

Condoms in sub-Saharan Africa

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Abstract. Sub-Saharan Africa (SSA) is the region with the world's highest rates of HIV and other sexually transmissible infections (STIs), yet numerous studies show that condom use is generally rare. This suggests a need for a better understanding of how condoms fit within sexual practices and relationships in SSA. This paper seeks to address this need by reviewing research published between the late 1980s and 2011 on use and factors influencing use of male condoms in SSA. What is evident from this research is that condom use involves complex social and interpersonal dynamics, with structural and cultural conditions exerting an influence through framing social cognitions and setting boundaries on autonomy that make the apparently irrational choice of eschewing condoms a rational decision. The influences of poverty; relationships with parents, peers and partners; limited, insufficient or absent information especially in rural areas and among men who have sex with men; gender and sexual norms, and the dynamics of gendered power; and beliefs and attitudes about HIV, condoms and sexuality all have been shown to work against condom use for a large proportion of Africa's people. However, promising results are shown in trends towards increased condom use among single women in numerous countries, increasing acceptance and use of condoms among some university students, successes in producing potentially sustainable condom use resulting from select interventions, and resistance to succumbing to the dominant gender–power dynamics and structural–cultural impediments that women in groups have mobilised.

Additional keywords: AIDS, beliefs, cultural influence, gender, HIV, social dynamics.

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Introduction

Sub-Saharan Africa (SSA) is the poorest region of the world¹ and the region with the highest rates of HIV and other sexually transmissible infections (STIs),² sexual health burdens that could be reduced through improved condom use. Yet numerous studies, from diverse regions of SSA, suggest that the goal of correct, consistent condom use remains elusive for the majority of the population despite general knowledge of the prophylactic properties of condoms and universal fear of HIV and AIDS.² Syntheses of evaluated interventions targeting condom use have produced discouraging conclusions.^{3–7} Although multiple interventions in schools and communities in diverse countries of SSA have been successful at increasing knowledge and attitudes related to the prophylactic benefits of condoms, few have led to increased use and even fewer to sustained use. This suggests that we need a better understanding of how condoms fit within sexual practices and relationships in SSA as well as the factors that influence condom use.

This paper seeks to address this need by examining and synthesising the research on the use of the male condom in SSA (referred to merely as condom use from herein), including research on factors influencing use.

Methods

This paper draws on research from diverse populations and sexual circumstances in SSA to provide an overview of

knowledge to date on condom use in this region of the world. A search of computerised databases indexing social scientific literature was conducted using SOCIOFILE, Social Science Citation Index, PsychInfo, Medline, AIDSline and Google Scholar. The search terms condom(s) and Africa, and the publication period 1990–2011 were used. These searches produced 1373 distinct peer reviewed articles and 23 book chapters. Resources were sorted by country (articles that reported research results from multiple countries counted in each), then by the population addressed, and finally by whether the reference reported results based on quantitative or qualitative (or both) methods of data collection and analysis, or whether it reported a synthesis and discussion of the research of others. Countries were clustered into their respective regions using the United Nations (UN) scheme of geographic regions.⁸ A second search was conducted using specific names of countries for which two or fewer references had been found. An additional 73 articles was found for a total of 1479 sources. Of this total, 55% were from countries of eastern Africa, 20% from southern Africa, 20% from western Africa, and 5% from central or middle Africa. The imbalance is, in part, a result of disparities in the size of regions, and is also most likely to be a reflection of funding, research priorities and feasibility of conducting research.

Two types of data appeared in this collection: quantitative studies that statistically analysed primarily survey data, and qualitative studies that analysed textual data based on

interviews, observations and field notes. Different population groups were addressed ranging from coverage of the general population in national surveys to unique subpopulations such as students, residents in specific urban or rural communities, distinct occupational groups (e.g. sex workers, truck drivers or tailors), clinic attendees, those who are HIV-positive, serodiscordant couples and participants in intervention trials. The collection included reports of single research projects and reports of evaluations of discrete interventions; analyses of Demographic and Health Survey (DHS) data; syntheses or meta-analyses of multiple projects, collections of data or intervention evaluations; and overviews or discussion papers that drew from diverse research projects and data sources to address a specific theme related to condom use.

To ensure representation from all regions of SSA and to draw from the diversity of published research, a sequence of priorities was applied to selecting publications for inclusion. For studies

using quantitative data, all publications based on analyses of national survey data or data from representative samples collected since 1990 were included. For countries where national data were available, smaller-scale studies were only included if they provided unique information that was not covered in these larger-scale studies. They were included if they approximated representative sampling strategies and if generalisations were made appropriate to the population sampled. Studies reporting the results of outcome evaluations of interventions were included if they used experimental or quasi-experimental designs with appropriate sampling strategies and statistical analyses. Studies of distinct population subgroups (e.g. sex workers, HIV-positive people, serodiscordant couples) were included if they provided descriptions of their sampling strategy so that generalisations could be made to the appropriate reference population. It was this collection of studies that were relied on to establish correlates, determinants and trends related to condom use.

Qualitative studies contributed insight into decision-making processes, relationship dynamics, ways of knowing and the meanings ascribed to condoms, sexuality and HIV/AIDS. They were included if they provided a description of their recruitment strategy and a profile of their participants that was sufficient for deciding the transferability of study results. Overviews and synthesising papers provided in-depth analyses and discussions of overarching themes that benefited from an amalgamation of results and insights from a range of research projects. They were included if they drew together results of research that met criteria similar to those applied here. Table 1 lists the number of studies using data from each country and region that were used in this paper.

In reviewing the studies available for this paper, it became evident that two substantive themes predominated: a focus on heterosexual, penile–vaginal intercourse and a focus on male condoms. Too few studies were located to produce trustworthy syntheses of research on nonheterosexual interactions, female condoms or use of condoms in other than penile–vaginal intercourse. Consequently, only the research on use of male condoms in heterosexual penile–vaginal intercourse is reviewed for this paper.

Results

Synthesising research from a world region as diverse as SSA is a decided challenge. The countries of SSA differ economically, politically, socially and culturally. National boundaries do not enclose similar ethnic and cultural groups, nor do they separate those that are dissimilar. They rather reflect the patterns and priorities of colonial rule, yet a considerable amount of research takes a national approach, identifying patterns by country without consideration of whether the national boundaries reflect sociocultural divisions amongst people. Some rural areas are inhabited by communities that have limited contact with the world outside their community, and follow economic, social and cultural systems that have changed little over hundreds of years. Nomadic groups traverse regions of the continent, defying attempts to survey or count them. In contrast, large and growing urban centres are inhabited by diverse cultural groups both from within SSA and from

Table 1. Number of articles used in this research and the countries from which they drew their data

	# Articles	% Articles
Eastern Africa	118	51.5
Comoros	1	
Eritrea	2	
Ethiopia	2	
Kenya	29	
Madagascar	2	
Malawi	8	
Mozambique	4	
Rwanda	5	
Uganda	20	
Tanzania	15	
Zambia	20	
Zimbabwe	10	
Middle Africa	14	6.1
Angola	2	
Cameroon	8	
Chad	1	
Congo	1	
Democratic Republic of the Congo	1	
Gabon	1	
Southern Africa	44	19.2
Botswana	2	
Namibia	2	
South Africa	40	
Western Africa	53	23.1
Benin	4	
Burkina Faso	7	
Cote d'Ivoire	2	
Gambia	1	
Ghana	13	
Guinea	2	
Mali	3	
Niger	2	
Nigeria	10	
Senegal	5	
Sierra Leone	1	
Togo	3	
TOTAL	229	

widely disparate world regions. Economic lives in these cities are governed by an advanced and changing market economy. In these cities, multiple cultural and social groups interact and influence each other, and global communication brings exposure to a vast array of information and diversity. Development and extraction of local resources, predominantly for export, draws migrant workers from within and across national boundaries and regions of the subcontinent, disrupting traditional family and community patterns, and creating populations and settlements of migrant workers. Populations in some areas have faced persistent and repeated warfare and conflict spanning multiple generations; some have endured repeated cycles of severe famine and drought. Both of these drive many to become refugees, often living years in camps or 'temporary' settlements. All of these macrolevel factors influence sexual patterns, choices and activities, including condom use. They also affect research possibilities and priorities. War-torn areas and areas experiencing drought and famine, or populations 'on the move' (e.g. refugees, nomadic groups, migrant workers) are not often included in research on sexuality. For most of these, there are not even data available on basic sexual and reproductive health issues. Research has tended to concentrate on urban and easy-to-reach rural areas where social order predominates, with remote locations or locations of social disorder, conflict and warfare being excluded. These represent segments of SSA's populations about which the research literature is mostly silent and they are consequently absent from a synthesis such as this.

Several precautions have been taken in this synthesis to avoid overgeneralisation and homogenisation of the diversity across people and locations. Research has purposefully been drawn from many countries, using the best available data. The quantitative data provide information about patterns, whereas the qualitative data add information about processes, meanings and local content of the constructs used in quantitative research. Findings have been identified by the location, form or context of the research to avoid overgeneralisation and homogenisation. The responsibility now rests with readers to recognise and acknowledge the boundaries and limitations of this work when referencing or using the results presented here.

The remainder of this paper is organised into six sections. Studies that contribute to an understanding of factors influencing condom use in SSA are divided into four sections. Presented first are those that focus on sociodemographic characteristics associated with condom use. This is followed by results from research applying social cognitive models to explain condom use based on knowledge, beliefs and attitudes. Since condoms are influenced by interactions and relationships with others, relationship influences are reviewed next. Finally, research examining the influence of structural factors in communities and resource availability is reviewed. These sections are followed by a discussion of the findings focussing on 'ways forward' and an overview of the limitations of this work. The last section provides conclusions.

Sociodemographic characteristics of condom users

Large-scale survey research and multivariate analyses with populations aged 15–49 years using national and regional surveys from 14 countries in southern, eastern, western and

middle Africa^{9–18} uniformly support the conclusion that men, and those who are younger, have higher education, greater economic resources and are urban dwellers are more likely to be condom users. Smaller scale studies in Angola,¹⁹ Kenya,^{20,21} Zimbabwe,²² Rwanda²³ and Cameroon²⁴ restricted to adolescent populations (15–19 years) obtain the same results with the exception that reported condom use increases with age. Religious affiliation and practice have not been the focus of attention of many studies. Where they have, the results are mixed. For example, research with unmarried youth in Kenya²⁵ and Zambia²⁶ that compared condom use across different religious groups found differences in use associated with religious affiliation. Similar results were found using data from married men and women in three districts of Malawi.²⁷ However, no association between religious affiliation and condom use was found in an analysis of DHS data from Ghana.²⁸ Two studies using various measures of religiosity, the first with Christian women drawn from the same Malawian sample as above²⁹ and the second with a Muslim sample of university students in Senegal,³⁰ found no associations between religiosity and condom use. These results suggest there may be variations by region of SSA, age and marital status, and between religious affiliation and religiosity that require further research to identify patterns.

Gender influences

The findings for gender presented above are consistent with a model of male control of sexuality that dominates the literature, particularly for southern and eastern Africa,^{31–39} but is also discussed by Orubuloye *et al.*⁴⁰ based on research in Nigeria. Despite variations in gender and relationship norms and power across ethnic groups and regions, the research literature consistently supports a conclusion that social, cultural, political and gender–power dynamics all constrain women's ability to introduce condoms into their relationships,^{31–40} with condom use remaining predominantly under the control of men. Improving the balance of power in heterosexual relationships through educating women has been promoted as a way to increase condom use.^{32,34} This approach is supported by results from studies in Madagascar,¹⁸ Angola¹⁹ and South Africa,⁴¹ which have found that women with higher education – particularly those with post-secondary education – are more likely to report condom use. Greig and Koopman,⁴² using national-level data for school enrolment and DHS data for condom use from 35 countries across all regions of SSA, found that at the national level, higher enrolment of women in secondary education was associated with higher reported levels of condom use.

Age influences

The younger age of condom users as compared with nonusers is consistent with the focus of many HIV prevention interventions.^{3–7} These interventions make youth (those 15–24 years of age) a population group that is likely to have been exposed to information, encouragement and skills building related to condom use. Several characteristics of unmarried youth also make them more amenable to condom use. With the exception of those who are married,⁴³ youth are usually

found to be more interested in postponing conception than those who are older, are less likely to be in long-term relationships and are more likely to still be in school. These are all factors which, on their own, contribute to greater likelihood of condom use.^{19–23} Similar explanations are at work for the results showing greater likelihood of condom use among those with higher education and particularly among post-secondary students.^{41,44–46} Those still in school are less likely to be in long-term relationships, more likely to be postponing childbearing, and are more likely to be exposed to information and interventions related to HIV prevention, each of which are associated with higher levels of condom use.

Influence of economic resources and urban location

Economic resources and urban location contribute to condom use through better access to condoms. At the interpersonal level, for women, greater economic resources decrease dependence on men and contribute to negotiation of diverse aspects of their sexual relationship, including condom use. Gysels and colleagues found this association held even for female sex workers in Uganda.⁴⁷ For young men, Stephenson, using DHS data for Burkina Faso, Ghana and Zambia, demonstrated that it is both individual economic resources and the median household income in one's residential area that benefit condom use.⁴⁸ Women from residential areas with higher household incomes, however, still faced cultural and relationship barriers to condom use that were only overcome when they themselves had more economic resources.⁴⁸

Urban, compared with rural, dwellers have greater access not only to condoms, but also to information and health services. They may also, as Katz found in analyses of DHS data from South Africa, have higher exposure to media carrying information and motivational messaging about condoms,⁴⁹ which may contribute to motivation to use condoms.

Social cognitions influencing condom use

Social cognitive theories explain differentials in condom use as a function of beliefs, attitudes and subjective evaluations.⁵⁰ Most of these theories are grounded in an assumption of personal autonomy in sexual decision-making or control of condom use. Key cognitions and evaluations addressed in these theories include perceptions of susceptibility (e.g. to HIV/AIDS) and the severity of the consequences of not using a condom, instrumental efficacy of condoms (i.e. they work to prevent STIs or HIV), self-efficacy related to condom use (i.e. I can use a condom), costs *v.* benefits associated with condom use, and social norms (i.e. my ethnic group, community, peers, etc. think condoms should be used). These cognitions are theorised to exert an influence either directly or through intentions to use a condom. Critics of social cognitive models caution against over-privileging individual rationality and autonomy to the disadvantage of social, cultural, economic and political forces that may set boundaries around personal autonomy.^{31,50,51} Supporters of social cognitive models claim these environmental forces are not ignored but are understood as influencing the content of cognitions (e.g. beliefs, attitudes, self-efficacy) and the actualisation of intentions formed based on social cognitions. Critics and supporters alike acknowledge

the influence of both environmental forces and social cognitions on condom use. The difference is in where they focus their attention.⁵⁰

In studies of nonmarital, heterosexual relationships from Ethiopia, Ghana, Kenya, Mali, Cameroon, South Africa, Tanzania and Zambia,^{21,52–67} the specific contents of cognitions have been found to vary across countries. However, when these differences are taken into account in operationalisation of constructs, analyses produce similarities in the cognitions that most often influence intentions and condom use in nonmarital relationships. Self- and instrumental efficacy, beliefs that favour condom use, and supportive peer norms are positively correlated with condom use.^{21,52–67} Although it is widely acknowledged that the perception that one is susceptible to an STI such as HIV is necessary to motivate preventive action, perception of susceptibility to HIV infection has produced mixed and what appear to be contradictory, influences on condom use.^{24,63,66–68} Difficulties in establishing time ordering in the predominantly cross-sectional samples and acknowledgement that perceptions of susceptibility and condom use form a reciprocal relationship of influence have been used to explain these contradictions.

What has rarely been found to influence condom use is factual knowledge about HIV transmission and prevention. Endorsement of local myths and beliefs about HIV transmission and acquisition, however, has been shown to negatively influence condom use in studies using cognitive models in Kenya,²⁴ Ghana,^{69,70} Uganda⁷¹ and Zambia.⁷² This suggests that the influence of specific local beliefs is an important area for further research and inclusion in interventions.

Ethnographic and interview-based research, on its own and in combination with survey-based research, provides insights into the content of beliefs, values and attitudes that influence condom use. These include those related to understandings of condoms and personal susceptibility, and of masculinity, femininity and sexuality.

Inside cognitions: beliefs about HIV and condoms

Both an optimistic bias related to susceptibility to HIV and fatalistic beliefs have been documented across qualitative and quantitatively-based studies in Kenya^{73,74} and South Africa.^{63,75} Persistent beliefs about HIV transmission as a result of mundane activities such as being touched by someone who is infected, and events outside one's personal control such as witchcraft, spirits or spells have been documented in Ethiopia,⁶¹ Ghana,⁵² Kenya^{24,73,74} and South Africa.^{75–78} Combined with a fatalistic belief that God determines one's life course, including time and means of death,^{73,79} these appear to contribute to an ambiguous association between perceptions of personal susceptibility and other cognitions such as self efficacy or the cost–benefit assessment of condom use. Thus, for example, young men in two studies in Kenya pointed out that condoms are useless in preventing infection since it is only God who can determine one's life course, including whether infection will result from a particular sexual encounter or whether death will result from infection. In this way of thinking, the inconveniences and disadvantages (costs)

of condom use are the dominant influences on condom use since there are no benefits to use.^{73,74} In interviews, beliefs that influence perceptions of susceptibility often combine with a discourse about the lack of instrumental efficacy of condoms. These include beliefs that condoms do not fully protect against STIs or HIV (because they slip, break or allow infectious agents to pass through) or even that condoms increase the risk of HIV transmission (because they are manufactured with the virus in them or with holes in them as a plot to wipe out the people of SSA, or that the virus is small enough to pass through condoms). As has been found in studies in Ghana,⁵² South Africa,⁷⁵ Malawi⁸⁰ and Kenya,^{73,74,81} when combined together, the specific content and explanations of susceptibility (such as those described here) along with self- and instrumental efficacy can present a major impediment to condom use.

Inside cognitions: beliefs about masculinity, femininity and reproduction

Attitudes towards condoms also draw from cultural understandings of masculinity, femininity, and the meaning and purpose of sexual relationships. For example, studies from Kenya,⁷³ Nigeria,⁸² South Africa⁸³ and Zaire⁸⁴ have identified a core cultural assumption that men have a biological need for frequent sexual release, a 'natural' desire for diversity in partners, and an obligation to provide for women's sexual and fertility needs. Multiple sexual relationships and inseminations are taken as evidence of masculinity. The deposit of semen is seen to display manliness,^{73,75,84} with negative attitudes towards abstinence bolstered by beliefs that abstinence leads to deterioration in men's health.^{81,85,86} Discounting risks also enhances masculinity in these gendered belief systems.^{40,73,87} The coercion and violence documented as common themes in heterosexual relationships in studies in Kenya,^{74,81} Mali,⁶² Nigeria,⁸⁵ Tanzania,⁷⁹ South Africa^{31,37,63,88,89} and Rwanda⁹⁰ has been linked to the belief that a man needs and has a right to sex. That right may be legitimately exercised with physical force or, in some locations, even with gang rape, especially when it is perceived that a girl or woman 'owes' sex to a boy or man.^{31,74,79,81,87}

Complementary core assumptions about femininity identified in studies in Kenya,^{74,87} Nigeria⁸⁵ and South Africa^{86,88,89} are that sex and pregnancy enhance womanhood, abstinence is deleterious to women's health and the proper maturation of adolescent girls, the deposit of sperm in a woman's vagina enhances her beauty, women are naturally subservient to men, and sexuality and fertility are women's primary and appropriate resources for negotiating material and economic advantages. In combination, these gendered norms and attitudes lead both men and women to reject condoms since their use detracts from or contradicts norms of masculinity or femininity.

Research from Tanzania,⁷⁹ Nigeria,^{85,91,92} South Africa,^{89,93,94} Kenya,^{73,95} and Zambia⁹⁶ supports the observation that these beliefs about masculinity and femininity overlap with the belief that the core purpose of sexual interaction is a demonstration of virility and fertility. Sexual activity that does not involve the deposit of semen in the vagina has been described as 'wasting semen' and inhibiting the

pleasure of both partners in Tanzania,⁷⁹ Kenya,^{73,95} Nigeria⁹² and Zambia.⁹⁶ In several of these studies, men report and are reported to make holes in condoms to ensure their sperm or semen can escape into the vagina, and both men and women speak of 'tricking' their partner into condomless sex.^{73,79,95-97} Children and parenthood remain of primary importance to both men and women, even when the risk of HIV transmission is high, as in serodiscordant couples. In data collected in both Kenya^{38,98} and Togo,⁹⁹ men in serodiscordant relationships ignored the risk of transmission because they wanted children. Their desire was supported by community and ethnic norms that often required a couple to have children as a way of validating their relationship. The importance of fertility is also supported in studies in Nigeria⁸⁵ and South Africa,⁷⁵ where proof of fertility is important in the transition from child to adult. Clearly, fertility cannot be demonstrated if condoms are used.

The importance of seminal deposits for fertility and to reaffirm one's masculinity or femininity, together with the perception that condoms interfere with desired feelings of sexual intercourse, are captured in the frequently recorded statements that 'real sex' requires skin-to-skin contact. Without such contact, sex loses both its meaning and pleasure. Phrases such as 'It is like eating a candy with the wrapper on,' 'eating chicken with the feathers still on,' or complaints that 'You cannot taste the sweetness' of sex or 'It denies my essence,' are shown in studies in Kenya,^{73,86} South Africa^{64,75} and Nigeria⁸⁵ to describe sex with a condom.

Besides the effects of traditional beliefs and norms on condom use, as Kaler¹⁰⁰ points out, the political history of condoms in SSA continues to work against their use. In some regions, condoms continue to be associated with twentieth century campaigns of population control, which are interpreted as a desire of 'western' countries to depopulate Africa.

Relationship influences on condom use

Three types of relationships have been discussed in the literature as influencing condom use: those with parents, with peers and with sexual partners.

Parent-child communication about condoms

Studies from South Africa,⁶³ Kenya¹⁰¹ and Uganda^{102,103} have identified communication between parents and their children about sexual matters as extremely limited and, in all of these locations, explicitly prohibited by cultural norms. Absent from the literature are models or examples of good parent-child communication. When communication is described, it consists of reprimands, warnings and injunctions against sexual activity, usually levelled at daughters. The sexuality of sons is rarely an area of parental comment or, as found in studies in Kenya, parents feel they cannot or should not attempt to curb young men's sexual activity.^{73,74} In studies in South Africa^{63,75,104} and Uganda,¹⁰¹ parents have been found to forbid contraception and condoms, with daughters punished if they are found with condoms or contraception.

Peer pressure

Among youth (aged 13–25), peers are reported to exert pressure on each other to engage in sex and to forgo condom use in studies in Kenya,^{74,81} Nigeria,⁸³ South Africa^{63,75} and Uganda.¹⁰⁵ In South Africa, quantitative studies have demonstrated greater susceptibility to the role modelling and pressure exerted by peers among young men than women,⁶³ with masculine norms promoting sexual activity policed primarily by peer groups. Research reports from South Africa,⁸⁵ Kenya,^{81,84} Nigeria⁸⁵ and Uganda¹⁰⁵ describe how young men not only goad and chide each other to sexual performance, but may also arrange for female partners for members of their group, ‘stand guard’ to prevent intrusion, watch each other as sex is performed or collectively engage in sex with a single female partner – with or without her ‘consent.’ This makes it nearly impossible for young men to either refrain from sexual activity or to use a condom unless their peer group condones such action.

From their work in Kenya, Buhler and Kohler¹⁰⁶ report that preferred methods of protection, as well as perceived risk, depend on the opinions that prevail in the personal networks of both young men and women. Although in most research those perceptions, preferences and pressures do not support condom use,^{63,74,75,81,83–85,105} in some studies, peers have been documented as encouraging and endorsing condom use. This was evidenced, for example, among university students in Durban, South Africa, where peer norms were supportive of both condom use and of women having a say in decisions about condoms.⁴¹ The possibility of influencing peer norms and peer group actions through targeted interventions is illustrated in the work of Maticka-Tyndale and colleagues in Kenya.^{105–109} Their evaluation of an HIV prevention program showed how participating upper primary school students (grades 6 and 7) reported both increased peer support for condom use and identification of specific strategies endorsed by peer groups for introducing condoms into their relationships. Although the intervention took place during upper primary school, the strategies continued operating well into secondary school years.¹⁰⁷ Clearly, peer groups exert considerable influence. This is most often against condom use but, as these few examples illustrate, it can be mobilised to support use.

Noncommercial relationships

Condom use occurs within the context of a partnered sexual encounter. Condoms are most often reported as used by those who have multiple partners, and in what are variously described as casual, one-time or occasional partnerships rather than repeated, relationship-based or marital sexual partnerships.^{9–24,52–56} In fact, Adetunji¹¹⁰ found marital status to be the strongest predictor of condom use in his analysis of DHS data from Zimbabwe. The greater likelihood of condom use among those with multiple partners and in ‘casual’ relationships has been found across diverse forms of sexual partnering – among youth with no ‘long-term’ relationship in Ghana and South Africa,^{52–56,111} among those who are married and have additional casual or multiple partnerships in studies in all regions of SSA,^{79,82,112–114} and among sex workers in South Africa^{33,36} who have both regular and casual sexual partnerships.

Consistently across studies from countries in all regions of SSA, condoms are associated with promiscuity, unfaithfulness and distrust.^{43,73,74,79,113,115,116} For these reasons, condoms are not only considered unnecessary, but are also seen as damaging in a relationship built on trust, most especially in marriage.^{32,76,80,114–117} In Chimbiri’s study in Malawi, for example, condoms were referred to as ‘an intruder into the domestic space.’⁷⁷ This is even the case for serodiscordant couples. Husbands of HIV-positive wives in studies in Kenya^{38,98} and Togo⁹⁹ who refused to use condoms referred to their wives as ‘prostitutes’ if they encouraged condom use. King *et al.*, in their study of HIV-positive individuals in Uganda, found that even among those with a strong commitment not to infect others (expressed as ‘The virus stops with me’), consistent condom use was problematic in long-term relationships.¹¹⁸ Further evidence of the problematic nature of condom use among serodiscordant couples is provided in two studies that included HIV widows whose ethnic group practiced ‘wife inheritance’ (a widow becomes the wife of a male relative on the death of her husband). In both studies, new husbands insisted on sex without a condom^{38,119} even though they suspected that their ‘new’ wives were infected with HIV. The negative correlation found between condom use and viewing condoms as an issue of trust by Agha *et al.* in analysis of data from eight SSA countries¹¹³ and Montgomery *et al.* in four countries¹¹⁵ is consistent with results of these qualitative inquiries. Across all eight countries in Agha’s study, trust (i.e. trust that the partner was faithful and condoms were therefore unnecessary) was the main reason given for lack of condom use in marriage and regular partnerships. This contrasts with dislike of condoms, which was the primary reason in casual partnerships.¹¹³

Already addressed earlier in this paper is the issue of power or control over condom use in sexual relationships. Across all regions of SSA, control of use is in the hands of men, with initiation of condom use extremely difficult, if not impossible, for women.^{31,32,34,35,37–39,120,121} Blanc’s review of results from DHS data from countries in southern, eastern and western Africa demonstrated that women have more influence on condom use where there is a more equitable balance of power between partners.¹²²

Commercial sexual relationships

Sex workers – those who provide for all or most of their economic needs through the payment they receive for providing sexual services to a variety of partners – are among those who stand to gain the most from condom use for protection against STIs. Consistent with the focus on heterosexual intercourse in the literature from SSA, little research is available on male sex workers. Consequently, this section is based on research that relates exclusively to the work of female sex workers.

Rates of condom use among sex workers vary across countries. Research in Uganda,⁴⁷ South Africa,¹²³ Zimbabwe,¹²⁴ and The Democratic Republic of the Congo¹²⁵ support the conclusion that condom use frequency and consistency are low among sex workers in these countries. Campbell, for example, found that condoms were used in fewer than 10% of sexual encounters in her South African sample.¹²³ Ray *et al.*¹²⁴ found no condom use at all among

sex workers in Zimbabwe at the baseline data collection for an intervention designed to increase condom use. In contrast, other research in Uganda⁴⁵ as well as in urban areas in the west African countries of Senegal,¹²⁶ Gambia¹²⁷ and Cote d'Ivoire¹²⁸ found high rates of condom use (ranging from 76% to well over 90% of commercial encounters) based on reports from both sex workers and their clients. Five themes consistently emerge from the research literature as influencing condom use in the sex work relationship: the nature of the worker–client relationship, price, time, availability of condoms and violence.

Sex workers may have a combination of regular and casual clients. The latter are defined as one-off encounters with no further obligation or expectation of contact. This contrasts with regular partners where there is an ongoing commercial relationship accompanied by an expectation of trust and 'faithfulness,' with the latter variously conceptualised as exclusivity during the time together but not in the interim, or preference and priority given to the regular over casual partners. Research in both Tanzania¹¹⁷ and South Africa¹²³ found that condom use is typically taboo with regular sexual partners, except for purposes of contraception. Similar to research results for noncommercial partnerships, when condoms are used, it is almost always with casual partners.

The price of a sexual encounter is the second factor influencing condom use. Typically, sex workers focus on negotiating for the best price. The more a customer is willing to pay for sex without a condom, the more likely the sex worker will forgo the condom.^{36,47,123} If a worker accepts the lower fee in order to retain the use of a condom, more clients will have to be serviced to garner an adequate income. In most sex work settings, competition for clients is intense, resulting in workers going along with each client's demands for fear of losing the client or earning less.^{33,36,47,123,125,129–131}

Time and availability of condoms are the third and fourth themes. Sex workers have described their encounters, especially with casual partners, as brief, with minimal conversation or negotiation. Time is money and workers prefer to move on to additional partners as quickly as possible, but sex with a condom usually requires more time.³⁶ The importance of availability of condoms is evidenced in a study in Zimbabwe, where the percentage of sex workers reporting condom use increased from 0% to 52% when they were provided with both male and female condoms, and from 0% to 82% when provided with male condoms.¹²⁴

Finally, studies of sex work in Tanzania,¹³² South Africa,^{33,36,123,129} Uganda⁴⁷ and Zimbabwe¹²⁴ discussed the ever-present fear and experience of violence among sex workers. When sex workers want to use condoms, they must balance this desire against awareness that using, or at times even suggesting, condoms may produce a violent response from a client.

The influence of these factors is evidenced in the research of Gysels *et al.*⁴⁷ at Ugandan truck stops. They found that sex workers who reported regular condom use were those with greater economic security, in some cases because sex work was not their only source of income. In this study, women who regularly used condoms restricted their work to casual partners, avoiding the expectations associated with regular partnerships. Truck drivers cooperated with condom use, and

Gysels' team noted that drivers were aware of HIV risk and the protective property of condoms. Thus, the sex workers at these sites had the casual nature of the relationship, cooperation of their clients – and consequently a lower concern with violence resulting from the suggestion or use of condoms – a commonly shared norm for condom use and greater security of income all contributing to condom use. This is not the case at all 'truck stops' as illustrated in Karim *et al.*'s research in South Africa³³ and Summola's in Nigeria,¹³³ where truck drivers resisted condom use with the local sex workers and rates of use were low.

Structural influences on condom use

Community- and national-level influences

A relatively new area of research involves multilevel modelling to include the structural and environmental conditions that may influence condom use. Stephenson,⁴⁹ Ukwuani *et al.*¹⁶ Benefo,⁶⁶ and Maticka-Tyndale and Tenkorang²⁵ examined the local community structures and conditions that influence HIV risk-taking, and Greig and Koopman⁴² examined multilevel (national and individual) analyses using national data and DHS data from 35 SSA countries. Stephenson⁴⁹ focussed on the economic and social profile of local communities and neighbourhoods in Burkina Faso, Ghana and Zambia. In each instance, higher median household income, levels of employment of men and women, median age of first marriage for women and educational level of community residents were each associated with higher proportions of men reporting condom use. For women, however, only the employment profile of women in the community influenced condom use, with fewer women reporting use in communities with a higher percentage of women employed. Benefo⁶⁶ in Zambia, and Ukwuani *et al.*¹⁶ in Tanzania and Uganda found that indicators of development and modernisation were associated with a greater likelihood of reported condom use by both men and women. Greater community-level awareness and communication about HIV and AIDS were found to be associated with greater condom use by Benefo⁶⁶ in Zambia and Maticka-Tyndale and Tenkorang²⁵ in Kenya. In both cases, the influence of these environmental factors was additional to that of individual-level sociodemographics and social cognitions. Greig and Koopman⁴² found condom use was correlated with levels of female enrolment in secondary education and the secondary net enrolment ratio of females to males, controlling for indicators of economic development. These latter results are often used to support claims that empowerment of women contributes to condom use.^{31,134,135} However, studies finding that higher levels of female employment are associated with lower reported levels of condom use⁴⁹ suggest our understanding of empowerment and its effect on condom use is incomplete.

Media influences

Exposure to media such as radio or television has demonstrated a positive influence on condom use. High levels of media penetration have been associated with emerging cultures of risk prevention through condoms among youth in South Africa, Burkina Faso, Ghana, Malawi and Uganda.^{49,136} However, Eaton *et al.*,⁶³ based on their work in

South Africa, caution that media messages may be confusing and difficult to understand. In cultures where sex is not in the popular domain of discourse or communication, and different ethnic groups each have their own way of speaking about sexuality and condom use, it is difficult to craft messages that are readily and uniformly understood.

Condom access

Access to condoms may also be an issue. With the exception of remote rural areas, studies at the individual level rarely identify access as problematic.¹¹³ At the country and regional level, however, availability and access may be issues. Shelton and Johnston,¹³⁷ using data from United Nations Population Fund and United States Agency for International Development, examined the availability of condoms across SSA. Combining the number of condoms provided by donor agencies and purchased by countries' own funds, they estimated a total of 724 million condoms were available across SSA in the year 1999. This amounted to 4.6 condoms a year for each man aged 15–59 years. Clearly, these numbers are inadequate. Access is particularly difficult in rural areas where health facilities providing condoms may be many kilometres away and visits are typically only made in times of illness – leaving only the possibility of purchasing condoms from private vendors. In addition, youth in both Tanzania⁸² and South Africa^{63,74} have complained of treatment by clinic staff. Girls and young women report being chastised when they request condoms. They fear rumors and gossip about their clinic visit will affect their reputation in the community and reach their parents, resulting in punishment. In their study in Botswana, Meekers and colleagues¹³⁸ found that youth chose private purchase over public clinic access to condoms because of the treatment they received and difficulties they encountered in public access.

Poverty

Poverty is an overarching structural and environmental factor that has been identified as affecting condom use in a wide array of studies.^{34,37,79,117,139,140} Poverty compromises overall health and access to health care, including testing and treatment for STIs and HIV. It not only restricts access to condoms, but also influences sexual practices and partnerships, creating barriers to condom use. Although poverty affects both men and women, a greater focus of research has been on its effects on women. Cultural beliefs and norms related to femininity and sexuality in diverse locations have been found to support women engaging in sex to meet their material needs. Formal sex work is one response to poverty. Beyond this, in Kenya,^{81,107} Nigeria,⁸⁵ Uganda¹⁴¹ and South Africa,¹⁴² women have reported expecting material gain from sex. Women may use the 'gifts' provided by sexual partners to assist in providing food for themselves or their family, to pay fees (e.g. school), gain transportation or better grades in school, or for personal items such as clothing, cell phones, meals in restaurants, cosmetics or jewellery. Results of research from Kenya,^{73,81} Tanzania¹⁴³ and Zimbabwe¹⁴⁴ have challenged the portrayal of the 'sugar daddy' relationship as exclusively that of male predator and female prey, describing girls and women who specifically seek out wealthy men to access greater gains from sex. Men in these relationships are

considerably older and have the luxury of multiple partners because of their wealth. In all of these circumstances, and most especially in relationships with 'wealthy' partners, condom use depends predominantly on men's interest, with women less likely to advocate for use, fearing loss of a lucrative partner.^{87,115,143} Under conditions of poverty, providing for immediate needs takes priority over the possibility of disease and, when poor women do have money, they use it to buy food rather than condoms.

Discussion

What is evident from the research reviewed here is that sex and condom use involves complex social and interpersonal dynamics. Structural and cultural conditions not only exert an influence through social cognitions but also set boundaries that limit autonomy and may make the choice of eschewing condoms desirable or even unavoidable. Multiple factors work against condom use for a large proportion of Africa's population. There is limited access and availability of condoms. Parent and peer relations typically work against condom use. Information is insufficient or absent, with myths often disguised as facts. In many regions, gender and sexual norms promoting male dominance and sexual need, and female subservience to that need, combine with norms stressing male virility necessitating a demonstration of fertility (inhibited by condom use) for both men and women. Gendered power may be exercised by men through wealth and force, and by women through using their sexuality for material gain, neither of which facilitate condom use. When faced with poverty, women privilege economic survival over health or longevity and, if they are able to access condoms, are unlikely to insist on use if it threatens economic gain. Local myths and beliefs about HIV transmission counter the instrumental efficacy of condoms and self-efficacy in being able to protect against HIV. Attitudes towards sex and condoms associate condoms with promiscuity and unfaithfulness as well as with interfering with pleasure, fertility and the meaning of sex. All of these dimensions vary across countries and regions of SSA, but appear to have a consistent association with condom use. In regions and among populations of SSA where they predominate, condom use is infrequent and inconsistent. Where they are weaker or nonexistent, condom use is more common. Considering the diverse and multilayered influences on condom use, it is not surprising that HIV prevention programming has had, at best, a limited impact on use.

Despite what may appear to be insurmountable obstacles to improving condom use, there is good news emerging from some research. Most far-reaching are the results of Cleland *et al.*¹⁴⁵ and Cleland and Ali,¹⁴⁶ who examined DHS data collected between 1993 and 2007 in 18 countries that cut across all regions of SSA, and Adair's examination of condom use among men using DHSs from five countries.¹⁴⁷ Cleland and his colleagues^{145,146} found a consistent pattern of increased condom use among single women in all countries for which they had data, with the increase reaching statistical significance in 13 of the 18 countries. Specifically, the median proportion of women reporting any condom use increased from 5.3% in 1993 to 18.8% in 2007. Reports of condom use in the most recent

intercourse also increased from 19.3% to 28.4%. Perhaps most encouraging was that 58.5% of condom-using single women in 2007 reported use was not for pregnancy prevention. While these numbers are still low, the increases are promising. Unfortunately, there were no significant changes found among married or cohabiting women. Given the importance of fertility and the association of condoms with unfaithfulness, this is not surprising. However, it is of concern given that research has demonstrated that at least half of heterosexual transmission is within the context of marriage.^{144,148} Adair's¹⁴⁷ results were more mixed, with statistically significant increases in men's reports of condom use between the late 1990s and early 2000s with nonmarital, noncohabiting partners in Cameroon, Tanzania and Burkina Faso, but only slight, nonsignificant increases in Kenya and Zambia.

Several evaluated interventions in South Africa have demonstrated results which may, over time prove beneficial for condom use. Given the importance of gender power to use of condoms, two interventions that specifically target gender relations are of particular interest. Jewkes and her colleagues¹⁴⁹ reported that fewer men who participated in a community-based intervention called *Stepping Stones* reported perpetrating intimate partner violence than those who did not. Kim and her colleagues¹³⁵ demonstrated similar results among men and women who participated in an intervention called *IMAGE*. These two programs were designed to influence sexual relationship dynamics, particularly intimate partner violence, and consequent condom use. They consisted of workshops and, in the case of *IMAGE*, also a microfinance program designed to empower women. Despite the beneficial results related to relationship dynamics, neither program produced statistically significant gains in condom use, although this may relate to the high proportion of married people participating in the interventions.

Prevention programs targeting young people in Kenya,^{107,150} Zambia¹⁵¹ and Tanzania¹⁵² have been the most successful, demonstrating increases in condom use that were sustained for at least a year and, in one case, for up to three years. Kirby and his colleagues,⁴ and Maticka-Tyndale and her colleagues^{6,7} have drawn lessons on 'best practices' for influencing condom use from these and other studies that provide guidance for future work.

The results of Maharaj and Cleland's⁴¹ research on post-secondary students in South Africa are also promising. Despite the extensive research evidence that condoms are not merely absent from the norms related to sexual activity, but actually contradict the values underlying many of these norms, Maharaj and Cleland found that condoms had become an expected part of sex and acceptable to the majority in their sample of post-secondary students.⁴¹ Although most of these students reported use for purposes of contraception, 75% reported condom use at last sex. There also appeared to be a shift in gender power among these young adults, with almost half of males and two-thirds of females rejecting the idea that men alone control decision-making related to condoms.⁴⁴ Further research with post-secondary students in South Africa and other countries may provide insights into how this well-educated cohort has countered the multiplicity of factors that push against condom use. Finally, some interventions among female sex workers have

also shown promise in increasing their ability to introduce and use condoms in their commercial encounters.^{124,153,154}

What is evident from this review is the influence of the gendered power dynamic on condom use. Across multiple diverse cultural groups, men in SSA control sex and condom use, and view the costs of condom use as far greater than the benefits. Even when women see condoms as providing gain – in controlling fertility and preventing disease – their power to ensure use is questionable. Considering this power differential and its consequences, it is promising to see that some interventions, such as *Stepping Stones* and *IMAGE*, have demonstrated improvements in relationship dynamics.^{135,149} It is also promising to see research results that support the conclusion that some women in SSA are resisting the dominant gendered power dynamic. Wojcicki and Malala,³⁶ and Campbell¹²³ from their research in South Africa, and Gysels *et al.*⁴⁷ in Uganda write of the power exerted by women sex workers to maximise their earnings and, especially in Uganda, to protect their health through condom use. Maticka-Tyndale and her colleagues^{107–109} write of the strategies used by young female adolescents to resist unwanted sex, including sex with partners who refuse to use a condom. Wojcicki,¹⁴² and Barnett and Maticka-Tyndale⁸³ write of how women exercise their agency and power within the well-established sexual exchange scripts of South Africa and Nigeria respectively. Luginaah *et al.*¹¹⁹ write of how Luo widows of HIV-positive men in Kenya resist the wife inheritance tradition by banding together and supporting each other. Several researchers have observed that it is among the better educated youth of African countries that condom use is taking a hold.^{18,41,76,113} Given the power inherent in the structural, cultural, interpersonal and gendered barriers to condom use, the changes that are beginning to be shown will need to be maintained and further expanded into the diverse social and physical spaces where condom use is decided and enacted in order to see sufficient change to reverse the sexual health burdens that dominate the landscape of SSA.

Limitations

The boundaries and limitations of this overview and synthesis must be noted. The primary limitation is that the scope of the review is limited by the scope of published research. As highlighted in the Methods and Background sections, research has been concentrated on specific countries and regions of SSA, and on condom use in heterosexual, penile–vaginal intercourse. The regions, subpopulations (such as men who have sex with men) or sexual acts (such as anal intercourse) that have been omitted might produce a different portrayal of condom use. Another weakness of the research is that it is predominantly cross-sectional in nature and relies on self-report. The cross-sectional nature of the research means that causal order cannot readily be established. Self-report raises concerns that social desirability bias may influence reports of condom use. Of interest is that this bias may contribute to under-reporting of condoms among populations where social norms reject condom use and over-reporting where social norms promote condom use.

Perhaps the two most important, and related, cautions that must accompany the results reported here are those related to

potential spuriousness and homogenisation. Large, national and regional surveys, such as the DHSs, which have applied rigorous sampling and data collection procedures, provide the methodologically most trustworthy results linking sociodemographics, life circumstances and several attitudinal and experiential variables to condom use. However, these, and smaller-scale studies as well, do not fully examine for potential spuriousness of results, nor do they adequately examine intersectionalities between characteristics or subgroups within sociodemographic groupings that would promote an understanding of the pathways of influence or particularities of patterns of influence in distinct population subgroups. Qualitative research points to conditionalities, processes, interactions, distinct local understandings and meanings, which are likely to influence condom use and would contribute to a more nuanced, particularised and complete understanding. However, these have not been pursued in survey research and, consequently, do not contribute to the statistical profile available in the literature.

Conclusions

Consistent and correct use of condoms in sexual interactions has been promoted as a beneficial strategy to reduce the personal risk of acquiring an STI, including HIV. Nowhere is condom use more important than in SSA, where the sexual and reproductive health burdens are the highest in the world. What is evident from this review and synthesis is that condom use involves complex social and interpersonal dynamics with structural and cultural conditions exerting an influence through framing social cognitions and setting boundaries on autonomy that make condom use difficult. However, promising results are shown in trends towards increased condom use among single women in numerous countries of SSA, increasing acceptance and use of condoms among some university students, successes in producing potentially sustainable condom use resulting from select interventions, and resistance to succumbing to the dominant gender–power dynamics and structural–cultural impediments that women in groups have mobilised. The next steps in research require examinations of factors contributing to these beneficial changes. The next steps in advancing such desirable change require application of ‘lessons learned’ that are documented in the literature reporting results for successful interventions as well as literature synthesising intervention evaluation results.

Conflicts of interest

None declared.

References

- 1 United Nations Development Program (UNDP). Human development report 2003 on millennium development goals. New York, NY: United Nations; 2003.
- 2 UNAIDS. AIDS epidemic update. Geneva: UNAIDS; 2009.
- 3 Gallant M, Maticka-Tyndale E. School-based HIV prevention programmes for African youths. *Soc Sci Med* 2004; 58: 1337–51. doi:10.1016/S0277-9536(03)00331-9
- 4 Kirby DB, Laris BA, Roller LA. Sex and HIV education programs: their impact on sexual behaviors of young people throughout the world. *J Adolesc Health* 2007; 40: 206–17. doi:10.1016/j.jadohealth.2006.11.143
- 5 Magnussen L, Ehiri J, Ejere H, Jolly P. Interventions to prevent HIV/AIDS among adolescents in less developed countries: are they effective? *Int J Adolesc Med Health* 2004; 16: 303–24. doi:10.1515/IJAMH.2004.16.4.303
- 6 Maticka-Tyndale E, Barnett JP. Peer educators: a synthesis of the research. *Eval Program Plann* 2010; 33: 98–112. doi:10.1016/j.evalprogplan.2009.07.001
- 7 Maticka-Tyndale E, Brouillard-Coyle C. The effectiveness of community interventions targeting HIV and AIDS prevention at young people in developing countries. In Ross DA, Dick B, Ferguson J, editors. Preventing HIV/AIDS in young people: a systematic review of the evidence from developing countries. Geneva: WHO; 2006. 243–285.
- 8 United Nations Statistical Division of the UN Department of Economic and Social Affairs (DESA). Composition of macro geographical (continental) regions, geographical sub-regions, and selected economic and other groupings: DESA. Available online at: <http://unstats.un.org/unsd/methods/m49/m49regin.htm#africa> [verified June 2011].
- 9 Lagarde E, Aubert B, Chege J, Sukwa T, Glynn JR, Weiss HA, et al. Condom use and its association with HIV/sexually transmitted diseases in four urban communities of sub-Saharan Africa. *AIDS* 2001; 15: S71–78. doi:10.1097/00002030-200108004-00008
- 10 Glick P, Sahn DE. Are Africans practicing safer sex? Evidence from Demographic and Health Surveys for eight countries. *Econ Dev Cult Change* 2008; 56: 397–439. doi:10.1086/522893
- 11 Adetunji J, Meekers D. Consistency in condom use in the context of HIV/AIDS in Zimbabwe. *J Biosoc Sci* 2001; 33: 121–38. doi:10.1017/S0021932001001213
- 12 Mnyika KS, Klepp K-I, Kvale G, Ole-Kingori N. Determinants of high-risk sexual behaviour and condom use among adults in the Arusha region, Tanzania. *Int J STD AIDS* 1997; 8: 176–83. doi:10.1258/0956462971919840
- 13 Lagarde E, Pison G, Enel C. Knowledge, attitudes and perception of AIDS in rural Senegal: relationship to sexual behaviour and behaviour change. *AIDS* 1996; 10: 327–34. doi:10.1097/00002030-199603000-00012
- 14 Waithaka M, Bessinger R. Sexual behavior and condom use in the context of HIV prevention in Kenya. Population Services International, Kenya; 2001.
- 15 Zellner SL. Condom use and accuracy of AIDS knowledge in Cote d’Ivoire. *Int Fam Plan Perspect* 2003; 29: 41–7. doi:10.2307/3181000
- 16 Ukwuani FA, Amy OT, Chirayath MS. Condom use for preventing HIV infection/AIDS in sub-Saharan Africa: a comparative multilevel analysis of Uganda and Tanzania. *J Acquir Immune Defic Syndr* 2003; 34: 203–13. doi:10.1097/00126334-200310010-00011
- 17 Agha S. Sexual activity and condom use in Lusaka, Zambia. *Int Fam Plan Perspect* 1998; 24: 32–7. doi:10.2307/2991917
- 18 Glick P, Randriamamonjy J, Sahn DE. Determinants of HIV knowledge and condom use among women in Madagascar: an analysis using matched household and community data. *Afr Dev Rev* 2009; 21: 147–79. doi:10.1111/j.1467-8268.2009.00206.x
- 19 Prata N, Vahidnia F, Fraser A. Gender and relationship differences in condom use among 15–24 year olds in Angola. *Int Fam Plan Perspect* 2005; 31: 192–9. doi:10.1363/3119205
- 20 Cherutich P, Brentlinger P, Nduati R, Kiarie JN, Farquhar C. Condom use among sexually active Kenyan female adolescents at risk for HIV-1 infection. *AIDS Behav* 2008; 12: 923–9. doi:10.1007/s10461-008-9445-6

- 21 Kabiru CW, Orpinas P. Correlates of condom use among male high school students in Nairobi, Kenya. *J Sch Health* 2009; 79: 425–32. doi:10.1111/j.1746-1561.2009.00430.x
- 22 Betts SC, Peterson DJ, Huebner AJ. Zimbabwean adolescents' condom use: what makes a difference? Implications for intervention. *J Adolesc Health* 2003; 33: 165–71. doi:10.1016/S1054-139X(02)00565-7
- 23 Babalola S, Awasum D, Quenum-Renaud B. The correlates of safe sex practices among Rwandan youth: a positive deviance approach. *Afr J AIDS Res* 2002; 1: 11–21. doi:10.2989/16085906.2002.9626540
- 24 Meekers D, Klein M, Foyet L. Patterns of HIV risk behavior and condom use among youth in Yaoundé and Douala, Cameroon. *AIDS Behav* 2003; 7: 413–20. doi:10.1023/B:AIBE.0000004733.26053.c8
- 25 Maticka-Tyndale E, Tenkorang E. A multi-level model of condom use among upper primary school students in Nyanza, Kenya. *Soc Sci Med* 2010; 71: 616–25. doi:10.1016/j.socscimed.2010.03.049
- 26 Agha S, Hutchinson P, Kusanthan T. The effects of religious affiliation on sexual initiation and condom use in Zambia. *J Adolesc Health* 2006; 38: 550–5. doi:10.1016/j.jadohealth.2005.04.012
- 27 Trinitapoli J. Religious teachings and influences on the ABCs of HIV prevention in Malawi. *Soc Sci Med* 2009; 69: 199–209. doi:10.1016/j.socscimed.2009.04.018
- 28 Takyi BK. Religion and women's health in Ghana: insights into HIV/AIDS preventive and protective behavior. *Soc Sci Med* 2003; 56: 1221–34. doi:10.1016/S0277-9536(02)00122-3
- 29 Muula AS. Marriage, not religion, is associated with HIV infection among women in rural Malawi. *AIDS Behav* 2010; 14: 125–31. doi:10.1007/s10461-009-9624-0
- 30 Gilbert S. The influence of Islam on AIDS prevention among Senegalese university students. *AIDS Educ Prev* 2008; 20: 399–407. doi:10.1521/aeap.2008.20.5.399
- 31 Leclerc-Madlala S. Youth, HIV/AIDS and the importance of sexual culture and context. Cape Town: South Africa: Centre for Social Science Research; 2002.
- 32 Ulin P. African women and AIDS: negotiating behavioural change. *Soc Sci Med* 1992; 34: 63–73. doi:10.1016/0277-9536(92)90068-2
- 33 Karim QA, Karim SSA, Soldan K, Zondi M. Reducing the risk of HIV infection among South African sex workers: socioeconomic and gender barriers. *Am J Public Health* 1995; 85: 1521–5. doi:10.2105/AJPH.85.11.1521
- 34 Baylies C, Bujra J. AIDS, sexuality and gender in Africa: collective strategies and struggles in Tanzania and Zambia. London: Routledge; 2000.
- 35 Campbell T, Kelley M. Women and AIDS in Zambia: a review of the psychosocial factors implicated in the transmission of HIV. *AIDS Care* 1995; 7: 365–74. doi:10.1080/09540129550126579
- 36 Wojcicki JM, Malala J. Condom use, power and HIV/AIDS risk: sex-workers bargain for survival in Hillbrow/Joubert Park/Berea, Johannesburg. *Soc Sci Med* 2001; 53: 99–121. doi:10.1016/S0277-9536(00)00315-4
- 37 Wood K, Jewkes R. Violence, rape and sexual coercion: everyday love in a South African township. *Gen Dev* 1997; 5: 41–6. doi:10.1080/741922353
- 38 Amuyunzu-Nyamongo M, Okeng'o L, Wagura A, Mwenza E. Putting on a brave face: the experiences of women living with HIV and AIDS in informal settlements of Nairobi, Kenya. *AIDS Care* 2007; 19: 25–34. doi:10.1080/09540120601114618
- 39 Terry P, Mhloyi M, Masvaure T, Adlis S. Gender equity and HIV/AIDS prevention: comparing gender differences in sexual practice and beliefs among Zimbabwe university students. *Int Q Community Health Educ* 2005–2006; 24: 29–43. doi:10.2190/F5VV-JPNE-71AT-8FUH
- 40 Orubuloye IO, Caldwell JC, Caldwell P. African women's control over their sexuality in an era of AIDS. *Soc Sci Med* 1993; 37: 859–72. doi:10.1016/0277-9536(93)90139-U
- 41 Maharaj P, Cleland J. Condoms become the norm in the sexual culture of college students in Durban, South Africa. *Reprod Health Matters* 2006; 14: 104–12. doi:10.1016/S0968-8080(06)28253-3
- 42 Greig F, Koopman C. Multilevel analysis of women's empowerment and HIV prevention: quantitative survey results from a preliminary study in Botswana. *AIDS Behav* 2003; 7: 195–208. doi:10.1023/A:1023954526639
- 43 Clark S, Bruce J, Dude A. Protecting young women from HIV/AIDS: the case against child and adolescent marriage. *Int Fam Plan Perspect* 2006; 32: 79–88. doi:10.1363/3207906
- 44 Ahmed S, Lutalo T, Wawer M, Serwadda D, Sewankambo NK, Nalugoda F, et al. HIV incidence and sexually transmitted disease prevalence associated with condom use: a population study in Rakai, Uganda. *AIDS* 2001; 15: 2171–9. doi:10.1097/00002030-200111090-00013
- 45 Stewart TJ, Richter DL. Perceived barriers to HIV prevention among university students in Sierra Leone, West Africa. *Int Q Community Health Educ* 1994; 15: 253–66. doi:10.2190/JQP2-V6HA-EQK5-8EWP
- 46 Heeren GA, Jemmott JB, Mandeya A, Tyler JC. Sub-Saharan African university students' beliefs about condoms, condom-use intention, and subsequent condom use: a prospective study. *AIDS Behav* 2009; 13: 268–76. doi:10.1007/s10461-008-9415-z
- 47 Gysels M, Pool R, Nnalusiba B. Women who sell sex in a Ugandan trading town: life histories, survival strategies and risk. *Soc Sci Med* 2002; 54: 179–92. doi:10.1016/S0277-9536(01)00027-2
- 48 Stephenson R. Community influences on young people's sexual behavior in 3 African countries. *Am J Public Health* 2009; 99: 102–9. doi:10.2105/AJPH.2007.126904
- 49 Katz I. Explaining the increase in condom use among South African young females. *J Health Commun* 2006; 11: 737–53. doi:10.1080/10810730600934674
- 50 Maticka-Tyndale E. Can we? Have we? Prevention of sexual transmission of HIV. *Can J Hum Sex* 1995; 4: 79–102.
- 51 Airhihenbuwa C, Obregon R. A critical assessment of theories/models used in health communication for HIV/AIDS. *J Health Commun* 2000; 5: 5–15. doi:10.1080/10810730050019528
- 52 Adih W, Alexander C. Determinants of condom use to prevent HIV infection among youth in Ghana. *J Adolesc Health* 1999; 24: 63–72. doi:10.1016/S1054-139X(98)00062-7
- 53 Bosompra K. Determinants of condom use intentions of university students in Ghana: an application of the theory of reasoned action. *Soc Sci Med* 2001; 52: 1057–69. doi:10.1016/S0277-9536(00)00213-6
- 54 Hendriksen ES, Pettifor A, Lee S, Coates TJ, Rees HV. Predictors of condom use among young adults in South Africa: the reproductive health and HIV research unit national youth survey. *Am J Public Health* 2007; 97: 1241–8. doi:10.2105/AJPH.2006.086009
- 55 Bryan A, Kagee A, Broaddus MR. Condom use among South African adolescents: developing and testing theoretical models of intentions and behavior. *AIDS Behav* 2006; 10: 387–97. doi:10.1007/s10461-006-9087-5
- 56 Peltzer K. Factors affecting behaviours that address HIV risk among a sample of junior secondary school students in the northern province, South Africa. *Psychological Reports* 2001; 89: 51–56.
- 57 Jemmott JB, Heeren GA, Ngwane Z, Hewitt N, Jemmott LS, Shell R, et al. Theory of planned behaviour predictors of intention to use condoms among Xhosa adolescents in South Africa. *AIDS Care* 2007; 19: 677–84. doi:10.1080/09540120601084308

- 58 Schaalma H, Aaro LE, Flisher AJ, Matthews C, Kaaya S, Onya H, *et al.* Correlates of intention to use condoms among sub-Saharan African youth: the applicability of the theory of planned behaviour. *Scand J Public Health* 2009; 37: 87–91. doi:10.1177/1403494808090632
- 59 Sheeran P, Abraham C, Orbell S. Psychosocial correlates of heterosexual condom use: a meta-analysis. *Psychol Bull* 1999; 125: 90–132. doi:10.1037/0033-2909.125.1.90
- 60 Benefo KD. Determinants of condom use in Zambia: a multilevel analysis. *Stud Fam Plann* 2010; 41: 19–30. doi:10.1111/j.1728-4465.2010.00221.x
- 61 Bogale GW, Boer H, Seydel ER. Condom use among low-literate, rural females in Ethiopia: the role of vulnerability to HIV infection, condom attitude, and self-efficacy. *AIDS Care* 2010; 22: 851–7. doi:10.1080/09540120903483026
- 62 Boileau C, Zunzunegui MV, Rashed S. Gender differences in unsafe sexual behavior among young people in urban Mali. *AIDS Care* 2009; 21: 1014–24. doi:10.1080/09540120802626162
- 63 Eaton L, Flisher A, Aaro L. Unsafe sexual behaviour in South African youth. *Soc Sci Med* 2003; 56: 149–65. doi:10.1016/S0277-9536(02)00017-5
- 64 Lugoe WL, Biswalo PM. Self-restraining and condom use behaviours: the HIV/AIDS prevention challenges in Tanzanian schools. *Int J Adolesc Youth* 1997; 7: 67–81.
- 65 Reddy P, Meyer-Weitz A, van den Borne B, Kok G. Determinants of condom-use behaviour among STD clinic attenders in South Africa. *Int J STD AIDS* 2000; 11: 521–30. doi:10.1258/0956462001916434
- 66 Taylor M, Dlamini SB, Nyawo N, Huver R, Jinabhai CC, deVries H. Reasons for inconsistent condom use by rural South African high school students. *Acta Paediatr* 2007; 96: 287–91. doi:10.1111/j.1651-2227.2007.00060.x
- 67 Meekers D, Klein M. Determinants of condom use among young people in urban Cameroon. *Stud Fam Plann* 2002; 33: 335–46. doi:10.1111/j.1728-4465.2002.00335.x
- 68 Akwara A, Madise J, Hinde A. Perception of risk of HIV/AIDS and sexual behaviour in Kenya. *J Biosoc Sci* 2003; 35: 385–411. doi:10.1017/S0021932003003857
- 69 Crentsil P. Deaths, ancestors, and HIV/AIDS among the Akan of Ghana. *Suomen Antropologiyety* 2007; 32: 54–62.
- 70 Yankah K. Narrative in times of crisis: AIDS stories in Ghana. *Journal of Folklore Research* 2004; 41: 181–98. doi:10.2979/JFR.2004.41.2-3.181
- 71 Behrend H. The rise of occult powers, AIDS and the Roman Catholic Church in western Uganda. *J Relig Afr* 2007; 37: 41–58. doi:10.1163/157006607X166582
- 72 Yamba BC. Cosmologies in turmoil: witchfinding and AIDS in Chiawa, Zambia. *Journal of International African Institute* 1997; 67: 200–23. doi:10.2307/1161442
- 73 Maticka-Tyndale E, Kyeremeh C. The trouble with condoms: norms and meanings of sexuality and condom use among school-going youth in Kenya. *Int J Sex Health* 2010; 22: 234–47. doi:10.1080/19317611.2010.491377
- 74 Nzioka C. Perspectives of adolescent boys on the risks of unwanted pregnancy and sexually transmitted infections: Kenya. *Reprod Health* 2001; 9: 108–17. doi:10.1016/S0968-8080(01)90014-X
- 75 MacPhail C, Campbell C. 'I think condoms are good but, aai, I hate those things': condom use among adolescents and young people in a Southern African township. *Soc Sci Med* 2001; 52: 1613–27. doi:10.1016/S0277-9536(00)00272-0
- 76 Maharaj P, Cleland J. Condom use within marital and cohabiting partnerships in KwaZulu-Natal, South Africa. *Stud Fam Plann* 2004; 35: 116–24. doi:10.1111/j.1728-4465.2004.00013.x
- 77 Kalichman SC, Simbayi L. Traditional beliefs about the cause of AIDS and AIDS-related stigma in South Africa. *AIDS Care* 2004; 16: 572–80. doi:10.1080/09540120410001716360
- 78 Maharaj P. Reasons for condom use among young people in Kwazulu-Natal: prevention of HIV, Pregnancy or Both? *Int Fam Plan Perspect* 2006; 32: 28–34. doi:10.1363/3202806
- 79 Plummer ML, Wight D, Wamoyi J, Mshana G, Hayes RJ, Ross DA. Farming with your hoe in a sack: condom attitudes, access, and use in rural Tanzania. *Stud Fam Plann* 2006; 37: 29–40. doi:10.1111/j.1728-4465.2006.00081.x
- 80 Chimhiri AM. The condom is an 'intruder' in marriage: evidence from rural Malawi. *Soc Sci Med* 2007; 64: 1102–15. doi:10.1016/j.socscimed.2006.10.012
- 81 Maticka-Tyndale E, Gallant M, Brouillard-Coyle C, Holland D, Metcalfe K, Wildish J, *et al.* The sexual scripts of Kenyan young people and HIV prevention. *Cult Health Sex* 2005; 7: 27–41. doi:10.1080/13691050410001731080
- 82 Caldwell JC, Caldwell P, Quiggin P. The social context of AIDS in sub-Saharan Africa. In Orubuloye IO, Caldwell JC, Caldwell P, Santow G, editors. *Sexual networking and AIDS in sub-Saharan Africa: behavioural research and the social context.* Health Transition Series No. 4. Canberra: Australian National University; 1994. pp. 129–161.
- 83 Moffett H. "These women, they force us to rape them": rape as narrative of social control in post-apartheid South Africa. *J South Afr Stud* 2006; 32: 129–44. doi:10.1080/03057070500493845
- 84 Schoepf BG. Women at risk: case studies from Zaire. In Herdt G, Lindenbaum S, editors. *In the time of AIDS: social analysis, theory and method.* London: Sage; 1993. pp. 259–86.
- 85 Barnett J, Maticka-Tyndale E. The gift of agency: sexual exchange scripts among Nigerian youth. *J Sex Res* 2010; 47: 1–11.
- 86 Meyer-Weitz A, Reddy P, Weijtz W, van den Borne B, Kok G. The socio-cultural contexts of sexually transmitted diseases in South Africa: implications for health education programmes. *AIDS Care* 1998; 10: 39–55. doi:10.1080/09540129850124352
- 87 Silberschmidt M. Men, male sexuality and HIV/AIDS: reflections from studies in rural and urban East Africa. *Transformation* 2004; 54: 42–58.
- 88 Jewkes R, Vundule C, Maforah F, Jorjaan E. Relationship dynamics and teenage pregnancy in South Africa. *Soc Sci Med* 2001; 52: 733–44. doi:10.1016/S0277-9536(00)00177-5
- 89 Wood K, Maforah F, Jewkes R. "He forced me to love him": putting violence on adolescent sexual health agendas. *Soc Sci Med* 1998; 47: 233–42. doi:10.1016/S0277-9536(98)00057-4
- 90 van der Straten A, King R, Grinstead O, Vittinghoff E, Seruflira A, Allen S. Sexual coercion, physical violence, and HIV infection among women in steady relationships in Kigali, Rwanda. *AIDS Behav* 1998; 2: 61–73. doi:10.1023/A:1022311424652
- 91 Caldwell J. Rethinking the African AIDS epidemic. *Population and Development Review*. 2002; 26: 117–135.
- 92 Caldwell J, Orubuloye I, Caldwell P. Obstacles to behavioural change to lessen the risk of HIV infection in the African AIDS epidemic: Nigerian research. In Caldwell JC, editor. *Resistance of behavioural change to reduce HIV/AIDS infection.* Canberra: Health Transition Centre; 1999. pp. 113–24.
- 93 Preston-Whyte E. Reproductive health and the condom dilemma: identifying situational barriers to HIV protection in South Africa. In Caldwell JC, Caldwell P, Anarfi J, Awusabo-Asare K, Ntozi J, Orubuloye IO, Marck J, Cosford W, Colombo R, Hollings E, editors. *Resistances to Behavioural Change to Reduce HIV/AIDS Infection in Predominantly Heterosexual Epidemics in Third World Countries.* Canberra: Australian National University. 1999. pp. 139–155.

- 94 Karim SSA, Karim QA, Preston-Whyte E, Sankar N. Reasons for lack of condom use among high school students. *S Afr Med J* 1992; 82: 107–10.
- 95 Coast E. Wasting semen: context and condom use among the Maasai. *Cult Health Sex* 2007; 9: 387–401. doi:10.1080/13691050701208474
- 96 Bond V, Dover P. Men, women and the trouble with condoms: problems associated with condom use by migrant workers in rural Zambia. *Health Transit Rev* 1997; 377–91.
- 97 Gausset Q. AIDS and cultural practices in Africa: the case of the Tonga (Zambia). *Soc Sci Med* 2001; 52: 509–18. doi:10.1016/S0277-9536(00)00156-8
- 98 Undie CC, Zirabaa A, Madisex N, Kebasoa J, Kimani-Murage E. “If you start thinking positively, you won’t miss sex”: narratives of sexual (in)activity among people living with HIV in Nairobi’s informal settlements. *Cult Health Sex* 2009; 11: 767–82. doi:10.1080/13691050903105031
- 99 Moore AR, Oppong J. Sexual risk behavior among people living with HIV/AIDS in Togo. *Soc Sci Med* 2007; 64: 1057–66. doi:10.1016/j.socscimed.2006.10.004
- 100 Kaler A. The moral lens of population control: condoms and controversies in Southern Malawi. *Stud Fam Plann* 2004; 35: 105–15. doi:10.1111/j.1728-4465.2004.00012.x
- 101 Mbugua N. Factors inhibiting educated mothers in Kenya from giving meaningful sex-education to their daughters. *Soc Sci Med* 2007; 64: 1079–89. doi:10.1016/j.socscimed.2006.10.008
- 102 Muyinda H, Kengeya J, Pool R, Whitworth J. Traditional sex counseling and STI/HIV among young women in rural Uganda. *Cult Health Sex* 2001; 3: 353–61. doi:10.1080/13691050152484768
- 103 Muyinda H, Nakuya J, Pool R, Whitworth J. Harnessing the *senga* institution of adolescent sex education for the control of HIV and STDs in rural Uganda. *AIDS Care* 2003; 15: 159–67. doi:10.1080/0954012031000068308
- 104 Wood K, Maepa J, Jewkes R. Adolescent sex and contraceptive experiences: perspectives of teenagers and clinic nurses in the northern province. Pretoria: Centre for Epidemiological Research in Southern Africa; 1997.
- 105 Nyanzi S, Pool R, Kinsman J. The negotiation of sexual relationships among school pupils in South-Western Uganda. *AIDS Care* 2001; 13: 83–98. doi:10.1080/09540120020018206
- 106 Buhler C, Kohler H-P. Talking about AIDS: the influence of communication networks on individual risk perceptions of HIV/AIDS infection and protective behaviors in South Nyanza district, Kenya. Rostock, Germany: Max Planck Institute for Demographic Research; 2002.
- 107 Maticka-Tyndale E. Sustaining gains made in a primary school HIV prevention program in Kenya into the secondary school years. *J Adolesc* 2010; 33: 563–73. doi:10.1016/j.adolescence.2009.03.003
- 108 Maticka-Tyndale E, Wildish J, Gichuru M. Quasi-experimental evaluation of a national primary school HIV intervention in Kenya. *Eval Program Plann* 2007; 30: 172–86. doi:10.1016/j.evalprogplan.2007.01.006
- 109 Maticka-Tyndale E, Wildish J, Gichuru M. Thirty-month quasi-experimental evaluation follow-up of a national primary school HIV intervention in Kenya. *Sex Educ* 2010; 10: 113–30. doi:10.1080/14681811003666481
- 110 Adetunji J. Condom use in marital and nonmarital relationships in Zimbabwe. *Int Fam Plan Perspect* 2000; 26(4): 196–200. doi:10.2307/2648258
- 111 Boer H, Mashamba MT. Psychosocial correlates of HIV protection motivation among black adolescents in Venda, South Africa. *AIDS Educ Prev* 2005; 17: 590–602. doi:10.1521/aeap.2005.17.6.590
- 112 Stoskopf C, Kim YK, Richter D. Factors related to condom use among young people in Kenya. *Int Q Community Health Educ* 2001; 20: 193–208. doi:10.2190/W018-WPSU-PN2Q-ERH6
- 113 Agha S, Kusanthan T, Longfield K, Klein M, Berman J. Reasons for non-use of condoms in eight countries in sub-Saharan Africa. Washington, DC: Population Services International; 2002.
- 114 Van Rossem R, Meekers D, Akinyemi Z. Consistent condom use with different types of partners: evidence from two Nigerian surveys. *AIDS Educ Prev* 2001; 13: 252–67. doi:10.1521/aeap.13.3.252.19745
- 115 Montgomery CM, Lees S, Stadler J, Morar NS, Ssali A, Mwanzaf B, et al. The role of partnership dynamics in determining the acceptability of condoms and microbicides. *AIDS Care* 2008; 20: 733–40. doi:10.1080/09540120701693974
- 116 Tavory I, Swidler A. Condom semiotics: meaning and condom use in rural Malawi. *Am Sociol Rev* 2009; 74: 171–89. doi:10.1177/000312240907400201
- 117 Ghosh J, Kalipeni E. Women in Chinsapo, Malawi: vulnerability and risk to HIV/AIDS. *Journal of Social Aspects of HIV/AIDS* 2005; 2: 320–332.
- 118 King R, Lifshay J, Nakayiwa W, Katuntu D, Lindkvist P, Bunnell R. The virus stops with me: HIV-infected Ugandans’ motivations in preventing HIV transmission. *Soc Sci Med* 2009; 68: 749–57. doi:10.1016/j.socscimed.2008.11.008
- 119 Luginaah I, Elkins D, Maticka-Tyndale E, Landry R, Muthui M. Challenges of a pandemic: HIV/AIDS-related problems affecting Kenyan widows. *Soc Sci Med* 2005; 60: 1219–28. doi:10.1016/j.socscimed.2004.07.010
- 120 Harrison A, Xaba N, Kunene P. Understanding safe sex: gender narratives of HIV and pregnancy prevention by rural South African school-going youth. *Reprod Health Matters* 2001; 9(17): 63–71. doi:10.1016/S0968-8080(01)90009-6
- 121 Hart GJ, Pool R, Green G, Harrison S, Nyanzi S, Whitworth JAG. Women’s attitudes to condoms and female-controlled means of protection against HIV and STDs in South-Western Uganda. *AIDS Care* 1999; 11(6): 687–98. doi:10.1080/09540129947596
- 122 Blanc A. The effect of power in sexual relationships on sexual and reproductive health: an examination of the evidence. *Stud Fam Plann* 2001; 32: 189–213. doi:10.1111/j.1728-4465.2001.00189.x
- 123 Campbell C. Selling sex in the time of AIDS: the psycho-social context of condom use by sex workers on a Southern African mine. *Soc Sci Med* 2000; 50: 479–94. doi:10.1016/S0277-9536(99)00317-2
- 124 Ray S, van de Wijgert J, Mason P, Ndowa F, Maposhere C. Constraints faced by sex workers in use of female and male condoms for safer sex in urban Zimbabwe. *J Urban Health* 2001; 78: 581–92. doi:10.1093/jurban/78.4.581
- 125 Ntumbanzondo M, Dubrow R, Niccolai L, Mwandagilirwa K, Mersoni M. Unprotected intercourse for extra money among commercial sex workers in Kinshasa, Democratic Republic of Congo. *AIDS Care* 2006; 18: 777–85. doi:10.1080/09540120500412824
- 126 Gomes do Espirito Santo M, Etheredge G. HIV prevalence and sexual behaviour of male clients of brothels’ prostitutes in Dakar, Senegal. *AIDS Care* 2003; 15: 53–62. doi:10.1080/0954012021000039752
- 127 Pickering H, Todd J, Dunn D, Pepin J, Wilkins A. Prostitutes and their clients: a Gambian survey. *Soc Sci Med* 1992; 34: 75–88. doi:10.1016/0277-9536(92)90069-3
- 128 Vuylsteke BL, Ghys PD, Traore M, Konan Y, Mah-Bi G, Maurice C, et al. HIV prevalence and risk behavior among clients of female sex workers in Abidjan, Cote d’Ivoire. *AIDS* 2003; 17: 1691–4. doi:10.1097/00002030-200307250-00014

- 129 Wechsberg WM, Luseno WK, Lama WK. Violence against substance-abusing South African sex workers: intersection with culture and HIV risk. *AIDS Care* 2005; 17: S55–S64. doi:10.1080/09540120500120419
- 130 Adu-Oppong A, Grimes R, Ross M, Risser J, Kessie G. Social and behavioral determinants of consistent condom use among female commercial sex workers in Ghana. *AIDS Educ Prev* 2007; 19: 160–72. doi:10.1521/aeap.2007.19.2.160
- 131 Needle R, Kroeger K, Belani H, Achrekar A, Parry CD, Dewing S. Sex, drugs, and HIV: rapid assessment of HIV risk behaviors among street-based drug using sex workers in Durban, South Africa. *Soc Sci Med* 2008; 67: 1447–1455. doi:10.1016/j.socscimed.2008.06.031
- 132 Mgalla Z, Pool R. Sexual relationships, condom use and risk perception among female bar workers in north-west Tanzania. *AIDS Care* 1997; 9: 407–16. doi:10.1080/713613167
- 133 Sunmola M. Sexual practices, barriers to condom use and its consistent use among long distance truck drivers in Nigeria. *AIDS Care* 2005; 17: 208–21. doi:10.1080/09540120512331325699
- 134 Krishnan S, Dunbar M, Minnis M, Medlin CA, Gerdtz CE, Padian N. Poverty, gender inequities and women's risk of human immunodeficiency virus/AIDS. *Ann N Y Acad Sci* 2008; 1136: 101–10. doi:10.1196/annals.1425.013
- 135 Kim J, Ferrari G, Abramsky T, Watts C, Hargreaves J, Morison L, et al. Assessing the incremental effects of combining economic and health interventions: the IMAGE study in South Africa. *Bull World Health Organ* 2009; 87: 824–32. doi:10.2471/BLT.08.056580
- 136 Bankole A, Ahmed F, Neema S, Ouedraogo C, Konyani S. Knowledge of correct condom use and consistency of use among adolescents in four countries in sub-Saharan Africa. *Afr J Reprod Health* 2007; 11: 197–220. doi:10.2307/25549740
- 137 Shelton JD, Johnston B. Condom gap in Africa: evidence from donor agencies and key informants. *BMJ* 2001; 323: 139. doi:10.1136/bmj.323.7305.139
- 138 Meekers D, Ahmed G, Molatlheg M. Understanding constraints to adolescent condom procurement: the case of urban Botswana. *AIDS Care* 2001; 13: 297–302. doi:10.1080/09540120120043946
- 139 Kelley M, Parker W. Communities of practice: contextual mediators of youth response to HIV/AIDS. Beyond Awareness campaign report. Pretoria: Department of Health; 2000.
- 140 Greif M, Doodoo N, Jayaraman A. Urbanisation, poverty and sexual behaviour: the tale of five African cities. *Urban Stud* 2011; 48: 947–57. doi:10.1177/0042098010368575
- 141 Nobelius A, Kalina B, Pool R, Whitworth J, Chesters J, Power R. “You still need to give her a token of appreciation”: the meaning of the exchange of money in the sexual relationships of out-of-school adolescents in rural southwest Uganda. *J Sex Res* 2010; 47: 490–503. doi:10.1080/00224499.2010.494776
- 142 Wojcicki J. Commerical sexwork or *ukuphanda*? Sex-for-money exchange in Soweto and Hammanskraal area, South Africa. *Cult Med Psychiatry* 2002; 26: 339–70. doi:10.1023/A:1021291922026
- 143 Silberschmidt M, Rasch V. Adolescent girls, illegal abortions and “sugar-daddies” in Dar es Salaam: vulnerable victims and active social agent. *Soc Sci Med* 2001; 52: 1815–26. doi:10.1016/S0277-9536(00)00299-9
- 144 Wyrod R, Fritz K, Woelk G, Jain S, Kellogg T, Chirowodza A, et al. Beyond sugar daddies: intergenerational sex and AIDS in urban Zimbabwe. *AIDS Behav* 2011; 15: 1275–82. doi:10.1007/s10461-010-9800-2
- 145 Cleland J, Ali MM, Shah I. Trends in protective behaviour among single vs. married young women in Sub-Saharan Africa: the big picture. *Reprod Health Matters* 2006; 14: 17–22. doi:10.1016/S0968-8080(06)28250-8
- 146 Cleland J, Ali MM. Sexual abstinence, contraception, and condom use by young African women: a secondary analysis of survey data. *Lancet* 2006; 368: 1788–93. doi:10.1016/S0140-6736(06)69738-9
- 147 Adair T. Men's condom use in higher-risk sex: trends in five sub-Saharan African countries. *J Popul Res* 2008; 25: 51–62. doi:10.1007/BF03031940
- 148 Dunkle KL, Stephenson R, Karita E, Chomba E, Kayitenkore K, Vwalika C, et al. New heterosexually transmitted HIV infections in married or cohabiting couples in urban Zambia and Rwanda: an analysis of survey and clinical data. *Lancet* 2008; 371: 2183–91. doi:10.1016/S0140-6736(08)60953-8
- 149 Jewkes R, Nduna M, Levin J, Jama N, Dunkle K, Puren A, et al. Impact of Stepping Stones on incidence of HIV and HSV-2 and sexual behaviour in rural South Africa: cluster randomized controlled trial. *BMJ* 2008; 337: A506. doi:10.1136/bmj.a506
- 150 Erulkar AS, Ettayang O, Hyagah M. Behaviour change evaluation of a culturally consistent reproductive health program for young Kenyans. *Int Fam Plan Perspect* 2004; 30: 58–67. doi:10.1363/3005804
- 151 Esu-Williams E, Schenk K, Motsepe J, Geibel S, Zulu A. Involving young people in the care and support of people living with HIV and AIDS in Zambia. Washington, DC: Population Council; 2004.
- 152 Ross D, Changalucha J, Obasi A, Todd J, Plummer M, Cleophas-Mazige B, et al. Biological and behavioural impact of an adolescent sexual health intervention in Tanzania: a community-randomized trial. *AIDS* 2007; 21: 1943–55. doi:10.1097/QAD.0b013e3282ed3cf5
- 153 Ngugi E, Simonsen JN, Bosire M, Ronald AR, Plummer FA, Cameron DW, et al. Prevention of transmission of human immunodeficiency virus in Africa: effectiveness of condom promotion and health education among prostitutes. *Lancet* 1988; 332: 887–90. doi:10.1016/S0140-6736(88)92480-4
- 154 Williams E, Lamson N, Efem S, Weir S. Implementation of an AIDS prevention program among prostitutes in the Cross River State of Nigeria. *AIDS* 1992; 6: 229–30. doi:10.1097/00002030-199202000-00016