IPV question: 0.3% (67/19568)	Unspecified	-Assumes MAR, non-response=no violence
Foluso et al. 2011	Nigeria	No	Did not participate: data not available Skipped IPV question: data not available	Unspecified	-Assumes MAR, non-response=no violence
Francisco 2010	Uganda	No	Did not participate: 29% (control and intervention) Skipped IPV questions: data not available	Excluded those with missing data for outcomes and covariates	-Assumes MAR, non-response=no violence
Gass et al. 2010	South Africa	No	Did not participate: 14.5% overall Skipped IPV question: unknown	Unspecified	-Assumes MAR, non-response=no violence
Go et al. 2011	India	Yes	Did not participate: 1% Skipped violence question: 0/522	No missing violence data reported	n/a (no missing data)
Helweg-Larsen et al. 2011	Denmark	Yes	Did not participate: ~25% not interviewed; 13% did not complete IPV questionnaire 1; 14% did not complete IPV questionnaire 2; Skipped IPV question: 9.0% (1317/14700)	Missing data at variable level reported for select variables (SES, chronic disease, self-rated health, relationship to perpetrator)	-Assumes MAR, non-response=no violence
Jeyaseelan 2007	India	No	Did not participate: 9% (rural); 16% (urban-slum); 23% (urban non-slum) Skipped IPV question: unknown	Unspecified	-Assumes MAR, non-response=no violence
Johnson et al. 2008	Liberia	No	Did not participate: 1.8% (30/1696) Skipped IPV question: unknown	Documented reasons for non-participation	-Assumes MAR, non-response (to IPV or combatant question)=no violence
Johnson et al. 2010	DRC	Yes	Did not participate: 0.7% (7/1005) Skipped IPV question: 7.7% (77/998)	Unspecified	-Assumes MAR, non-response=no violence
Johnson et al. 2011	USA	No	Did not participate: data not available Skipped violence question: data not available	Only included those who disclosed a PTSD event	-Assumes MAR, non-response=no violence
Kapadia et al. 2010	Pakistan	No	Did not participate: unknown Skipped IPV question: unknown	Unspecified	-Assumes MAR, non-response=no violence
Maman et al. 2010	Tanzania	No	Did not participate: data not available Skipped IPV question: data not available	Excluded those with missing data	-Assumes MAR, non-response=no violence
Nada et al. 2010	Egypt	No	Did not participate: data not available Skipped violence question: data not available	Unspecified	-Assumes MAR, non-response=no violence
Nayak et al.	India	Yes	Did not participate: 1.1% (28/2630 recruitment of broader sample);	Unspecified	-Assumes MAR, non-

\Study	Country	Estimates available	Missing data	Handling of missing data for specific DV question	Implications for estimation of DV rate
2010			0.5% (5/943 of eligible IPV interviewees) Skipped IPV question: 3.7% (30/821)		response=no violence
Nguyen 2008	Vietnam	No	Did not participate: 0.1% (1/884) Skipped IPV question: unknown	Unspecified	-Assumes MAR, non-response=no violence
Peredes-Solis et al. 2005	Mexico	Yes	Did not participate: 10% (266/2655 at initial recruitment) Skipped IPV question: 0.2% (1/524 eligible women without partner present for interview)	Separate analysis for women interviewed with/without partner present; women interviewed alone were ~ twice as likely to report violence vs. those interviewed with partner present	-Assumes MAR, non-response=no violence
Ravi et al.	USA	Yes	Did not participate: unclear Skipped violence question: 23/1588	Excluded non-responders from IPV prevalence	-Assumes MAR, non-response=no violence
Rico et al. 2011	DHS in Egypt, Honduras, Kenya, Malawi Rwanda.	Yes	Did not participate: unknown Skipped IPV question: 1.7% (99/5711, Egypt); 0.01% (2/14371, Honduras); 10% (367/3679, Kenya); 5.6% (495/8787, Malawi); 11.3% (324/2871, Rwanda).	Document reasons for non-participation/exclusion; purposely selected countries without large amounts of missing data; discuss implications of missing data	-Assumes MAR, non-response=no violence
Sarkar et al. 2008	India	No	Did not participate: data not available Skipped violence question: data not available	Unspecified	-Assumes MAR, non-response=no violence
Schnitzer et al. 2010	9 European countries	Yes	Did not participate: unknown Skipped IPV question: 0.07% (1/1341)	Unspecified	-Assumes MAR, non-response=no violence
Silverman et al. 2008	India	Yes	Did not participate: 5% Skipped IPV question: 32% of those with HIV test results did not answer IPV question (9245 women were excluded from analysis because HIV test results not available)	Document reasons for missing HIV test results; excluded those missing data for primary exposure (IPV) or outcome (HIV test results); recoded some missing data for number of lifetime sex partners to referent group; analyses weighted to account for nonresponse; sensitivity analysis (showed no effect estimate modified by 1% or more)	-Assumes MAR, non-response=no violence
Smith et al. 2008	USA	No	Did not participate: unknown Skipped IPV question: unknown	Unspecified	-Assumes MAR
Solomon et al. 2009	India	No	Did not participate: 20% Skipped IPV question: data not available (19 excluded from analysis due to 'multiple missing data points')	Excluded those with 'multiple missing data points'	-Assumes MAR, non-response=no violence
Speizer et al. 2009	South Africa	No	Did not participate: data not available Skipped question: data not available	Unspecified	-Assumes MAR, non-response=no violence
Swain et al. 2011	India	No	Did not participate: 6% declined participation Skipped IPV question: data not available	Excluded those with missing data	-Assumes MAR, non-response=no violence
Tanha et al. 2010	USA	Yes	Did not participate: unknown Skipped IPV question: 24.9% (253/1015 couples) did not complete RBRS (Relationship Behaviour Rating Scale)	Compared 762 couples that completed RBRS with 253 that did not (non-response/ missing) on 7 socio-demographic factors and four case variables to see if missing data was random.	-Assumes MAR, non-response=no violence

\Study	Country	Estimates available	Missing data	Handling of missing data for specific DV question	Implications for estimation of DV rate
Townsend et al. 2011	South Africa	Yes	Did not participate: 2/430 Skipped IPV question: 1/428 skipped physical IPV; 0 skipped other IPV questions	Unspecified	-Assumes MAR, non-response=no violence
Uthman et al. 2009	17 sub-Saharan countries	No	Did not participate: unknown (stated as 'high') Skipped IPV question: unknown	-analyses weighted to adjust for sampling probability and non-response	-Assumes MAR(?)
Wubs et al. 2009	Tanzania and South Africa	No	Did not participate: unknown Skipped IPV question: unknown	Unspecified	-Assumes MAR, non-response=no violence
Zorrilla 2010	Spain	No	Did not participate: 27% (930/3434); further 14.7% (368/2504) excluded from analysis Skipped IPV question: unknown	Unspecified	-Assumes MAR, non-response=no violence

Appendix 3. Risk factors identified and analytical approach of 75 recent studies of intimate partner violence

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
Experimental Studies					
Abraham s et al. 2010	South Africa	Randomized controlled trial Intervention: telephonic psycho-social support, leaflet and adherence diary intervention	PEP adherence	n/a (outcome was PEP adherence among rape victims)	Multivariate logistic regression
Bair-Merritt et al. 2010	USA	Randomized controlled trial Intervention: Home visitors provided direct services and linked families to community resources	Maternal IPV victimization or perpetration	Multivariate analysis: <u>IPV victimization</u> : home visitor program at yr 3 <u>IPV perpetration</u> : home visitor program* at yr 3 (adj for child age, program site, and maternal mental health, problem alcohol use, past year employment, and baseline IPV)	-Negative binomial regression modeling
Beattie et al. 2010	India	Program evaluation (before/after comparison) Intervention: Sex worker-focused HIV prevention intervention	Violence in the previous year; HIV/STI prevalence; condom use; experience with HIV prevention program	Multivariate analysis: Violence in past year: Intervention (before/after)* (adj for survey round, age, marital status, residency, migrant, duration sex work, place entertain clients, clients per week and regular partner)	-‘Multivariate modeling’
Jewkes et al. 2008	South Africa	Randomized controlled trial Intervention: participatory learning program to build sexual health knowledge, risk awareness, and communication skills	HIV incidence rate (primary outcome); >1 incident of physical/sexual IPV	Multivariate analysis: <u>Adj HIV incidence rate</u> : intervention <u>Adj HSV-2 incidence rate</u> : intervention* (adj for stratum, sex, participant’s age, and baseline cluster prevalence)	-Generalised linear mixed models (GLMMs) in which clusters treated as random effect -Generalised estimating equation (GEE) models also fitted to test robustness of GLMMs
Kalichman et al. 2009	South Africa	Quasi-experimental field trial (randomized but only 2 clusters) Intervention: GBV/HIV risk reduction sessions	GBV, condom use, HIV testing	Multivariate analysis: <u>Hit sex partner in past month</u> : intervention* (at 6 mo, not at 1 or 3 mo) <u>Condom use</u> : intervention* (at 1 mo, not at 3 or 6 mo) <u>Tested for HIV for first time in past month</u> : intervention* (at 1 and 3 mo, not 6) (adj for age and baseline values)	-Analyses of co-variance (ANCOVA) for continuous variables -Logistic regressions for categorical variables
Kiely et al. 2010	USA	Randomized controlled trial Intervention: integrated cognitive behavioral intervention (counseling) during prenatal care	IPV victimization (physical and/or sexual) in past year, measured by Conflict Tactics Scale (CTS)	Multivariate analysis: <u>Minor IPV</u> : intervention at postpartum*, first follow up*, second follow up* <u>Severe IPV</u> : intervention at postpartum*, first follow up, second follow up <u>Physical IPV</u> : intervention at postpartum*, first follow up*, second follow up	-Univariate and multivariate logistic regression

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
				<u>Sexual IPV</u> : intervention at postpartum, first follow up, second follow up (all adj for alcohol use during pregnancy and depression at baseline)	
Kim et al. 2009	USA	Before-after Intervention trial Intervention (5-part): SV advisory committee, hospital rape management policy, training workshop for service providers, centralization/coordination of care w/ designated exam rm, community awareness campaigns	Quality of post-rape care indicators: clinical history, physical exam, provision of pregnancy test & prevention, STI prevention, VCT, PEP, referrals	Multivariate analysis: Clinical history: intervention* Physical exam: intervention* Pregnancy test: intervention* Pregnancy prevention (EC): intervention* STI prevention meds given: intervention* VCT given: intervention* PEP given: intervention* Referrals given: intervention* (adj for whether or not presented in <72 hrs, whether age <14, whether seen by senior doctor, sex of healthcare worker, whether presented to hospital after-hours)	-Multivariate Poisson regression
MacGowan et al. 1997	USA	Randomized trial	Knowledge, attitudes and methods of dealing with relationship violence	Knowledge about relationship violence: intervention* Attitudes towards nonphysical violence: intervention* Attitudes towards physical violence: intervention Methods of dealing with relationship violence: intervention	-Chi-square and Wilcoxon matched pairs signed-ranks test (nonparametric) -T-tests and one-way and two-way ANOVA and ANCOVA
McFarlane et al. 2000	USA	Randomized trial Intervention: counseling and outreach program	Abuse, use of resources	Multivariate analysis: <u>Abuse</u> : intervention <u>Use of resources</u> : intervention (adj for threat of violence at baseline, physical violence at baseline, education, perception of ability to financially support themselves)	-Repeated measures ANOVA and MANCOVA -Multivariate logistic regression
McFarlane et al. 2006	USA	Randomized controlled trial Intervention: Nurse case management program	Indicators of secondary IPV: threats of abuse, assaults, danger risks for homicide, events of work harassment, safety behaviours adopted, use of community resources	Secondary IPV (and all other outcomes): Nurse case management*	-Repeated measures analyses of variance (ANOVAs) -Bonferroni's method for multiple comparisons
Melendez et al. 2003	USA	Randomized trial Intervention: cognitive-behavioral, psychoeducational empowerment sessions	Secondary IPV, unprotected sex, and negotiation skills	Univariate analysis: <u>Secondary IPV</u> : 4-session intervention after 1 mo, 6 mo. 1 yr follow up, 8-session intervention after 1 mo, 6 mo. 1 yr <u>Safe sex</u> : 4-session intervention after 1 mo, 6 mo. 1 yr follow up, 8-session intervention after 1 mo*, 6 mo. 1 yr* <u>Safe sex discussion</u> : 4-session intervention after 1 mo, 6 mo. 1 yr follow up, 8-session intervention after 1 mo*, 6 mo*. 1 yr	-Generalized estimating equation (GEE) logistic regression (univariate subgroup analysis among those with IPV experience)

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
Pronyk et al. 2006 and Kim et al. 2007	South Africa	Randomized cluster controlled trial (matched) Intervention: microloan program for women	IPV experience in past year (physical or sexual) by spouse or other sexual partner; unprotected sex at last occurrence with non-spousal partner in past year; HIV incidence	Multivariate analysis: <u>IPV</u> : microloan intervention for women*(adjusted for lifetime experience of intimate-partner violence by current partner at baseline, age, village pair, marital status) <u>Unprotected sex</u> : microloan intervention for women (adjusted for baseline level, age, village pair, sex) <u>HIV incidence</u> : microloan intervention for women (adjusted for age, village pair, sex)	-Univariate and multivariate logistic regression -Inverse-variance weighting to account for differences in denominators between villages
Rau et al. 2010	USA	Randomized controlled trial	Rape knowledge, myth acceptance, and empathy	Univariate analysis: <u>Rape knowledge</u> : intervention* <u>Rape myth acceptance</u> : intervention* <u>Rape empathy</u> : intervention*	ANOVA
Surratt et al. 2010	USA	Randomized trial Intervention: Sex-Worker Focused, peer delivered intervention (designed to reduce risky drug use and sexual behaviors through engagement, education, action, testing, referral)	Alcohol/drug use, sex work while high, unprotected sex, sexual victimization, physical victimization	Univariate analysis: Alcohol/drug use: intervention at 3 mo, at 6 mo follow-up Sex work while high: intervention at 3 mo, at 6 mo follow-up Unprotected oral sex: intervention at 3 mo, at 6 mo follow-up* Unprotected vaginal sex: intervention at 3 mo, at 6 mo follow-up* Sexual victimization: intervention at 3 mo, at 6 mo follow-up* Physical victimization: intervention at 3 mo, at 6 mo follow-up	-Chi-square and t-tests -Univariate logistic regression
Taft et al. 2011	Australia	Randomized cluster controlled trial Intervention: 12 mo. weekly home visiting from trained and supervised local mothers offering non-professional befriending, advocacy, parenting support and referrals	IPV (composite abuse scale); depression	Multivariate analysis: <u>IPV (CAS 7+)</u> : home visitation program <u>Depression</u> : home visitation program (adj for baseline level, propensity score)	-Multivariate logistic regression -Propensity score (PS) analysis to balance the arms for potential confounding from possible selection bias -Adjusted for cluster design
Taylor et al. 2010	USA	Randomized cluster controlled trial Intervention: school-based GBV/harassment prevention program	Dating violence (DV) and sexual harassment (SH) victimization, perpetration, attitudes	Victim of DV: intervention* (at 6 mos) Perpetrator of DV: intervention* (but in unexpected direction) Victim of SH: intervention Perpetration of SH: intervention Attitudes towards DV/SH: intervention* (select measures at select time points)	-Hierarchical linear modeling
Tiwari et al. 2005	China	Randomize controlled trial Intervention: empowerment training	IPV: physically or emotionally hurt by someone or forced to have sexual activities within the last year, as per Conflict Tactics Scale	Univariate analysis (no adj for covariates): <u>Psychological IPV</u> : intervention* <u>Minor physical IPV</u> : intervention* <u>Severe physical IPV</u> : intervention <u>Sexual IPV</u> : intervention	-Compared mean CTS scores -Statistical method not specified (z/t-test?)

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
Wechsberg et al. 2006	South Africa	Randomized pilot intervention study Intervention: woman-focused HIV prevention intervention	Condom use; alcohol use; cocaine use; sexual/physical violence in past year/month	Univariate analysis: <u>Condom use</u> : intervention group (*for some indicators), control group <u>Alcohol use</u> : intervention group, control group <u>Cocaine use</u> : intervention group*, control group* <u>Violence</u> : intervention group* (vs. control at follow-up)	Univariate analysis: McNemar test, t-test, logistic regression (compared before-after, not intervention vs. control)
Weir et al. 2009	USA	Randomized controlled trial Intervention: motivational interviewing on HIV/IPV risk reduction	IPV in past 3 months (any sexual coercion, injury, or physical assault perpetrated by a current main partner or a current or former sex partner (but not a sex customer); unprotected sex; needle sharing	<u>IPV</u> : MI intervention <u>Unprotected sex</u> : MI intervention* <u>Needle sharing</u> : MI intervention* (adjusted for baseline levels, mode of interview administration, education level, main partner status, health status, alcohol use, marijuana use, other drug use, and exchanging sex)	Generalized estimating equations (GEE)
Wolfe et al. 2009	Canada	Randomized cluster controlled trial Intervention: "Fourth R: Skills for Youth Relationships," within existing Health and Physical Education curriculum (strategies for addressing PDV)	Physical dating violence (PDV) in past year	Multivariate analysis: <u>PDV</u> : intervention (adj for stratification variables, baseline score, and sex)	-Random-effects Bernoulli models with school as random effect to account for clustering
Weisz et al. 2001	USA	Quasi-experimental study (unclear if randomization occurred) Intervention: school-based sexual assault and dating violence prevention program	Dating violence knowledge, attitudes, perpetration and victimization	Univariate analysis: Knowledge: intervention* Attitude: intervention* Perpetration: intervention Victimization: intervention	-t-tests -Repeated measures ANOVA
Yeater et al. 2004	USA	Randomized trial Intervention: bibliotherapy (self-help book on relationships)	Sexual victimization; risky dating behaviour; sexual communication	Multivariate analysis: <u>Sexual victimization</u> : intervention <u>Risky dating behaviour</u> : intervention* <u>Sexual communication</u> : intervention*	-Mixed-design repeated measures multivariate analysis of variance (MANOVA)

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at $\alpha=0.05$)	Data Analysis
Longitudinal Studies					
Cohen et al. 2000	USA	Longitudinal study	Domestic violence (physical or sexual abuse or coercion by intimate partner or spouse); Childhood sexual abuse (sexual abuse experience before age 18)	Multivariate analysis: <u>Recent DV</u> : HIV status*, age*, race/ethnicity, education, annual household income, drug use ever*, IDU recent, lifetime number of male sex partners >10*, sex for drugs/money/shelter <u>CSA</u> : drug use ever*, IDU recent, male partner at risk for HIV*, lifetime number of male sex partners >10*, sex for drugs/money/shelter* (adj for HIV status, age, race/ethnicity, annual household income)	-Multivariate logistic regression
Gilbert et al. 2007	USA	Longitudinal study	HIV/STIs, IPV perpetration	Multivariate analysis: <u>IPV perpetration</u> : condom use (* for some levels), any STI, HIV+ status, multiple partners, buying sex, IDU*, partner HIV+, partner had multiple partners, partner IDU, condom use with nonmain partners, any sexual coercion*	-Multivariate logistic regression
Gruskin et al. 2002	USA	Longitudinal study	Physical or sexual abuse	Multivariate analysis: <u>Physical or sexual violence among HIV±</u> : CD4 levels*, age, relationship status, past violence ever as an adult*, marijuana use, crack use, number of sex partners* <u>Physical or sexual violence among all</u> : CD4 levels, age, relationship status (*for separated/divorced), past violence ever as an adult*, marijuana use*, crack use*, number of sex partners* (adj for all other covariates in model)	-Multivariate Cox regression (for fixed and time-dependent variables)
Jewkes et al. 2010.	South Africa	Cohort analysis of data from randomized cluster controlled trial Intervention: Stepping Stones, a 50-h participatory intervention on sexual and reproductive health and HIV	HIV incidence (lifetime and recent physical and sexual partner violence as exposure)	(looked at IPV primarily as risk factor for HIV)	-random effects modeling -analyses adjusted to account for study/sampling design (note: current analysis does not evaluate impact of intervention)
Martinez-Torteya et al. 2009	USA	Longitudinal study	Domestic violence, i.e. male aggression towards a female partner (primary outcome is child resilience to exposure to DV against mother)	(looked at predictors of resilience to DV exposure)	-Multivariate logistic regression
Olowookere 2010	Nigeria	Retrospective review of case notes	HIV infection	(look at sexual assault as risk factor for HIV)	Descriptive analysis only (percentages)

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
Wingwood et al. 2009	USA	Longitudinal analysis of RCT	HPV infection	(looked at sexual abuse as risk factor for HPV)	-Multivariate logistic regression
Zablotska et al. 2009	Uganda	Cohort study	Prevalent HIV; physical and sexual violence	Multivariate analysis: <u>Physical violence in past year</u> : alcohol use before sex* (adj for age, education, occupation, marital status, number of sex partners in past year and condom use in last relationship), age, religion, education, occupation, marital status*, multiple partners*, condom use (* for some categories) <u>Sexual coercion in past year</u> : alcohol use before sex* (adj for education, occupation, marital status, number of sex partners in past year and condom use in last relationship), age, religion, education, occupation, marital status*, multiple partners*, condom use (* for some categories) <u>Prevalent HIV</u> : sexual coercion in past year (adj for age, religion, education, occupation, marital status, lifetime number of partners and condom use in last relationship), alcohol use before sex*, age*, religion, education, occupation, marital status (* for some categories), multiple partners*, condom use*	Univariate and multivariate 'longitudinal' logistic regression models with robust variance estimation accounting for within-individual correlation over time
Cross-sectional Studies					
Abramsky 2011	WHO multi-country	Data from WHO Multi-country Study on Women's Health and Domestic Violence: Cross-sectional, population-based household survey	Experience of physical and/or sexual partner violence in last 12 months	Multivariate analysis (several strata for each variable for 14 sites, select variables/strata are statistically significant): 'Prior to relationship' variables: education, history of abuse 'Current situation' variables: SES, woman's age, age gap with partner, relative education, relative employment, attitudes toward violence, alcohol use, non-intimate partner violence (physical/sexual/fight with other men), woman has children from >1 father, partner has concurrent relationship(s), marital status 'Characteristics of union': duration of relationship, choice of husband, dowry, polygamy	-Univariate and multivariate logistic regression -did not adjust for clustering because clustering of outcomes found to be 'small' (ICC<0.06)
Akmatov et al. 2008	Egypt	DHS: Cross-sectional study (multi-stage cluster sampling)	Beaten by husband in the last 12 months	Multivariate analysis: <u>1995</u> : lower education (wife*, husband*), rural (vs. urban) location, younger age*, age at first marriage, young age at first birth*, Muslim* (vs. Christian) religion, not working, more children in household, no blood relation to husband* <u>2005</u> : lower education (wife*, husband*), rural (vs. urban) location, younger age*, age at marriage, young age at first birth*, Muslim (vs. Christian) religion, not working, more children in household*, no blood relation to husband,	-Chi-square tests (univariate analysis) -Multivariate logistic regression analysis -analyses weighted to account for sampling design

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at $\alpha=0.05$)	Data Analysis
Amowitz et al. 2002	Sierra Leone	Cross-sectional study (systematic random sampling and cluster sampling)	War-related human rights abuses in the last 10 years (since war started) among household members (beaten, shot, killed, tortures, seriously injured, sexually assaulted, raped, abducted, violence amputations, forced labour by combatants)	Descriptive data only: characteristics of respondents including age, marital status, wife status, tribe, religion, years since displacement, times fled fighting, months in camp/town, years of formal education, occupation	-Fisher exact test, Yates chi-square and Pearson chi-square test, analysis of variance, Kruskal-Wallis test
Amowitz et al. 2004	Iraq	Cross-sectional study (multi-level cluster sampling)	One or more abuses among themselves or households members since 1991 (torture, killings, disappearance, forced conscription, beating, gunshot wounds, sexual assault, rape, kidnappings, being held hostage, ear amputation)	Descriptive data only: characteristics of respondents by region, age, sex, marital status, ethnicity, religion, occupation	- Fisher exact test, Yates chi-square and Pearson chi-square test, analysis of variance -sample was weighted to control for cluster and design effect
Anastario 2009	Mississippi USA	Successive cross-sectional randomized surveys	Lifetime and recent (since displaced by Hurricane Katrina) gender-based violence, including intimate partner violence and sexual violence	(primarily examined GBV as risk factor for mental health outcomes)	-Pearson design-based F statistics, analysis of variance -logistic and Poisson regression -all analyses adjusted for response weight and grouping of responses by trailer park
Andersson et al. 2007	Southern Africa (8 countries)	Cross-sectional household survey (stratified rural/urban last-stage random sampling)	Reported partner physical violence (beat, kicked, or slapped) in the last year	Multivariate analysis: <u>Men</u> : multiple partners*, income gap*, negative attitudes about sex and violence*, feels himself to be at risk of getting AIDS*, negative attitude to AIDS* <u>Women</u> : multiple partners*, income gap*, negative attitudes about sex and violence*, feels herself to be at risk of getting AIDS*, negative attitude to AIDS*	-multivariate logistic regression -estimates weighted to account for stratified sampling
Andersson et al. 2009, 2010	Pakistan	Cross-sectional household survey (stratified last-stage random cluster sampling)	Experienced physical abuse (beatings)	(Examines factors related to a woman who has been beaten telling someone about her experience)	-univariate and multivariate logistic regression -estimates weighted to account for sampling design, clustering
Antai 2011	Nigeria	Cross-sectional study (stratified two-stage cluster sample)	IPV (any acts of physical, emotional and sexual abuse by a current or former partner whether cohabiting or not)	Multivariate analysis: <u>Lifetime physical violence</u> : controlling behaviour*, justifies wife beating*, decision-making autonomy*, income relative to partner, education level relative to partner, age relative to partner, type of union, woman's age, education level, occupation (* for	-Multivariate logistic regression (no adjustment for cluster sampling design?)

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
				some), partner's education, partner's occupation, rural/urban* <u>Lifetime sexual violence</u> : controlling behaviour*, justifies wife beating*, decision-making autonomy*, income relative to partner (* when woman earns more), education level relative to partner, age relative to partner, type of union, woman's age, education level, occupation, partner's education, partner's occupation, rural/urban	
Da Silva et al. 2010	Brazil	Cross-sectional study	Suffered physical and sexual violence in the last 12 months	Multivariate analysis: partner's alcohol consumption*, family violence witnessed during woman's childhood/adolescence*, woman's level of education, woman's mental disorder [only show statistically significant factors]	-Chi-square or Fisher exact test -Multivariate logistic regression
Decker et al. 2010	Thailand	Cross-sectional study	Sexual or physical violence in past week; STI outcomes	Univariate analysis: <u>Sexual or physical violence</u> : current age, length of time in sex work, ethnicity, region*, sex work setting*	Chi-square tests and log-binomial regression
Djikanovic 2010	Serbia	Data from WHO Multi-country Study on Women's Health and Domestic Violence: Cross-sectional, population-based household survey	Report any of six acts of physical violence or one of three acts of sexual violence	Multivariate analysis: <u>Women</u> : age, education, frequency of communicating with family members, experience of physical violence by non-partners, experience of sexual abuse by non-partners, nature of first sexual intercourse (wanted vs. unwanted)*, woman's mother was beaten by her mother's partner <u>Partners</u> : education*, alcohol consumption*, drug consumption, fighting with other men*, infidelity*, mother was beaten by mother's partner*, beaten as a child by family member* <u>Relationship characteristics</u> : socioeconomic status, cohabitation with partner's family	-Descriptive cross-tabulations -Univariate and multivariate logistic regression
Dunkle et al. 2004	South Africa	Cross-sectional study	Physical or sexual assault from a male partner	Univariate analysis: IPV: 5+ partners*, non-primary male partner*, transactional sex*, never used condom, alcohol or drug problem	Univariate and multivariate logistic regression (only univariate for IPV)
Ellsberg 2008; Garcia et al. 2006	WHO multi-country	Data from WHO Multi-country Study on Women's Health and Domestic Violence: Cross-sectional, population-based household survey	Lifetime and recent experience of physical and/or sexual partner violence	Regression model controlled for: site, age, partnership status, educational attainment	-Univariate and multivariate logistic regression -adjusted for cluster sampling
Foluso et al. 2011	Nigeria	Cross-sectional survey	Sexual and cultural abuse	Univariate analysis: 'Experience of widowhood': education level*, religion, age	-Descriptive analysis -ANOVA
Francisco 2010	Uganda	Baseline data from cluster randomized controlled trial	Psychological/physical/sexual IPV in the last 12 months	Multivariate analysis: Men: <u>Physical/sexual/psychological IPV perpetration</u> : multiple partners* (adj for SES, cohabitation, and ICC), concurrent (but	-Univariate and multivariate logistic regression -adjusted for clustering with

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
				non-polygamous) partners* (adj for education, cohabitation, ICC), HIV+ status* (adj for number of children, polygamy, and intra-class correlation) Women with current sexual partner: <u>Physical/sexual/psychological IPV experience</u> : partner has concurrent partners* (adj for age, SES, number of children)	ICC
Gass et al. 2010	South Africa	Cross-sectional nationally representative study (three-stage clustered area probability sample design)	Intimate partner violence (partner or spouse pushed, grabbed, shoved, threw something, slapped or hit them)	Multivariate analysis: <u>Health-risk behaviours</u> : smoking*, non-med sedative use*, non-med stimulant use, non-med analgesic*, cannabis use*, other drug use <u>Health-seeking behaviours</u> : partner stability, sexual precautions, AIDS test, any MD visit*, any healer visit*, any health visit <u>Physical illness</u> : arthritis, back problems, headaches, chronic pain, allergies, stroke, heart attack, ever heart disease, ever high BP, ever asthma, ever TB, ever lung disease, ever malaria, ever ulcer, ever thyroid disease, ever neurological problem, ever HIV/AIDS, ever epilepsy, ever cancer	-Multivariate logistic regression
Go et al. 2011	India	Cross-sectional analysis of baseline data from cluster RCT	Forced sex in last 3 mos.	Multivariate analysis: Forced sex: no. days consumed alcohol in last 30 days (*for some categories); no. ppl spoke with about family violence in last 3 mos*; no. partners with strong tendency to drink alcohol before sex*;	Multivariate proportional odds models with generalized estimating equations (GEE) to account for clustering
Helweg-Larsen 2011	Denmark	Data from Danish National Health Interview Surveys (NHIS): Cross-sectional nationally representative survey (random selection from civil register)	Exposure to physical violence over the last 12 months	Multivariate analysis: <u>Men</u> : Age*, education*, marital status*, alcohol consumption*, physical activity*, smoking*, stress, BMI <u>Women</u> : Age*, education, marital status*, alcohol consumption*, physical activity, smoking*, stress*, BMI*	-Multivariate logistic regression
Jeyaseelan 2007	India	Population-based cross-sectional study (stratified probability sampling)	Physical partner violence against women	Multivariate analysis: Area (rural vs. urban), social support*, # persons sharing room, # appliances in household*, toilet facility*, women's age, woman's education*, employment difference*, dowry harassment*, husband's age, husband's education*, husband's alcohol use*, harsh physical punishment in woman's childhood*, witnessed father beat mother*	-ANOVA, chi-square tests -Multivariate logistic regression
Johnson et al. 2008	Liberia	Cross-sectional, population-based, multi-stage random cluster survey	Lifetime sexual violence (primarily as predictor of mental health outcomes)	(primarily examined sexual violence as predictor of mental health outcomes)	-multivariate logistic regression models (ORs weighted to account for cluster sampling) -95% CIs calculated using

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at $\alpha=0.05$)	Data Analysis
					jackknife variance estimation to account for complex sample design
Johnson et al. 2010	DRC	Cross-sectional, population-based, cluster survey	Lifetime exposure to sexual violence (primarily as predictor of mental health outcomes)	(primarily examined sexual violence as predictor of mental health outcomes)	-multivariate logistic regression models (ORs weighted to account for cluster sampling) -95% CIs calculated using jackknife variance estimation to account for complex sample design
Johnson et al. 2011	USA	Cross-sectional analysis of longitudinal study at baseline	Lifetime sexual trauma	Multivariate analysis: <u>Sexual trauma</u> (demographic model): age, ethnicity, marital status*, health status*, education level, employment status, homeless*, receive welfare <u>Sexual trauma</u> (psychopathology model): marital status, health status*, homeless, lifetime depression disorder*, antisocial personality disorder*, lifetime alcohol dependence, lifetime cocaine dependence <u>Sexual trauma</u> (sexual risk model): health status*, depression*, antisocial personality disorder*, lifetime sexing trading*, lifetime STD history	Univariate and multivariate logistic regression
Kapadia et al. 2009	Pakistan	Cross-sectional study (non-random sampling)	Lifetime marital sexual abuse	Multivariate analysis (only provide data for select variables): Age at marriage, age difference, current age of women, educational level (women and spouse), gravidity*, unwanted pregnancy*, conflicts with in-laws*, perceived social support*, lack of dowry	Univariate and multivariate logistic regression
Maman et al. 2010	Tanzania	Cross-sectional study	Perpetration of physical or sexual violence with partner	Multivariate analysis (model with all variables): <u>Ever perpetrated violence</u> : age, education*, marital status, religion, household wealth, childhood physical abuse*, childhood sexual abuse, witness domestic violence, beating a woman is acceptable, acceptability of refusing sex, age at first sex, number of lifetime partners*, controlling behaviour, alcohol use before sex, partner tells you sexual desires, person who initiates sex in relationship	Multivariate logistic regression
Nada et al. 2010	Egypt	Cross-sectional study	Violence, substance use, sexual behaviour	n/a (descriptive analysis only)	Descriptive analysis only (percentages)
Nayak et al. 2010	India	Cross-sectional survey (two-stage probability sampling)	Partner violence in past 12 months: either physical violence (slapped, hit, kicked, punched, physically	(primarily examined violence as predictor for mental health outcomes)	-Univariate analysis -Multivariate logistic regression -applied gender-specific weights to adjust for design-

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
			hurt) or sexual (primarily as predictor for mental health outcomes)		related biases (sampling procedure, population size, age distribution)
Nguyen 2008	Vietnam	Cross-sectional population-based survey (stratified cluster sampling)	Lifetime and past-years physical and sexual violence against women (also measured psychological violence)	Multivariate analysis: <u>Lifetime</u> : age, woman's education*, husband's education*, household income*, # of children, husband's occupation (professional vs. un/semi-skilled), husband has >1 partner/wife* <u>Past-year</u> : age, woman's education, husband's education*, household income*, # of children, husband's occupation (professional vs. un/semi-skilled), husband has >1 partner/wife	-Univariate and multivariate logistic regression
Paredes-Solis et al. 2005	Mexico	Cross-sectional study (complete coverage)	History of physical abuse and physical abuse during the last pregnancy	Multivariate analysis (final model): Age <30yrs*, partner's alcohol consumption*, 3 or more pregnancies*, ethnicity (speaks indigenous language)* Other factors considered: education, occupation status, use of family planning methods, social security coverage, prenatal care, nutrition during pregnancy, alcohol and tobacco consumption during pregnancy, complications during pregnancy, vaginal bleeding during pregnancy, abortion, premature birth	-Univariate and multivariate logistic regression (ORs and 95% CIs)
Ravi et al. 2007	USA	Cross-sectional study	HIV risk behaviour (unprotected sex)	Multivariate analysis: <u>Unprotected sex</u> : experienced violence* (in some models), race, sex work, drug use, employment, has non-primary partners* (primarily examined maternal IPV as predictor of child health outcomes)	-Multivariate logistic regression
Rico et al. 2011	Egypt, Honduras, Kenya, Malawi, Rwanda	Data from demographic health surveys (DHS: multi-stage cluster sampling)	Maternal exposure to IPV (physical and/or sexual violence) since age 15 yrs		-Univariate and multivariate logistic regression -applied sample frequency weights provided by DHS to account for sampling design
Sarkar et al. 2008	India	Cross-sectional study	HIV status and HIV risk factors	(look at violence as risk factor for HIV and risk behaviours)	-‘Univariate and multivariate analysis’
Schnitzer 2010	9 European countries	Cross-sectional study (respondent-driven sampling)	Involved in physical fight in nightlife environment in past 12 months	Multivariate analysis (final models): <u>Males</u> : age*, sexual orientation*, cocaine use*, drunkenness frequency*, factor Tolerant and Easy*, country* <u>Females</u> : age*, sexual orientation*, cocaine use*, drunkenness frequency*, factor Tolerant and Easy*, country* Excluded from model because not statistically significant: income, use of cannabis, use of ecstasy, multiple substance use of other illicit drugs, frequency of visiting bars or nightclubs in the past 4 weeks, frequency of nights going out to a nightclub at a weekend, length of time for going out at one night, factor	-Chi-square and t-tests -Principal component analysis with varimax rotation was used to reduce the 18 variables affecting choice of bars and clubs to four principle factors. -Conditional multivariate logistic regression

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at ≈ 0.05)	Data Analysis
				Healthy and Safe, and factor Easy	
Silverman et al. 2008	India	Data from Indian National Family Health Survey (DHS): Cross-sectional survey (stratified, multistage cluster sampling)	Lifetime experience of physical or sexual violence from a woman's current husband (primarily examined as predictor of HIV infection)	(primarily examined violence as risk factor for HIV infection) Univariate analysis (Chi-square tests comparing IPV across demographic characteristics): Age*, education*, religion*, wealth index*, lifetime sex partners*, lifetime condom use*	-Wald Chi-square tests -Multivariate logistic regression (OR and 95%CI) -analyses weighted to account for selection probability and nonresponse
Smith et al. 2008	USA	Data from the BRFSS (Behavioral Risk Factor Surveillance System): Cross-sectional (disproportionate stratified sampling)	Four types examined: -threatened violence -attempted violence -physically abused -unwanted sex	Univariate analysis (?): <u>Threatened violence</u> : gender*, disability*, age*, ethnicity*, education, employment status*, relationship status* <u>Attempted violence</u> : gender*, disability*, age*, ethnicity, education, employment status*, relationship status* <u>Physically abused</u> : gender*, disability*, age*, ethnicity*, education, employment status*, relationship status* <u>Unwanted sex</u> : gender*, disability*, age*, ethnicity, education*, employment status*, relationship status*	-Chi-square analyses -Logistic regression -Analyses weighted based on BRFSS sampling weights
Solomon et al. 2009	India	Cross-sectional study	Physical and sexual IPV	Multivariate analysis: <u>Frequency of physical IPV</u> : age (*for some categories); religion; type of family*; woman's education level (* for some categories); spouse education level (*for some categories), residence*, number of rooms in house*, bathroom shared with other ppl outside family* <u>Frequency of forced sex</u> : woman's education level (* for some categories); spouse education level (*for some categories); residence*, number of rooms in house*, bathroom shared with other ppl outside family*	Univariate and multivariate logistic regression
Speizer et al. 2009	South Africa	Cross-sectional survey	HIV status; condom use; pregnancy experience	(looked at violence as independent variable)	Multivariate logistic regression analyses using Huber-White standard errors to account for clustering (model included individual and community-level variables); analyses weighted to represent SA adolescent population
Swain et al. 2011	India	Cross-sectional survey (two-stage cluster sampling)	HIV risks and reproductive health (# pregnancies, pregnancy loss, forced abortion, condom use)	(looked at violence as risk factor, not outcome)	Multivariate logistic regression
Tanha et	USA	Cross-sectional study (non-	-psychological abuse	Multivariate analysis:	-paired sample t-tests

Study	Country	Study Design	Primary outcome indicators	Risk factors identified (*statistically significant at $\alpha=0.05$)	Data Analysis
al. 2010		random sampling)	-sexual assault -intimidation and coercion -physical abuse -severe threats and escalated physical violence	Gender*, coercive control*	-analytical structural equation modeling (SEM)
Townsend et al. 2011	South Africa	Cross-sectional study	Perpetration of physical or sexual IPV in last 12 mos.	Multivariate analysis: <u>Physical IPV</u> : condom use (adj for STI symptoms, problem alcohol use, employment); STI infection* (adj for condom use, problem alcohol use and employment, partner has other partners); transactional sex* (adj for problem alcohol use); problem alcohol use* (no covariates); >5 partners (adj for problem alcohol use); partner has other partners* (adj for employment) <u>Sexual IPV</u> : condom use (adj for STI symptoms, problem alcohol use, employment); STI infection* (adj for condom use, problem alcohol use and employment, partner has other partners); transactional sex* (adj for problem alcohol use); problem alcohol use (no covariates); >5 partners* (adj for problem alcohol use); partner has other partners (adj for employment) <u>Any IPV</u> : condom use* (adj for STI symptoms, problem alcohol use, employment); STI infection* (adj for condom use, problem alcohol use and employment, partner has other partners); transactional sex* (adj for problem alcohol use); problem alcohol use* (no covariates); >5 partners (adj for problem alcohol use); partner has other partners* (adj for employment)	Multivariate logistic regression
Uthman et al. 2009	17 sub-Saharan countries	Data from DHS: Cross-sectional survey (stratified, multistage cluster sampling)	Degree of acceptance of intimate partner violence against women	Multivariate analysis (statistical significance varied across countries): Sex, age, education, occupation, marital status, wealth, urban vs. rural, decision-making indices, media access	-Pearson Chi-square tests -Multivariate logistic regression -Analyses weighted to adjust for differences in probability of selection and to adjust for non-response
Wubs et al. 2009	Tanzania and South Africa	Baseline data from randomized cluster controlled trial (school-based)	Had a girl/boyfriend who beat them up	Multivariate analysis: <u>Capetown</u> : age*, male gender*, lower socioeconomic status* <u>Mankweng</u> : age*, male gender*, lower socioeconomic status* <u>Dar es Salaam</u> : mother's has no formal education*	-cross-tabulations and multivariate logistic regression (adjusted for cluster effects)
Zorrilla 2010	Spain	Cross-sectional survey (stratified random sampling)	IPV: psychological, physical or sexual violence	Multivariate analysis: <u>Psychological-only violence</u> : age*, type of relationship*, women's occupation, household income <u>Physical violence</u> : age, type of relationship*, women's main activity	-Univariate and multivariate logistic regression

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