Mechanisms leading to transactional sex - understanding pathways for women and men in urban informal settlements

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A thesis completed by published work,

Submitted to the School of Public Health, Faculty of Health Sciences,

University of the Witwatersrand,

in fulfilment of the requirements for the degree of

Doctor of Philosophy

Sheffield, South Africa

14 January 2025

Declaration

This thesis is submitted in the optional format, approved by the Faculty of Health Sciences, of published work with an encompassing introduction and conclusion.

I, Sarah Magni, student number 0109790w, declare that this thesis is my original work. It is being submitted for the degree of Doctor of Philosophy in Public Health in the Faculty of Health Sciences of the University of the Witwatersrand, Johannesburg, South Africa. It has not been submitted before for any degree or examination at this or any other university.
I have read the sections on referencing and plagiarism in the WITS Plagiarism Policy. I am aware that the plagiarism is wrong and that the University of the Witwatersrand may take disciplinary action should plagiarism be found in this work. I have followed the required conventions in referencing the thoughts and ideas of others. I confirm that all of the work submitted in this thesis is my own unaided work except where I have explicitly indicated otherwise.

Signature: 

Name: Sarah Magni

Dedication

I dedicate this work to my husband, who supported my efforts and made it possible to complete this PhD.

I also dedicate this doctoral research to my children, whose gave me the space to undertake this PhD and never complained.

Presentations arising from this PhD

Conference	Presentation
Oral presentation at the International Conference on AIDS and STIs in Africa, Kigali, December 2019	Predictors of transactional sex in men living in an urban informal area, South Africa
Poster presentation at the International AIDS Conference, Montreal, July 2022	Pathways for women's engagement in transactional sex with a non-primary sex partner: the role of partner type
Oral presentation at AIDS Impact, Stockholm, June 2023	Predicting pathways for transactional sex in women from a peri-urban area in South Africa: A structural equation model*
Poster presentation at HIVR4P, Peru, October 2024	Latent class analysis to understand how transactional sex fits with other HIV risk behaviours: Implications for male-focused HIV prevention programming

* Awarded prize for best abstract

Publications arising from this PhD

Magni, S., Abdelatif, N., Hatcher, A., Wamoyi, J., and Christofides, N. Masculinities, engagement in transactional sex, alcohol misuse and violence: a latent class analysis of young adult men. In submission.

Magni, S. Hatcher, A. Gibbs, A. Wamoyi, J. Dunkle, K. Christofides, N. AIDSImpact special issue: pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity, and alcohol misuse. AIDS Care, 2024: 9:1-8.

Magni, S., Hatcher, A.M., Wamoyi, J., Christofides, N. Predictors and Patterns of Transactional Sex with Casual Partners Among Adult Men Living in an Informal Urban Area, South Africa. AIDS and Behavior. 2020; 24, 2616–2623.

Appendix 9 outlines the contribution of each author for each publication.

Abstract

Background

Transactional sex is a risk factor for HIV acquisition in sub-Saharan Africa. There are several gaps in the knowledge base including inconsistent measurement of transactional sex , especially for men; and less precision around motivations for or pathways underpinning transactional sex. Few studies of the patterns and predictors of engaging in transactional sex in men exist, nor is it known whether men who engage in particular clusters of behaviour are more inclined to engage in transactional sex. The overall aim of this study is to explore mechanisms and patterns of transactional sex among women and men living in urban informal settings in South Africa.

Methods

This PhD made use of data from two different quantitative studies: the Stepping Stones Creating Futures Trial (SS-CF) and the Sonke CHANGE Trial. Both studies were conducted in urban informal settlements outside of major metropolitan cities in Gauteng and in KwaZulu-Natal. I conducted secondary analysis of longitudinal data from 545 women 18-30 years retained at endline in the SS-CF study. I conducted structural equation modelling, multivariable analysis and latent class analysis using two cross-sectional waves of data from the Sonke CHANGE trial of men aged 18-40 years.

Results

Prevalence of transactional sex was high in both women and men in informal urban settlements. Women reported engaging in transactional sex for cash, while men speculated that casual sexual partners exchanged sex to support their children or families. Women with main partners who exhibited high levels of control were more likely to have transactional sex with a casual partner in the future and men exhibiting high levels of relationship control were more likely to engage in transactional sex. Classes of men displaying more aggressive behaviour were the most likely to engage in transactional sex.

Conclusions

This study is the first to my knowledge to make use of a new measure of transactional sex in men. It is also the first to explain men's motivations for transactional sex and to report that they are embedded in masculinities. To understand women's motivations for engaging in transactional sex, it is important to consider the role of controlling behaviour by their main partners. Due to these varied drivers of transactional sex, interventions addressing transactional sex for both women and men should operate at the individual, interpersonal, and societal levels. Specifically, interventions for men

should integrate gender transformation efforts, including critical reflections on relationship control in all relationships, alongside economic empowerment initiatives.

Acknowledgements

There are numerous people I need to thank for their help with my PhD journey.

Firstly, to my supervisors, thank you for your continued support over what really has been a journey. You have unwaveringly supported me even when I could not answer my original research questions with the data I had:

- Professor Nicola Christofides, you have been an inspiration to me since I did my first course with you at Wits. Thank you for believing in me, advocating for me, and giving me so many opportunities. I count myself lucky to have had you as a supervisor for both my MSc and PhD.
- Dr Joyce Wamoyi, thank you for agreeing to be my supervisor when I approached you at a workshop. Thank you for providing ongoing technical insight into transactional sex. I could not have tackled this complex concept (or that of masculinities) without you.
- Dr Abigail Hatcher, you have brought such enthusiasm to my PhD. I am grateful for your having taught me structural equation modelling and for the way in which you have pushed me intellectually.

Dr Andrew Gibbs, thank you for making the Stepping Stones-Creating Futures database available and for answering my many questions (and doing so quickly). To Dr Kristin Dunkle, thank you too for allowing me to use the SS-CF data and for your input into my Paper 1. Nada Abdelatif, thank you for taking the time to teach me Latent Class Analysis and for your input into Paper 3.

Thank you to my Genesis team for believing in me and supporting my attendance at conferences.

Finally, thank you to all of the research participants who gave of their time and whose insights allowed me to complete this PhD.

Contents

Acronyms

aOR	Adjusted odds ratio
AGYW	Adolescent girls and young women
aBIC	adjusted Bayesian information criterion
AIDS	Acquired Immunodeficiency Syndrome
ASERT	Ascertaining Sexual Relationship Types
AUDIT	Alcohol Use Disorder Identification Test
BREC	Biomedical Research Ethics Committee
CAIC	Consistent Akaike Information Criterion 44
CFI	Comparative Fit Index
CHANGE	Community Health Action for Norms and Gender Equity
CI	Confidence Interval
c-RCT	Cluster randomised controlled trial
DREAMS	Determined, Resilient, Empowered, AIDS-free, Mentored, Safe
G2	Likelihood ratio test
GEMS	Gender Equitable Men Scale
GP	Gauteng Province
GPC	Global HIV Prevention Coalition
HIV	Human Immunodeficiency Virus
IPV	Inter-personal violence
KZN	KwaZulu-Natal
LCA	Latent Class Analysis
MSP	Multiple sexual partnerships
OR	Odds ratio
PhD	Doctor of Philosophy
PrEP	Pre-exposure prophylaxis
RMSEA	Root-mean-square error of approximation
SD	Standard deviation
SEM	Structural Equation Modelling
SPRS	Sexual Relationship Power and Control Scale
SRHR	Sexual and reproductive health and rights
SS- CF	Stepping Stones – Creating Futures
STIs	Sexually transmitted infections
TLI	Tucker-Lewis Index

VAW	Violence Against Women
WHO	World Health Organization

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Preface

Embarking on a PhD journey has been a profound and transformative experience for me. As an experienced researcher, I have had the privilege of designing and managing numerous large-scale research projects, both qualitative and quantitative in nature. I have lectured on Masters in Public Health Programme for the past ten years and am currently co-supervising an MSc Epidemiology Masters student to foster the next generation of researchers.

I come from a background where contributing to societal improvement is deeply ingrained. The way that I aim to do this is through meaningful public health research. Undertaking research that can inform policy and programming for HIV prevention aligns with my personal values and aspirations to contribute positively to my country. It is my hope that this PhD will not only advance academic knowledge but also lead to tangible improvements in public health interventions, particularly for marginalised communities affected by HIV.

I originally registered for my PhD in 2017 with ambitious research questions and a clear vision for my study. This was off the back of my being a co-Principal Investigator on a study to evaluate the long term impact of enrolment in Soul Buddyz Clubs on sexual risk behaviours and HIV status, where I became interested in transactional sex and its relationship to HIV acquisition. However, as time progressed, it became apparent that the data I had initially relied upon would not suffice to answer these questions. This realisation prompted a significant recalibration of my research journey: I had to change my research title, aim, and objectives, and embark on the challenging task of finding new data sources.

Obtaining new data and navigating the approval processes from Principal Investigators were formidable tasks that consumed considerable time and effort. I also recognised the importance of additional guidance, leading to the inclusion of an additional supervisor and resubmission to ethics and assessors, which was successfully completed in 2019. It wasn't until 2021 that my revised topic and aims were approved, marking a pivotal milestone in my PhD trajectory.

In addition to these academic challenges, my professional journey has been deeply intertwined with my personal commitments. Having worked extensively with sex workers and adolescent girls and young women (AGYW), I have witnessed firsthand the complexities of their lives in informal urban settlements across South Africa. These experiences highlighted a critical gap in understanding transactional sex dynamics within these marginalised communities. Moreover, there remains a

significant gap in understanding transactional sex among men, particularly in how patterns and predictors influence their engagement with casual partners in urban informal settings.

Throughout this journey, I worked a full-time demanding job to provide for my family, a task that mirrors the challenges many women face in balancing multiple responsibilities. Additionally, I welcomed a baby into my life during my PhD, highlighting the unique challenges faced by women as caregivers, providers and scholars.

The real value of my PhD work lies in the rigorous analysis that pushes the boundaries of current knowledge. I have employed sophisticated data analysis techniques such as Structural Equation Modelling and Latent Class Analysis to explore complex relationships and patterns within the context of transactional sex. These methods have provided deeper insights and nuanced understanding, contributing to the advancement of knowledge in this critical area. This is particularly true in relation to men's use of transactional sex – where there was little existing research.

This preface not only introduces my dissertation but also serves as a testament to the personal and professional growth that has defined my PhD journey. I am grateful to my supervisors, colleagues, and loved ones who have supported me unconditionally throughout this transformative experience.

Chapter 1: Introduction

1.1 Background

HIV remains a public health issue in South Africa, with the latest National HIV Prevalence, Incidence, Behaviour and Communication Survey estimating that 16.3% of adults 15 years and older were living with HIV in 2022 (1). HIV prevalence differs across with country, ranging from 21.8% in adults in KwaZulu-Natal province to 15.0% in Gauteng province and to 8.2% in Western Cape province (1). Patterns of HIV infection also differ by settlement type, with urban informal settlements showing the highest prevalence (2).

HIV disproportionately impacts adolescent girls and young women (AGYW) (3). One factor which increases women's vulnerability to HIV acquisition is engagement in transactional sex (4-6). Transactional sex is defined many different ways but usually refers to a sexual relationship which is primarily motivated by financial or material exchange (7, 8). A systematic review of the association between transactional sex and HIV found that transactional sex was associated with HIV in women in African studies (9).

There have been far fewer studies on transactional sex in men. Individual studies have found an association between engaging in transactional sex and HIV infection in men (10). However, a systematic review and meta-analysis found that there were inconsistent findings on the association between transactional sex and HIV (9). Of the ten studies reporting on men's engagement in transactional sex, only two found a positive association (9).

There are several explanations for the relationship between transactional sex and HIV acquisition in women. For women, engaging in transactional sex is associated with several different HIV risk factors including different types of violence, low sexual relationship power, alcohol use, multiple sexual partners and age-disparate sex (11-14). A power imbalance underpins the relationship dynamic between the givers of gifts or money (often men) and the receivers (mostly women). This power imbalance often means women in transactional relationships are less able to influence the timing and nature of sex (15, 16). Where there is little negotiating power to insist on use of condoms, women experience a higher risk of contracting sexually transmitted infections (STIs), including HIV (17).

The unclear relationship between transactional sex and HIV acquisition in men may be partly because far fewer studies have explored transactional sex in men but may also be due to inaccurate measurement of transactional sex in men (9).

It has been suggested that transactional sex lies at the heart of AGYW's exceptional vulnerability to HIV and that one of the reasons HIV interventions have been sub-optimal is that they have not adequately addressed transactional sex (18). There are a number of gaps in the literature which need to be filled in order for transactional sex programming addressing to be more effective. These include: a lack of clear understanding and measurement of transactional sex, especially for men; a lack of distinction in the motivations for transactional sex; and little quantitative research to understand the pathways leading to engagement in transactional sex. A major gap is that the transactional sex literature predominantly focuses on women. Few studies of the patterns and predictors of engaging in transactional sex in men exist, nor is it known whether men who engage in particular clusters of behaviour are more inclined to engage in transactional sex.

1.1.1 Transactional sex is defined and measured differently across different studies

Transactional sex has been defined differently across different studies. Some of the ways in which the concept is described include: "noninstitutional sexual exchange" (19), "informal sex work" (20), "sugar daddy relationships" (21), "informal exchange relationships" (22), "sex for consumption" (23) and "transactional sex" (24, 25).

Measurement of the concept also differs across studies. One of the key differences in measurement relates to with which sexual partners transactional sex is measured. Some studies ask respondents about transactional sex with concurrent partners only (4), whereas others ask about transactional sex in both main relationships and with concurrent, secret partners or once-off relationships (6). The meaning and measurement of transactional sex has also been conflated with sex work (26).

These different definitions and ways of measuring transactional sex may account for the varying rates of prevalence reported in women across African countries (7, 27, 28). Similarly, prevalence of transactional sex in men also differs across studies (12, 29). If the definition and measurement of transactional sex were more precise and consistent, the evidence base regarding its contribution to HIV could be significantly strengthened (30).

The STRIVE research consortium, which investigated how social drivers create vulnerability to HIV, undertook significant work to resolve measurement issues in relation to transactional sex, especially the conflation between sex work and transactional sex. Wamoyi and colleagues (2017) developed a new measure of transactional sex (31) using cognitive interviewing in Uganda and Tanzania. This measure also differentites transactional sex in casual or concurrent, secret partners from exchange in

main partnerships. However, prior to this PhD study, this proposed measure of transactional sex had not been widely used, nor had it been applied to men's engagement in transactional sex.

1.1.2 Motivations for engaging in transactional sex are heterogenous

The reasons behind women's engagement in transactional sex vary. Women have reported engaging in transactional sex for a number of motivations including to obtain basic needs, consumerism, emotionality and, in some cases, to increase a sense of agency (32-36). Across the region, the meaning attached to transactional sex varies widely and can signify: a committed relationship; an acknowledgement of respect; an expression of love; an obligation fulfilled; or a display to impress other men (4, 7, 24, 29).

A recent review of the transactional sex literature of women found three unique segments of transactional sex: sex for basic needs, sex for improved social status and sex and material expressions of love (35). These were used to develop a unified conceptualisation of transactional sex (35). Stoebenau et al (2016) argue that donors and civil society groups tend to emphasise one paradigm, usually sex for basic needs, at the expense of another segment (35). This is potentially problematic as it may bias interventions to one paradigm, meaning that transactional sex is not addressed comprehensively.

Despite fairly robust qualitative work to explore the motivations for women accepting transactional sex, little quantitative research has pinpointed these transactional sex mechanisms. There is a need to explore pathways for the contexts and behaviours that predict later transactional sex, and this can be done using longitudinal data. Without quantitative measures around transactional sex, HIV programming may find it difficult to address the underlying conditions that lead to women's transactional sex use.

1.1.3 Limited research on transactional sex in men exists

Jewkes and colleagues (2012) state that the idea of transactional sex, which was developed through research with women, does not easily lend itself to men (12). Few studies have explored the reasons why men engage in transactional sex. In addition, the conceptual framework developed by Stoebenau and colleagues (2016) which unifies the different paradigms used to describe transactional sex, draws on the literature which is primarily focused on women (35). It has been postulated that both men and women expect that men play a provider role, in line with Connell's Theory of Gender and Power (37). A complexity is that this shared expectation is central to many

types of relationships, though it may be more pronounced among transactional sex relationships (12, 14).

Systematic, quantitative research on men's engagement in transactional sex is lacking. Little research has explored the patterns, predictors and motivations of “giving” for sex. Other than the gendered concept around men attempting to meet a provider role (12, 14), little is known about what contributes to or motivates men to engage in transactional sex. To my knowledge, a limited number of studies have examined the factors associated with transactional sex in men in sub-Saharan Africa (12, 29). This gap in knowledge makes it difficult for programming to reduce the risk behaviour of transactional sex among men, and may inadvertently place the blame on young women for a phenomenon that is present across genders in heterosexual relationships.

1.2 Justification of the research

It has been argued that transactional sex “is at the core of young women’s exceptional HIV vulnerability” and that one of the reasons HIV interventions have been largely ineffective is that they have failed to adequately address transactional sex (18): page 1041. This study addresses a number of gaps in the literature, allowing for a better understanding of transactional sex in men and women.

This dissertation advances the field by pinpointing pathways leading to women’s engagement in transactional sex. It improves measurement of transactional sex by employing a novel, multi-item measure of transactional sex among men. Lastly, I use advanced statistical methods within a community sample to predict which groups of men are most likely to engage in transactional sex.

Importantly, for both men and women, this PhD explores transactional sex in urban informal settlements. HIV prevalence is highest in these areas in South Africa (2), health outcomes are often poor (38) and housing in urban informal settlements represent a large proportion of households in the country (39). Despite this, most transactional sex research has been conducted in urban (4) and rural (29, 40) settings.

1.3 Key concepts

Transactional sex

Transactional sex is defined as “a sexual relationship which is primarily motivated by financial or material exchange and which occurs outside of marriages or “formal” sex work” (35, 41-43). The World Health Organization (WHO) states that both transactional sex and sex work have financial and

sexual components, but transactional sex differs from sex work in that the those engaging in transactional sex do not self-identify as a sex workers, nor are they viewed as such by their communities (44). Research from the region has demonstrated that exchange of sex for material or financial resources is commonly practiced by women and the majority who engage in such transactions do not self-identify as sex workers (15, 16, 24, 33, 45-47).

Figure 1 below, adapted from Coetzee (2017), illustrates the continuum of sex work, from non-paying partnerships on one end to sexual exploitation on the other (48). It shows that while transactional sex is on the continuum of sex work, it is distinct from this practice although there may be some overlap with informal sex work (48). Transactional sex is seen by those who participate in the practice as more socially acceptable than formal sex work. This is mainly due to the fact that exchange occurs within the context of a relationship (no matter how temporary or ambiguous its nature) (49, 50).

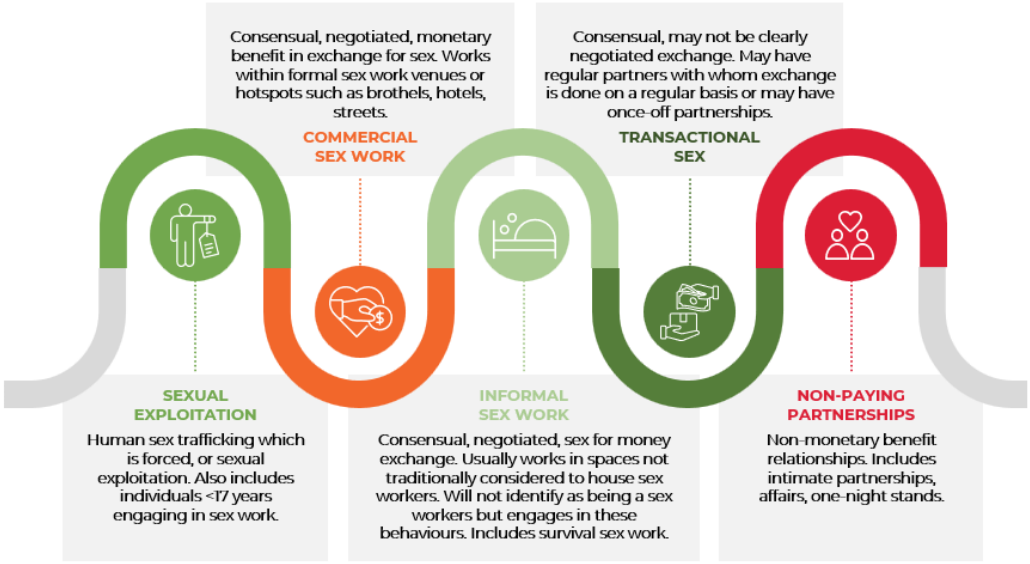


Figure 1: Continuum of sex work, adapted form Coetzee 2017

Transactional sex has been measured with main relationships in some studies (6). In line with new guidance (26), in this PhD study, transactional sex is measured in non-marital partners only. The working definition is: sex exchanged for a number of different motivations and which is distinct from commercial sex work.

I acknowledge that both men and women can be providers of gifts or money or provide sex in exchange for these. However, in this dissertation, transactional sex in men refers to men as the providers or givers of money or gifts and transactional sex in women refers to the receivers of these and those providing sex in exchange.

Khwapheni

The term khwapheni (plural makhwapheni) refers to a concurrent sexual partnership which is hidden from a main partner (51). In isiZulu it means “side dish” and typically represents a second main partner who is in a longer-term relationship (52).

Gender norms and masculinities

Connell’s Theory of Gender and Power posits that gender is not an inherent biological trait but a social construct which is continuously shaped and reshaped through social interactions and cultural norms (37). The construct of “hegemonic masculinity” explains how some men employ a set of practices and attributes tied to strength, virility and risk-taking (53). Hegemonic masculinity refers to an idealised standard that legitimises men's dominance over women and other men (37). Importantly, most communities have multiple expressions of masculinities, with hegemonic masculinity representing but one form of how men can express their gender (37). Nevertheless, masculinity seems to undermine health through the types of behaviours, self-protection, and mutual care men feel they can accept or take part in (54).

Urban informal settlements

The United Nations Human Settlements Programme (UN-Habitat) defines a slum household as “a group of individuals that live under the same roof that lack one or more of the following conditions; access to improved water, access to improved sanitation, sufficient living space, durability of housing and secure tenure” (55). There are several different definitions of slums and these have been applied inconsistently (56). Importantly, there have been concerns raised that the term carries emotional connotations and can be considered derogatory (57). The term “informal settlement” has been proposed as another option and has been used in this PhD. The South African Census 2001 defined urban informal settlements as unplanned settlements on land not defined as residential, and comprising informal dwellings (58).

1.4 Aim and objectives

The overall aim of this study is to explore mechanisms and patterns of transactional sex among men and women living in urban informal settings in South Africa.

The research objectives are:

1. To assess longitudinal pathways of young women’s engagement in transactional sex in an urban informal setting in eThekwini, South Africa

2. To characterise patterns and predictors of men's transactional sex with casual partners in an urban informal setting near Johannesburg, South Africa
3. To determine how sub-groups of men living in an urban informal setting near Johannesburg, South Africa engage in transactional sex and the relationship to other sexual risk behaviours

Together, this PhD sought to strengthen the evidence base with supplementary data around transactional sex pathways. The long-term goal of this doctoral work is to allow HIV programmes to better address transactional sex.

1.5 Organisation of the thesis

This chapter comprises the introduction. Chapter 2 summarises existing transactional sex literature and highlights gaps in the literature to demonstrate how this this thesis can inform the field. Chapter 3 describes the methods for this PhD.

The results section of this thesis comprises two published peer-reviewed publications in Chapters 4 and 5 and a draft paper in Chapter 6.

Chapter 4 explores the pathways contributing towards women's engagement in transactional sex with khwapheni and casual partners. Using quantitative, longitudinal data, I explore the pathways contributing to women's future engagement in transactional sex with a non-marital partner. I identify particular methods in which the research can inform future interventions to disrupt transactional sex pathways. The published paper is found in Appendix 7.

Chapter 5 examines quantitative data from 2,189 men from an informal urban settlement near Johannesburg, South Africa. Using cross-sectional data from a community sample of adult males, we learn that a large proportion (47%) of men report transactional sex in the past year. Men reporting higher levels of controlling behaviour in their main relationship had nearly double the odds of engaging in transactional sex within khwapheni or casual relationships. Appendix 8 comprises the published paper.

Using data from 1,509 men, Chapter 6 proposes a three-class solution to the latent class analysis (LCA) to explore how different groups of men engage in transactional sex and other risky sexual behaviours. I demonstrate how men with higher levels of violent behaviours are most likely to engage in transactional sex and discuss how best to reach and intervene with this group.

Chapter 7 synthesises the findings of the doctoral research in light of extant literature. I reflect on prevalence of transactional sex and ways the concept is measured. Motivations for women and men's engagement in transactional sex are discussed. I situate the findings in an urban informal setting and propose a revised conceptual framework for transactional sex. I also discuss the limitations to this research.

This PhD concludes in Chapter 8 by reflecting that transactional sex is likely to be higher in urban informal settlements, although it may also be influenced by a tighter measure of the behaviour when restricted to with khwapheni only. Motivations for women's engagement in transactional sex could be expanded by considering the role of controlling behaviour in main partners. Men's motivations for engagement in transactional sex are embedded in masculinities and a way for men to exert power and control over women. This chapter highlights specific ways my research can inform future HIV programming and policy. I propose that interventions to address transactional sex for both women and men need to do so at an individual, interpersonal and societal level. Interventions to address transactional sex for men need to pair gender transformation interventions including critical reflections on relationship control in all relationships, with economic strengthening.

Chapter 2: Literature review

This literature review addresses three primary topics: transactional sex, constructions of masculinities, and urban informal settlements. Firstly, it introduces the concept of transactional sex, distinguishing it from sex work, and discusses how it is measured. Transactional sex prevalence in the region, and in South Africa specifically, is outlined. The review explores various motivations for engaging in transactional sex and examines factors associated with transactional sex among both men and women. Secondly, it includes a discussion on constructions of masculinities. While this PhD as a whole aims to address the gap in transactional sex research among men, the literature review serves to lay the groundwork for this by introducing and providing context for both transactional sex and constructions of masculinities. Thirdly, this review explores informal urban settlements, highlighting that HIV prevalence is highest in these environments. This focus underscores the socio-economic dynamics of urban informal settlements and how they intersect with transactional sex practices and constructions of masculinities.

2.1 Transactional sex

There is clear evidence that transactional sex is an important contributor to risk of HIV acquisition in women (4, 5) and mixed evidence in men (9) in sub-Saharan Africa.

Although transactional sex was first mentioned in the literature over 30 years ago, it remains an easily misconstrued concept and is often conflated with sex work and age-disparate sex (35, 59). The conflation of transactional sex and sex work complicates attempts to understand its contribution to HIV risk and hinders the design and delivery of interventions to address transactional sex (35). Defining what is meant by the term, and understanding how it has been - and should be - measured is therefore critical.

2.1.1 Defining transactional sex

The first study to use the term “transaction” or “transactional” sex was published in 1989 (60). This concept arose following a critical examination of the way in which relationships involving sexual exchange in sub-Saharan Africa were being described during the early HIV epidemic (35).

In the early 1990s, the prevailing biomedical narrative on HIV prevention in sub-Saharan Africa categorised prostitutes or sex workers as “reservoirs of infection” (61, 62). Off the back of anthropological studies which investigated sexual relationships and the significance of exchange

within these (63), social scientists started to critically examine how relationships involving sexual exchange were all labelled as either "prostitution" or "commercial sex work". Studies also drew attention to how gendered social and economic inequalities structured sexual exchange (63) .

By the mid-1990s, transactional sex was regarded as an important contributor to HIV transmission in sub-Saharan Africa. Although there have been many studies on transactional sex, with the vast majority conducted in Africa, there has been little attention paid to what actually constitutes transactional sex (64).

The distinction between transactional sex has often been blurred with that of sex work. For example, Fitzgerald-Husek et al. label participants in their research as "sex workers" despite acknowledging that these individuals distinguished themselves from "commercial sex workers" (65). This conflation remains despite the fact that research from sub-Saharan Africa has demonstrated that exchange of sex for material or financial resources is commonly practiced by women and the majority who engage in such transactions do not self-identify as sex workers (12, 16, 33, 45, 46, 66-69). This is reflected by terms used for the different practices. For example, in two areas in South Africa, women used the term “ukuphanda”, an isiZulu verb that loosely translated means “to try to get money,” to distinguish between transactional sex and more formalised sex work (referred to as marhosha or matekatse) (20). Hunter (2002) explains that “Transactional sex has a number of similarities to prostitution. ...[but] Transactional sex differs in important ways: participants are constructed as “girlfriends” and “boyfriends” ... and the exchange of gifts for sex is part of a broader set of obligations that might not involve a predetermined payment” (15): pages 100-101.

Similarly, there is a misconception that transactional sex and age-disparate sex are interchangeable terms. Age disparate sex is a risk factor for HIV acquisition in young women (17) and refers to sex with adult men who provide money or gifts in exchange for sexual favours from much younger women (35). They are commonly referred to as sugar-daddies. However, transactional sex also takes place in relationships with similar-age partners (70-72) and sugar-daddy relationships make up a smaller fraction of exchange relationships than is commonly believed (72, 73). Recently, the terminology “blesser/blesse” has emerged in South Africa (74). These relationships are similar to "sugar-daddy" arrangements, where older men provide younger women with money and gifts in exchange for sex and companionship.

Finally, the vast majority of the literature refers to transactional sex as a sexual exchange relationship where men are givers of money or gifts and women receivers thereof (35). Although this is true in almost all instances, it is worth noting that transactional sex is not an entirely unidirectional term. In a few cases, older and wealthier women are the providers of money or gifts (although to a lower

value) and men the receivers thereof (75). As exception rather than the norm, sugar-mommy relationships have also been described (21, 76).

2.1.2 Measuring transactional sex

Measurement of transactional sex differs across studies. One of the key differences in measurement relates to with which sexual partner type transactional sex is measured. Some studies ask respondents about transactional sex with concurrent partners only (4), whereas others ask about transactional sex in both main relationships and with concurrent or casual relationships (6).

These different definitions and ways of measuring transactional sex may account for the varying rates of prevalence reported in women across African countries (7, 27, 28). Similarly, prevalence of transactional sex in men also differs across studies (12, 29). This could be because there does not seem to be consensus on how best to operationalise the concept of transactional sex (77). Some scholars only focus on the exchange of sex for money, privileges or favour with those who are not regular partners (78), while others focus on both main and casual partners (40). In Dunkle's seminal 2004 study in South Africa, women were asked about transactional sex with concurrent sexual partners only (4) whereas in Jewkes's 2012 South African study, respondents were asked about exchange of money and goods for sex in both spousal/main relationships and in casual or concurrent sexual partnerships (6).

Another issue with measurement of transactional sex is that questions tend to be single item measures. Surveys typically do not incorporate specific questions on the quantity or nature of gifts exchanged, nor do they explore the context surrounding these exchanges (47). This makes it difficult to fully understand the the magnitude of exchange. It is important to note that although cash is often exchanged, a range of goods or services such as accommodation or transport may also be involved (4, 12, 32).

Measuring transactional sex in women

Table 1 below includes examples of measures of transactional sex for women from a sample of studies, the majority of which are from South Africa and include urban, peri-urban and rural settings.

Table 1: Selection of definitions of transactional sex in women

Authors and year	Study setting	Questions
Duby et al, 2021 (79)	Cape Town (Western Cape), Ehlanzeni (Mpumalanga), O.R. Tambo (Eastern Cape), Tshwane (Gauteng), King Cetshwayo and Zululand (KwaZulu–Natal), South Africa	1) Have you ever given oral, anal, or vaginal sex to someone because you expected to get or got any of these things? 2) In the past 12 months have you started or stayed in a relationship with a man or boy so that you could receive any of the following? Answer options were: Money; Transport; Food for myself and/or my family; Clothes or shoes; Shelter; School fees/school uniforms; Airtime; Cellphone; Items for children or family; Cosmetics
Ranganathan et al, 2016 (80)	Agincourt, Mpumalanga, South Africa	1) Did you feel like you had to have sex with [initials] because they gave you money'? 2) Did you feel like you had to have sex with [initials] because they gave you things (such as airtime, cell phone, groceries, clothes or shoes, perfume or lotions, make-up, cool-drinks, sweets or chips, CDs, DVDs or videos, alcohol or drugs, flowers, other (specify))?
Choudry et al, 2015 (10)	Urban and rural Uganda	1)Did you ever give sex in exchange for goods or services? 2) Did you ever give sex in exchange for money? 3) Did this happen in the last 12 months?
Pitpitan et al, 2014 (81)	Cape Town, South Africa	Has someone given you money, alcohol, drugs or a place to stay in exchange for sex in the past 4 months?
Jewkes et al, 2012 (40)	Eastern Cape, South Africa	Have you ever become involved with a [main partner, concurrent partner, casual partner] because he provided you with or you expected that he would provide you with? Food?; Clothes?; Transport, tickets or money for transport?; (If school) Your own school fees or residence fees?; Somewhere to stay?; Cash?; Status?; Cosmetics?; Items for your children or family such as clothes, food, school fees?
Dunkle at al, 2004 (4)	Soweto, Gauteng, South Africa	Have you ever become involved with a roll-on/nyatsi/makhwapheni because he provided you with or you expected that he would provide you with? food; cosmetics; clothes; transportation, tickets or money for transport; items for children or family such as clothes, food or school fees; woman's own school or residence fees; somewhere to sleep, or cash. Have you ever become involved with a once-off partner because he provided you with or you expected that he would provide you with? food; cosmetics; clothes; transportation, tickets or money for transport; items for children or family such as clothes, food; woman's own school or residence fees; somewhere to sleep, or cash.

Measuring transactional sex in men

Table 2 below shows that several of the studies which measured transactional sex in men were the same as those which measured transactional sex in women.

Table 2: Selection of definitions of transactional sex in men

Authors and year	Study setting	Questions
Bhushan et al, (2023)	Mpumalanga, South Africa	Defined as having given money, gifts or financial assistance to any named partner to start or continue a sexual relationship.
Choudry et al, 2015 (10)	Urban and rural Uganda	In the last 12 months, did you pay anyone in exchange for having sexual intercourse?'
Pitpitan et al, 2014 (81)	Cape Town, South Africa	Has someone given you money, alcohol, drugs or a place to stay in exchange for sex in the past 4 months?
Jewkes et al, 2012 (12)	Eastern Cape and KwaZulu-Natal, South Africa	Men were asked separately for main partners and on-going secondary partners: "Do you think any of them became involved with you because they expected you to do, or because you did do any of the following:" with yes/no response options for providing food, clothes, cell phone or transportation; school fees or residence fees; somewhere to stay; cosmetics; items for children or family; handyman work; cash or money to pay bills; and anything else that she could not afford by herself. For once-off partners, men were asked "Have you ever had sex with a woman just as a once off because you gave her or she expected that you would give her:" with response options for food, clothes, or cosmetics; transportation; a place to sleep for the night; handyman work; cash or money to cover expenses; and anything else that she could not afford by herself.
Dunkle et al, 2007 (29)	Eastern Cape, South Africa	Transactional sex where a man gave to a casual partner was defined as occurring when the man thought the woman's participation was motivated by his providing her (or her expectation that he would provide her) with food, cosmetics, clothes, transportation, items for children or family, school fees, somewhere to sleep, alcohol or a ''fun night out'', or cash.

Proposed new measurement of transactional sex

To address the lack of clarity in measurement and address some of the ways in which transactional sex is conflated with sex work, the STRIVE research consortium undertook a deep dive into the concept (31). Coming out of this work, Stoebenau and colleagues (2016) defined transactional sex as non-commercial, non-marital sexual relationships which are motivated by the unspoken assumption that sex will be exchanged for material support or other aid (35).

Also as an output of this work, Wamoyi and colleagues (2017) developed a new measure of transactional sex (31). Starting with a measure originally used in South Africa (4), they conducted congnitive interviewing in Tanzania and Uganda to refine the measure and assess its feasibility in different contexts (26). Its performance was further evaluted in KwaZulu-Natal, South Africa (30). This measure, described in Tables 3 (women) and 4 (men) below, comprises one question asked as part of the relationship module, and another which is a stand-alone question.

Despite this extensive work and the guidance developed, examples of research which has made use of these measures is limited. Ranganathan et al (2022) drew on these recommendations (although not exclusively) to ask women about their engagement in transactional sex. Women were asked: "In the past 12 months, did you start a sexual relationship with [recent partner] in order to get things that you needed, such as money or gifts?" (82). However, it is not clear in relation to which sexual partner these questions were asked. Other than commenting on the issues around potential social desirability bias (82), this paper does not add to the discourse on measurement. To my knowledge, there has been no further critique or comment on these measures.

Table 3: STRIVE recommended transactional sex measures, women

Module	Question	Explanatory notes
Relationship module	Did you enter into/start a sexual relationship with (INITIALS) mainly to get things you need, money, gifts or other things that are important to you?	• This question would be asked of any partner who is not the respondent's husband, or with respect to non-marital relationships • "sexual relationship" is less likely to be conflated with sex work than "have sex with" • "relationship" differentiates this practice from discrete sex work exchanges • "enter into/start a sexual relationship" is less judging than 'become sexually involved with" • "mainly in order to" directs attention to the motivation for the relationship • "things that you need" and "things that are important to you" are subjective and captured items ranging from oil and sugar to school fees, clothing, and cell phones • Money and gifts are common items in exchange relationships • The exact wording may vary by context: o Start vs enter into varied by local language translation o "gifts" may be confusing if it signals a transfer that does not require exchange • This question is understood as intended by the majority of women, but can be "heard" by a few as a question simply asking if their partner had provided for them. It therefore may lead to slight over-reporting
Stand alone	In the last 12 months, did you enter into/start a sexual relationship with a man mainly in order to get things that you need, money, gifts, or other things that are important to you?	• This question would be asked to unmarried women, or could be analysed among all women, excluding those who married within the last 12 months (as those married for more than a year would be answering to other relationships they 'started' in the last 12 months) • "In the last 12 months" was chosen so that older women and younger women are being asked about the same time frame; and allows for a long enough time frame for younger women with larger gaps between sexual partners and activity to be captured o For studies addressing only AGYW (15-24), a question asking about lifetime or "ever" engaging in transactional sex is also recommended o "start" a sexual relationship in the last 12 months also reduces probability of response referring to a spouse (BUT surely you need to be explicit about this and not implied) • For this stand-alone question, it is necessary to specify that this refers to a "sexual" relationship

Table 4: STRIVE recommended transactional sex measures, men

Module	Question	Explanatory notes
Relationship module	Have you given [INITIALS] any money, (gifts) or helped her to pay for things mainly in order to start or continue a sexual relationship with her?	• This question would be asked of non-marital relationships • As is the case for women, "mainly in order to" emphasises the motivation for the relationship • "to start or continue" recognises that men feel they must continue to provide for a woman if they wish to continue the relationship, as well as it recognises that men sometimes provide goods before sex, or after the relationship begins • "Sexual relationship" was used here to help differentiate the question from sex work, it points to more than a single encounter • "Money, gifts, or helped her to pay for things" captures some of the transfers common in transactional sex and allows for subjective interpretation with "help to pay for things" • The word "gifts" may not work in some contexts for men, as described above for women
Stand alone	In the last 12 months, have you given a woman who is not your wife and is also not a sex worker, any money, (gifts) or helped her to pay for things mainly so you could start or continue a sexual relationship with her?	• "Who is not your wife and is also not a sex worker" is important in helping men to identify the type of relationship this question refers to

2.1.3 Prevalence of transactional sex

Partly due to the differences in definition described above, prevalence of transactional sex in both men and women differs significantly across studies in the region.

Prevalence of transactional sex in women

One study found that across 12 African countries, the prevalence of transactional sex in women aged 15 years and above ranged from 1.8% to 11% (7), while Luke's review in sub-Saharan Africa found that prevalence of ever engaging in transactional sex ranged from 5% to over 80% of young women (47). Moore et al (2007) report that, depending on how it is defined, the prevalence of transactional sex in sexually active adolescent girls from four countries ranged from 36% to 80% (28).

Prevalence of transactional sex among women in South Africa also differed. For example, in Agincourt, Mpumalanga, 14% of sexually active young women and 4% of all young women 16 -20 years reported engaging in transactional sex (80), while 6% of women sampled from venues serving alcohol in a peri-urban township in Cape Town reported that they had engaged in transactional sex (81). In a cluster randomised controlled trial (c-RTC) with young women 15-26 years in the Eastern Cape, 9% of women who were followed-up reported having had transactional sex with a a casual partner (6). Ten percent of all AGYW aged 15-24 years and 14% of AGYW who have ever had sex, reported they had stayed in a relationship for money or goods in four districts (83).

Prevalence of transactional sex in men

The literature on prevalence of transactional sex in men is scanty, especially outside of South Africa. This is largely because of the way in which transactional sex has been framed around women's risk of HIV acquisition. A study in the Eastern Cape found that 17.7% reported providing "material resources or money to casual sex partners" and 14.9% reported being in transactional relationships with main girlfriends (29). In another study in Eastern Cape and KwaZulu-Natal provinces, the authors found that 66% of men 18-49 years reported at least one type of transactional sexual relationship (12). A tenth of men sampled from venues serving alcohol in a peri-urban township in the Western Cape, South Africa reported engaging in transactional sex (81). A study in rural Mpumalanga, South Africa was conducted with men aged 18-30 years who reported having AGYW sex partners. Prevalence of engagement in transactional sex was high with Bhushan and colleagues (2023) reporting that 48% of participants indicated that they had "given money, gifts, or financial assistance to any named partner to start or continue a sexual relationship" (84)

2.1.4 Motivations for transactional sex

This sub-section builds on Chapter 1 and discusses the reasons why people engage in transactional sex. This is a complex phenomenon, with far more research having been conducted with women than with men.

Motivations for transactional sex in women

The reasons why young women engage in transactional sex are multifaceted (79). In some cases, transactional sex is driven by structural factors, including poverty, gender inequality, and low levels of education. However, it is also driven by a number of psychosocial factors, including societal and peer pressure, aspirations for social mobility, and material consumer goods, as well as romantic notions of love and security (49). Women have reported engaging in transactional sex for a number of motivations including to obtain basic needs, consumerism, affectivity and, in some cases, to increase a sense of agency (32-35).

Stoebenau and colleagues' (2016) systematic review is the most recent and complete work exploring and summarising women's motivations for engagement in transactional sex. At the time of writing, no further work has been undertaken to expand on or engage with this framework. Thus, the sub-sections below draw almost entirely on the framework proposed by Stoebenau et al (2016) (35), shown in Figure 2.

Sex for basic needs

Here, women are positioned as "vulnerable victims" (35) who, due to their economic dependence on men and gendered economic inequality, are forced to exchange sex for money, food, or other material support (85, 86). In early literature, this was often the only motivation for transactional sex which was recognised. Over 20 years ago, Basset described how the economic situation in Zimbabwe forced women to exchange sex to cover several different obligations and that this was not considered prostitution (87).

Sex for improved social status

The second paradigm described by Stoebenau et al (2016) as "sex for improved social status", positions women as sexual agents who engage in transactional sex in an attempt to attain a middle-class status and lifestyle. This discourse was presented in the early 2000s and proposed that another motivation for women's engagement in transactional sex was to improve their social status (88, 89). These critiques expanded beyond the "basic needs" narrative in three ways.

Firstly, authors noted that transactional sex was not limited to women who were impoverished. Materials exchanged are not limited to basic needs but included "commodities of modernity" (89-91). In Zimbabwe, ethnographic research uncovered that transactional sex allowed young women to consume luxury goods such as mobile phones, pedicures and hairdos (92), while Bell (2012) describes how women in Uganda both accepted and actively sought support in order to better their circumstances (93).

Secondly, researchers argued that most women displayed some level of agency in transactional relationships and should not be viewed as victims only (67, 89, 94, 95). In South Africa, Swartz (2016) argues that young women are strategic in their choice of sexual partners and the way in which they navigate these relationships (90). This is reflected by the language used in various sub-Saharan African settings. In Dar es Salaam, Tanzania, men were called "buzi" (a goat to be milked) (33), in Maputo, Mozambique, engaging in transactional sex was "sengue" (to milk the cow) (96) and in urban townships in Gauteng, South Africa, women referred to men as "chickens" to be plucked (97). Although women may speak of exploitatively obtaining financial resources from a man, they frequently do so according to his terms of sexual engagement, such as whether or not a condom is used (64).

Finally, scholars put forward evidence that, through sexual exchange, women gained not just economic capital but social capital too (96-100). For example, Verheijen (2011) argues that in Malawi, by having transactional relationships, young women have access to a type of "insurance" which may increase their support during times of economic hardship and reduce social exclusion (101).

Sex and material expressions of love

The third paradigm, "sex and material expressions of love," draws attention to the connections between love and money, and the role of men as providers in relationship (35).

Qualitative studies have demonstrated that young women often interpret receiving money, gifts, or favours in a relationship as evidence of love (68, 95). In Tanzania, women reported that it was humiliating for transaction not to occur in relationships (95). In South Africa, Swartz (2016) report that for young women in an urban informal setting outside of Cape Town, where poverty is high, material support formed an important source of connection between young people. Practical gifts portrayed affection and commitment in relationships (90).

Women describe feeling an unspoken expectation to engage in sex whenever they receive material gifts or financial support from a romantic partner (64, 85). Researchers have discovered that among

young people in romantic relationships in Durban, South Africa, exchanging gifts is frequently linked to sex (70). These relationships are based on the mutual expectation that men are responsible for providing financial support to their partners (14).

These paradigms of transactional sex in women are replicated in the way in which women refer to transactional sex partners. For example, in Khayelitsha, an informal setting outside of Cape Town, South Africa, community members referred to men as the "minister of finance," "minister of transport" and "minister of recreation", alluding to the kinds of material benefits that men offer their female sexual partners (90). Figure 2 below shows a framework developed by Stoebenau and colleagues (2016). It unifies the three different paradigms used to describe transactional sex, highlights a common set of broad structural forces that shape each paradigm and introduces a series of spectra bridging them (35). The authors suggest that transactional sex and the motivations for this practice are better represented as ranges of deprivation, agency and instrumentality rather than discrete paradigms (35). At a distal level, there is a continuum of deprivation that describes the context within which transactional sex takes place or the extent to which transactional sex is structured by poverty (absolute deprivation) compared with economic inequality (relative deprivation). At a proximal level, there is a continuum of the degree of agency which women exhibit. Most studies suggest women's positions vary over time and between relationships - from the extremes of "vulnerable victim" to "powerful agent". The last continuum is instrumentality, or the extent to which a relationship is motivated by financial or status incentives. This continuum runs perpendicular to the other two continua as the degree to which a relationship is motivated by instrumentality can vary independently of women's agency or the economic context in which the relationship takes place (35).

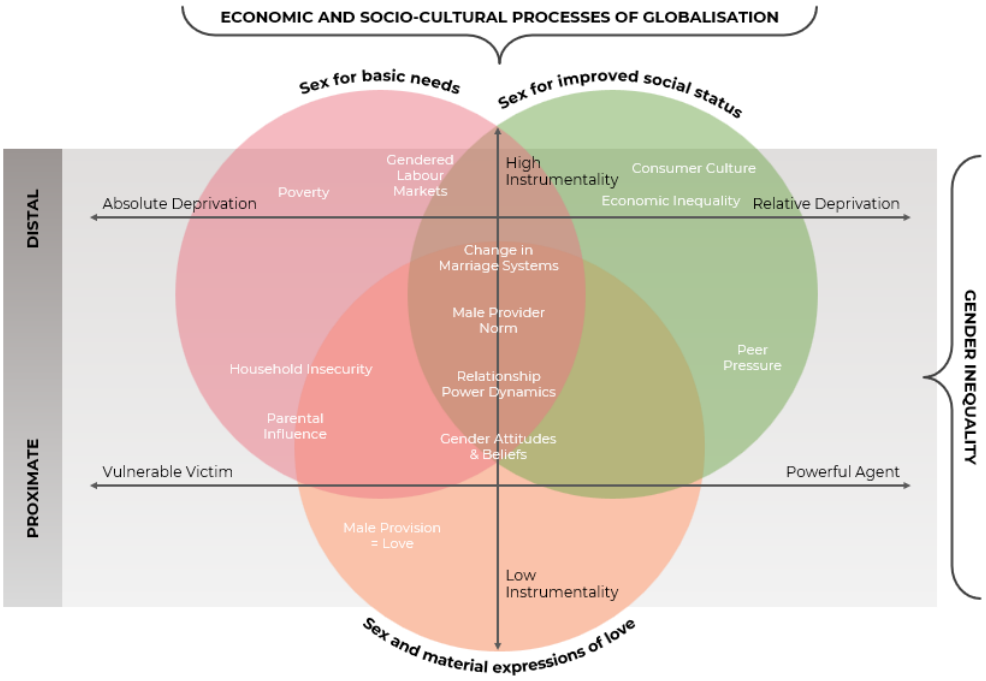


Figure 2: Conceptual framework for transactional sex in women in sub-Saharan Africa, adapted from Stoebenau, 2016

Motivations for transactional sex in men

The motivations for men's engagement in transactional sex have been far less well explored and conceptualised. Stoebenau et al (2016) state that gender expectations about male provision were central to multiple transactional sex paradigms described for women (35). In many settings, there is a cultural norm that if men live up to their expectations of being a provider, women are to provide sex (102). It has been further explained that provision of economic support is one way in which young men were able to identify with and show affection for their partners (90). Transactional sex is an extension of these assumptions.

Other authors have gone further and argued that, in Malawi, wealthy men are encouraged to participate in multiple transactional sexual relationships to distribute their wealth, reflecting traditional notions of social responsibility (103) .

2.1.5 Factors associated with transactional sex

Factors associated with transactional sex among women

Extant literature reveals several factors, aside from other sexual risk behaviours (see section 2.1.6), which are associated with women's engagement in transactional sex.

Several sociodemographic factors are associated with transactional sex in women. Research has demonstrated that younger women and those who are unmarried are more likely to engage in transactional sex (7). Poverty, including housing deprivation and food insecurity, also influence transactional sex (104-107). On the other hand, contribution to household income by women was protective. Tolmay and colleagues (2022) found that women who helped support their households financially were less likely to engage in transactional sex than those who did not contribute (108). However, these findings are inconsistent. A study exploring the connection between household wealth and transactional sex among adolescents and young people in 12 African countries discovered that low wealth was a risk factor in some countries but not in others (7). Higher education and enrolment in school are factors which, conversely, have been shown to be protective (107).

Relationship control has demonstrable relationships with transactional sex. A study in South Africa found that young South African women who had engaged in transactional sex were more likely to have low levels of relationship control as measured by the sexual relationship power scale (SPRS) (80). However, in this paper (5), transactional sex was measured in both main and causal partners, and it is unclear with which sexual partner, relationship control was measured.

Research from the region demonstrated that women who have experienced sexual violence in childhood (13, 109) and those who experienced several adverse childhood events compared with those who did not are more likely to engage in transactional sex as adults (109). In South Africa, women's provision of sex in exchange for goods or materials was associated with several types of childhood abuse including ever emotional and sexual abuse (110).

Factors associated with transactional sex among men

There has been far less research published on the factors associated with transactional sex in men.

A study from three African countries revealed that community context had implications for men's involvement in transactional sex. Men living in communities where women had higher levels of education and later ages at first birth were less likely to report risky transactional sex (111). Jewkes et al (2012) found that, relative to younger men, those older than 24 years were more likely to report transactional sex. Men who had some income were more likely to do so than those with little income (12).

Research has demonstrated that men's experience of childhood trauma in different forms increases their likelihood of providing money or goods in exchange for sex in adulthood. For example, Kanagasabai and colleagues (2024) found that, across five sub-Saharan African countries, men who were exposed to sexual violence, were nearly four times more likely to engage in transactional sex

than those who were not (109). Evidence from Uganda suggests that boys who experienced sexual coercion had higher odds of paying for sex (10) while research from South Africa found that men's experience of emotional or sexual abuse was associated with their engagement in transactional sex (110).

2.1.6 Transactional sex and other risk behaviours for HIV

The pathways through which transactional sex increases HIV risk are not very clear. Some proposed pathways include a power imbalance between the givers (mainly men) and the receivers (mostly women). Engaging in transactional sex often means that women are less capable of influencing the timing and characteristics of sex (15, 16).

In this section, the demonstrable associations between transactional sex and other risky sexual behaviours are described. It is possible that these associations may help to explain the pathways through which transactional sex influences HIV risk. However, transactional sex is imprecisely defined in some extant literature, and it is unclear whether transactional sex is a cause or consequence of other sexual risk behaviours. The majority of the studies have again focused on the relationship between transactional sex and sexual risk behaviours in men.

Having multiple sexual partners (MSP) is a risk factor for HIV (112-115) and there is evidence of the association between MSP and transactional sex (10, 28). It is not clear whether being in multiple partnerships leads to transactional sex or vice versa or whether the two related behaviours synergistically increase HIV risk. Interestingly, in an exploration of whether certain sexual risk behaviours mediated the relationship between transactional sex and HIV, where none was found, Ranganathan and colleagues (2016) suggested that this may be because that the men with whom young women are having sex belong to networks of sexually connected individuals who are at a ''high risk'' for HIV infection (80). This makes sense as transactional sex is often implicit in descriptions (and new measures) of concurrent sexual partnerships (64).

Another factor which is a risk factor for HIV acquisition is age-disparate sex. Older men are more likely to be HIV positive than young women's' peers and sexual partnering between older men and younger women is a driver of the epidemic in the region (116). Age-disparate sex, is often, but not always, associated with transactional sex (117-119). For example, among South African AGYW 15-24 years reporting transactional relationships, two thirds had partners within five years of their own age, with only one third of transactional relationships being age-disparate too (79).

Inconsistent condom use is also a risk factor for HIV. Consistent condom use has been shown to be associated with reduced HIV transmission (120). A systematic review and meta-analysis found that, when used consistently, condoms can reduce HIV transmission by more than 70% in sero-discordant heterosexual couples (121). Conversely, inconsistent condom use would be associated with increased HIV transmission. There is evidence that transactional sex is associated with inconsistent condom use (72, 75) for the reasons discussed earlier.

Alcohol and drug use is also associated with transactional sex (122-126). Research from South Africa has demonstrated that it is not just alcohol use which increases the likelihood of engaging in transactional sex, but also the type of hazardous alcohol use (124). There is ample research on the relationship between alcohol use and transactional sex in both men and women in South Africa (81, 122-124, 127).

Transactional sex is also associated with various types of violence (29, 128). Research has demonstrated that transactional sex is associated with experience of male-perpetrated intimate partner violence (29, 129). Dunkle and colleagues (2007) found that male perpetration of physical and sexual interpersonal violence (IPV) was the largest covariate associate with men's engagement in transactional sex (29).

A study among young women in Zambia found that young women involved in transactional sex face a nearly 30% higher risk of pregnancy before marriage compared to their peers who are not involved, even when considering other risky sexual behaviours (130).

2.2. Gender and masculinities

Socio-behavioural researchers typically approach gender through a social constructivist framework, defining it as the traits of femaleness and maleness shaped by societal influences rather than biological determinants (131). This perspective suggests that while sex is biologically determined, gender is not an inherent individual trait but rather shaped through social interactions (132, 133).

2.2.1 Understanding masculinities

Masculinities refers to a collection of socially constructed expectations dictating how men and boys should behave, appear, experience life, and express their emotions (134). A man's masculinity is influenced by his public actions and interactions, alongside how his social context perceives them. These behavioural patterns become ingrained in culture, institutions, and policies, shaping a social

framework that significantly impacts individuals' lives. Consequently, men's societal "competence" heavily relies on their adherence to gender-specific behavioural norms (133).

One of the robust theories to understand masculinities is Connell's Theory of Gender and Power (37). This theory integrates aspects of Sociology, Psychology, and Gender studies to suggest that multiple masculinities exist and that these are influenced by various social, cultural, and economic factors (37). It also underscores the fluidity and variability of masculinities over time and across cultures and acknowledges that what is considered masculine is influenced by shifts in social, economic, and cultural contexts and can change (37).

2.2.2 Hegemonic masculinity

Central to Connell's theory is the idea of hegemonic masculinity. This term describes the culturally dominant ideal of manhood that maintains and legitimises men's dominance over women and other gender identities (132). It encapsulates the gender norms, values, attitudes and behaviours within a particular society which perpetuate gender inequality. Hegemonic masculinity is often characterised by traits such as physical strength, stoicism and competitiveness (37).

Connell's theory also postulates that the construction of masculinity is deeply intertwined with societal power dynamics. Hegemonic masculinity not only prescribes certain behaviours for men but also dictates power dynamics, evident in various settings, where traditional gender roles are perpetuated and rewarded (37). Social norms requiring adherence to the attributes likely account for the widespread association between masculinity and various harmful behaviours, including sexual violence, which are often intended to validate one's masculinity (135).

The dominant conception of masculinity often emphasises power over others, leading men to seek ways to assert their power in relationships with women. Connell's Theory (37) which has been applied to HIV by Wingood and DiClemente (136), provides a framework for how gender and power is negotiated between men and women. Three social structures which characterise the gendered relationships between these sexes have been identified (37). They include: 1) the sexual division of labour, 2) the sexual division of power and 3) the structure of cathexis (social norms and affective attachments) imposes differential norms of sexual behaviour for men and women and increases vulnerability of both as their sexual behaviours are constrained by social norms (136). These socio-structural contexts of heterosexual relationships create power dynamics that facilitate men's use of sexual behaviours as a strategy to demonstrate their masculinity.

2.2.3 Hegemonic masculinity, sexual risk behaviour and economic conditions

Socially constructed gender norms play a crucial role in shaping sexual behaviours and influencing vulnerability to HIV (137). Gender norms, especially those related to masculinity, are believed to have a profound impact on the HIV epidemic (137-139). As outlined in the pioneering work of Gagnon and Simon, sexual behaviours are deeply intertwined with social practices and are seldom driven solely by biological urges alone. The sexual behaviours of men are theorised to play a crucial role in shaping their masculine identity (140).

A wide body of literature demonstrating the relationships between men's acceptance of masculine norms and sexual risk behaviours exists (134, 141-144). There is also evidence from Mpumalanga, South Africa, that conflict and stress men experience in relation to fulfilling gender expectations of men, is associated with increased odds of engaging in HIV risk behaviours (145). These studies make use of a variety of measures such as the Gender Equitable Men Scale (144) and Sexual Relationship Power Scale (146). Fleming et al (2016) identified three major dimensions of masculine norms that shape men's sexual behaviour: 1) uncontrollable male sex drive, 2) capacity to perform sexually, and 3) power over others (147).

Men's engagement in transactional sex perpetuates gendered hierarchies by reinforcing norms of masculinity. Men validate or undermine each other based on their performance of masculinity. For instance, those who attract multiple girlfriends through financial support are often seen as superior. Engaging in transactional sex therefore becomes a means of affirming one's masculinity and social status among peers. Closson et al (2020) report an association between transactional sex and men's attempts to uphold gendered inequalities (148).

Howard-Merrill and colleagues (2022) undertook research in Tanzania, finding that men often display two sets of gender norms in relation to transactional sex and masculinity. Firstly, men were expected to be able to provide financially within their relationships and secondly, one way in which men could demonstrate their masculinity was through increased sexual prowess and virility (149). The authors report that transactional sex can enable men to fulfil the gendered norm of men's material provision, by perpetuating women's' and girls' economic dependence on men, and highlighting men's social dominance over women. Interestingly, participants' description of transactional sex mirrored some of the motivations described by Stoebenau et al (35). Older men reported "trapping" young women in (sometimes) coercive transactional relationships by the provision of basic needs whereas younger men reported feeling pressured to provide gifts as material expressions of love

(149). For young men in particular, their ability to provide in these relationships, influenced how they were perceived to be able to provide in the future.

Men who fail to conform to certain masculine ideals within their particular social context may face social disapproval, ostracism (150), or even violence (151) from their social circles. While men have a range of behaviours to demonstrate virility and strength, they may sometimes use their sexual activity, drinking ability, or displays of force to exhibit these masculine traits to their peers (152, 153).

2.2.4 Provider masculinity and transactional sex

In many societies worldwide, the concept of "provider masculinity" is a widely accepted and desirable expression of hegemonic masculinity (53, 103). In this context, male provision relates to the societal expectation that men should fulfil the role of primary financial provider for their families or dependents. Hegemonic masculinity places a strong emphasis on the breadwinner role, where men are expected to be the primary earners and providers for their households (154). This role is often associated with economic success, status, and power within society. Providing economically is not just about meeting material needs but also about establishing and maintaining social status and power. Men who fulfil the provider role are often seen as more successful and respected within their communities. For men subscribing to hegemonic masculinity, their identity and sense of self-worth can be closely tied to their ability to fulfil the provider role effectively. This can lead to pressure and stress to succeed economically, which may influence various aspects of their lives, including relationships.

Meeting these societal expectations is especially hard in the context of immense poverty, high levels of unemployment and inadequate urban planning and insufficient infrastructure. Where these factors come together, like in urban informal settlements, the disconnect between the ideal of provider masculinity and what is actually achievable may become a source of tension. The next section introduces urban informal settlements and the expands on how these environments promote behaviours which are high risk for HIV acquisition.

2.3 Urban informal settlements

2.3.1 Introducing urban informal settlements

Informal settlements, often interchangeably referred to as slums, present a critical urban phenomenon prevalent across many developing countries. Over the past fifty years, developing countries, particularly in sub-Saharan Africa, have witnessed a significant surge in urban expansion, with informal settlements often accommodating more than half of the population (155). Informal settlements in South Africa are continuously growing. About one out-of-seven households in the country live in informal settlements (39). These settlements, typically located close to employment opportunities, highlight the shortcomings of land use planning, which historically prioritised colonial settlement designs, leading to unequal access to services (156).

2.3.2 Health challenges in urban informal settlements

Living conditions within informal settlements pose profound health risks to residents, amplifying existing challenges residents face in accessing clean water, sanitation, and healthcare services. Limited infrastructure and inadequate waste management systems contribute to the proliferation of disease vectors and environmental pollution. Most studies describe the conditions of many informal settlements as detrimental to health, highlighting how poverty and poor environmental conditions threaten public health and safety (157).

In addition to an increased risk of infectious and non-communicable diseases, people living in informal settlements are at higher risk of HIV acquisition. In South Africa, prevalence of HIV was higher in urban informal settlements than in urban formal and rural areas (2). Studies have demonstrated that young people in informal settlements face significant challenges concerning their sexual and reproductive health and rights (SRHR) too. This leads to adverse outcomes such as early and unintended pregnancies, STIs, and sexual violence. A scoping review revealed that many studies emphasise individual-level risks while overlooking how neighbourhood environments, concentrated poverty, and social exclusion influence behaviours and norms related to health (158).

Underpinning health implications, informal settlements grapple with profound social issues stemming from the lack of social cohesion and community infrastructure. Research has demonstrated that larger, established informal settlements have lower social capital than newer ones. An increase in the average duration of residence in an urban informal area is positively correlated with higher prevalence of violence (159). Benefo's exploration of social disorganisation

underscores the challenge of unregulated behavioural norms in diverse urban informal environments, where migrant communities lack the cohesive networks necessary for monitoring and reporting on social conduct (160). This fragmentation of social ties further compounds vulnerabilities, creating fertile ground for high-risk sexual behaviour and violence.

2.4 Conceptual framework

The existing literature has been organised into a conceptual framework for this PhD using an adapted version of the socio-ecological model (161). One model for women and men has been developed although there are slight differences for men and women at each level.

Figure 3 shows the relationship between individual, interpersonal and socio-cultural factors which influence engagement in transactional sex with a khwapheni or casual partner. At an individual level, various sociodemographic factors influence transactional sex in women. These include: age (7), marital status (7) and education (107). For men, those who are older, those with some money and those with lower levels of education are more likely to engage in transactional sex (12). Three different motivations for women's engagement in transactional sex have been described (35). For men, the notion of needing to be a provider (37), influences their engagement in transactional sex .

At an interpersonal level, the literature has described how peer pressure and pressure from potential partners (93) can influence transactional sex, especially in relation to sex in exchange for improved social status. Partner characteristics, such as relationship control (5) may influence engagement in transactional sex. There is significant research on the role of hazardous alcohol use, particularly when consumed in taverns, in influencing engagement in transactional sex (81, 123, 124). Watching nearby residents or peers engage in sexual activities, possibly to support their own needs, can also enhance women's perception of this behaviour as socially acceptable and may even legitimise it as a feasible option when other means of earning income are unavailable (32).

Finally, at a distal level, this framework suggests that transactional sex is influenced by higher acceptance of violence against children, gender-based violence and structural violence. Kangasabai and colleagues have described how adverse childhood experiences is associated with future transactional sex (109). The literature also describes how in places like urban informal settlements, where social cohesion may be lower and many inhabitants are migrants, social norms around engagement in practices (like transactional sex) may differ (160). It proposes that economic conditions influence engagement in transactional sex. It is well documented that people may exchange sex for goods or food when levels of poverty and unemployment are high (104-107). Economic conditions also capture factors like rural-urban migration in an attempt to escape high

levels of poverty, as well as poor infrastructure and racialised underfunding and planning in communities especially urban informal settlements. Finally, gendered expectations mean that where women receive money or gifts, there is an expectation that they provide sex in exchange (102). Women who have lower levels of control in their relationships are more likely to engage in transactional sex (5).

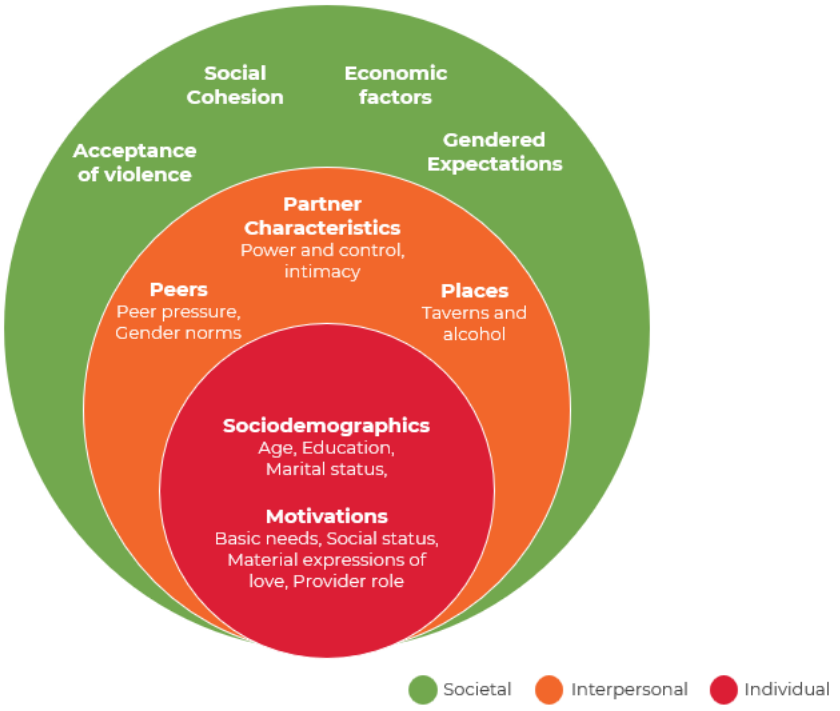


Figure 3: Conceptual framework for women and men's engagement in transactional sex

Chapter 3: Methodology

The three specific objectives of this doctoral research were answered using data from two different quantitative studies (Stepping Stones and Creating Futures Trial and the Sonke CHANGE Trial).

Table 5 shows that objective 1 was answered using data from primary study 1 (the Stepping Stones and Creating Futures (SS-CF) study). Objectives 2 and 3 used two different rounds of cross-sectional data from primary study 2 (the Sonke CHANGE trial).

Table 5: Summary of PhD data sources and research methods

Aim: To explore mechanisms and patterns of transactional sex in men and women living in urban informal settings in South Africa

	Objective 1: To assess pathways of young women's engagement in transactional sex in an urban informal setting in eThekwini, South Africa	Objective 2: To characterise patterns and predictors of men's transactional sex giving with casual partners in an urban informal setting near Johannesburg, South Africa	Objective 3: To determine which sub-groups of men living in an urban informal setting near Johannesburg, South Africa engage in transactional sex and how this is related to other sexual risk behaviours
Data Sources	Stepping Stones & Creating Futures	Sonke CHANGE Trial	
Timepoints	Baseline: September 2015 – September 2016 Endline: March – October 2018	Baseline: April - September 2016	Endline: December 2017 -June 2018
Setting	eThekwini, KwaZulu-Natal	Diepsloot, Gauteng	
Participants	Women aged 18-35 years	Men aged 18-40 years	
Analysis	Structural equation modelling	Multivariable analysis	Latent class analysis

3.1 Primary study settings

Both primary studies were conducted in urban informal settlements outside of major metropolitan cities. Primary study 1 was conducted in eThekwini, KwaZulu-Natal and primary study 2 was conducted in Diepsloot, Gauteng (Figure 4).

Figure 4: Map of South Africa showing location of primary settings

3.1.1. eThekwini municipality

Primary Study 1 involves a secondary analysis of a trial carried out in urban informal settlements within the eThekwini municipality, KwaZulu-Natal. As the third largest city in South Africa, eThekwini stands out for having the highest number of informal settlements in the country. Approximately 25% of its population resides in informal housing. The municipality encompasses 587 informal settlements, housing over 312,000 households (162).

The investigators of the primary study 1 chose not to name the specific communities in which SS-CF was conducted due to the potential for stigmatising communities with high levels of violence. The study areas comprised 32 clusters from 15 wards in and around eThekwini. A study in urban informal settlements in eThekwini (163) which includes communities similar to those in which SS-CF was conducted, found that the majority of residents come from within KwaZulu-Natal province, that unemployment is high at around 40% and many people live in makeshift housing. Housing typically consists of densely packed dwellings constructed from readily available materials such as corrugated iron, wood, and plastic sheets as depicted in Figure 5. Access to municipal services such as clean water, sanitation, electricity, and waste management is inconsistent (163).

Photo credit: SS-CF team

Figure 5: Study setting, eThekwini

3.1.2 Diepsloot

Primary Study 2 was conducted out in Diepsloot, an informal urban settlement situated near Johannesburg, South Africa. Established in 1994, Diepsloot emerged as a settlement during a period when many South Africans were relocating to urban areas in search of job opportunities. The majority of Diepsloot's inhabitants live in government-subsidised housing or makeshift tin shacks tin shacks (164). While exact population figures are scarce, the 2011 census recorded approximately 140,000 residents, though estimates generally range from 250,000 to 500,000. The settlement is predominantly populated by black individuals, with significant internal migration from other South African provinces and transnational migration from various African countries. The average age of Diepsloot's residents is around 25 years, reflecting the youthful demographic typical of the region. Water and electricity are largely available but there are areas where residents lack access to basic services such as sewerage and rubbish removal as shown in Figure 6. It is estimated that approximately 50% of the population is unemployed (165).

Photo credit: Professor Nicola Christofides

Figure 6: Study setting, Diepsloot

3.2 Primary study designs

3.2.1 Primary study 1

Primary study 1 was a c-RCT among 18-30-year-old men and women which sought to assess a participatory intervention focused on gender transformation and strengthening livelihoods (166). I conducted a secondary post-hoc analysis using longitudinal data from the baseline and endline of the SS-CF trial (Chapter 4) (167).

Recruitment

Recruitment for the study was carried out over a 12-month period. All 34 clusters, each consisting of 19-21 participants, consented to take part between May and July 2015. Baseline data (t0) was collected between 2015 and 2016, follow-up assessments at 12 months post-baseline were conducted from January to September 2017, while the 24-month post-baseline follow-up (t2) took place from January to September 2018 (168).

Eligibility criteria for the primary study were as follows: participants had to be residents of an informal settlement, aged 18 to 30 years, not formally employed, capable of communicating in the

primary languages of the study, and free from learning difficulties, psychosis, intoxication, or drug impairment. Both men and women were eligible to participate (168).

Sample size

SS-CF recruited 674 men and 677 women 18-30 years at baseline. At endline, 24 months later, 74.9% of men (n=505) and 80.5% of women (n= 545) were retained in the study (168). All women at t2 (n=545) were included in the analysis for paper 1 of this doctoral research (167).

Data collection

Participants completed the questionnaires on mobile phones provided to them by trained fieldworkers, who were available to offer assistance or answer questions. The questionnaire was accessible in English, isiXhosa, or isiZulu (166, 169).

3.2.2 Primary study 2

Primary study 2 was a cluster-randomised controlled trial (c-RCT) that assessed the effectiveness of a community mobilisation intervention aimed at reducing the perpetration of violence against women (VAW) (164). The Sonke CHANGE trial aimed to measure the impact of the Sonke Community Health Action for Norms and Gender Equity (CHANGE) intervention on the primary and secondary study outcomes. The goal of this intervention was to prevent the use of sexual or physical violence against an intimate partner and to lessen the severity of such acts (164).

I conducted secondary data analysis using two cross sectional waves of data collection. The baseline data answered objective 2 (Chapter 5, (170)) and the endline data answered objective 3 (Chapter 6) (171).

Recruitment

Around 120–150 men aged 18–40 years, residing in the area for a minimum of 12 months, were enlisted from each cluster and followed up at 24 months following their enrolment in the study. Trial staff recruited participants by going door-to-door within clusters, supplemented by word-of-mouth referrals from individuals within the area who had heard about the study from others. Men were invited to participate and provided written informed consent. They were then requested to complete a locator form, providing contact information for themselves and significant individuals in their lives. To maintain contact with participants between data collection points, text messages and phone calls were used (172).

Sample size

Baseline data were available for 2,406 men aged 18-40 years enrolled in the study. Ninety percent (n=2,189) of men who reported ever having had sex were included in the analysis for objective 2. Endline data were available for 1,509 men and 1,232 who had had sex in the past 12 months were included in the analysis for objective 3.

Data collection

Participants self-administered the questionnaire using ACASI on Open Data Kit on 7-inch Samsung tablets in one of four languages, English, isiZulu, Sepedi and XiTsonga selected by participants. They were supported by trained facilitators (172).

3.3 Measures

3.3.1 Measuring transactional sex in this PhD

For each objective transactional sex was the outcome measure. The challenges in measuring transactional sex and the importance of doing so well has been described in Chapter 2. The concept was measured slightly differently in each chapter depending on the study population (women for chapter 4 and men for chapters 5 and 6) and the timing (chapter 6 using endline data from primary study 2 made use of the new measure).

In chapter 4, transactional sex in women was assessed using five questions asked in relation to non-marital partners and which were adapted from those previously used in South Africa (12). Participants were asked: “In the past 12 months please think about any man you had sex with just once or any casual partner or khwapheni. Did you have a relationship or sex with them because you expected to receive, or received any of the following?”. Answer options, to which they responded yes or no, included: Cash or money to be looked after; somewhere to stay; support or money for your children or family; drugs food, cosmetics, clothes, a cell phone, airtime, transportation or anything else you couldn’t afford by yourself. The relevant sections of the SS-CF questionnaire can be found in Appendix 1.

In chapter 5, the same set of questions were asked to men, also in relation to non-marital partners. However, men were asked to speculate about their sex partner’s intentions. The question was: “In the last 12 months, please think about any one-night-stand or any casual partner or makhwapeni you had sex with. Do you think any of them may have had sex with you because they expected you to do, or because you did do any of the following”. Answer options were the same five described in the

previous paragraph. Appendix 2 contains the relevant section of the questionnaire from the baseline study.

For chapter 6, which used endline data from primary study 2, a new measure of transactional sex, based on guidance from Wamoyi and colleagues (173) and further developed by the researcher, was piloted. In other questionnaires (29) all respondents were asked to think about any casual partner or makhwapeni they had had sex with in the previous year and were then asked if that sexual partner had sex with them because they did (or expected them to) provide them with various items. The first change the researcher made was to separate the transactional sex questions into two questions.

First, drawing on Wamoyi et al (173), participants were asked "In the last 12 months, have you given a woman who is not your wife and is also not a sex worker, any money, (gifts) or helped her to pay for things mainly so you could start or continue a sexual relationship with her?". Answer options were yes or no. Next, only those who answered in the affirmative, were asked: "Thinking of the last time you gave a woman who is not your wife or a sex worker money or gifts for a sexual relationship, which of the following did you provide?". Multiple responses were allowed.

In developing the revised answer options, the researcher considered three aspects. Firstly, literature was examined to determine what items men reported providing and women reported receiving in exchange for sex. These were incorporated to ensure the list of potential answer options was exhaustive. Secondly, the researcher examined the existing answer options and broke them out into separate answer options to ensure mutual exclusivity. Finally, the researcher considered the three motivations described by Stoebenau and colleagues (35) and ensured that all three were covered by options provided and that similar items were grouped together.

For example, in the original set of questions asked to men, one answer option was: "Gave drugs, food, cosmetics, clothes, a cell phone, airtime, transportation or anything else they could not afford". The researcher perceived that these items belonged to different motivations with food belonging to *basic needs*, clothes to *consumerism* and cosmetics to *material expressions of love*. Using the new measure, response options included: cash, food/groceries, place to stay, items for children/family, school fees, alcohol, transport, cell phone/airtime, clothes/shoes, toiletries/make-up/perfume/lotions. Appendix 3 contains the relevant sections comprising the new measure of transactional sex from the endline survey of the Sonke CHANGE trial.

In an attempt to better understand motivations for transactional sex, the researcher developed and included additional transactional sex questions for men based on the women's literature (35) and this literature review. Men were asked: "Thinking of the last time you gave a woman who is not your

wife or a sex worker money or gifts for a sexual relationship, *how much do you agree with following statements*?" and were able to answer from strongly agree to strongly disagree. Statements were: "It's a normal part of a sexual relationship, I love my khwapheni / casual partner, My khwapheni / casual partner needed something for her family/children, My partner wanted to look good /be flashy, It shows that I am committed to my khwapheni / casual partner, I wanted my khwapheni / casual partner to dress a certain way, To impress other men.

3.3.2 Covariates

Several covariates were measured in each chapter. The chapter to which they are applicable is shown in Table 6 below. Details of the measurement of each covariate is described once thereafter.

Table 6: Covariate measures in each chapter

Measure	Paper 1	Paper 2	Paper 3
Alcohol Use Disorder Identification Test	x	x	
Childhood Trauma Questionnaire		x	
Gender Equitable Men's Scale		x	x
Sexual Relationship Power and Control Scale	x	x	x

Alcohol use was assessed using the Alcohol Use Disorder Identification Test (AUDIT), a ten-item scale used to measure past year alcohol use and identify risks for alcohol misuse and dependence (174). Scores were summed and a score of eight or more was considered hazardous. There was strong internal reliability, with Cronbach's alpha = 0.81 in both chapters 4 and 5.

The Childhood Trauma Questionnaire which comprised 15 items was used to measure childhood trauma (Cronbach's alpha = 0.83) (175). Example items to which respondents could choose from answer options "never", "sometimes", "often" and "very often" included: "Before I reached 18 there were times that I did not have enough to eat" and "Before I reached 18 I was beaten at home with a belt or stick or whip or something else which was hard". The score was summed and dichotomised into no childhood trauma or one or more traumas.

Men's gender attitudes were measured using nine items from the Gender Equitable Men's Scale (GEMS) (144). Example Likert scale items included: "I think that a man should have the final say in all family matters" and "I think that if a wife does something wrong her husband has the right to punish her" (Cronbach's alpha=0.85). Three levels were created: low, medium and high support for equitable gender norms.

Across all three papers, controlling behaviour in a relationship was measured using the Sexual Relationship Power and Control (SPRS) scale (176), which has been validated in South Africa (177). For men (papers 2 and 3), sample items included "I have more to say than she does about important decisions that affect us" and "I want to know where my partner is all of the time" (Cronbach's alpha =0.80). This scale was classified as a four-level categorical variable, with higher scores representing greater controlling behaviour. It was then dichotomised at the midpoint [19]. Eight items adapted from the SPRS scale (146, 178), were asked of women to measure their experience of controlling behaviour in main relationships. Sample items included "When he wants sex he expects me to agree" and "If I asked him to use a condom, he would get angry" (Cronbach's alpha =0.75). The scale was treated as a continuous score (range 0–24). Higher scores indicated greater relationship control by a main partner.

Chapter 6 also assessed various violent and antisocial behaviours among men. Respondents were questioned about how frequently they had engaged in specific actions towards a current or former girlfriend, partner, or wife over the past 12 months. These actions included: insulting, humiliating, scaring or intimidating, threatening, damaging important belongings, preventing the partner from working, taking their earnings, evicting the partner from the home, spending money on alcohol or drugs when the partner lacked sufficient funds, slapping, pushing, hitting, kicking or beating, threatening or attacking with a weapon, forcing sex, intimidating into sex, and coercing into other sexual acts. Binary variables (never/yes) were created to indicate any incidence of psychological IPV economic IPV, physical IPV, and sexual IPV within the past year. Additionally, past-year non-partner rape was evaluated using a scale developed in South Africa (179), along with other violent and antisocial behaviours such as fighting with a knife, bottle, or sharp object; possession of an illegal firearm; and gang involvement.

Other covariates included: age, education, food security (180), time in the community and relationship status. Food security over the past month was evaluated using three questions. Respondents were asked about the frequency of having no food to eat, whether any household member had gone to bed hungry, and if there were instances where they had not eaten for an entire day and night due to a lack of money or food. A cumulative score was calculated (ranging from 0 to 9), with higher scores reflecting greater food insecurity (180).

3.4 Data analysis

This doctoral research used quantitative data analysis, all undertaken in Stata versions 15 and 17 (181).

For chapter 4 (167), logistic regression was performed to estimate both crude odds ratios (ORs) and adjusted odds ratios (aORs) for transactional sex at t2, while controlling for sociodemographic factors and other behaviours, including transactional sex at t0. A continuous outcome score, ranging from 0 to 5, for transactional sex with a casual partner or khwapheni at t2 was used in the structural equation model (SEM). This SEM was developed based on theoretical pathways and fitted to the data using maximum likelihood estimates to account for missing values. Model fit was evaluated using goodness-of-fit measures (167).

For chapter 5 (170), multivariable logistic regression analysis was conducted to identify the covariates associated with transactional sex among men. Variables were incorporated into the model based on their theoretical relevance or their association with transactional sex as indicated by the bivariate analysis (170).

For chapter 6, Latent Class Analysis (LCA) was employed to categorise men into distinct classes. We iteratively constructed models with varying numbers of classes, ranging from one to three, and evaluated the fit of each model using several criteria: the likelihood ratio chi-squared statistic (L2), adjusted BIC (aBIC), consistent Akaike Information Criterion (CAIC), and the likelihood ratio test (G2). To explore the factors linked to transactional sex among men, we developed a model using backward stepwise multivariable logistic regression analysis (171).

3.5 Ethics

This doctoral research was approved by the University of the Witwatersrand's Human Research Ethics Committee (M180269). The ethics certificate for this PhD can be found in Appendix 4. Datasets from the primary studies were de-identified prior to analysis.

Primary study 1, SS-CF, received ethical approval from both the South African Medical Research Council Ethics Committee (EC006–2/2015) and the Biomedical Research Ethics Committee (BREC) at the University of KwaZulu-Natal, Durban, South Africa (BFC043/15). These certificates comprise Appendix 5.

Primary study 2, the Sonke CHANGE Trial, received ethical approval from the University of the Witwatersrand Human Research Ethics Committee (M150443) – see Appendix 6.

Chapter 4: Pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity and alcohol misuse

Magni, S., Hatcher, A., Gibbs, A., Wamoyi, J., Dunkle, K and Christofides, N (2024). AIDSImpact special issue: pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity and alcohol misuse. AIDS Care. 0.1080/09540121.2024.2307385

Introduction

Transactional sex increases women's vulnerability to HIV acquisition in sub-Saharan Africa, but more longitudinal studies are needed to establish the causal pathways between transactional sex and HIV (9). Transactional sex is defined as a sexual relationship which is primarily motivated by financial or material exchange and which occurs outside of marriages or 'formal' sex work (7, 35, 41, 42). Women engaging in transactional sex are often less able to influence the timing and nature of sex (16, 46), placing them at higher risk of HIV acquisition.

Reasons why women engage in transactional sex are not uniform (35). Transactional sex can be driven by structural factors such as poverty and food insecurity (105), where women exchange sex to obtain basic needs (34, 106). It can also be motivated by psychosocial factors, including aspirations for social mobility, a modern lifestyle and material consumer goods (32-34, 79, 89, 91, 106, 182). The practice is also driven by the intertwined nature of romantic notions of love and security (94, 98, 183).

Transactional sex occurs in different types of sexual relationships. Women in sub-Saharan Africa frequently report receiving gifts from their main partners (16, 70, 184). These gifts are demonstrations of love (98). Although gifts may incentivise women to have sex, they are not the only reason women have these relationships (16, 70). Transactional sex is often reported with non-primary partners, including *khwapheni* [concurrent sexual partnership which is hidden from a main partner] (184) and casual partners. Sex with casual partners is exchanged for a variety of reasons such as a place to stay for the night (46), a lift (70) or in appreciation of alcoholic drinks (85).

Factors associated with transactional sex in women include younger age, household hunger and lower socioeconomic status, low education, having a partner five or more years older and alcohol use (10, 13, 79, 185). However, there are two gaps in the knowledge base which would be useful to fill in order to improve HIV policy and programming for women.

Quantitative research on transactional sex pathways using longitudinal data have not, to our knowledge, been adequately explored. This means that frequently HIV programming addresses one reason for transactional sex, at the expense of the others (35). For example, in South Africa, one 'sugar daddies' campaign, which highlighted the issue of cross-generational sex in exchange for gifts or money (186) focused on sex for improved social status only, neglecting the other reasons described in the literature (35).Secondly, little research has explored the relationship between controlling behaviour by a main partner and women's engagement in transactional sex.

This paper aims to quantitatively explore the pathways which contribute towards women's engagement in transactional sex with *khwapheni* and casual partners in South Africa. Specifically, we explored women's experiences of their main partner's controlling behaviour in the pathway.

Materials and methods

Design

Data were drawn from a two-arm cluster randomised controlled trial (CRCT) in urban informal settlements in eThekwini Municipality, South Africa (166). An estimated 3.4 million people live in eThekwini municipality, about 30% of whom are unemployed (187). At a cluster level, eligibility was defined as urban informal settlements in the eThekwini Municipality, areas where the implementing partner, Project Empower, had determined it was safe to work. Informality was defined as not having formal service provision within the home. Clusters (n = 34) were informal settlements, with organically occurring boundaries.

In each cluster ~20 men and ~20 women were recruited. Women and men aged between 18 and 30, who were out of school, not in formal work, normally resident in an informal settlement, and able to communicate in English, isiXhosa or isiZulu were eligible (166). Data were collected from participants at baseline (t0; September 2015-September 2016) and 24 months later (t2; March – October 2018). Some 677 women aged 18-35 years were enrolled and 80.5% (n=545) were followed up two years later.

The C-RCT evaluated Stepping Stones and Creating Futures, two separate interventions designed to transform gender attitudes and strengthen livelihoods. Further information on the study design is available elsewhere (166). After providing written informed consent, questionnaires in English,

isiZulu and isiXhosa were self-completed on mobile phones (166). For this analysis, only women's data were included.

The primary study was approved by the Biomedical Research Ethics Committee (BREC) at the University of KwaZulu-Natal, Durban, South Africa (BFC043/15) and the South African Medical Research Council Ethics Committee (EC006–2/2015). Secondary data analysis was approved by the University of the Witwatersrand (M180269). All participants provided written informed consent. Data were de-identified prior to analysis.

Measures

We measured past year transactional sex using questions adapted from those previously used (12). Participants were asked: "In the past 12 months please think about any man you had sex with just once or any casual partner or *khwapheni*. Did you have a relationship or sex with them because you expected to receive, or received any of the following?". Examples of answer options are: "Somewhere to sleep for the night, bills or school fees" and "Cash or money to be looked after". Any transactional sex was defined as a positive answer to one or more of the five questions (12). A sum score ranging from 0-5 was created (Cronbach's alpha =0.79). A score closer to five indicated a higher intensity of transactional sex engagement. Participants who had not had sex in the past 12 months were coded as 0. Alcohol use was assessed using the Alcohol Use Disorder Identification Test (AUDIT) scale (174). Ten items asked about past year alcohol use, with scores summed. AUDIT demonstrated strong internal reliability (Cronbach's alpha =0.81).

Eight items from the adapted sexual relationship power scale (SPRS) (146, 188), asked about controlling behaviours with the respondent's current or most recent main partner. Examples of the items, scored using a four level Likert scale, are: "when he wants sex, he expects me to agree" and "he tells me who I can spend time with". This demonstrated good internal reliability (Cronbach's alpha =0.75). The scale was treated as a continuous score (range 0–24) with higher scores indicating more controlling behaviours by a main partner. We constructed a latent variable for main partner's controlling behaviour using the eight items of the SPRS score and tested this using confirmatory factor analysis [for which the data fit the latent construct in a strong manner: root-mean-square error of approximation (RMSEA) = 0.029; comparative fit index (CFI) = 0. 969 and Tucker-Lewis Index (TLI) = 0.958]. Socio-demographic variables considered included: age (continuous, per year) and education (highest level completed). Household food insecurity in the past month was assessed with three items: how often in the past month was there no food to eat, any member of your household

goes to sleep hungry, and not eating for whole day and night, because there was no money or food (180). A direct sum was derived (range 0–9) with higher scores indicating more food insecurity. A dichotomous variable for intervention and control groups was included.

Statistical analysis

Data were analysed in Stata version 17 (181). Sociodemographic characteristics of the sample were presented using frequencies and percentages. We compared the characteristics of those followed up and those lost to follow up at 24 months. We compared categorical variables using Pearson's Chi-squared test.

We used logistic regression to estimate crude odds ratios (ORs) and adjusted ORs (aORs), for transactional sex at t2, controlling for age, education, food insecurity, main partners' controlling behaviours, hazardous drinking, and transactional sex at t0 using the survey commands in Stata to account for clustering. We report ORs, aORs, 95% confidence intervals (CIs), and p-values.

We conducted structural equation modelling (SEM) and sem builder command. The continuous outcome score was transactional sex (0-5) with a casual partner or *khwapheni* at t2. We built the SEM using theoretical assumptions about pathways and controlled for education, food security, intervention/control arm and clustering at t0. We included food insecurity at t2 as we hypothesised that new instances of food insecurity would be an important pathway for ongoing transactional sex. We fitted the SEM to these data using maximum likelihood missing value estimates. We then assessed Goodness of Fit Measures for model fit.

Results

At baseline, 677 participants were recruited into the study and at t2, 80.5% (545) of participants were followed up. The mean age of participants at t2 was 26.2 years (SD = 3.7). Over half (297/545, 54.5%) were food insecure. Most (461/545, 84.6%) had a sexual partner that they did not live with and 16.3% (89/545) were currently studying. Those retained in the study at t2 were significantly less likely to cohabit with their partners and more likely to be in the control arm (Table 7).

Table 7: Sociodemographic characteristics of those retained and loss to follow-up over two years

	Retained at t2	**Lost to follow-up t2**	
	n (%)	**n (%)**	**p value**
Sociodemographic characteristics			
Age in years (n = 677)			
16-24	308 (56.5)	80 (60.6)	
25-35	237 (43.5)	52 (39.4)	0.39

	Retained at t2	Lost to follow-up t2	
	n (%)	n (%)	p value
Food security (n = 677)			
Food secure	197 (36.2)	46 (34.9)	
Food insecure	348 (63.9)	86 (65.2)	0.78
Relationship status (n= 677)			
Cohabiting	79 (14.5)	34 (25.8)	
Not living together	466 (85.5)	98(74.2)	0.00
Behaviours			
Relationship control (n= 677)			
Lower control by main partner	331 (60.7)	72 (54.6)	
Higher control by main partner	214 (39.3)	60 (45.5)	0.19
Alcohol use (n= 634)			
Non-hazardous alcohol use	392 (76.6)	101 (82.8)	
Hazardous alcohol use	120 (23.4)	21 (17.2)	0.14
Intervention			
Intervention arm	260 (47.7)	79 (59.9)	0.01
Control arm	285 (52.3)	53 (40.2)	

At t2, 44.6%, (243/545) reported any transactional sex with a *khwapheni* or casual partner in the previous year (95%CI 0.40 – 0.49). Nearly a third (169/545, 31.0%) of women reported having had sex for cash or money to be looked after. About 15% (86/479, 15.8%) reported transactional sex for somewhere to stay. Some 22.2% (121/545) reported transactional sex to support their children or family and 22.9% (125/545) for various items including, drugs, cosmetics and clothes. Nearly a fifth (93/479, 17.1%) said they received somewhere to sleep for the night, bills or school fees.

Table 8 shows that transactional sex was significantly higher in women reporting food insecurity, having higher relationship control in a main partnership, and drinking hazardous levels. More women who reported t0 transactional sex engaged in transactional sex at t2 (58.2% vs 41.8%, <0.001).

Table 8: Associations between sociodemographic factors, behavioural factors and intervention/control group and transactional sex in women, t2 (%)

	Had any transactional sex in the past 12 months (t2)		
	Yes n (%)	No n (%)	p value
Sociodemographic characteristics			
Age in years (n = 545)			
18-24	82 (42.7)	110 (57.3)	0.52
25-35	161 (45.6)	192 (54.4)	
Education (n = 545)			
Not currently studying	207 (45.4)	249 (54.6)	0.39
Currently studying	36 (40.5)	53 (59.6)	
Food security (n = 545)			
Food insecure	157 (52.9)	140 (47.1)	<0.001
Food secure	86 (34.7)	162 (65.3)	

	Had any transactional sex in the past 12 months (t2)		
	Yes n (%)	**No n (%)**	**p value**
Relationship status (n= 545)			
Not living together	199 (43.2)	262 (56.8)	0.12
Cohabiting	44 (52.4)	40 (47.6)	
Behaviours			
Relationship control (n= 545)			
Lower control by main partner	130 (36.3)	228 (63.7)	<0.001
Higher control by main partner	113 (60.4)	74 (39.6)	
Alcohol use (n=465)			
Non-hazardous alcohol use	132 (36.6)	229 (63.4	<0.001
Hazardous alcohol use	67 (64.4)	37 (35.6)	
Transactional sex at t0 (n=475)			
No transactional sex at t0	83 (34.2)	160 (65.8)	<0.001
Transactional sex at t0	135 (58.2)	97 (41.8)	
Intervention arm (n=545)			
Control arm	125 (43.9)	160 (56.1)	>0.1
Treatment arm	118 (45.4)	142 (54.6)	

Women who reported higher relationship control by their main partner at t0 had 6% higher odds of engaging in transactional sex at t2. Hazardous drinkers had 4% higher odds of engaging in t2 transactional sex. Women who engaged in t0 transactional sex had significantly higher odds of having had any transactional sex at t2 (aOR 1.9, 95% CI 1.19 - 3.05) than those who did not report t0 transactional sex (Table 9).

Table 9: t0 factors associated with transactional sex at t2, n = 448

	Unadjusted odds ratio	**95% CI**	**P value**	**Adjusted odds ratio**	**95% CI**	**P value**
Age in years t0	1.02	0.97 - 1.07	0.420	0.98	0.92 - 1.04	>0.1
Completed high school education t0	0.50	0.34 - 0.72	<0.001	0.66	0.40 - 1.10	>0.1
Food insecure t0	1.13	1.06 – 1.21	<0.001	1.11	1.02 – 1.22	>0.1
Cohabitating t0	0.75	0.47 - 1.21	0.243			
Controlling behaviours by main partner t0	1.11	1.06 – 1.16	<0.001	1.06	1.00 - 1.12	0.05
Hazardous drinking t0	1.08	1.04 – 1.11	<0.001	1.04	1.00 - 1.09	0.05
Transactional sex t0	2.68	1.85 - 3.89	<0.001	1.90	1.19 - 3.05	<0,01
Treatment arm	1.06	0.76 - 1.49	0.721			

Our SEM works through three pathways, in addition to controlling for t0 engagement in transactional sex and sociodemographic factors. Figure 7 shows that there is a significant and medium effect between engaging in any transactional sex at t0 and transactional sex at t2. Controlling for past transactional sex, we found that relationship control by a main partner had a large effect size on

future transactional sex with a casual partner or *khwapheni* (d=0.60), while hazardous drinking had a medium effect size (d=0.45) and food insecurity a small effect size (d=0.24), (RMSEA 0.03, 90%CI 0.02–0.04; CFI 0.97; TLI 0.96).

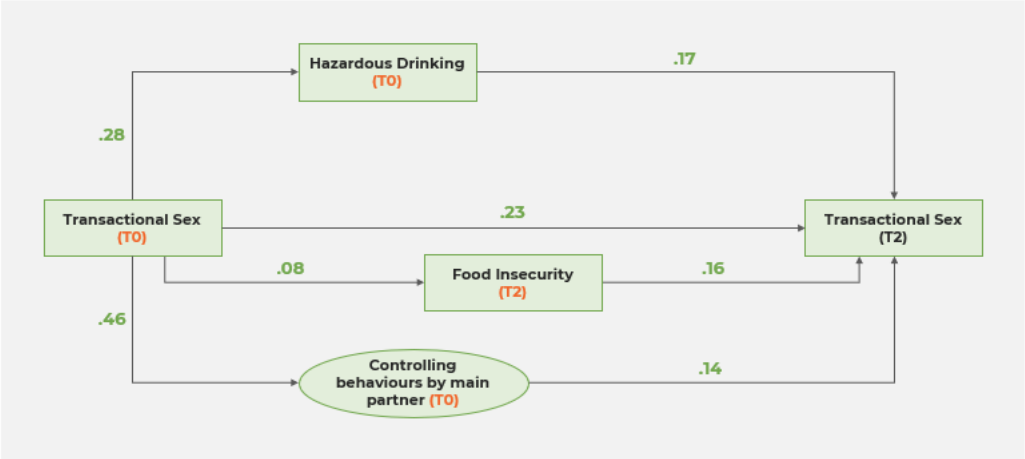


Figure 7: Structural equation model for pathways between controlling behaviours, hazardous alcohol use, and transactional sex

Discussion

This study is, to our knowledge, the first to quantitatively explore the pathways contributing to women's future engagement in transactional sex with a khwapheni or casual partner. We found that it is not just previous engagement in transactional sex which predicts future transactional sex. Consistent with other literature (4, 104-106, 124), this study found that social and structural factors are important pathways to future engagement in transactional sex. A novel finding is that higher relationship control in a main relationship is associated with transactional sex with a casual partner or khwapheni.

Prevalence of transactional sex with a *khwapheni* or casual partner in the past year was high with just over 40% of women aged 18-35 years reporting past year transactional sex. This is substantially higher than the 14% prevalence reported in 15-24 year-olds in five districts in South Africa (79). Although the measure of transactional sex was the same, we restricted transactional sex to casual partners or *khwapheni* in line recent guidance (26). This study was conducted in one district only,

with high unemployment, whereas Duby et al's study was conducted in five districts, not all of which comprised informal settlements.

The most common reason that women in this study gave for engaging in transactional sex was for cash or money to be looked after (35.3%). Although it is possible that women may be using the money received for luxury items, these findings suggest that material hardship and a lack of basic necessities seems to be driving a high proportion of transactional sex. The SEM demonstrates that controlling for baseline food insecurity, new food insecurity is an important pathway to future transactional sex. This is consistent with findings that food insecurity is associated with transactional sex (104, 189) and the paradigm of transactional sex for "basic needs" described in the literature (35).

Higher main partner relationship control is associated with transactional sex with a casual partner or *khwapheni*. Where main partners are aware of other sexual relationships women have, they may feel jealous and exert higher relationship control. There are two other potential explanations. Firstly, women in main relationships with high degrees of financial control, may have to engage in transactional sex for basic needs. Alternatively, women in controlling relationships may attempt to assert their agency by choosing with whom, and partially, what the terms are, for a transactional sexual relationship. Another study found that young women reported finding sexual relationships with transactional partners stimulating (79). There may also be other reasons why women engage in transactional relationships with *khwapheni*. For instance, they may be seeking out expressions of love (35) which they may not receive in their main relationship. Our data did not unpack these emotional pathways, but these would be worthwhile to explore in future studies.

Our finding that hazardous drinking is an important pathway contributing to transactional sex is consistent with other South African research (124). This may be because alcohol is a common and desired form of currency in transactional relationships (81). Especially in taverns, it is widely understood that when men buy women alcoholic drinks it is likely to end in sex (123, 190).

Implications for policy and programming

The findings from this research have several important implications for transactional sex policy and programming.

Firstly, initial engagement in transactional sex needs to be addressed. However, it is critical that interventions do not treat all women who engage in the practice as homogenous. Programming

needs to move beyond telling women to avoid “sugar daddies” on the assumption that the reason all women engage in transactional sex is to gain material goods. Understanding the underlying factors why women engage in transactional sex is an important first step. The next is developing tailored risk-reduction programmes to address these factors.

Secondly, to disrupt transactional sex pathways, interventions need to address food insecurity and behaviour simultaneously. Interventions which support women around job skills and savings can improve women’s livelihoods, however the Stepping Stones and Creating Futures intervention while significantly improving young women’s livelihoods did not see this translate into any impact on women’s engagement in transactional sex at follow-up (168). This suggests that factors such as emotions and gender norms are also important to address in effectively reducing transactional sex.

Relationship dynamics with a main partner can influence the extent to which women engage in future transactional sex. This novel finding suggests that interventions need to address women’s main partners in addition to their transactional sex partners. Gender transformative interventions aimed at couples, such as Indashyikirwa, have shown promise in reducing inter-personal violence (191) and could be adapted for South Africa.

Interventions addressing constructions of gender need to be implemented in conjunction with those to reduce entrenched poverty in women. Where women have controlling main relationships, it is unlikely that they will be able to keep much of their money. Without an alternative means of income, they are unlikely to escape the transactional sex cycle. Cash transfers which have shown promise in young women (192) may be a more appropriate intervention to disrupt the transactional sex cycle where women have controlling main partners. An alternative may be to reconsider the policies on provision of food parcels or other food security assurances.

Finally, it is important to consider hazardous drinking. Brief interventions offer a promising way to address hazardous drinking in South Africa (193). However, if, as postulated, hazardous drinking in women is related to a wish to defy gender norms and to increase agency (123, 194), these alone are unlikely to be efficacious.

Limitations

Although this study makes use of rich panel data, the results of should be interpreted in light of its limitations. Data were self-reported. This may have resulted in respondent bias in reporting transactional sex. We aimed to limit this by asking participants to insert data themselves, but given

widespread campaigns against “sugar daddies” it is possible that internalised sense of shame around these behaviours led to under- or skewed reporting of motives. That said, we measured transactional sex behaviours rather than measuring the labels such as “sugar daddies” or “blessers”. Given that this study was conducted with women aged 18-30 years in one area, the findings are not generalisable to other age groups or regions. This study comprised secondary data analysis and the research questions were not designed a priori. With only two timepoints, we were unable to explore the bidirectional relationship between hazardous drinking and transactional sex in our SEM. Longitudinal panel data among this population is an area for future study.

The published version of this article is found in Appendix 7.

Chapter 5: Predictors and Patterns of Transactional Sex with Casual Partners among Adult Men Living in an Informal Urban Area, South Africa

Magni, S., Hatcher, A., Wamoyi, J., and Christofides, N (2020). Predictors and Patterns of Transactional Sex with Casual Partners among Adult Men Living in an Informal Urban Area, South Africa. AIDS and Behavior. 24, 2616–2623

Introduction

Transactional sex usually refers to a sexual relationship which is primarily motivated by actual or anticipated gain (4). The relationship between transactional sex and HIV infection in women has been well documented (4, 5, 9, 49). Although one study has demonstrated an association between transactional sex and HIV status in men (10), a systematic review and meta-analysis found no association (9). In this study, transactional sex is defined as "non-commercial, non-marital sexual relationships motivated by implicit assumption that sex is exchanged for material goods or other benefits" (35).

Transactional sex almost always refers to women as the receivers of money or goods and men as the providers thereof (4, 5, 35). In line with Connell's Theory of Gender and Power (37), literature suggests that men and women expect that men play a provider role. This shared expectation is central to transactional relationships (12, 14, 35). Other than playing the role of a provider, little is known about what contributes to or motivates the "provider" to engage in transactional sex.

Only two studies have examined the factors associated with transactional sex in men in sub-Saharan Africa (12, 29). Dunkle et al. investigated the factors associated with transactional sex in young men (15–26 years) in rural villages in Eastern Cape province and found that transactional sex was associated with higher socio-economic status, more adverse childhood experiences, more lifetime sexual partners, and alcohol use (29). Jewkes et al. measured transactional sex in men aged 18–49 years from two provinces in South Africa. Transactional sex was more common in men with lower education levels, those who had low (but some) income and those aged 25–34 years (12).

The limited research focus in men restricts the extent to which transactional sex can be understood (12). By only providing data for young women, existing literature inadvertently places the locus of control to alter sexual relationship dynamics that are widely outside of their control on women. This is particularly important in South Africa where there is a large focus on HIV prevention programming

for adolescent girls and young women, despite increasing knowledge that their relationships are highly transactional in nature and are largely controlled by male sexual partners (195).

There is a clear gap in understanding the predictors of transactional sex in adult men from urban informal areas in South Africa. Urban informal areas comprise informal settlements (196) which are often under-resourced and lacking some of the basic necessities such as formal housing and water and sanitation (197). This is critical because the 2012 South African seroprevalence survey demonstrated that HIV prevalence in informal urban areas was significantly higher than in formal urban areas or rural areas (197). The aim of this paper is to characterise the predictors and patterns of transactional sex, or the provision of money or gifts in exchange for sex, with casual sexual partners or makhwapheni in adult men in an urban informal area in South Africa.

Methods

Design

Baseline data were drawn from a cluster randomised controlled trial in a peri-urban setting near Johannesburg, South Africa. The area where this study was conducted is made up of 13 “extensions” and many people reside in government subsidised housing or informal shacks. Many residents lack access to basic services such as running water, sewage and rubbish removal. There are no exact population figures, but it is estimated that there are between a quarter and half a million residents in this area, many of whom are migrants from other African countries (164). Two-thousand-four-hundred and six male volunteers aged 18–40 years of age, normally resident in the community, were recruited between January and July 2016. There were 18 clusters which represented different geographic neighbourhoods in the peri-urban setting with 120–150 male participants per cluster (164).

After recruitment, participants signed written informed consent prior to being interviewed. Questionnaires with inbuilt logic and skip patterns, were self-completed on tablets with audio assist. Research assistants were available to provide support to participants as they completed the detailed questionnaire. Further information on the study procedures are available elsewhere (164). We present data from 2189 men who reported having sex at least once.

Measures

The University of the Witwatersrand's Human Research Ethics Committee (Medical) approved the study. Past year transactional sex, or provision of money or goods in exchange for sex, was assessed through five questions adapted from those previously used in South Africa (12). Per recent guidance on transactional sex measurement, questions were asked in relation to non-marital sexual partner(s) (26, 31) namely makhwapheni or casual partners. Participants were asked whether they thought a casual partner or makhwapheni had sex with them in the past 12 months primarily because she may receive a range of items (e.g. cell phone, gifts, food, a place to stay) from the respondent. Transactional sex was defined as a positive answer to one or more of the five questions (12). The variable was dichotomised into no transactional sex and one or more types of transactional sex.

Based on previous research (29, 198), socio-demographic variables considered a priori as potential covariates included: age (continuous, per year), education (dichotomised into completed Grade 11 or less and completed Grade 12 or higher), food security (score dichotomised into food secure and food insecure (180)), time in the community (dichotomised closest to the sample mean of 7 years); and relationship status (cohabiting and not living together). Childhood trauma was measured using fifteen items from the Childhood Trauma Questionnaire (175) (Cronbach's alpha=0.83) and was dichotomised into no childhood trauma and one or more childhood traumas.

We considered one attitudinal covariate based on the literature. Support for gender equitable attitudes was measured using nine items adapted for South Africa (188) from the Gender Equitable Men Scale (144). Examples of the items, scored using a four level Likert scale, are: "I think a woman should obey her husband" and "I think a woman cannot refuse to have sex with her husband" (Cronbach's alpha=0.85). Three levels were created: low, medium and high support for equitable gender norms.

Behaviours we measured included relationship control (199), hazardous alcohol use and multiple sexual partners (MSP) (29). Relationship control was measured using a nine item scale derived from the Sexual Relationship Power Scale (199) and adapted for South Africa in previous studies (178, 200). Sample items included "I won't let my partner wear certain things" and "I tell my partner who she can spend time with" (Cronbach's alpha=0.71). This scale was scored as a four-level categorical variable and higher scores indicated more controlling behaviour. It was dichotomised around the midpoint of the scale measurement (175). Alcohol use was assessed using the Alcohol Use Disorders (AUDIT) scale (Cronbach's alpha = 0.81) and dichotomised into hazardous and non-hazardous

drinking. A score of eight or more was considered hazardous (174). MSP (less than or more than three in the past 12 months) was also included.

Analysis

All analyses were conducted in Stata v14 (181). The pweight (probability weight) command was used to address clustering by neighbourhood to account for the fact that men from the same neighbourhoods may be similar. We present the sample description (Table 10) and patterns of transactional sex (Table 11) using frequencies and percentages. To understand the predictors of transactional sex in men, we developed a model using backwards stepwise, multivariable logistic regression analysis (Table 12). Sociodemographic and other relevant variables (experience of childhood trauma, attitudes to gender norms and behaviours) which were selected on the basis of theoretical relevance and being independently associated with transactional sex (P value <0.1 in the bivariate analysis), were included in the model. The results of the final logistic regression models are reported using Adjusted Odds Ratios (AORs) and 95% confidence intervals (CIs).

Results

The mean age of men who had ever had sex was 27.7 years (SD=5.6). Some 44% (n=928) had completed high school and nearly a third (32.4%) were classified as food insecure. Sixty percent had a sexual partner who they did not live with. Nearly two thirds (66.8%) lived in their own house. Just under half (47%, n=1004) had transactional sex in the year preceding the survey.

Table 10 shows that prevalence of transactional sex was higher in men aged 28–40 years, those who had completed Grade 11 or below and those who were food insecure. There were also significant relationships between transactional sex and, time in the community, childhood trauma, inequitable gender norms, relationship control, hazardous drinking and MSP.

Table 10: Sample description and associations between sociodemographic, attitudinal and behavioural factors and transactional sex in men who had ever had sex (%)

	Respondents who had ever had sex	**Had any transactional sex in the past 12 months (n=2,117)**			
	n (%)	**Yes n (%)**	**No n (%)**	χ^2	**P value**
Sociodemographic characteristics					
Age in years (n = 2,189)					
18-27	1,153 (52.67)	568 (56.57)	554 (49.78)		
28-40	1,036 (47.33)	436 (43.43)	559 (50.22)	9.79	<0.05

	Respondents who had ever had sex	Had any transactional sex in the past 12 months (n=2,117)			
	n (%)	Yes n (%)	No n (%)	χ^2	P value
Completed high school education (n = 2,093)					
Grade 12 or above	928 (44.34)	388 (41.01)	521 (48.06)	10.15	<0.05
Food security (n = 2,189)					
Food insecure	710 (32.43)	345 (34.36)	329 (29.56)	5.61	<0.05
Time in the community (n=2,189)					
≤ 7 years	1,096 (50.07)	477 (47.51)	577 (51.84)		
>7 years	1,093 (49.93)	527 (52.49)	536 (48.16)	3.96	<0.05
Relationship status (n= 2,169)					
Cohabiting	869 (40.06)	395 (39.74)	446 (40.29)		
Not living together	1,300 (59.94)	599 (60.26)	661 (59.71)	0.07	>0.1
Housing type (n= 2,054)					
Own house	1,356 (66.02)	629 (67.56)	688 (64.72)		
Own shack	244 (11.88)	104 (11.17)	131 (12.32)		
Rented shack	352 (17.14)	147 (15.79)	196 (18.44)		
Rented room	102 (4.97)	51 (5.48)	48 (4.52)	44.02	>0.1
Past experiences					
Childhood trauma (n= 2,189)					
One or more experiences	986 (45.04)	495 (49.30)	454 (40.79)	12.48	<0.001
Attitudes					
Support for equitable gender norms (n=2,116)					
Low	1,516 (71.64)	759 (78.01)	709 (65.11)		
Moderate	235 (11.11)	93 (9.56)	140 (12.86)		
High	365 (17.25)	121 (12.44)	240 (22.04)	44.02	<0.001
Behaviours					
Relationship control (n= 1,815)					
Higher control	1,018 (56.09)	560 (65.34)	424 (46.75)	61.78	<0.001
Alcohol (n= 2,132)					
Hazardous alcohol use	867 (40.67)	459 (46.69)	385 (35.39)	27.35	<0.001
Number sexual partners in the past 12 months (n= 2,189)					
3 or more	658 (30.06)	457 (45.52)	173 (15.54)	226.88	<0.001

Respondents were asked whether any past-year casual partners had sex with them because they expected to receive, or did receive, something from them. Table 11 shows that 30% of men who had sex reported having provided cash or money to look after their sex partner and 28% said they gave a sex partner somewhere to stay. A third (32.8%) reported having provided support or money for a sex partner's children or family. Provision of goods like drugs, cell phones or airtime was reported by 25%. Some 24% said that they provided somewhere for their sex partner to sleep or money for school fees.

Table 11: Patterns of transactional sex with a casual partner in the past 12 months

Transactional sex	Number	Percentage
Gave cash or money to be looked after	647	29.97
Gave somewhere to stay	613	28.34
Gave support or money for their children or family	709	32.84
Gave drugs, food, cosmetics, clothes, a cell phone, airtime, transportation or anything else they could not afford	537	24.92
Gave somewhere to sleep for the night, bills or school fees	513	23.82

Table 12 shows the unadjusted and adjusted results from the logistic regression analysis. Compared with men who had lived in the community for seven years or less, those who lived in the community for more than seven years had higher odds of transactional sex. Men reporting greater relationship control had nearly double the odds of engaging in transactional sex than those with lower levels of relationship control (AOR = 1.88, 95% CI 1.43–2.47). Hazardous drinkers had 34% higher odds of engaging in transactional sex than non-hazardous drinkers. Men reporting three or more sexual partners had significantly higher odds of having had any transactional sex (AOR 3.86, 95% CI 2.92–5.10) than those with two or fewer sexual partners in the preceding year.

Table 12: Factors associated with transactional sex, n=1,631

	Unadjusted odds ratio	(95%CI)	P value	Adjusted odds ratio	(95%CI)	P value
Age in years	0.97	0.95 - 0.99	<0.001	1.0	0.97 - 1.02	>0.1
Completed high school education	0.75	0.63 - 0.90	<0.05	0.86	0.67 - 1.09	>0.1
Food secure	0.80	0.67 - 0.96	<0.05	0.89	0.68 - 1.15	>0.1
Time in the community >7 years	1.19	1.00 - 1.41	<0.05	1.31	1.03 - 1.67	<0.05
Multiple childhood traumas	1.59	1.23 – 2.07	<0.001	1.09	0.75 - 1.58	>0.1
Support for equitable gender norms						
High Support	Ref.			Ref.		
Moderate support	1.32	0.94 - 1.85	>0.1	0.97	0.60 - 1.56	>0.1
Low support	2.12	1.67 - 2.70	<0.001	1.10	0.77 - 1.57	>0.1
Controlling behaviours	2.15	1.77 - 2.60	<0.001	1.88	1.43 - 2.47	<0.001
Hazardous drinking	1.60	1.34 - 1.91	<0.001	1.34	1.04 - 1.71	<0.05
>=3 sexual partners in past 12 months	4.54	3.70 - 5.57	<0.001	3.86	2.92 - 5.10	<0.001

Discussion

Nearly half (47%) of men in an informal South African settlement reported engaging in transactional sex in the past 12 months, suggesting transactional sex is a common practice in this setting. This study found that men reported provision of money or goods in exchange for sex for a variety of reasons. Men who had three or more sexual partners in the previous year, those who drank at a hazardous level, those with controlling behaviours and those who had lived in the community for seven or more years had higher odds of engaging in transactional sex.

Prevalence of transactional sex in this study was significantly higher than the 2007 study with young men (17.7%) (29). There are several plausible reasons for this difference. Firstly, this study was conducted in a periurban informal setting where income disparities, which are associated with transactional sex, are higher than in rural settings, where the 2007 study was conducted (29). Secondly, this study comprised older participants than the 2007 study of 15–26-year-olds. Other research has found that transactional sex is more common in older men (aged 25–34 years) (12). A third possibility is that reporting on expectations of "providing" may be more common in 2016 than nine years ago. This is may be due to the intense media coverage of "blessers" (74), the term used on social media in South Africa to describe men who offer money or gifts for sexual relationships with younger partners (201). Prevalence in this study however, was lower than the 66% prevalence in the 2012 study with men aged 18–49 years (12). It is possible that this is related to a slight difference in measurement of transactional sex. The 2012 study asked about transactional sex in both main partners and makhwapheni, whereas this study asked about transactional sex in relation to casual partners only. By including main partners, it is possible that the 2012 study may have over-estimated prevalence of transactional sex, and that this accounts for the difference between the two studies. Another potential reason is the rising cost of living, making transactional sex more expensive currently than in the previous study.

The high levels of transactional sex in this setting could be explained by gender norms and constructions of masculinities. This is especially true where men report higher levels of controlling behaviours and more sexual partners. It is possible that men in this informal settlement are trying to fulfil the gender norm of men as providers for their sexual partners (98). The male provider role is normative in many parts of the world and is an accepted way of enacting hegemonic masculinity (37, 202). Historically in South Africa, being able to provide as a man has been a prerequisite for marriage, with men only getting married once they could establish a homestead (98). With low marriage levels in this study, it is plausible that many men feel they would not have had the

opportunity for relationships if they did not fulfil this provider role (98) and when they do act as a provider, they should be rewarded with sex (12).

Our findings suggest a large number of men think that their casual partners had sex with them because they provided, or felt they were expected to provide, a wide range of goods including support, money or a place to stay for their sexual partner or her family. However, since the questions required men to speculate on their sexual partners motives for having sex with them, we are unable to definitively state that the provider role is the reason large numbers of men have transactional sex.

It is possible that men are engaging in transactional sex for sexual pleasure (203). However, we suggest that the reason many men from this urban informal area engage in transactional sex is to exert power and control as described in Connell's Theory of Gender and Power (37). Research has demonstrated that where power dynamics do not exist, such as where men are poor and unemployed, men may try to assert their masculinity in other ways, such as though sexual behaviour, hazardous drinking and violence (147, 153).

Consistent with other research with men in South Africa (126), our analysis found that men who were hazardous drinkers had higher odds of engaging in transactional sex. This is likely due to alcohol affecting risk perception, particularly in a tavern-type environment (76, 204). In line with other studies (205), we also found that there was an association between MSP and transactional sex. We suggest that men in this informal settlement are exerting their masculinities through MSP and that transactional sex is one way for these men to have several casual partners in this setting.

The argument that men are using transactional sex to assert their masculinity is bolstered by our finding that the likelihood of engaging in transactional sex was higher in men with high levels of controlling behaviour. Transactional sex can lead to a power imbalance in relationships, for instance women who receive money or goods often have to accept sex on the provider's terms e.g. without a condom (16, 21). However, our research suggests that men with controlling relationship attitudes have higher odds of transactional sex. This is in line with Dunkle et al. who suggest that transactional sex in main and casual relationships is part of a broader scale of gendered power and control (29). Taken together, this suggests that the relationship between masculinity and controlling behaviour is bi-directional. Men with hyper-masculine beliefs and behaviour are more likely to engage in transactional sex and men engaging in transactional sex may use this as a means to control the terms around sex.

Other factors associated with transactional sex in men identified in the literature are: childhood trauma (198) and attitudes towards gender equitable norms (142, 206). Gibbs et al. found that past

year transactional sex was associated with childhood experience of emotional, physical and sexual abuse (110). Men who have inequitable gender beliefs or attitudes or control their partners are more likely to engage in transactional sex (142, 200, 206). Although we measured and included these variables in our analysis, neither were significant in our final model.

This paper has contributed new knowledge to a gap in the literature around the predictors and patterns of transactional sex in adult men in an urban informal area in South Africa. However, there are several limitations. Firstly, this study was a cross-sectional study which made use of questions which required men to report their behaviour. Secondly, our questions required men to speculate about the motives of their sexual partners. It is possible that this may have resulted in inaccurate reporting. Response bias, comprising under or over-reporting, either deliberately, or through misconstruing women's intentions, is a recognised issue in transactional sex research. Thirdly, social desirability bias in relation to reporting of transactional sex may be present. Although self-complete questionnaires were used to try and reduce this, respondents may still have over- or under-reported transactional sex depending on whether they thought that it was normal for a man to "provide" or socially unacceptable to engage in transactional sexual relationships. Finally, this study did not explore the reasons why men reported engaging in transactional sex. Jewkes et al. suggest that measuring motivations for sexual relationships in those who "provide" gifts or money in exchange for sex (usually men) is difficult. This is because those involved in the partnership may have different motivations (12). Despite the challenges, exploring motivations would be a useful addition to future studies with men.

Implications for policy and practice

Women in sub-Saharan Africa remain at higher risk for HIV infection than their male counterparts. Transactional sex is one of the drivers of HIV infection but literature on the subject has largely focused on women. Unintentionally this may place responsibility to change sexual relationship dynamics, which are largely outside of their control, on women. This study is different in that it explores the patterns and predictors of transactional sex, or provision of money or goods in exchange for sex, in the providers (men).

The findings from this study suggest that rather than HIV prevention interventions focusing solely on trying to stop transactional sex, programmes should address transactional sex in the context of provider norms, masculinity and the concept of control of women in relationships. Interventions like Stepping Stones (207) have been successful in shifting harmful gender norms in men, although these interventions may need to be adapted for older men in informal areas. Participants should be

required to critically reflect on relationship control and how this contributes to HIV risk through transactional sex. Interventions to reduce risk of HIV through transactional sex in men need to also address MSP and hazardous alcohol use.

Conclusion

Prevalence of transactional sex with a casual partner is common in the informal setting in which this study was conducted. Predictors include hazardous drinking, having MSP and exhibiting greater relationship control. To address the HIV risk related to transactional sex, programmes should address issues pertaining to harmful masculinities. Motivations for engaging in transactional sex in men should be further explored.

Appendix 8 contains the published version of the article.

Chapter 6: Masculinities, engagement in transactional sex, alcohol misuse and violence: a latent class analysis of young adult men

Magni, S., Abdelatif, N., Hatcher, A., Wamoyi, J., and Christofides, N. Common ground of initiating transactional sex and violence or alcohol misuse in a community sample of adult men

Introduction

Transactional sex is a term used to describe a sexual relationship which is primarily motivated by actual or anticipated financial gain (in the form of gifts or cash) (4). Its role in increasing risk for HIV acquisition in women in sub-Saharan Africa has been well described (4, 5, 9, 208). Although the relationship between transactional sex and HIV infection in men is less clear (9), interventions to address transactional sex use in men are needed if countries are to meet UNAIDS targets of reducing HIV incidence in young women (209).

Transactional sex is most commonly understood to mean sexual exchange where men provide money or gifts, and women receive them (35). Previous research has demonstrated that men can be both the givers and receivers of money or gifts with casual partners (29). In this paper, however, we concentrate on men as the providers of money or gifts in exchange for sex from women.

Understanding which groups of men provide cash or goods in exchange for sex is an important first step in designing and targeting efficacious interventions to address this transactional sex. This is particularly important in the context of reducing donor funding for HIV programming (210) and the call to deliver people-centred precision-prevention responses for priority populations (211). Precision-prevention is a focus on the places and populations with the greatest HIV prevention needs and adjusting interventions accordingly (211). Prevalence of transactional sex in men is high in urban informal settlements in South Africa (170) and are therefore natural places in which to prioritise tailored programming. However, targeting investments to reduce the risk associated with transactional sex is often difficult as transactional sex in men has not been comprehensively explored.

Firstly, measures of transactional sex in men have largely been adapted from those used for women (12, 29, 170). South African studies have measured the concept by asking men whether they thought that their casual partner(s) had sex with them because he was providing – or she expected him to provide – a variety of items. Response options, modified from studies conducted with women, encompassed cash, food, personal care products, clothing, travel, items for children or family, school fees, accommodation or alcohol (12, 29, 170). Although guidance to better measure transactional sex

in men has been developed (173), as far as we are aware, prior to this, no studies have used the proposed measure to explore provision of items in exchange for sex.

Secondly, the factors associated with transactional sex have been incompletely investigated. Three studies have explored factors associated with men's provision of items in exchange for sex in South Africa (12, 29, 170). Sociodemographic covariates such as age, race, education, income, marital status (12, 29) and time in the community food security and housing type (170) were those most commonly explored factors. Two of the three studies also explored experiences, attitudes and other sexual risk behaviours as covariates (29, 170).

Masculinities refers to a collection of socially constructed expectations dictating how men and boys conduct themselves, navigate life, and express their feelings (134). Hegemonic masculinity describes the culturally dominant conception of manhood that reinforces and justifies men's dominance over women and other gender identities (132) and is one of many expressions of masculinity within any society (212). Other hypermasculinities (213) may emerge among socially marginalised men such as those living in urban informal settlements. Power, aggression and violence are all components of hypermasculinities which arise from the interactions between dominant ideals and the capacity of certain men to conform to them . It has been proposed that provision of goods in exchange for sex falls along a spectrum of gendered dominance and influence (29). However, there is scanty literature available on this association in men.

One way for programmers to deliver precision prevention is by identifying groups or classes of individuals most likely to engage in transactional sex. For example, Bell and colleagues (2021) used latent class analysis (LCA) to identify five different segments of men in relation to their attitudes to HIV and their barriers to uptake of HIV testing and treatment (214). Results were used to make recommendations about these could be operationalised for HIV programming (214). Jewkes and Morrell (2018) have explored how distinct patterns of interconnected violent, sexually risky, and antisocial behaviours segmented men based on multiple masculinities, and examined how applying this perspective can improve the effectiveness of targeted interventions (206).

This study aims to fill these gaps in the literature by 1) making use of the proposed measure of transactional sex, 2) adding to the knowledge base on factors associated with transactional sex and 3) using LCA to explore how different groups of men engage in transactional sex in an urban informal settlement in South Africa.

Materials and Methods

Study design

We used cross-sectional endline data from a cluster randomised controlled trial in an urban informal settlement northwest of Johannesburg, South Africa. This area is made up of 13 "extensions" and most residents live in government-subsidised housing or informal dwellings. A significant portion of the population does not have access to essential services like running water, sewage systems, and waste disposal. Although precise population numbers are unavailable, estimates suggest that this area is home to between 250,000 and 500,000 residents, many of whom are migrants from rural South Africa or other African nations (164).

Some 1,509 men aged 18-42 years, normally resident in the community were interviewed at endline (164). Participants signed written informed consent prior to being interviewed. They then self-completed the questionnaire on tablets using audio assist. Research assistants were available to provide support. Additional details on the study procedures are provided elsewhere (164). We present data from 1,232 men who reported having sex in the previous year. The University of the Witwatersrand's Human Research Ethics committee approved this study.

Measures

To measure transactional sex, we piloted a new measure in the endline study using guidance from Wamoyi and colleagues (173). Respondents were asked "In the last 12 months, have you given a woman who is not your wife and is also not a sex worker, any money, (gifts) or helped her to pay for things mainly so you could start or continue a sexual relationship with her?". Response options were yes or no. A dichotomous variable for any transactional sex was created. Respondents reporting transactional sex were asked: "Thinking of the last time you gave a woman who is not your wife or a sex worker money or gifts for a sexual relationship, which of the following did you provide?". Examples of response options included cash, school fees and cell phone.

For the LCA, we measured a range of men's violent and unsocial practices in line with other research (206, 215). We assessed different forms of violence perpetrated by men using behaviourally specific items which has been used in South Africa previously (188). Respondents were asked how often they had undertaken the following actions with a current or previous girlfriend, partner or wife in the past 12 months: (1) insulted, (2) humiliated, (3) scared/intimidated, (4) threatened, (5) hurt others/things of importance, (6) stopped partner working, (7) taken earnings, (8) thrown partner out of house, (9) spent money on alcohol/drugs when partner didn't have enough, (10) slapped, (11) pushed, (12) hit,

(13) kicked/beat, (14) threatened or attacked with a weapon, (15) forced to have sex, (16) intimidated to have sex, (17) forced other sexual act. Response options to each were: "never", "once", "few", or "many". Binary variables (never/yes) were created indicating any past year perpetration of psychological IPV (items 1–5), economic IPV (items 6-9), physical IPV (items 10–14), and sexual IPV (items 15–17). We also assessed past year non-partner rape, using a scale developed in South Africa (179), which asked four items about behaviours in the past year of the men acting alone or with others (gang rape), with responses, “never”, “once”, “few” or “many”, and recoded as never/yes. We also asked about a range of other violent and anti-social behaviours, specifically: past year fighting with a knife, bottle or sharp object; having an illegal firearm and gang involvement. Hazardous alcohol use was assessed using the 10 item AUDIT (Cronbach’s alpha = 0.82) and dichotomised into hazardous and non-hazardous drinking. A score of eight or more was considered hazardous (174). We also included having four or more sex partners in the past year.

To assess associations between transactional sex and sociodemographic and other risk factors, we assessed age, education (dichotomised into completed Grade 11 or less and completed Grade 12 or higher), food insecurity (score dichotomised into food secure and food insecure (180), and a single item about having worked in the past three-months. In line with previous research (29, 170) we also assessed time in the community (dichotomised closest to the sample mean of 7 years); and relationship status (cohabiting and not living together).

Support for gender equitable attitudes was assessed using nine items adapted for South Africa (188) from the Gender Equitable Men Scale (216). These items, scored on a four-point Likert scale, included statements such as "I think a woman should obey her husband" and "I think a woman cannot refuse to have sex with her husband" (Cronbach’s alpha = 0.85). Based on these responses, three levels of support for equitable gender norms were established: low, medium, and high. We measured relationship control using a nine-item scale adapted from the Sexual Relationship Power Scale (146) and used in South Africa previously (178). Example items included “I won’t let my partner wear certain things” and “I tell my partner who she can spend time with” (Cronbach’s alpha =0.80). The scale was treated as a four-level categorical variable, with higher scores reflecting greater controlling behaviour. It was subsequently divided into two categories at the midpoint [19].

Statistical analysis

Stata v17 was used to conduct the analysis (181). We present the sample description (Table 13) using frequencies and percentages. We used LCA to group men into ‘classes’, as has been shown elsewhere (215) that latent subgroups were present, characterised by the interaction of variables associated

with risky sexual behaviour, substance use and different types of violence infliction. Nine variables, measured at baseline, were used to define these groups. We systematically developed models with varying numbers of classes, ranging from one to three, and evaluated the fit of each model. We used the likelihood ratio chi-squared statistic (L2), adjusted BIC (aBIC), consistent Akaike Information Criterion (CAIC), and the likelihood ratio test (G2) to assess best model fit. A key assumption of LCA is that variables are locally independent within each latent class. To evaluate this assumption, we examined the bivariate residual Pearson chi-squared statistic. Once we identified the optimal class solution for the data, we proceeded on the assumption that men could be allocated to a particular class.

We developed a model using backwards stepwise, multivariable logistic regression analysis (Table 13) to understand the factors associated with men's use of transactional sex. Sociodemographic and other relevant variables (attitudes to gender norms and relationship control) were selected for the model based on their theoretical relevance, where we considered them as ideational factors influencing behaviours, and their independent association with transactional sex (p value < 0.1 in the bivariate analysis). The final logistic regression models results are presented using Adjusted Odds Ratios (AORs) and 95% confidence intervals (CIs).

Results

The mean age of men who had sex in the past 12 months was 29.1 years (SD = 5.7). Less than half (42.9%) had completed high school. Over two-fifths had not worked in the past three months (42.1%) and nearly a third (34.1%I) were food insecure. Just under half (46.6%) had a non-cohabiting sexual partner. Over 60% (61.3%) lived in their own house.

Of the 1,232 men who had sex in the previous year, 1,222 answered the transactional sex question. Just over a fifth (284/1,222, 23.2%) reported any transactional sex in past 12 months. Table 13 shows that there were significant relationships between transactional sex and, food security, inequitable gender norms and relationship control.

Table 13: Sample description and associations between sociodemographic, attitudinal, and behavioural factors and transactional sex in men who had sex in the past 12 months

	Had sex in the past 12 months (n = 1,232) n (%)	**12 month transactional sex (n=1,222) n (%)**	**No transactional sex in past 12 months n (%)**	**χ2**	**P value**
Sociodemographic characteristics					
Age in years (n = 1,232)					
18-27	569 (46.2)	135 (47.5)	428 (45.6)	0.32	>0.1

	Had sex in the past 12 months (n = 1,232) n (%)	12 month transactional sex (n=1,222) n (%)	No transactional sex in past 12 months n (%)	χ2	P value
Sociodemographic characteristics					
28-42	663 (53.8)	149 (52.5)	510 (54.4)		
Completed high school education (n = 1,232)					
Grade 12 or above	528 (42.9)	416 (44.4)	112 (39.4)	2.14	>0.1
Work for pay in past 3 months (n = 1,227)					
Yes	711 (57.95)	167 (59.0)	540 (57.8)	0.13	>0.1
Food security (n = 1,232)					
Food insecure	420 (34.1)	112 (39.4)	303 (32.3)	4.95	<0.05
Time in the community (n = 1,232)					
≤ 7 years	834 (67.7)	187 (65.9)	638 (68.0)	0.47	>0.1
>7 years	398 (32.3)	97 (34.2)	300 (32.0)		
Relationship status (n= 1,232)					
Cohabiting	532 (43.2)	131 (46.1)	396 (42.2)	1.36	>0.1
Not living together	700 (56.8)	153 (53.9)	542 (57.8)		
Housing type (n= 1,157)					
Own house	709 (61.3)	161 (60.8)	539 (61.1)	0.46	>0.1
Own shack	167 (14.4)	36 (13.6)	131 (14.9)		
Rented shack	208 (18.0)	50 (18.9)	157 (17.8)		
Rented room	73 (6.3)	18 (6.8)	55 (6.2)		
Attitudes					
Support for gender equitable norms					
Low	760 (62.7)	191 (69.0)	564 (60.8)	15.18	0.001
Moderate	194 (16.0)	50 (18.1)	142 (15.3)		
High	259 (21.4)	36 (13.0)	222 (23.9)		
Behaviours					
Relationship control					
Higher control	618 (50.9)	184 (65.7)	427 (46.2)	32.70	0.000

The item which men most commonly reported providing to a non-marital sex partner in exchange for sex was cash (18.6%). Provision or a cell phone or airtime was the next most common (17.5%) followed by transport (14.7%).

The model that best fit the data was a three-class solution. Table 14 and Figure 8 show the conditional probability of men's behaviour as allocated in the three different classes. The majority (66.5%) were in the low violence class, a quarter (27.0%) in the medium violence class, and 6.6% in the high violence class. Broadly, men in the high violence class (*aggressors)* had the highest probability of reporting each behaviour and those in the low violence class (*nice enough guys*) the lowest probability. Men in the low violence and medium violence (*power and control seeker*) classes reported much lower probabilities of engaging in unlawful and anti-social behaviours than those in the high violence class.

Table 14: Measurement probabilities of variables loading on the masculinity classes

Variable	Measurement probability		
	Nice enough guys **- Low violence class (66%)**	***Power and control seekers*** **- Medium violence class (27%)**	***Aggressors*** **- High violence class (7%)**
>2 emotional violence infliction	0.155	0.771	0.853
>2 economic violence infliction	0.065	0.567	0.777
Any physical or sexual IPV perpetration	0.035	0.541	0.837
Involved in a gang	0.053	0.072	0.597
Fought with a knife	0.048	0.186	0.910
Had an illegal firearm	0.012	0.020	0.680
Non-partner sexual violence perpetration	0.031	0.426	0.873
Hazardous alcohol use	0.290	0.612	0.665
4 or more sexual partners	0.328	0.656	0.861

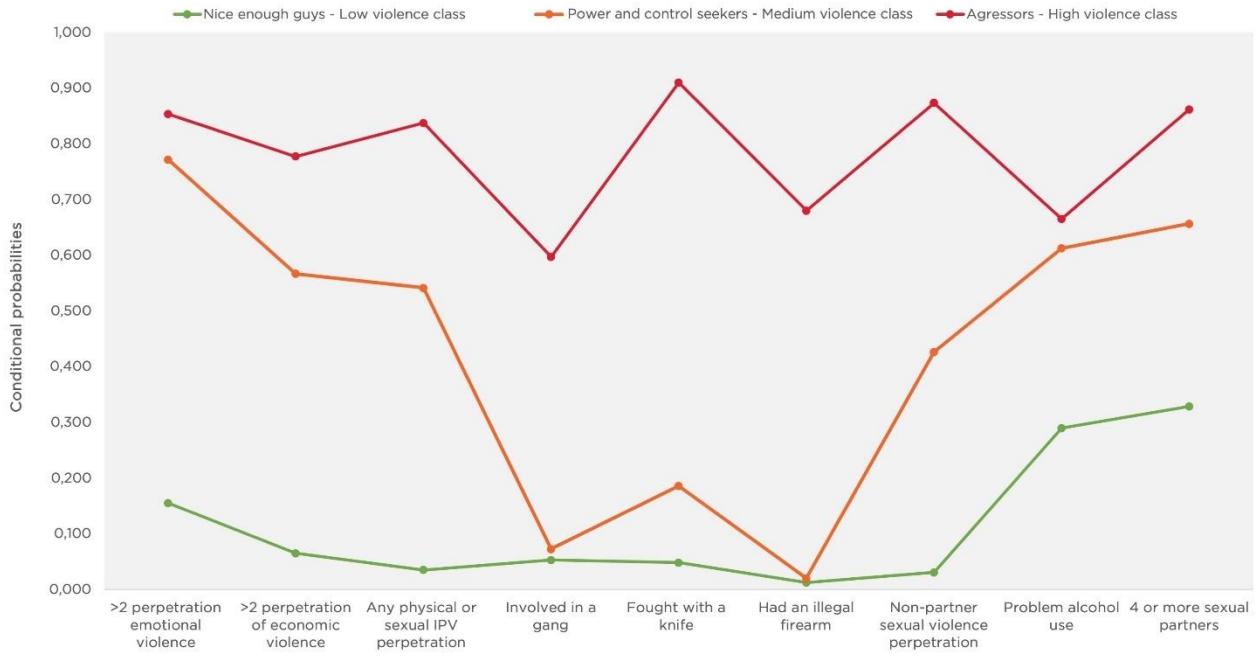


Figure 8: Conditional probabilities for past year behaviours at baseline by masculinity class

Table 15 shows the unadjusted and adjusted results from the logistic regression analysis. Compared with men exhibiting lower relationship control, those displaying higher relationship control in their main partnership had higher odds of having engaged in transactional sex (AOR = 1.86, 95% CI 1.35 - 2.55). *Power and control seekers* were nearly three times more likely to have engaged in

transactional sex than nice enough guys. Men in the high-violence class had markedly higher odds of engaging in any transactional sex (AOR 4.49, 95% CI 0.06 - 0.33) than those in the low violence class.

Table 15: Factors associated with transactional sex, n = 1,196

	Unadjusted odds ratio	95%CI	P value	Adjusted odds ratio	95%CI	P value
Nice enough guys	Ref			Ref		
Power and control seekers	2.82	2.1 - 3.79	<0.001	2.60	2.74 -7.35	<0.001
Aggressors	5.14	3.22 - 8.22	<0.001	4.49	0.06 - 0.33	<0.001
Age in years	0.98	0.96 - 1.01	0.158	1.00	0.97 - 1.02	> 0.1
Food secure	0.73	0.56 - 0.96	0.026	0.77	0.57 - 1.02	> 0.1
Low for gender equitable norms support	Ref			Ref		
Moderate support for gender equitable norms	2.17	1.35 - 3.5	<0.001	1.64	1.00 - 2.71	0.05
High support for gender equitable norms	2.09	1.42 - 3.08	<0.001	1.32	0.86 - 2.03	> 0.1
Higher relationship control	2.23	1.69 - 2.95	<0.001	1.86	1.35 -2.55	<0.001

Discussion

Our analysis of male participants in the endline study of the Sonke CHANGE trial in a South African urban informal settlement demonstrated that men could be allocated into three masculinity classes, determined by their engagement in violence within personal relationships and public environments, alongside their sexual and antisocial conduct. These three classes are similar to those uncovered in eThekwini Municipality and described by Gibbs et al (215) although the distribution across the classes differed. In our study, the percentage of men in the medium and high violence classes was lower than in Gibbs' paper (27% vs 50% in the medium violence class) and (7% vs 30% in the high violence class). It is possible that these differences are due to our exclusion of transactional sex from the LCA as it was the outcome of interest in this study. Since transactional sex use is a relatively common behaviour, it is likely to change the percentage in each masculinity class and may be the reason for these differences.

Our sub-group analysis suggests that, in this setting, men's motivations for engagement in transactional sex may be much more about exerting power and control than helping women. Other authors have described hypermasculinities in socially disadvantaged men (213, 217), a characterisation that aptly fits the participants in this study, many of whom are food insecure, unemployed and living in informal housing. Hypermasculinities emphasise dominance and

aggression (218), and often represent the most violent forms of masculinity. These categories can be understood as forms of defiant masculinity, which rejects societal norms that discourage non-conformity to laws and the use of violence.

We found that violent men who engage in some criminal behaviour - *aggressors* - are most likely to engage in transactional sex. This group of men makes up less than 10% but this pattern of behaviour suggests that control and exploitation is the most likely reason for transactional sex. This is consistent with other research which has suggested that transactional sex exists along a continuum of power and control (29). The medium violence class seems to be less likely to engage in illegal behaviour but are still perpetrating IPV and engaging in multiple risk behaviours such as having more than one sexual partner and problematic drinking. This group is also more likely to engage in transactional sex than *nice enough guys.*

Our analysis clearly demonstrates the challenge of developing and implementing interventions supporting less violent and more gender equitable masculinities, necessary to address both men and women's risk of HIV infection. Put crudely, the challenge is to shift men from being positioned in the *aggressor* or *power and control seeker* categories toward the *nice enough guy* category. This is further complicated by an increasingly resource-constrained environment, where there is increasing focus on biomedical interventions like long-acting Cabotegravir to prevent HIV acquisition (219) and less appetite for funding social and structural programmes.

Segmentation, long used in the private sector, has been infrequently used to target public health interventions (220) although pilots from Malawi, and Zambia and Zimbabwe show promise for improved HIV programming (221, 222). A typing tool may help community mobilisers segment men into those most likely to engage in transactional sex based on their masculinity profile and if a transactional sex intervention is needed. Since this analysis shows that men engage in overlapping risk behaviours, interventions may not be transactional sex specific but rather address several risk behaviours. It is unclear what interventions are likely to be the most effective with *aggressors*, and this is an area for further research. Stepping Stones Creating Futures (SS-CF) demonstrated a positive effect on the most violent group of men (215), suggesting that interventions which combine economic strengthening and address gender norms in peri-urban settings where poverty and patriarchy are high show promise.

This study suggests two important framings for messaging around transactional sex in men. Men using transactional sex are not (only) the older, predatory men often described as "sugar daddies" in HIV campaigns (186). Messaging on transactional sex needs to be reorientated to reach younger men who are using transactional sex. This study also found that, using this measure, most men do not use

transactional sex and that the majority of men fall into the low violence masculinity category. To avoid creating a perception that the majority of men are engaging in high risk behaviours, communication should adopt a positive social norms approach.

Another important output of this study is that it is the first to have used the new proposed measure of transactional sex in men, and to have done so in an informal urban setting. Using this measure, in relation to casual and ongoing secondary partners only, we found that just under a quarter of men reported any transactional sex in the past year. This is towards the lower end of prevalence in men reported in other studies, which ranged from 18% in young men in the Eastern Cape in 2007 (29) to 66% with men aged 18–49 years in Eastern Cape and KwaZulu-Natal in 2012 (12). It is possible that the specificity of the measure may have resulted in fewer men reporting transactional sex. Since it is the first time that this measure has been used and we would need to determine if, in other studies, a similar pattern emerges.

Prevalence of transactional sex in this study is also substantially lower than prevalence reported at baseline (23% vs 47%). This is consistent with the reduction in the main outcome of interest – interpersonal violence- between baseline and endline reported by Christofides and colleagues (172). Since loss to follow-up (37%) was equal in the control and intervention groups (172), it is possible that men who were more likely to engage in transactional sex dropped out, accounting for this reduction. There are a few other possibilities. This finding may be due to social desirability bias. Between baseline and endline studies, media highlighted the issue of “sugar daddies” and “blessers”. This emphasis might have discouraged men from openly reporting their involvement in this socially undesirable behaviour. An alternative is that by making use of the new question with the phrasing asking men to exclude “sex workers”, reported prevalence of transactional sex may have decreased. Finally, since at endline, respondents were administered both measures, it is possible that they were tired and did not want to answer the questions the second time they were asked them, albeit slightly differently.

This study has several limitations. Firstly, all data were self- reported and men could have reduced their reporting of illegal behaviours or perceived undesirable behaviour (like transactional sex). However, questionnaires were self-completed, likely limiting social desirability bias. We used a cross-sectional approach to allocate men into different masculinity classes and masculinities are constantly changing. It is important to note that do not wish the analysis to be interpreted as suggesting that masculinities are fixed. However, drawing on data from interviews conducted in 2017/2018, we have categorised these men based on their reported practices at that particular point in time. We acknowledge that many of the variables used in this categorisation may change over time, meaning

that individual men could move between different masculinity categories. This study includes a post hoc analysis, meaning the analyses are exploratory in nature.

Conclusions

Men's engagement in transactional sex in an urban informal settlement in South Africa is not uniform. Using LCA to identify different associations with transactional sex and risk behaviour is a useful way for programmers to tailor HIV prevention interventions to where they will be most helpful. This represents a critical area for future research and consideration for those involved in intervention practices.

Chapter 7: Discussion

Chapter 7 synthesises the key findings of the doctoral research in light of extant literature. Findings from across the three papers are integrated in this discussion. First, I discuss the particulars of transactional sex in urban informal settlements, proposing reasons why prevalence is higher in these settings. Next, I discuss prevalence of transactional sex and discuss how this is linked to how it is measured, with whom and where. The chapter then engages with motivations for transactional sex and introduces a conceptual framework for men's engagement in transactional sex. I discuss the role that a controlling main partner has on women's likelihood of engaging in transactional sex with a khwapheni and explore how men may be using transactional sex as a way to exert power and control over women. Finally, I discuss limitations of this PhD.

7.1 Urban informal settlements provide fertile ground for increased engagement in transactional sex

Several studies have found that, relative to other populations, those living in urban informal settlements are more likely to engage in risky sexual behaviour and less likely make use of HIV prevention measures (223, 224). In comparison to existing studies on prevalence of transactional sex in South Africa, Chapters 4-6 (167, 170) found higher prevalence of transactional sex in both women and men. Tables 15 and 16 in section 7.2 compare and contrast these studies and show that these differences may be due to the nature of the area (urban formal, urban informal and rural) in which the studies were conducted.

In this section, I suggest several plausible reasons why transactional sex is likely to be higher in urban informal settlements than in urban formal areas and rural areas. Firstly, it is possible that the environmentally vulnerable and often temporary nature of housing in urban informal settlements may cause women to worry about the future. To address this, they may engage in transactional sex to supplement their stability. Secondly, rapid urbanisation and urban poverty increases the proliferation of the informal economy, in which some women partake by selling sex formally or by engaging in transactional sex. Finally, it is also possible that weaker social networks in urban informal settlements, which often comprise many migrants, results in higher likelihood of engaging in risky sexual behaviours.

7.1.1 The physical attributes of urban informal housing contribute towards transactional sex in women

Although international literature suggests that being homeless is associated with risky sexual behaviour and HIV infection (225, 226), there has been relatively little focus on sexual risk behaviour among people who have homes but whose housing situation is insecure, such as those living in urban informal settlements. Living in urban informal settlements in sub-Saharan Africa is especially precarious. Residents seldom own their homes and often face the threat of displacement as well as being more susceptible to natural disasters, such as floods (227). For example, eThekwini, KwaZulu-Natal, in which primary study 1 (SS-CF) was conducted, was recently devastated by floods (228).

With few alternative housing options available, fear of homelessness is a factor which could influence's women's sexual activity (229, 230) and they may turn to formal sex work or engage in transactional sex to accumulate financial benefits (32, 231). It is entirely plausible that men in these urban informal settings have the same worries about future housing security as women. While some men do provide sex in exchange for money or goods (29), it is unlikely that this is the main way in which they may try to mitigate this risk. Employment may be more natural option and men, especially younger men, are more likely to be employed than women (232).

7.1.2 One way for women to participate in the informal urban economy is through transactional sex

South African women experience high levels of unemployment (232). This, combined with rapid urbanisation, creates an environment where one way in which women can participate in the informal economy is to sell sex (233). This PhD has pointed out several times that transactional sex and sex work differ conceptually. They are, however, both points along a continuum as shown in Figure 1 (Chapter 1) and are ways in which women may be able to participate in an informal economy where they may otherwise have few options to do so.

In rural areas women are often poor but they may be able to grow some food. Women living in urban poverty, however, have to buy food from local sources, driving up prices and leading to greater insecurity (105). Consistent with other research with women in urban informal areas (105), Chapter 4 found that ongoing food security was one pathway leading to women's engagement in transactional sex in urban informal areas around eThekwini (167).

7.1.3 Urban informal settlements may influence attitudes towards sexual behaviour for both women and men

Researchers have acknowledged the importance of residential context in influencing attitudes towards sex and risky sexual behaviour. While engagement in transactional sex is likely to still attract some stigma, I argue that in urban informal settlements, communities may be more accepting of this behaviour.

Sex work and transactional sex as understandable for women under particular conditions

Grief (2012) demonstrated how local social environment intensifies sexual risk, writing that there is greater acceptance of promiscuity in urban settings (105). The author also states that when there is easy visibility of women selling sex, it can convey a lack of employment opportunities and suggest that engagement in sexual relationships, like transactional ones, can improve socioeconomic status (105).

In eThekwini, unemployment among women is high (Chapter 3). It is possible that, as postulated by Wamoyi et al (2010), women who see their neighbours or peers engaging in transactional relationships to subsidise their needs, may have enhanced perception of this practice being socially acceptable. It may even validate this as a viable way for women to look after themselves, and their families, where other means are unavailable (32). This may be why Chapter 4 found such high prevalence of transactional sex in women compared with other studies.

Migration reduces social cohesion, especially among men

Diepsloot, in which the findings from Chapters 5 and 6 are situated, is home to many migrants from other more rural provinces and other African countries. There is a strong body of evidence that migrancy is associated with riskier behaviours, especially sexual risk behaviour (234, 235). A likely cause of this is the disruption of social networks due to migration, which can increase risky behaviour by diminishing oversight and discouragement of non-normative actions (160, 236). This is particularly the case in impoverished urban environments in comparison to the strong social networks found in smaller, rural villages, from which many migrants originate (237).

Interestingly, research from Kenya demonstrated that people moving to urban informal settings from more affluent environments have a protective factor when they first arrive. This attenuates over time as residents internalise the social norms associated with urban informal settlements (238). This in consistent with the results from Chapter 5 which found that men who had lived in Diepsloot for longer than seven years (the median) were more likely to report having provided money or goods in

exchange for sex in the past year than those who had lived in the community for a shorter time (170).

7.1.4 Urban informal settings may influence motivations for engagement in transactional sex

Section 7.2 discusses the motivations for engagement in transactional sex. Chapter 5 found that nearly a third of women who reported having engaged in transactional sex did so for cash or money to be looked after (167). It is clear from these findings that women's engagement in transactional sex is influenced by the impoverished urban setting in which Study 1 was conducted, and a large percentage of women are engaging in transactional sex for basic needs. However, the next most common reason women around eThekwini reported for providing sex was for items including cosmetics and clothes (167). This suggests that a substantial proportion of women are also engaging in transactional sex for conspicuous consumption (89).

I propose that the pattern of motivations for women's engagement in transactional sex in an urban informal settlement is likely to differ from that in rural or urban formal settings. Chapter 4 argues that women in this setting engage in transactional sex both for basic needs and to improve their social status. There is no research from a purely urban formal setting, but Dunkle's 2004 research with pregnant women in Soweto found that the most common reason women reported engaging in transactional sex was food followed by clothing (4).

On the other hand, women living in rural areas are often very poor and may need to engage in sex for basic needs. However, they are also able to grow their on food and it is likely that men are almost as likely to be living in poverty as women, reducing the likelihood that men can provide money and goods in exchange for sex. In rural areas, there is also less likely to be the social pressure that women in more urban areas are exposed to. I hypothesise that women living in urban poverty are therefore more likely than women from rural areas to engage in transactional sex for basic needs and for consumerism. Since women living in urban formal areas are more likely to be able to afford basic needs I hypothesise that women from urban informal areas are more likely to do so.

For men, some of the reasons for increased prevalence of transactional sex are described in section 7.2. Gibbs proposes that although young men aim for traditional masculinity, focused on economic power and household control, in urban informal settlements, a particular masculinity often develops. Characteristics are violence and control over sexual partners, seeking multiple sexual partners, and violence toward other men as ways to display power (239).

7.2 Prevalence is influenced by how, where and with whom transactional sex is measured

Chapter 2 engages with how transactional sex is often conflated with sex work both in measurement and conceptualisation. In this section I compare the results from Chapters 4-6 to those from existing studies. Many of these studies intended to be measure transactional sex as opposed to sex work (4, 5, 12, 29, 79), yet the measurement used does not seem to be entirely accurate nor is it applied consistently across studies.

For example, in other South African studies, the reference point for transactional sex differs, with some using the past 12 months, some a respondent's lifetime and others not reporting it at all. These findings are consistent with a global review which found that the majority of studies (12) used lifetime reference periods, four asked about transactional sex in the past 12 months, three studies used two or more reference periods (e.g., lifetime, past year, past month), and two studies did not report a reference period at all (240).

Restricting measurement to the past 12 months and within certain relationship types (i.e. not including main partners per the measurement guidelines proposed (173)) may decrease the reported prevalence of transactional sex. This may have been the case for results described in Chapter 6, where I made use of the new measure and where transactional sex was towards the lower end of prevalence reported in other studies. Chapters 4 and 5 found that prevalence of transactional sex in both women and men was higher than in several previous studies. I argue that this may be due to 1) better sensitivity in terms of with whom transactional sex is measured and in what reference period and 2) where measurement takes place i.e. higher in urban informal settlements.

7.2.1 Prevalence of transactional sex in women

Research on the prevalence of transactional sex women in South Africa is extensive, with findings in slightly different populations ranging from roughly 6%-20% (4, 79, 80). This PhD has contributed towards the literature in that it reports prevalence of transactional sex in women from urban informal areas around eThekwini, where HIV prevalence is high, and it excludes transactional sex with main partners. Prevalence of transactional sex is measured with only khwapheni and once-off partners in the past 12 months in line with the guidance (26).

Chapter 4 found that prevalence of transactional sex in women 18-35 years was 45% (167). This is more than double that found in pregnant women 16-44 years from Soweto, Gauteng (4) and

significantly higher than that reported in other papers (79, 80). This large difference is likely to be due to participant characteristics but could also be related to measurement.

Table 16 shows that Dunkle and colleagues' (2004) setting and measurement (4) is most similar to those in my Chapter 4 (167). Both studies were conducted in urban areas with similar aged participants, and both measured transactional sex with khwapheni and once-off partners. However, Dunkle et al (2004) report on lifetime prevalence of transactional sex and describe transactional sex by khwapheni and casual partner separately (4). Literature on measurement of sexual behaviour suggests that longer recall periods, like lifetime prevalence, may result in inaccurate recollection of sexual activity (241, 242). It is plausible that, by using this reference period, true prevalence may have been underestimated. I considered whether recruitment of pregnant women may have resulted in social desirability bias, resulting in under-reporting. However, the authors tried to overcome this by, for instance, making use of pre-printed numbers which participants could circle and not have to show to the interviewers when they reported on their number of sexual partners (4). Another potential reason for the lower prevalence is that while Soweto while also comprising some informal urban settlements, it also has large areas comprising formal housing. It is possible that women attending antenatal care from Soweto may be wealthier and less likely to have to engage in sex for basic needs. The fact that they were attending antenatal care may also suggest greater relationship stability.

The three other studies (5, 6, 79) were conducted with younger female participants and all found lower prevalence of transactional sex. This finding seems a little counter-intuitive as Chatterji (2005) found that younger women were more likely to engage in transactional sex than older women (7). However, these studies were all conducted in rural areas, which are traditionally more conservative, and it is possible that women's engagement in transactional sex may be seen as socially undesirable, resulting in underreporting. Recent research has highlighted the importance of understanding the social context in which transactional sex questions are answered (30). South African studies dating back to the 1930s, which depict "modern" women who are seen as compromising genuine love by feigning affection for men with money as dubious (243). Since relationships perceived to be motivated by financial gain are judged, women may feel compelled to under-report transactional relationships (183). Contrastingly, in urban settings, sex work is more visible and arguably more accepted. Greater visibility of sex workers can convey a lack of educational and employment opportunities, suggesting that transactional sex may be an alternative way to supplement one's income (105). This PhD suggests that when interpreting prevalence of reported transactional sex, it is critical to bear in mind the setting in which it was measured.

Table 16: Summary of literature on prevalence of women's engagement in transactional sex in South Africa

	Dunkle, 2004	Jewkes, 2012	Ranganathan, 2016	Duby, 2021	Magni, 2024
Participant characteristics	16-44 years, pregnant	15-26 years	13-20 years	15-24 years	16-35 years
Setting	Urban Gauteng	Rural Eastern Cape	Rural Mpumalanga	Rural and urban Eastern Cape, Gauteng KwaZulu-Natal, Mpumalanga, and Western Cape	KwaZulu-Natal (urban)
Measure	Khwapheni and once-off partner	Main partner, khwapheni and once-off partner	Three most recent sex partners	Not reported	Khwapheni or once-off partner
Reference period	Ever	Ever	Unclear	Ever and past year	Past year
Prevalence	19.8% - khwapheni 6.1% - once – off partner	8.7% – khwapheni or once off partner	14% of sexually active women	12.1% of sexually active AGYW – ever 13.7% sexually active AGYW stayed in relationship for money or good in past year	44.6% - khwapheni or once off partner

7.2.2 Prevalence of transactional sex in men

Relatively little literature exists on the prevalence of men's engagement in transactional sex in South Africa. Prior to this PhD, as far as I can discern, only three studies reported on prevalence of transactional sex use in men. The first, published in 2007, found that 17.7% of men 15-26 years from rural Eastern Cape villages reported lifetime transactional sex with a khwapheni (29). In 2012, Jewkes and colleagues, described the prevalence of transactional sex among men aged 18-49 years from three districts in Eastern Cape and KwaZulu-Natal provinces. The authors found that 58.0% of participants had transactional sex with a main partner, 41.7% of respondents had ever a transactional relationship with a casual partner and 43.9% with a once-off partner (12). More recently, a study in rural Mpumalanga, found that 48% of male partners of AGYW aged 18-30 years reported engaging in transactional sex with any named partner (84). Chapter 5 describes relatively higher levels of transactional sex with a khwapheni than the other two studies which report on transactional sex with a khwapheni. Among men 18-42 years from an urban informal settlement near

Johannesburg, and using the existing measure, past year engagement in transactional sex with a casual partner or khwapheni was 47% (170). Prevalence found using the new measure of transactional sex at endline (Chapter 6) was towards the lower end of prevalence found elsewhere. This may well be as a result of using a tighter measure but could also be due to other reasons discussed in chapter 6. Since this is speculative, I recommendations future research comparing the existing vs the new measure in chapter 8.

Table 17 compares and contrasts the methods and findings from the extant literature and from this PhD. Four of the five studies were conducted with adult men, whereas the first included men under 18 years and with the upper limit being 26 years. This may partly explain why prevalence was lowest in this study as transactional sex use is often higher among older men (12). Jewkes et al (2012) report prevalence of transactional sex by partner type and find that roughly 40% reported this among khwapheni and once-off partners. This is slightly lower than that reported Chapter 5 at 47.0% (170). However, the main difference between these studies is that Jewkes et al use a lifetime measure (12) whereas I report on transactional sex in the previous year. Had I made use of a lifetime measure, prevalence would likely have been higher in this urban informal settlement, where income disparities lend themselves to transactional sex (35). Although Chapter 6 was also conducted in this informal urban area, prevalence of engagement in transactional sex almost halved between baseline and endline. This is consistent with the overall trial, which found a reduction in reporting on all risk behaviours between baseline and endline (172). However, there are several other possible reasons for this change including a change in the measure. It is difficult to draw a concrete conclusion and as such, chapter 8 expands on the need to compare the existing vs the new measure of transactional sex.

This PhD expands the literature on prevalence of transactional sex use among men by reporting on prevalence of transactional sex use from two cross-sectional studies. Importantly, it furthers the literature on prevalence of transactional sex in men in two ways: 1) by excluding main partners and focusing on the previous 12 months in the transactional sex measure and 2) by exploring transactional sex in urban informal settlements where HIV prevalence is highest.

Table 17: Summary of literature on prevalence of men's engagement in transactional sex in South Africa

	Dunkle, 2007	Jewkes, 2012	Magni, 2020	Bhushan, 2023	Magni, in submission
Participant characteristics	15-26 years	18-49 years	18-40 years	18-30 years	18-42 years
Setting	Rural Eastern Cape	Eastern Cape and KwaZulu-Natal	Informal urban, Gauteng	Rural Mpumalanga	Informal urban, Gauteng
Measure	Khwapheni or once-off partner	Main partner, khwapheni and once-off partner	Khwapheni or once-off partner	Any named partner	Khwapheni or once-off partner, new wording
Reference period	Lifetime prevalence	Lifetime prevalence	Past year	Unclear	Past year
Prevalence	17.7%	58.0% - main partner, 41.7% - khwapheni, 43.9% - once-off partner	47.0%	48.0%	23.2%

7.3 Motivations for engaging in transactional sex differ for women and men

In this sub-section I propose a conceptual framework for men's engagement in transactional sex. I also suggest a possible enhancement to women's motivations depicted in Stoebenau's model (35). Men's motivations are briefly introduced but, since this is a major contribution of this PhD to the field, an entire section (7.4) has been dedicated to this topic.

7.3.1 Conceptual frameworks for women and men's engagement in transactional sex

This subsection shows two conceptual frameworks: one for women and, one of the major contributions to the field from this PhD, a novel conceptual framework for men's provision of money or goods in exchange for sex. I present these separately as the findings from this PhD suggest that the motivations for men's engagement in transactional sex are very different from those described for women. My results in chapters 5 and 6 suggest that men's motivations for using transactional sex are related to norms of masculinities.

Figure 9 shows the conceptual framework for women's engagement in transactional sex. The results of this PhD (Chapter 4) do not suggest any major changes to this framework. This is not unexpected given the comprehensive nature of the research undertaken on women's engagement in transactional sex. However, it should be acknowledged that there has been very little further

engagement with or critique of this framework post its publication. There may be room to engage more with the role that controlling main partners play, depicted as "relationship power dynamics" in the framework below. This is discussed in the next sub-section.

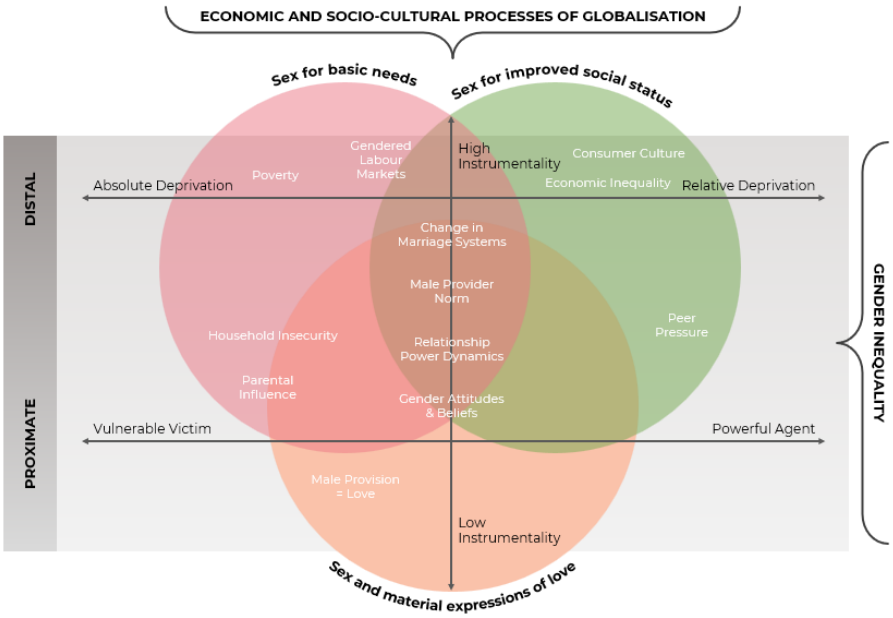


Figure 9: Conceptual framework for transactional sex in women in sub-Saharan Africa, adapted from Stoebenau, 2016

Introducing a framework for men's engagement in transactional sex

Figure 10 depicts the factors associated with and motivations for men's engagement in transactional sex based on the findings from this PhD and the extant literature. It build on the original conceptual framework outlined earlier and suggests that men's engagement in transactional sex is largely related to gender norms. This framework seeks to expand the field in that it is, to my knowledge, the first to propose motivations for men's use of transactional sex and to suggest how they may differ substantially from women's motivations. I expand on these in section 7.3.3. In section 8.2, I recommend further qualitative exploration of this framework and propose quantitative validation.

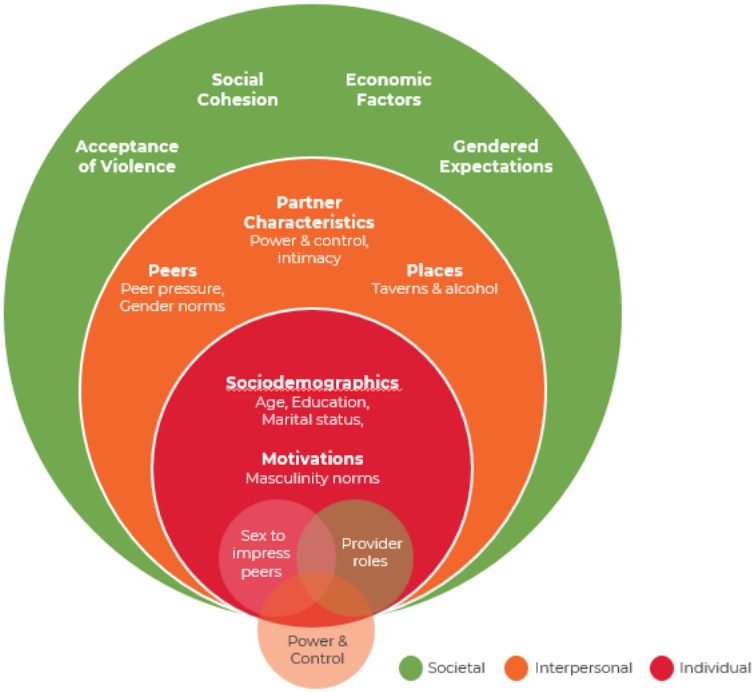


Figure 10: Conceptual framework for transactional sex in men

7.3.2 Women's motivations for transactional sex

I propose that the role of main partners and the extent to which they display controlling behaviour may need to be considered.

The role of main partners may need to be considered in exploring women's motivations

A novel contribution discussed in Chapter 4, is the finding that being in a controlling relationship with a main partner is associated with women's engagement in transactional sex with a causal partner (167). It is possible that this is one pathway through which IPV influences HIV risk, with another study demonstrating that women with low relationship control had higher risk of HIV infection (178). Chapter 4 proposes some reasons for the association between relationship control in a main partnership and transactional sex including: women in controlling relationships needing to engage in transactional sex outside of their main partnership for basic needs; and women in controlling relationships may seek to reclaim their agency by selecting additional sexual partners or pursuing sexual pleasure outside the relationship (167). The conceptual framework for women's engagement in transactional sex acknowledges both agency and deprivation. I propose that the results from

Chapter 4 may warrant further discussion on the inclusion of main partner behaviour in the conceptual framework.

A new contribution discussed in Chapter 4, is the finding that being in a controlling relationship with a main partner is associated with women's engagement in transactional sex with a causal partner (167). It is possible that this is one pathway through which IPV influences HIV risk, with another study demonstrating that women with low relationship control had higher risk of HIV infection (178). Chapter 4 proposes some reasons for the association between relationship control in a main partnership and transactional sex including: women in controlling relationships needing to engage in transactional sex outside of their main partnership for basic needs; women in controlling relationships attempting to assert their agency by choosing additional sexual partners or for sexual pleasure (167). While the framework on motivations (Figure 3) includes continua around agency and deprivation, this novel finding may warrant further discussion on how it could be included in the conceptual framework.

It is also worth noting that there may be a relationship between the "sex and materials expressions of love" paradigm, specifically in relation to male provision as a means of expressing love in the women's conceptual framework and the "provider role" motivation described for men in my new conceptual framework. It is plausible that this component is one into which men and women buy but how it is perceived is very different since my research has uncovered that men's use of transactional sex is far more about power and control. This may warrant further research.

7.3.3 Measuring men's motivations to engage in transactional sex

As far as I am aware, prior to this PhD, there has been no attempt to understand and to measure the motivations for men's engagement in transactional sex. Chapter 2 suggests that men engage in transactional sex primarily to fulfil provider norms. Chapter 5 found that the most common reason why men speculated that women had sex with them was to fulfil basic needs (support or children or family) (170). This measure is problematic as it measures men's perceptions of women's motivations rather than men's motivations themselves.

However, within the constraints of the existing measure, it is possible to draw some conclusions. Connells's Theory of Gender and Power and other theories postulate that social norms require men to take on the provider role. One way, particularly in an impoverished settings where men may not be consistently able to provide for their family, that they can demonstrate their masculinity may be by engaging in transactional sex. Provision may take place when they have some disposable income as many men in these settings are engaged in freelance or casual work where income is variable.

Men's material support for an intimate partner is deeply intertwined with expressions of love and commitment in several sub-Saharan African countries (244) and, where love and money are interwoven, exchange is viewed as a defining aspect (95). Relationships where men do not provide support and consequently lack access to female sexuality are not perceived as genuine relationships (95). An example of how this manifests is seen at a measurement level. For example, in parts of East Africa, research participants, sometimes battled to understand the motivation for engaging in transactional sex when asked about this practice, rather interpreting them to be about provision (30). However, based on their research in South Africa, Kyegombe and colleagues (2021) argue that in KwaZulu-Natal prevailing beliefs often distinguish love from financial considerations (30).

7.4 Men from urban informal settings may be motivated to engage in transactional sex to enhance their sense of manhood

This section adds significantly to the knowledge base on the reasons for men's engagement in transactional sex, which as the literature review shows, consists largely of a discussion on gendered expectations of male provision (Chapter 2). I propose that men's engagement in transactional sex is related to masculinity norms.

Masculinity is a fluid, socially conducted concept (37). Vandello and Bosson (2013) explain that there is a distinction between masculinity and manhood, emphasising that, in contrast to the set of traits and tendencies associated with masculinity, manhood refers to a fragile social status, which can be attained, lost and regained (135). Their work suggests that all men are placed along a continuum of masculinity from hypomasculine to hypermasculine. Manhood is attained by reaching a threshold along this continuum through demonstrating masculine behaviours and attributes (135).

I suggest that the three reasons why men from urban informal settlements exchange money or goods for sex with khwapheni or once-off partners. These are: 1) as a means to play the role of provider where they are otherwise unable to do so, 2) as a way to exert sexual power over women and, 3) to signal their manhood to their peers.

7.4.1 Transactional sex as a way to enact provider roles

One aspect of hegemonic masculinity which has been described is the expectation that men play the role of a breadwinner, providing financially for their households (154). Marginalised men such as those who have lower employment opportunities, access to institutions and positions of power may find it more difficult to demonstrate certain traits considered masculine (152) . This is particularly

true in relation to male provision, which is historically important in South Africa and often a pre-requisite for marriage (98).

Men from urban informal settlements, who are often poor, may have limited avenues to meet socially constructed provider expectations. This is likely to be especially true for migrants, who make up a large proportion of the population in Diepsloot (see Chapter 2). In such environments, men might resort to engaging in risky behaviours as a primary means of asserting their masculinity. Research has highlighted that men often display their manliness to their peers through their sexual activity, drinking prowess, or displays of physical aggression (152, 153). Men who experience frustration due to a perceived lack of power may turn to harmful coping strategies, including alcohol misuse or engaging in behaviours that provide a sense of control over others, such as sexual aggression or acts of violence (152, 245, 246).

Diepsloot, the area in which the Sonke CHANGE trial was conducted, has high levels of unemployment and poverty (165). The results described in Chapter 5 (170) are consistent with previous research which suggests that marginalised men may engage in risky sexual behaviour to enact their masculinity. Where men are unable to fulfil their provider masculinity role consistently, they may use alternative ways to bolster their status of manhood. Engagement in transactional sex, when they are able to provide, such as when they receive money from casual employment, is likely to be one of these. It is also possible that where main are unable to consistently provide in a main relationship, and where they exhibit high degrees of relationships control, they may engage with in transactional sex with a casual partner in an attempt to fulfil their provider role. It is possible that if their main partner is employed, they are receiving money from her. Further qualitative research to disentangle the complex relationship between main partners, relationship control and engagement in transactional sex with a khwapheni to enact provider roles could provide additional clarity.

My finding of high levels of hazardous drinking (also associated with transactional sex use) (170) is also consistent with extant literature which suggests that marginalised man may drink heavily either as a way to demonstrate their manhood or as a coping mechanism (152). Chapter 6 shows that a minority, but not insignificant, percentage of men from this community exhibit high levels of anti-social behaviour, including different types of violence (171). This finding further supports my proposal that, where men lack access to power and resources, such as in urban informal settlements, they engage in other risky behaviours, including violence to demonstrate their manhood. Chapter 6 shows how these anti-social behaviours often cluster together.

7.4.2 Transactional sex as a form of gender power and control over women

Various theories outline men's use of control and sexual behaviours. Malamuth and colleagues (2013) developed the Confluence Model of Sexual Aggression (247) implies that men who engage in sexual aggression derive satisfaction from exerting control or dominance over women. The Confluence Mediational Model proposes that a mix of situational influences, antisocial inclinations, and particular traits—such as hostile masculinity—increases the likelihood of men perpetrating sexual violence (248). Fleming et al identified three components of masculine norms that shape men's sexual behaviour. These were: 1) uncontrollable male sex drive, 2) capacity to perform sexually, and 3) power over others (147). The dimension of power refers to men seeking to dominate both other men and women through their sexual behaviours (147).

These theories are supported by evidence from South Africa. Research by Jewkes and colleagues revealed that men employ rape as a means of exercising social control over women (249, 250), while additional studies have shown that men use their routine sexual encounters to establish dominance over women (239, 251, 252). Ragnarrson et al. (2010) conducted a study in a peri-urban community in Cape Town, South Africa, and discovered that men engaged in MSP as a response to their perception that women possess too much agency within relationships (252).

I argue that engagement in transactional sex is one way that men enact components of hegemonic masculinities: provision, power over women and impressing peers. Qualitatively, Howard- Merrill and colleagues (2020) found that transactional sex in one way in which men perform hegemonic masculinities but the existing quantitative research is scanty. This PhD expands the knowledge base, with Chapter 5 finding that controlling behaviour in a relationship predicted engagement in transactional sex (170) and Chapter 6 found that men with higher levels of violent behaviour (*aggressors*) were significantly more likely to engage in transactional sex (171). The latter finding is consistent with Malamuth's description of hostile masculinity (248). This term refers to men exhibiting controlling and insecure attitudes towards women, which are assessed by measuring hostility towards women, dominance in sexual relationships, and acceptance of violence against women. Several of these constructs were measured in chapter 6 (171) and used to develop the three masculinity classes.

I also suggest that hyper masculine behaviour, which may include transactional sex, may partly be due to the disrupted social structures and inadequate social controls in urban, informal settlements.

This is particularly the case when men have been resident there for some time, like in Diepsloot (median time in the community was seven years) (170).

7.4.3 Transactional sex as way for men to impress their peers

Fleming et al. (2016) discuss a dimension of power in which men attempt to assert dominance over both other men and women, particularly through their sexual behaviours, including MSP. Sexual relationships are frequently depicted as a man's conquest of a woman, and engaging in MSP is often seen as a demonstration of sexual prowess and authority over women. These traits are regarded as indicators of masculinity, thereby enhancing a man's social standing in comparison to his male peers (147).

Research conducted with Ugandan men concluded that their social standing among peers was contingent on maintaining MSP (253, 254). Other studies support the notion that having more sexual partners is often seen as a sign of higher social status (239, 255, 256). In some settings men are encouraged to have MSP and those abstaining from or refusing sex are subjected to teasing challenging their masculine status (255, 256). Together, these studies indicate that men in sub-Saharan Africa receive social approval for having MSP, while also fearing social disapproval for abstaining from such relationships. In many situations, pursuing MSP can be a way for men to assert themselves and attain status and power over other men (147).

Transactional sex is integrally linked with MSP: by definition, where transactional sex refers to non-commercial sexual exchange outside of a marital relationship, transactional sex will always involve multiple partnerships. Chapter 5 found that men who had MSP had higher odds of exchanging money or goods for sex (170) and in chapter 6, the most aggressive class of men (most likely to have MSP) were more likely to engage in transactional sex (171). Similar to with MSP, peers' perceptions seem to influence how they perform masculinity in relation to transactional sex. For example, Howard-Merrill et al (2020) suggest that men who are able to attract MSP through gifts and economic support are seen as superior compared with those who cannot do so (257).

7.5 Limitations

Chapter 4 uses data from the SS-CF trial. Its limitations are fully described elsewhere (168). Of relevance to this PhD, is the fact that all measures are self-reported, and there may have been social desirability bias at play. This study was conducted with women 18–30 years from one area. The findings are therefore are not necessarily generalisable to older women or other regions.

Furthermore, this study involved secondary data analysis, and the research questions were not designed a priori.

Chapters 5 and 6 draw from the Sonke CHANGE trial which has several documented limitations. These results must be considered with these factors in mind. Although the authors (172) state that the loss to follow-up rate was acceptable, its potential impact on the findings cannot be overlooked, particularly since participants could not be followed up reported higher levels of baseline sexual and IPV. Knowledge of those who were lost to follow-up is relatively limited. Behaviours like transactional sex and other behaviours such as violence and criminal activity may be subject to social desirability and therefore underreported. Although the design of the data collection aimed to mitigate this by making use of self-completed questionnaires, it is likely that there was some under reporting. Additionally, these findings are specific to the largely informal urban environment in which the trial took place and results cannot be extrapolated beyond that. Chapter 6 makes use of LCA and it is crucial to emphasise that this analysis does not imply that masculinities are unchanging. Rather, using data from interviews conducted at a specific point in time, I have classified these men based on their behaviours reported during that specific period. Since the conceptual framework is based on results from informal settlements, where masculinities are heightened, it may not be applicable in other settings.

Chapter 8: Conclusions and recommendations

This chapter concludes the PhD and describes the implications for policy and practice. Good progress has been made in HIV prevention globally with encouraging declines in overall new infections in sub-Saharan Africa. However, these are not fast enough to get on track to achieve the aim of ending AIDS as a public health emergency in the next five years (211). The Global HIV Prevention Coalition (GPC) has stated that the target of fewer than 370,000 new HIV infections a year is possible if countries accelerate prevention. One of the countries which has been identified as this needing to happen is South Africa. The GPC has identified several strategies to do this, one of which is people-centred precision-prevention responses for priority populations (211). This includes identifying the populations and locations with the greatest HIV prevention needs and adjusting interventions and approaches with an appropriate balance between biomedical, behavioural and structural approaches (211). The findings from this PhD have been aligned with the HIV prevention roadmap 2025 and the precision prevention narrative to ensure that both women and men at risk of HIV acquisition or transmission through transactional sex receive tailored programming to mitigate their risk.

For interventions to truly disrupt transactional sex pathways in women, policies and programming need to address all three levels of the socio-ecological model. I acknowledge that the levels are intertwined but for ease of understanding, present them separately below.

As one the main findings from this PhD was that main partners controlling behaviour influences women's risk, it is important that interventions are combined, targeting both women and men. I present them together and, where necessary, call out if they are specifically applicable for women or men.

The concluding sub-section elaborates on future research priorities including measurement, motivation and evaluating interventions.

8.1. Implications for policy and planning

8.1.1 Identifying those at risk

The first step in providing tailored HIV prevention services in line with the premise of precision prevention, is to identify those who are at highest risk of (ongoing) engagement in transactional sex and there are several merits for using this approach including resource optimisation, improved health outcomes and greater access to services. Having said that, the discourse around targeting,

particularly in HIV programming, reflects a tension between effectiveness and ethics. Concern has been raised that targeting of interventions may place already vulnerable groups at higher risk of stigmatisation and marginalisation. It is critical therefore that identification of and interventions with of individuals at higher risk of engagement in transactional sex (and therefore HIV acquisition), is undertaken in a way which maximises the benefits and minimises potential stigmatisation. Ways to do this include providing services in a way that does not single out targeted groups, including members of the "target group" communities in designing interventions to ensure they are culturally appropriate and non-judgmental, and addressing broader social determinants of health e.g. poverty alongside targeted interventions to reduce root causes of vulnerability.

Identifying women likely to engage in transactional sex

To identify those high risk, implementing partners working in informal urban settlements could make use of an adapted version of the Girl Roster TM (258). This tool comprises a household questionnaire to understand the universe of girls in a catchment area as well as a segmentation tool to identify meaningful groups programmers can engage with (258). There is room for this tool to be adapted for use in urban informal settlements in South Africa using the results from chapter 4. For example, the tool could be expanded for use beyond girls i.e. to include women older than 18 and could include questions on food security. Exploring how some of the pathways to transactional sex identified in chapter 4 (167) could be included in the tool could help to further segment groups. Piloting the addition of questions on controlling behaviour in a main partnership and hazardous alcohol use could assist programmers to prioritise segments of women to engage with transactional sex programming. Prioritising, as discussed in chapter 6 (171) is increasingly important as donor funding for HIV is requires programmers to do more with less.

Identifying men likely to engage in transactional sex

Beyond socio-demographics, prior to this PhD, there was relatively little information on which groups of men were most likely to engage in transactional sex. Chapters 4 and 5 have substantially expanded that knowledge base identifying both individual characteristics (such as length of residence in the community (170)) and by masculinity class, shaped by their use of violence in intimate relationships and sexual and anti-social behaviour (171). Men's engagement in transactional sex is not uniform and using the findings from chapter 6 to develop a segmentation tool could help programmers to tailor HIV prevention interventions to those most likely to engage in transactional sex. This is a similar approach to one undertaken by Bell and colleagues in relation to men's testing behaviour (214).

Formative research to understand where best to administer a typing tool would need to be undertaken. One hypothesis is that different classes of men could be identified in drinking establishments. Future research on the tool itself as well as where it is useful in prioritising men would need to be undertaken.

8.1.2 Individual level interventions

Interventions at an individual level could focus on motivations for transactional sex. What is important is that programming acknowledges the array of motivations for engagement in transactional sex and not focus on one at the expense of the other. In women, transactional sex has often been framed from the perspective of the vulnerable victim paradigm (35), with programming focusing on narrowly on sugar daddy relationships with regards to AGYW (259) . More recently, the blesser/blesse phenomenon has gained increased attention (74, 260), including in popular fiction (261). The framing of these campaigns has been problematic. Some are seen as shaming men who have younger sexual partners (50, 259). Literature suggests that programmes which stigmatise women and men engaging in transactional sex can actually do more harm than good (50, 259).

Individual level interventions for women

To address the sex for basic needs motivation in women, and the fact that ongoing food insecurity is associated with future engagement in transactional sex (167), social protection programmes should be targeted towards women at highest risk for engagement in transactional sex: those who are young, poor, unmarried and living in informal urban settlements. A review of economic strengthening interventions found that both unconditional and conditional cash transfers, as well as support for education were each associated with reductions in self-reported risk behaviours, especially in AGYW. Combined with other support, food assistance also showed a positive reduction in risky sexual behaviour (262). However, it is important that in providing social protection to young women, men are not alienated. Where men are not able to fulfil their socially constructed role of provider, elevating women's economic status may place vulnerable women in even riskier positions. This is especially true where they may be engaging in transactional sex as a result of being in a controlling relationship in the first place as chapter 4 suggests (167).

Cluver and colleagues found that "cash plus care" interventions, which combined social protection measures with care in the form of psychosocial support were even more effective than stand-alone cash interventions to reduce sexual risk behaviour among adolescents in South Africa (263). There is evidence that interventions to reduce HIV risk can be strengthened by providing interventions which combined economic support and behavioural interventions (264, 265). The SS-CF intervention,

however, did not result in a decrease in women's engagement in transactional sex despite an improvement in their livelihoods (168). This finding suggests that factors such as gender norms and feelings also need to be addressed in order to truly disrupt transactional sex pathways.

This PhD found little evidence for paradigm described as sex and material expressions of love, although it is possible that there is a lot of overlap in the measurement of the motivations. Interventions around this paradigm are more difficult to design specifically. Rather than trying to address this motivation specifically, programmers may need to focus on safer sexual behaviour and referring young women for PrEP in these types of transactional relationships.

While motivations for women's engagement in transactional sex should be borne in mind, it is critical that programmes are not too reductionist. Staff should be sensitised to the fact that motivations may shift between partners, over time and depending on circumstances. The Ascertaining Sexual Relationship Types (ASERT) Tool is a tool which supports implementing partners to examine how girls convey and prioritise their sexual partners within their community, alongside the reasons for engaging in sexual relationships with each type of partner. (266). Programmers could use this tool to understand motivations for transactional sex in their communities and tailor their programming accordingly.

Interventions for women at an interpersonal level described thus far, address the sociodemographic risk factors and the motivation for engagement in transactional sex. However, as found in chapter 4, a main partner's controlling behaviour affects women's engagement in transactional sex with a casual partner. This strongly suggests that interventions with women need to support relationship dynamics not only in with khwapheni or casual partners but with the main partners too. How programmers engage the main partner of young women having transactional sex is, however, difficult and warrants further investigation.

The DREAMS (Determined, Resilient, Empowered, AIDS-free, Mentored and Safe) partnership is a comprehensive HIV prevention programme for AGYW in many sub-Saharan African countries (267). Its novelty lies in the fact that it layers different interventions, including socio-economic support and violence prevention, on top of each other for high risk AGYW (267). An evaluation of DREAMS in KwaZulu-Natal found no effect on reduction in HIV transmission (268) and the authors argue that this may be because DREAMS larger reached younger girls, many of whom were not sexually active and that the follow-up time was too short. They make the case for continued investment in structural interventions combined and propose that income generation activities are added to the package of interventions to appeal to young women transitioning from school to employment (268).

Individual level interventions for men

Individual level interventions for men will also need to address their motivations for engagement in the practice. Prior to this PhD, the framework for motivations was limited to women (35) and little literature beyond the provider role in men had explored this. I propose that men's engagement in transactional sex in urban informal settings is embedded in masculinity norms including provider masculinity, as a form of power and control, and as a way to impress their peers.

Since all of these motivations are influenced by the concept of manhood (135), individual level (and interpersonal and community level described later) interventions to shift harmful gender norms would be useful. Stepping Stones is one approach which has been effective in doing so (207) although it has primarily been implemented with younger men in rural areas and may require some refinement for men in urban informal settlements, Since the most violent men, aggressors, are most likely to engage in transactional sex, interventions which also address violent and anti-social behaviour are needed. The typing tool to understand in which class men fall (chapter 6) could be used to determine which men may require more comprehensive and in-depth programming.

Recent research proposes that it is useful to intervene with men from three different perspectives: men as partners; men as clients; and men as agents of change (269). This is a useful perspective to consider when designing interventions for men likely to engage in transactional sex, especially in relation to interventions to promote gender equity.

8.1.3 Interpersonal level interventions

At an interpersonal level, interventions to address transactional sex could comprise: couples counselling and interventions to reduce hazardous alcohol use .

Couples interventions

The interventions described to date have been aimed at the individuals engaging in transactional sex. However, paper 1 shows that having a controlling main partner influences women's engagement in transactional sex with a casual partner. This suggests that a behavioural intervention focused at women alone, even if coupled with economic support and alcohol risk reduction, is unlikely to be fully efficacious in disrupting women's engagement in transactional sex. Couples interventions with the main partners of women are needed to reduce controlling behaviour and improve communication. There is promising evidence from a trial in Rwanda. Indashyikirwa could be trialled for use in South Africa (191).

Interventions addressing hazardous drinking and in places where people drink

Taverns and shebeens are often the place where transactional sex is initiated. Literature describes how people search for sexual partners there and how alcohol is frequently used as a medium for exchange of sex (76, 81, 122). This thesis has demonstrated how hazardous drinking is associated with increased engagement in transactional sex in both women and men (167, 170, 171). A multi-faceted intervention is likely needed, again requiring an understanding the reasons for this as well as a place-based intervention.

Brief interventions comprise short, structured non-judgemental therapy which is provided by a professional. They are rooted in the paradigm of harm reduction and aim to reduce alcohol consumption to a safer level (270). There is some evidence that they are effective at reducing hazardous drinking in different populations in South Africa (271-273) and are definitely an additional intervention that could be provided to women engaging in transactional sex, especially segments identified as high risk. However, these alone are unlikely to be effective in reducing hazardous drinking as a means to disrupt transactional sex pathways because the reasons why hazardous drinking is high in these environments is complex.

Wolff and colleagues explain that high levels of hazardous drinking in women may be, at least in part, linked to their challenging traditional gender norms (194) while Watt et al suggest that this may be as a result of an increased sense of agency (123). Interventions to be explored could focus on helping women think through alternative and healthier ways of expressing their agency. A study conducted in the Western Cape demonstrated encouraging outcomes from the Women's CoOp. The authors propose that this model could be effectively implemented in a group setting with women at high risk (274).

A comprehensive intervention to address hazardous drinking and transactional sex would not be complete without intervening where hazardous drinking takes place. HIV prevention interventions have been rolled out in places where people drink (275) and there is often buy-in from bar owners, managers and patrons to do so (276).

8.1.4 Societal-level interventions

Interventions to reduce poverty

At a more distal level, interventions to address transactional sex are likely to be broader and cross-sectoral, focusing on poverty and gender inequalities. In line with GPC's guidance around precision prevention, I argue that interventions should be specifically focused on urban informal settlements.

Interventions to reduce poverty are broad in nature and beyond the scope of this PhD. In relation to specific high-risk groups, these interventions are likely to take the form of social assistance grants. There is good evidence that provision of cash transfers reduces IPV (277). Other options include stokvels or village savings accounts and entrepreneurship training.

Interventions to improve gender equity

Promoting gender equity in South Africa requires targeted, evidence-based interventions that focus on transforming social norms surrounding masculinities. Evidence from a systematic review and meta-analysis suggests that community mobilisation and group-based interventions can effectively engage men in challenging traditional gender roles and reduce IPV in LMIC (278). There is promising evidence that gender transformative community mobilisation interventions can reduce harmful gender norms in South Africa (279). Although a trial of a theory-based transformative community mobilisation intervention (One Man Can) did not show that changes in gender norms translated into changes in HIV risk behaviours, the authors note that more time may have been needed for this to occur (279).

Programmes like the "Stepping Stones" intervention, which has shown success in altering attitudes towards masculinity and promoting respectful relationships, underscore the importance of involving men in discussions about gender equity. Research from Mpumalanga suggests that gender transformative interventions should also be coupled with effective strategies to prevent and reduce men's gender role conflict and stress (145).

Additionally, media campaigns that portray alternative models of masculinity and mentorship schemes that encourage positive male role models have also been found to be effective in shifting harmful social norms. These interventions, grounded in the recognition that masculinities are socially constructed and can be reshaped, are essential for fostering a more equitable society.

8.2 Implications for research

Although this PhD has addressed many gaps in the transactional sex literature, it has also raised some questions and identified further gaps to be filled.

8.2.1 Measurement of transactional sex

Measurement of transactional sex in women

Although Wamoyi and colleagues (2019) proposed a new measure for women's engagement in transactional sex some time ago (31), this literature review revealed that its use has been limited, and there has been no engagement with its usefulness or whether it needs to be refined. There is a need for future researchers to use and validate this measure.

The question(s) proposed by the STRIVE consortium are different from those used in other South African studies in that they largely measure prevalence of engagement in transactional sex as opposed to both prevalence of and motivations for transactional sex. I put forward that a follow-up question to that proposed by Wamoyi et al (2019) should be asked of women who answer this question positively. Similar to the follow-up question I asked of men, this would aim to understand women's reasons for engagement in transactional sex. The answer options could build off those currently asked of women (4) but I propose that answer options are separated out (like I have done for men) to better reflect the various motivations described by Stoebenau et al (35). Specifically, the current questions do not clearly articulate which items could be considered "material expressions of love" and there is some potential overlap with the other motivations. This may be an area which future measurement may want to tease out better.

Researchers may also want to consider how best transactional sex is measured. I propose, in line with my first paper, that creating a continuous score may be a useful way to analyse this data.

Measurement of transactional sex in men

The measurement for men, which has been used previously is problematic in that it draws on work undertaken mainly with women and requires men to speculate on women's motivations for engagement in transactional sex. This PhD has made a major contribution to the literature in proposing a framework for men's engagement in transactional sex as well as being, as best I can tell, the first to use Wamoyi and colleagues' measure of transactional sex (31) and to pilot new questions on motivations for men's engagement in transactional sex. This PhD has raised several points for researchers to consider – both in relation to the actual measurement and in relation to the framework proposed (Figure 10).

There is a paucity of research which has made use of the new measure of transactional sex. My first recommendation is therefore for more researchers to use this measure and the follow-up questions I have developed. In so doing there are two aspects which need to be considered. Firstly, more

research is needed to compare the new measure vs the existing measure. The endline questionnaire from the Sonke CHANGE trial incorporated both existing and new measures and found substantially different results (41.5% vs 23.2% respectively). While there are various potential explanations for this difference including respondents not wanting to answer similar sets of questions and the removal of "sex work" from the new measure in a setting where use of sex work is high (roughly 20%), these explanations are speculative. This warrants further quantitative investigation as to which measure is valid. Secondly, the phrasing of Wamoyi and colleagues' question may need to be reconsidered in the South African setting. The question is phrased in relation to "a woman who is not your wife and is also not a sex worker". However, in South Africa, where marriage levels at a younger age are lower than in many other sub-Saharan African countries, the phrasing of "wife" may need further investigation in this setting. Researchers may want to explore cohabitation as a construct as opposed to marriage.

Firstly, researchers may wish to explore the framework I have proposed framework qualitatively. An area where I think the answer options I developed are incomplete is in relation to power and control. Paper 2 (Chapter 5) found a potential bi-direction relationship among controlling behaviours and transactional sex and this is also an area warranting further exploration. Researchers may want to validate the motivations I have proposed for men quantitatively.

8.2.2 Trialling interventions

This PhD has proposed several interventions at various different levels. Future research may want to explore their efficacy in disrupting transactional sex pathways. Particularly, as suggested by Bell and colleagues, the use of segmentation for precision programming needs to be further explored (214).

References

1. HSRC. SABSSM VI: The Sixth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey, 2022: Summary Sheet 2023.
2. Gibbs A, Reddy, T., Dunkle, K., Jewkes, R. HIV-Prevalence in South Africa by settlement type: A repeat population-based cross sectional analysis of men and women. PLOS ONE. 2020;15(3).
3. UNAIDS. The path that ends AIDS: UNAIDS Global AIDS Update 2023. Geneva; 2023.
4. Dunkle KL, Jewkes RK, Brown HC, Gray GE, McIntryre JA, Harlow SD. Transactional sex among women in Soweto, South Africa: prevalence, risk factors and association with HIV infection. Soc Sci Med. 2004;59(8):1581-92.
5. Ranganathan M, Heise L, Pettifor A, Silverwood RJ, Selin A, MacPhail C, et al. Transactional sex among young women in rural South Africa: prevalence, mediators and association with HIV infection. J Int AIDS Soc. 2016;19(1):20749.
6. Jewkes RD, K; Nduna, M; Shai, NJ. Transactional Sex and HIV Incidence in a Cohort of Young Women in the Stepping Stones Trial. Journal of AIDS & Clinical Research. 2012;3(5):doi: 10.4172/2155-6113.1000158.
7. Chatterji M MN, London D, Anglewicz P. . The factors influencing transactional sex among young men and women in 12 sub-Saharan African countries. . Soc Biol 2005;52((1-2)):56-72.
8. Pettifor AE, Measham DM, Rees HV, Padian NS. Sexual power and HIV risk, South Africa. Emerging infectious diseases. 2004;10(11):1996-2004.
9. Wamoyi J, Stobeanau K, Bobrova N, Abramsky T, Watts C. Transactional sex and risk for HIV infection in sub-Saharan Africa: a systematic review and meta-analysis. J Int AIDS Soc. 2016;19(1):20992.
10. Choudhry V, Ambresin AE, Nyakato VN, Agardh A. Transactional sex and HIV risks - evidence from a cross-sectional national survey among young people in Uganda. Glob Health Action. 2015;8:27249.
11. Fielding-Miller R, Dunkle KL, Jama-Shai N, Windle M, Hadley C, Cooper HL. The feminine ideal and transactional sex: Navigating respectability and risk in Swaziland. Soc Sci Med. 2016;158:24-33.
12. Jewkes R, Morrell R, Sikweyiya Y, Dunkle K, Penn-Kekana L. Transactional relationships and sex with a woman in prostitution: prevalence and patterns in a representative sample of South African men. BMC Public Health. 2012;12:325.
13. Okigbo CC, McCarraher DR, Chen M, Pack A. Risk factors for transactional sex among young females in post-conflict Liberia. Afr J Reprod Health. 2014;18(3):133-41.
14. Stoebenau K, Kyegombe N, Bingenheimer J, Ddumba-Nyanzi I, Mulindwa J. Developing Experimental Vignettes to Identify Gender Norms Associated With Transactional Sex for Adolescent Girls and Young Women in Central Uganda. Journal of Adolescent Health. 2019;64:S60-S6.
15. Hunter M. The materiality of everday sex: Thinking beyond 'prostitution'. African Studies. 2002;61(1):99-120.
16. 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(11):1613-27.
17. Gregson S, Nyamukapa CA, Garnett GP, Mason PR, Zhuwau T, Caraël M, et al. Sexual mixing patterns and sex-differentials in teenage exposure to HIV infection in rural Zimbabwe. Lancet. 2002;359(9321):1896-903.
18. Leclerc-Madlala S. Transactional sex, HIV and young African women: are we there yet? . Future Virology. 2013;8(11):1041-3.
19. Orubuloye IO, Caldwell JC, Caldwell P. Diffusion and focus in sexual networking: identifying partners and partners' partners. Stud Fam Plann. 1992;23(6 Pt 1):343-51.
20. Wojcicki JM. Commercial sex work or ukuphanda? Sex-for-money exchange in Soweto and Hammanskraal area, South Africa. Cult Med Psychiatry. 2002;26(3):339-70.

21. Meekers D, Calvès AE. 'Main' girlfriends, girlfriends, marriage, and money: the social context of HIV risk behaviour in sub-Saharan Africa. Health Transit Rev. 1997;7 Suppl:361-75.
22. Nancy Luke. Exchange and Condom Use in Informal Sexual Relationships in Urban Kenya. Economic Development and Cultural Change. 2006;54(2):319-48.
23. Kuate-Defo B. Young People's Relationships with Sugar Daddies and Sugar Mummies: What do We Know and What Do We Need to Know? African Journal of Reproductive Health / La Revue Africaine de la Santé Reproductive. 2004;8(2):13-37.
24. Leclerc-Madlala S. Transactional sex and the pursuit of modernity. . Social Dynamics 2003;29:213-33.
25. Nnko S PR. Sexual discourse in the context of AIDS: dominant themes on adolescent sexuality among primary school pupils in Magu district, Tanzania. Health Transition Review. 1997;Supplement 3(7):85-90.
26. Wamoyi J, Ranganathan M, Kyegombe N, Stoebenau K. Improving the Measurement of Transactional Sex in Sub-Saharan Africa: A Critical Review. J Acquir Immune Defic Syndr. 2019;80(4):367-74.
27. Luke N, Kurz K. Transactional Sexual Relations in Sub-Saharan Africa: Prevalence of Behavior and Implications for Negotiating Safer Sexual Practices. Washington, DC; 2002.
28. Moore AM, Biddlecom AE, Zulu EM. Prevalence and meanings of exchange of money or gifts for sex in unmarried adolescent sexual relationships in sub-Saharan Africa. Afr J Reprod Health. 2007;11(3):44-61.
29. Dunkle KL, Jewkes R, Nduna M, Jama N, Levin J, Sikweyiya Y, et al. Transactional sex with casual and main partners among young South African men in the rural Eastern Cape: prevalence, predictors, and associations with gender-based violence. Soc Sci Med. 2007;65(6):1235-48.
30. Kyegombe N, Stoebenau K, Chimbindi N, Zuma T, Shahmanesh M, Seeley J, et al. Measuring transactional sex in different contexts: How do tools to measure this practice perform in rural South Africa? African Journal of AIDS Research. 2021;20(4):329-35.
31. Wamoyi J, Stoebenau, K.,Kyegombe, N., Heise, L., Ranganathan, M.,. STRIVE Technical Brief: Measuring transactional sex and HIV risk. 2017.
32. Wamoyi J, Wight D, Plummer M, Mshana GH, Ross D. Transactional sex amongst young people in rural northern Tanzania: an ethnography of young women's motivations and negotiation. Reprod Health. 2010;7:2.
33. Maganja RK, Maman S, Groves A, Mbwambo JK. Skinning the goat and pulling the load: transactional sex among youth in Dar es Salaam, Tanzania. AIDS Care. 2007;19(8):974-81.
34. Zembe YZ, Townsend L, Thorson A, Ekström AM. "Money talks, bullshit walks" interrogating notions of consumption and survival sex among young women engaging in transactional sex in post-apartheid South Africa: a qualitative enquiry. Global Health. 2013;9:28.
35. Stoebenau K, Heise L, Wamoyi J, Bobrova N. Revisiting the understanding of "transactional sex" in sub-Saharan Africa: A review and synthesis of the literature. Social science & medicine (1982). 2016;168:186-97.
36. Barnett JP, Maticka-Tyndale E. The gift of agency: sexual exchange scripts among Nigerian youth. J Sex Res. 2011;48(4):349-59.
37. Connell R. Gender and Power. Stanford, CA: Standford University Press; 1987.
38. Weimann A, Oni T. A Systematised Review of the Health Impact of Urban Informal Settlements and Implications for Upgrading Interventions in South Africa, a Rapidly Urbanising Middle-Income Country. Int J Environ Res Public Health. 2019;16(19).
39. Selebalo H W, D.,. Monitoring the right of access to adequate housing in South Africa. . Johannesburg; 2017.
40. Jewkes R, Dunkle K. Transactional Sex and HIV Incidence in a Cohort of Young Women in the Stepping Stones Trial. Journal of AIDS & Clinical Research. 2012;03.

41. Fielding-Miller R, Dunkle KL, Hadley C, Cooper HL, Windle M. Agency as a mediator in the pathway from transactional sex to HIV among pregnant women in Swaziland: a multigroup path analysis. J Int AIDS Soc. 2017;20(1):21554.
42. Pettifor AE, Measham DM, Rees HV, Padian NS. Sexual power and HIV risk, South Africa. Emerg Infect Dis. 2004;10(11):1996-2004.
43. Chatterji M, Murray N, London D, Anglewicz P. The factors influencing transactional sex among young men and women in 12 sub-Saharan African countries. Soc Biol. 2005;52(1-2):56-72.
44. Organization. WH. Preventing HIV in sex work in settings in sub-Saharan Africa. Geneva; 2011.
45. Matasha E, Ntembelea T, Mayaud P, Saidi W, Todd J, Mujaya B, et al. Sexual and reproductive health among primary and secondary school pupils in Mwanza, Tanzania: need for intervention. AIDS Care. 1998;10(5):571-82.
46. 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(1):99-121.
47. Luke N. Age and economic asymmetries in the sexual relationships of adolescent girls in sub-Saharan Africa. Studies in family planning. 2003;34(2):67-86.
48. Coetzee J. Understanding factors associated with affecting HIV infections in female sex workers in Soweto - Interim Seminar. Johannesburg: University of the Witwatersrand; 2017 4 August 2017.
49. Kilburn K, Ranganathan M, Stoner MCD, Hughes JP, MacPhail C, Agyei Y, et al. Transactional sex and incident HIV infection in a cohort of young women from rural South Africa. AIDS (London, England). 2018;32(12):1669-77.
50. van der Heijden I, Swartz S. 'Something for something': the importance of talking about transactional sex with youth in South Africa using a resilience-based approach. Afr J AIDS Res. 2014;13(1):53-63.
51. Jewkes R, Nduna M, Jama N, Dunkle K, Levin J. Steadys, roll-ons and hit and runs: Using indigenous typology to measure number of sexual partners. Barcelona; 2002.
52. Hatcher AM, Gibbs A, McBride R-S, Rebombo D, Khumalo M, Christofides NJ. Gendered syndemic of intimate partner violence, alcohol misuse, and HIV risk among peri-urban, heterosexual men in South Africa. Social Science & Medicine. 2022;295:112637.
53. Connell RW, Messerschmidt JW. Hegemonic Masculinity:Rethinking the Concept. Gender & Society. 2005;19(6):829-59.
54. Ragonese C, Shand, T., Barker, G.,. Masculine Norms and Men's Health: Making the Connections. . Washington, DC.; 2019.
55. UN-HABITAT. Guide to Monitoring Target 11: Improving the lives of 100 million slum dwellers. Nairobi; 2003.
56. Chavez PR, Nelson DE, Naimi TS, Brewer RD. Impact of a new gender-specific definition for binge drinking on prevalence estimates for women. Am J Prev Med. 2011;40(4):468-71.
57. Gilbert A. The Return of the Slum: Does Language Matter? International Journal of Urban and Regional Research. 2007;31(4):697-713.
58. Housing Development Agency. South Africa: Informal settlements status. Johannesburg; 2012.
59. UNAIDS, STRIVE. Transactional sex and HIV risk: from analysis to action. Geneva; 2018.
60. Caldwell JC, Caldwell P, Quiggin P. The Social Context of AIDS in sub-Saharan Africa. Population and Development Review. 1989;15(2):185-234.
61. Plummer FA, Nagelkerke NJ, Moses S, Ndinya-Achola JO, Bwayo J, Ngugi E. The importance of core groups in the epidemiology and control of HIV-1 infection. Aids. 1991;5 Suppl 1:S169-76.
62. Simonsen JN, Plummer FA, Ngugi EN, Black C, Kreiss JK, Gakinya MN, et al. HIV infection among lower socioeconomic strata prostitutes in Nairobi. Aids. 1990;4(2):139-44.
63. Schoepf BG. Women, AIDS, and Economic Crisis in Central Africa. Canadian Journal of African Studies / Revue canadienne des études africaines. 1988;22(3):625-44.

64. Stoebenau K, Nixon S, Rubincam C, Willan S, Zembe Y, Tsikoane T, et al. More than just talk: The framing of transactional sex and its implications for vulnerability to HIV in Lesotho, Madagascar and South Africa. Globalization and health. 2011;7:34.
65. Fitzgerald-Husek A, Martiniuk AL, Hinchcliff R, Aochamus CE, Lee RB. "I do what I have to do to survive": an investigation into the perceptions, experiences and economic considerations of women engaged in sex work in Northern Namibia. BMC Womens Health. 2011;11:35.
66. Leclerc-Madlala S. Transactional sex and the pursuit of modernity. Cape Town; 2004.
67. Luke N. Age and Economic Asymmetries in the Sexual Relationships of Adolescent Girls in Sub-Saharan Africa. Studies in Family Planning. 2003;34(2):67-86.
68. Hunter M. The Materiality of Everyday Sex: Thinking beyond 'prostitution'. African Studies - AFR STUD. 2002;61:99-120.
69. Stoebenau K. Symbolic capital and health: the case of women's sex work in Antananarivo, Madagascar. Soc Sci Med. 2009;68(11):2045-52.
70. Kaufman CE, Stavros ES. 'Bus Fare Please': The Economics of Sex and Gifts among Young People in Urban South Africa. Culture, Health & Sexuality. 2004;6(5):377-91.
71. Nyanzi S, Nyanzi B, Kalina B, Pool R. Mobility, sexual networks and exchange among bodabodamen in southwest Uganda. Cult Health Sex. 2004;6(3):239-54.
72. Luke N. Confronting the 'sugar daddy' stereotype: age and economic asymmetries and risky sexual behavior in urban Kenya. Int Fam Plan Perspect. 2005;31(1):6-14.
73. 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(6):1275-82.
74. Mampane JN. Exploring the Blesser and Blesse… Phenomenon: Young Women, Transactional Sex, and HIV in Rural South Africa. SAGE Open. 2018;8.
75. Luke N, Goldberg RE, Mberu BU, Zulu EM. Social Exchange and Sexual Behavior in Young Women's Premarital Relationships in Kenya. J Marriage Fam. 2011;73(5):1048-64.
76. Morojele NK, Kachieng'a MA, Mokoko E, Nkoko MA, Parry CD, Nkowane AM, et al. Alcohol use and sexual behaviour among risky drinkers and bar and shebeen patrons in Gauteng province, South Africa. Soc Sci Med. 2006;62(1):217-27.
77. Ajayi AI, Somefun OD. Transactional sex among Nigerian university students: The role of family structure and family support. PLoS One. 2019;14(1):e0210349.
78. Dunkle KL, Wingood GM, Camp CM, DiClemente RJ. Economically motivated relationships and transactional sex among unmarried African American and white women: results from a U.S. national telephone survey. Public Health Rep. 2010;125 Suppl 4(Suppl 4):90-100.
79. Duby Z. “From Survival to Glamour: Motivations for Engaging in Transactional Sex and Relationships Among Adolescent Girls and Young Women in South Africa. AIDS and Behavior 2021.
80. Ranganathan M, Heise L, Pettifor A, Silverwood RJ, Selin A, MacPhail C, et al. Transactional sex among young women in rural South Africa: prevalence, mediators and association with HIV infection. Journal of the International AIDS Society. 2016;19(1):20749-.
81. Pitpitan EV, Kalichman SC, Eaton LA, Watt MH, Sikkema KJ, Skinner D, et al. Men (and women) as "sellers" of sex in alcohol-serving venues in Cape Town, South Africa. Prev Sci. 2014;15(3):296-308.
82. Ranganathan M, Quinones S, Palermo T, Gilbert U, Kajula L, Team TCPE. Transactional sex among adolescent girls and young women enrolled in a cash plus intervention in rural Tanzania: a mixed-methods study. Journal of the International AIDS Society. 2022;25(12):e26038.
83. Mathews C, Lombard C, Puren A, Cheyip5 M, Ayalew K, Jonas KN, et al. Evaluation of a South African Combination HIV Prevention Programme for Adolescent Girls and Young Women: HerStory Study. Cape Town: South African Medical Research Council; 2020.
84. Bhushan NL, Shangase N, Kimaru LJ, Gomez-Olive FX, Kahn K, Pettifor AE. HIV Related Behaviors Among Male Partners of Adolescent Girls and Young Women in Rural South Africa. AIDS Behav. 2023;27(5):1469-77.

85. Wojcicki JM. "She drank his money": survival sex and the problem of violence in taverns in Gauteng province, South Africa. Med Anthropol Q. 2002;16(3):267-93.
86. Kim J, Pronyk P, Barnett T, Watts C. Exploring the role of economic empowerment in HIV prevention. Aids. 2008;22 Suppl 4:S57-71.
87. Basset M. Vulnerability to HIV infection: The Zimbabwe experience. AIDS Analysis Africa (Southern African Edition). 1993;4(3):8-10.
88. Silberschmidt M, Rasch V. Adolescent girls, illegal abortions and "sugar-daddies" in Dar es Salaam: vulnerable victims and active social agents. Soc Sci Med. 2001;52(12):1815-26.
89. Leclerc-Madlala S. Transactional Sex and the Pursuit of Modernity. Social Dynamics. 2003;29(2):213-33.
90. Swartz A, Colvin C, Harrison A. The Cape Town boyfriend and the Joburg boyfriend: women's sexual partnerships and social networks in Khayelitsha, Cape Town. Soc Dyn. 2016;42(2):237-52.
91. Stoebenau K, Nair RC, Rambeloson V, Rakotoarison PG, Razafintsalama V, Labonté R. Consuming sex: the association between modern goods, lifestyles and sexual behaviour among youth in Madagascar. Globalization and Health. 2013;9(1):13.
92. Masvawure T. 'I just need to be flashy on campus': female students and transactional sex at a university in Zimbabwe. Cult Health Sex. 2010;12(8):857-70.
93. Bell SA. Young people and sexual agency in rural Uganda. Cult Health Sex. 2012;14(3):283-96.
94. Bhana D, Pattman R. Girls want money, boys want virgins: the materiality of love amongst South African township youth in the context of HIV and AIDS. Culture, Health & Sexuality. 2011;13(8):961-72.
95. Wamoyi J, Fenwick A, Urassa M, Zaba B, Stones W. "Women's bodies are shops": beliefs about transactional sex and implications for understanding gender power and HIV prevention in Tanzania. Arch Sex Behav. 2011;40(1):5-15.
96. Hawkins K, Price N, Mussa F. Milking the cow: young women's construction of identity and risk in age-disparate transactional sexual relationships in Maputo, Mozambique. Glob Public Health. 2009;4(2):169-82.
97. Selikow T, Zulu B, Cedras E. The Ingagara, the Regte and the Cherry: HIV/AIDS and Youth Culture in Contemporary Urban Townships. Agenda: Empowering Women for Gender Equity. 2002(53):22-32.
98. Hunter M. Love in the Time of AIDS. Inequality, Gender and Right in South Africa. . Pietermaritzburg: University of KwaZulu-Natal Press; 2010.
99. Thornton R. Sexual Networks and Social Capital: Multiple and Concurrent Sexual Partnerships as a Rational Response to Unstable Social Networks African Journal of AIDS Research. 2009;8(4):413–21
100. Cole J. Fresh contact in Tamatave, Madagascar: Sex, money, and intergenerational transformation. American Ethnologist. 2004;31(4):573-88.
101. Verheijen J. Complexities of the transactional sex model: Non-providing men, self-providing women, and HIV risk in rural Malawi. . Annals of Anthropological Practice 2011;35:116-31.
102. Leclerc-Madlala S. Cultural scripts for multiple and concurrent partnerships in southern Afrrica: why HIV prevention needs anthropology. . Sex Health. 2009;6:103-10.
103. Swidler A, Watkins SC. Ties of dependence: AIDS and transactional sex in rural Malawi. Stud Fam Plann. 2007;38(3):147-62.
104. Cluver L, Orkin M, Boyes M, Gardner F, Meinck F. Transactional Sex Amongst AIDS-Orphaned and AIDS-Affected Adolescents Predicted by Abuse and Extreme Poverty. JAIDS Journal of Acquired Immune Deficiency Syndromes. 2011;58(3):336-43.
105. Greif MJ. Housing, medical, and food deprivation in poor urban contexts: implications for multiple sexual partnerships and transactional sex in Nairobi's slums. Health Place. 2012;18(2):400-7.
106. Kamndaya M, Vearey J, Thomas L, Kabiru CW, Kazembe LN. The role of material deprivation and consumerism in the decisions to engage in transactional sex among young people in the urban slums of Blantyre, Malawi. Glob Public Health. 2016;11(3):295-308.

107. Gichane MW, Moracco KE, Pettifor AE, Zimmer C, Maman S, Phanga T, et al. Socioeconomic Predictors of Transactional Sex in a Cohort of Adolescent Girls and Young Women in Malawi: A Longitudinal Analysis. AIDS Behav. 2020;24(12):3376-84.
108. Tolmay J, Knight L, Muvhango L, Polzer-Ngwato T, Stöckl H, Ranganathan M. Women's Economic Contribution, Relationship Status and Risky Sexual Behaviours: A Cross-Sectional Analysis from a Microfinance-Plus Programme in Rural South Africa. AIDS Behav. 2022;26(7):2349-62.
109. Kanagasabai U, Thorsen V, Zhu L, Annor FB, Chiang L, McOwen J, et al. Adverse childhood experiences, HIV and sexual risk behaviors - Five sub-Saharan countries, 2018-2020. Child Abuse Negl. 2024;150:106541.
110. Gibbs A, Dunkle K, Washington L, Willan S, Shai N, Jewkes R. Childhood traumas as a risk factor for HIV-risk behaviours amongst young women and men living in urban informal settlements in South Africa: A cross-sectional study. PLoS One. 2018;13(4):e0195369.
111. Stephenson R, Winter A, Elfstrom M. Community environments shaping transactional sex among sexually active men in Malawi, Nigeria, and Tanzania. AIDS Care. 2013;25(6):784-92.
112. Zuma K, Gouws E, Williams B, Lurie M. Risk factors for HIV infection among women in Carletonville, South Africa: migration, demography and sexually transmitted diseases. International journal of STD & AIDS. 2003;14(12):814-7.
113. Pettifor AE, Hudgens MG, Levandowski BA, Rees HV, Cohen MS. Highly efficient HIV transmission to young women in South Africa. Aids. 2007;21(7):861-5.
114. Pettifor AE, Rees HV, Kleinschmidt I, Steffenson AE, MacPhail C, Hlongwa-Madikizela L, et al. Young people's sexual health in South Africa: HIV prevalence and sexual behaviors from a nationally representative household survey. Aids. 2005;19(14):1525-34.
115. Epstein H, Morris M. Concurrent partnerships and HIV: an inconvenient truth. J Int AIDS Soc. 2011;14:13.
116. de Oliveira T, Kharsany AB, Gräf T, Cawood C, Khanyile D, Grobler A, et al. Transmission networks and risk of HIV infection in KwaZulu-Natal, South Africa: a community-wide phylogenetic study. Lancet HIV. 2017;4(1):e41-e50.
117. Ott MQ, Bärnighausen T, Tanser F, Lurie MN, Newell ML. Age-gaps in sexual partnerships: seeing beyond 'sugar daddies'. Aids. 2011;25(6):861-3.
118. Kelly R, Kigozi G, Sewankambo N, Serwadda D, Wabwire-Mangen F, Lutalo T, et al. Age Differences in Sexual Partners and Risk of HIV-1 Infection in Rural Uganda. Journal of acquired immune deficiency syndromes (1999). 2003;32:446-51.
119. Beauclair R, Delva W. Is younger really safer? A qualitative study of perceived risks and benefits of age-disparate relationships among women in Cape Town, South Africa. PLoS One. 2013;8(11):e81748.
120. Weller S, Davis K. Condom effectiveness in reducing heterosexual HIV transmission. Cochrane Database Syst Rev. 2002(1):Cd003255.
121. Giannou FK, Tsiara CG, Nikolopoulos GK, Talias M, Benetou V, Kantzanou M, et al. Condom effectiveness in reducing heterosexual HIV transmission: a systematic review and meta-analysis of studies on HIV serodiscordant couples. Expert Rev Pharmacoecon Outcomes Res. 2016;16(4):489-99.
122. Norris AH, Kitali AJ, Worby E. Alcohol and transactional sex: how risky is the mix? Soc Sci Med. 2009;69(8):1167-76.
123. Watt MH, Aunon FM, Skinner D, Sikkema KJ, Kalichman SC, Pieterse D. “Because he has bought for her, he wants to sleep with her”: Alcohol as a currency for sexual exchange in South African drinking venues. Social Science & Medicine. 2012;74(7):1005-12.
124. Magni S, Christofides N, Johnson S, Weiner R. Alcohol Use and Transactional Sex among Women in South Africa: Results from a Nationally Representative Survey. PLoS One. 2015;10(12):e0145326.
125. Choudhry V, Agardh A, Stafström M, Östergren PO. Patterns of alcohol consumption and risky sexual behavior: a cross-sectional study among Ugandan university students. BMC Public Health. 2014;14:128.

126. Bello B, Moultrie H, Somji A, Chersich MF, Watts C, Delany-Moretlwe S. Alcohol use and sexual risk behaviour among men and women in inner-city Johannesburg, South Africa. BMC Public Health. 2017;17(Suppl 3):548.
127. Choudhry V, Östergren PO, Ambresin AE, Kyagaba E, Agardh A. Giving or receiving something for sex: a cross-sectional study of transactional sex among Ugandan university students. PLoS One. 2014;9(11):e112431.
128. Dunkle K, Jewkes R, Nduna M, Levin J, Jama-Shai N, Khuzwayo N, et al. Perpetration of partner violence and HIV risk behavior among young men in the rural Eastern Cape, South Africa. AIDS (London, England). 2006;20:2107-14.
129. Jewkes R, Dunkle K, Nduna M, Levin J, Jama N, Khuzwayo N, et al. Factors associated with HIV sero-status in young rural South African women: connections between intimate partner violence and HIV. Int J Epidemiol. 2006;35(6):1461-8.
130. Austrian K, Soler-Hampejsek E, Duby Z, Hewett PC. "When He Asks for Sex, You Will Never Refuse": Transactional Sex and Adolescent Pregnancy in Zambia. Stud Fam Plann. 2019;50(3):243-56.
131. Boles JK. HD. Historical Dictionary of Feminism. Lanham: Scarecrow Press; 2004.
132. Connell RW. Masculinities. Cambridge Polity Press; 1995.
133. West C, Zimmerman DH. Doing Gender. Gender and Society. 1987;1(2):125-51.
134. Pleck JH. The myth of masculinity. Cambridge, Massachusetts.: MIT Press; 1981.
135. Vandello JA, Bosson JK. Hard won and easily lost: A review and synthesis of theory and research on precarious manhood. Psychology of Men & Masculinity. 2013;14(2):101-13.
136. Wingood GM, Scd, DiClemente RJ. Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. Health Educ Behav. 2000;27(5):539-65.
137. Higgins JA, Hoffman S, Dworkin SL. Rethinking gender, heterosexual men, and women's vulnerability to HIV/AIDS. Am J Public Health. 2010;100(3):435-45.
138. Mane P, Aggleton P. Gender and HIV/AIDS: What Do Men have to Do with it? Current Sociology. 2001;49(6):23-37.
139. Stern E, Buikema R. The relational dynamics of hegemonic masculinity among South African men and women in the context of HIV. Culture, Health & Sexuality. 2013;15(9):1040-54.
140. Gagnon JH, Simon, W.,. Sexual Conduct. The Social Sources of Human Sexuality: Aldine Publishing Company 1973.
141. Shattuck D, Burke H, Ramirez C, Succop S, Costenbader B, Attafuah J, et al. Using the Inequitable Gender Norms Scale and Associated HIV Risk Behaviors among Men at High Risk for HIV in Ghana and Tanzania. Men and Masculinities. 2013;16:540-59.
142. Shannon K, Leiter K, Phaladze N, Hlanze Z, Tsai AC, Heisler M, et al. Gender inequity norms are associated with increased male-perpetrated rape and sexual risks for HIV infection in Botswana and Swaziland. PLoS One. 2012;7(1):e28739.
143. Shai NJ, Jewkes R, Nduna M, Dunkle K. Masculinities and condom use patterns among young rural South Africa men: a cross-sectional baseline survey. BMC Public Health. 2012;12(1):462.
144. Pulerwitz J, Barker G. Measuring Attitudes toward Gender Norms among Young Men in Brazil:Development and Psychometric Evaluation of the GEM Scale. Men and Masculinities. 2008;10(3):322-38.
145. Gottert A, Barrington C, McNaughton-Reyes HL, Maman S, MacPhail C, Lippman SA, et al. Gender Norms, Gender Role Conflict/Stress and HIV Risk Behaviors Among Men in Mpumalanga, South Africa. AIDS Behav. 2018;22(6):1858-69.
146. Pulerwitz J, Gortmaker SL, DeJong W. Measuring Sexual Relationship Power in HIV/STD Research. Sex Roles. 2000;42(7):637-60.
147. Fleming PJ, DiClemente RJ, Barrington C. Masculinity and HIV: Dimensions of Masculine Norms that Contribute to Men's HIV-Related Sexual Behaviors. AIDS Behav. 2016;20(4):788-98.

148. Closson K, Hatcher A, Sikweyiya Y, Washington L, Mkhwanazi S, Jewkes R, et al. Gender role conflict and sexual health and relationship practices amongst young men living in urban informal settlements in South Africa. Cult Health Sex. 2020;22(1):31-47.
149. Howard-Merrill L, Wamoyi J, Nyato D, Kyegombe N, Heise L, Buller AM. 'I trap her with a CD, then tomorrow find her with a big old man who bought her a smart phone'. Constructions of masculinities and transactional sex: a qualitative study from North-Western Tanzania. Cult Health Sex. 2022;24(2):254-67.
150. Cohan M. Adolescent Heterosexual Males Talk About the Role of Male Peer Groups in Their Sexual Decision-Making. Sexuality & Culture. 2009;13(3):152-77.
151. Kimmel MS, Mahler M. Adolescent masculinity, homophobia, and violence: Random school shootings, 1982-2001. American Behavioral Scientist. 2003;46(10):1439-58.
152. Courtenay WH. Constructions of masculinity and their influence on men's well-being: a theory of gender and health. Soc Sci Med. 2000;50(10):1385-401.
153. Hatcher AM, Colvin CJ, Ndlovu N, Dworkin SL. Intimate partner violence among rural South African men: alcohol use, sexual decision-making, and partner communication. Cult Health Sex. 2014;16(9):1023-39.
154. Jacques-Aviñó C, García de Olalla P, González Antelo A, Fernández Quevedo M, Romaní O, Caylà JA. The theory of masculinity in studies on HIV. A systematic review. Glob Public Health. 2019;14(5):601-20.
155. Ezeh A, Oyebode O, Satterthwaite D, Chen YF, Ndugwa R, Sartori J, et al. The history, geography, and sociology of slums and the health problems of people who live in slums. Lancet. 2017;389(10068):547-58.
156. Njoku PO, Edokpayi JN, Odiyo JO. Health and Environmental Risks of Residents Living Close to a Landfill: A Case Study of Thohoyandou Landfill, Limpopo Province, South Africa. Int J Environ Res Public Health. 2019;16(12).
157. Zerbo A, Delgado RC, González PA. Vulnerability and everyday health risks of urban informal settlements in Sub-Saharan Africa. Global Health Journal. 2020;4(2):46-50.
158. Akwara E, Pinchoff J, Abularrage T, White C, Ngo TD. The Urban Environment and Disparities in Sexual and Reproductive Health Outcomes in the Global South: a Scoping Review. J Urban Health. 2023;100(3):525-61.
159. Lucci P, Bhatkal T, Khan A. Are we underestimating urban poverty? World Development. 2018;103:297-310.
160. Benefo KD. Determinants of Zambian men's extra-marital sex: a multi-level analysis. Arch Sex Behav. 2008;37(4):517-29.
161. Bronfenbrenner U. Toward an experimental ecology of human development. American Psychologist. 1977;32(7):513-31.
162. Kaunda M. Portfolio Committee on Human Settlements - Parliament: Report on USDG, ISUPG and Land Invasion. eThekwini: Parlimentary Monitoring Group; 2023.
163. IQHAZA LETHU UPGRADING PARTNERSHIP INITIATIVE. SOCIO ECONOMIC SURVEY REPORT. eThekwini; 2022.
164. Christofides NJ, Hatcher AM, Pino A, Rebombo D, McBride RS, Anderson A, et al. A cluster randomised controlled trial to determine the effect of community mobilisation and advocacy on men's use of violence in periurban South Africa: study protocol. BMJ Open. 2018;8(3):e017579.
165. Mahajan S, editor. Economics of South African Townships: Special Focus on Diepsloot. Washington DC: The World Bank; 2014
166. Gibbs A, Washington L, Willan S, Ntini N, Khumalo T, Mbatha N, et al. The Stepping Stones and Creating Futures intervention to prevent intimate partner violence and HIV-risk behaviours in Durban, South Africa: study protocol for a cluster randomized control trial, and baseline characteristics. BMC Public Health. 2017;17(1):336.

167. Magni S, Hatcher A, Gibbs A, Wamoyi J, Dunkle K, Christofides N. AIDSImpact special issue: pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity and alcohol misuse. AIDS Care. 2024:1-8.
168. Gibbs A, Washington L, Abdelatif N, Chirwa E, Willan S, Shai N, et al. Stepping Stones and Creating Futures Intervention to Prevent Intimate Partner Violence Among Young People: Cluster Randomized Controlled Trial. Journal of Adolescent Health. 2020;66(3):323-35.
169. Gibbs A, Hatcher A, Jewkes R, Sikweyiya Y, Washington L, Dunkle K, et al. Associations Between Lifetime Traumatic Experiences and HIV-Risk Behaviors Among Young Men Living in Informal Settlements in South Africa: A Cross-Sectional Analysis and Structural Equation Model. JAIDS Journal of Acquired Immune Deficiency Syndromes. 2019;81(2):193-201.
170. Magni S, Hatcher A, Wamoyi J, Christofides N. Predictors and Patterns of Transactional Sex with Casual Partners Among Adult Men Living in an Informal Urban Area, South Africa. AIDS Behav. 2020;24(9):2616-23.
171. Magni S. Latent class analysis to understand how sub-groups of men engage in transactional sex: Implications for male-focused HIV prevention programming In press.
172. Christofides NJ, Hatcher AM, Rebombo D, McBride RS, Munshi S, Pino A, et al. Effectiveness of a multi-level intervention to reduce men's perpetration of intimate partner violence: a cluster randomised controlled trial. Trials. 2020;21(1):359.
173. Wamoyi J, Stoebenau K, Kyegombe N, Heise L, Ranganathan M. STRIVE Technical Brief: Measuring transactional sex and HIV risk. National Institute of Medical Research, Mwanza, Tanzania; International Center for Research on Women, Washington D.C., USA; London School of Hygiene & Tropical Medicine, London, UK; 2017.
174. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption--II. Addiction. 1993;88(6):791-804.
175. Bernstein DP, Stein JA, Newcomb MD, Walker E, Pogge D, Ahluvalia T, et al. Development and validation of a brief screening version of the Childhood Trauma Questionnaire. Child Abuse Negl. 2003;27(2):169-90.
176. Pulerwitz J, Amaro H, De Jong W, Gortmaker SL, Rudd R. Relationship power, condom use and HIV risk among women in the USA. AIDS Care. 2002;14(6):789-800.
177. Dunkle KL, Jewkes RK, Brown HC, Gray GE, McIntryre JA, Harlow SD. Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. Lancet. 2004;363(9419):1415-21.
178. Jewkes RK, Dunkle K, Nduna M, Shai N. Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: a cohort study. Lancet. 2010;376(9734):41-8.
179. Jewkes R, Nduna M, Levin J, Jama N, Dunkle K, Khuzwayo N, et al. A cluster randomized-controlled trial to determine the effectiveness of Stepping Stones in preventing HIV infections and promoting safer sexual behaviour amongst youth in the rural Eastern Cape, South Africa: trial design, methods and baseline findings. Trop Med Int Health. 2006;11(1):3-16.
180. Deitchler M, Ballard T, Swindale A, Coates J. Validation of a Measure of Household Hunger for Cross-Cultural Use. 2010.
181. StataCorp. Stata Statistical Software: Release 14 Tx: College Station; 2015.
182. Ranganathan M, Heise L, MacPhail C, Stöckl H, Silverwood RJ, Kahn K, et al. 'It's because I like things… it's a status and he buys me airtime': exploring the role of transactional sex in young women's consumption patterns in rural South Africa (secondary findings from HPTN 068). Reprod Health. 2018;15(1):102.
183. Mojola SA. Love, Money, and HIV: Becoming a Modern African Woman in the Age of AIDS: Univ of California Press.; 2014.
184. Jewkes R, Vundule C, Maforah F, Jordaan E. Relationship dynamics and teenage pregnancy in South Africa. Soc Sci Med. 2001;52(5):733-44.

185. Pascoe SJS, Langhaug LF, Mavhu W, Hargreaves J, Jaffar S, Hayes R, et al. Poverty, food insufficiency and HIV infection and sexual behaviour among young rural Zimbabwean women. PloS one. 2015;10(1):e0115290-e.
186. KwaZulu-Natal MECs launch campaign against 'Sugar Daddies' [press release]. South Africa2012.
187. Statistics South Africa. Ethekwini 2021 [Available from: http://www.statssa.gov.za/?page_id=1021&id=ethekwini-municipality.
188. Jewkes R, Morrell R. Gender and sexuality: emerging perspectives from the heterosexual epidemic in South Africa and implications for HIV risk and prevention. J Int AIDS Soc. 2010;13:6.
189. Weiser SD, Leiter K, Bangsberg DR, Butler LM, Percy-de Korte F, Hlanze Z, et al. Food insufficiency is associated with high-risk sexual behavior among women in Botswana and Swaziland. PLoS Med. 2007;4(10):1589-97; discussion 98.
190. Townsend L, Ragnarsson A, Mathews C, Johnston LG, Ekström AM, Thorson A, et al. "Taking care of business": alcohol as currency in transactional sexual relationships among players in Cape Town, South Africa. Qual Health Res. 2011;21(1):41-50.
191. Dunkle K, Stern E, Chatterji S, Heise L. Effective prevention of intimate partner violence through couples training: a randomised controlled trial of Indashyikirwa in Rwanda. BMJ Glob Health. 2020;5(12).
192. Cluver LD, Orkin FM, Yakubovich AR, Sherr L. Combination Social Protection for Reducing HIV-Risk Behavior Among Adolescents in South Africa. J Acquir Immune Defic Syndr. 2016;72(1):96-104.
193. Kalichman SC, Simbayi LC, Vermaak R, Cain D, Jooste S, Peltzer K. HIV/AIDS risk reduction counseling for alcohol using sexually transmitted infections clinic patients in Cape Town, South Africa. J Acquir Immune Defic Syndr. 2007;44(5):594-600.
194. Wolff B, Busza J, Bufumbo L, Whitworth J. Women who fall by the roadside: gender, sexual risk and alcohol in rural Uganda. Addiction. 2006;101(9):1277-84.
195. Council P. Male partners of adolescent girls and young women: relationship characteristics and HIV risk—findings from DREAMS implementation science research. Washington, DC: Population Council; 2018.
196. Statistics South Africa. Census 2001: investigation into appropriate defnitions of urban and rural areas for South Africa: Discussion document. Pretoria, South Africa; 2003.
197. Shisana O R T, Simbayi, LC., Zuma, K., Jooste, S., Zungu, N., Labadarios, D., Onoya, D., et, al.;. . South African National HIV Prevalence, Incidence and Behaviour Survey, 2012. Cape Town; 2014.
198. Gibbs A, Hatcher A, Jewkes R, Sikweyiya Y, Washington L, Dunkle K, et al. Associations Between Lifetime Traumatic Experiences and HIV-Risk Behaviors Among Young Men Living in Informal Settlements in South Africa: A Cross-Sectional Analysis and Structural Equation Model. J Acquir Immune Defic Syndr. 2019;81(2):193-201.
199. Pulerwitz J, Gortmaker S, Dejong W. Measuring relationship power in HIV/STD research. Sex Roles. 2000;42:637-60.
200. Kaufman MR, Shefer T, Crawford M, Simbayi LC, Kalichman SC. Gender attitudes, sexual power, HIV risk: a model for understanding HIV risk behavior of South African men. AIDS Care. 2008;20(4):434-41.
201. Dube Y. Social media fuels transactional sex. The Chronicle 2016 23 May 2016.
202. Wentzell E. 'I help her, she helps me:' Mexican men performing masculinity through transactional sex. Sexualities. 2014;17:856-71.
203. Wamoyi J, Buller AM, Nyato D, Kyegombe N, Meiksin R, Heise L. "Eat and you will be eaten": a qualitative study exploring costs and benefits of age-disparate sexual relationships in Tanzania and Uganda: implications for girls' sexual and reproductive health interventions. Reprod Health. 2018;15(1):207.
204. Rich EP, Nkosi S, Morojele NK. Masculinities, alcohol consumption, and sexual risk behavior among male tavern attendees: A qualitative study in North West Province, South Africa. Psychology of Men & Masculinity. 2015;16(4):382-92.

205. Onoya D, Zuma K, Zungu N, Shisana O, Mehlomakhulu V. Determinants of multiple sexual partnerships in South Africa. J Public Health (Oxf). 2015;37(1):97-106.
206. Jewkes R, Morrell R. Hegemonic Masculinity, Violence, and Gender Equality: Using Latent Class Analysis to Investigate the Origins and Correlates of Differences between Men. Men and Masculinities. 2017;21(4):547-71.
207. 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 randomised controlled trial. BMJ. 2008;337:a506.
208. Kilburn K, Ranganathan M, Stoner MCD, Hughes JP, MacPhail C, Agyei Y, et al. Transactional sex and incident HIV infection in a cohort of young women from rural South Africa. AIDS (London, England). 2018;32(12):1669-77.
209. UNAIDS. Global AIDS STRATEGY 2021–2026.
210. UNAIDS. Global AIDS update 2020: Seizing the Moment. Geneva; 2020.
211. Global HIV Prevention Coalition. HIV Prevention 2025 – Road Map: Getting on track to end AIDS as a public health threat by 2030. Geneva; 2022.
212. Jewkes R, Morrell R, Hearn J, Lundqvist E, Blackbeard D, Lindegger G, et al. Hegemonic masculinity: combining theory and practice in gender interventions. Cult Health Sex. 2015;17 Suppl 2(sup2):S112-27.
213. Herek G. M. On Heterosexual Masculinity: Some Psychological Consequences of the Social Construction of Gender and Sexuality. In: Kimmel M. S., editor. Changing Men: New Directions in Research on Men and Masculinity. Beverly Hills, CA: SAGE; 1987. p. 365–74.
214. Bell J, Sharma S, Malone S, Levy M, Reast J, Ciecieląg J, et al. Targeting interventions for HIV testing and treatment uptake: An attitudinal and behavioural segmentation of men aged 20-34 in KwaZulu-Natal and Mpumalanga, South Africa. PLoS One. 2021;16(3):e0247483.
215. Gibbs A, Abdelatif N, Washington L, Chirwa E, Willan S, Shai N, et al. Differential impact on men in an IPV prevention intervention: A post hoc analysis using latent class analysis of the Stepping Stones and Creating Futures intervention in South Africa. Soc Sci Med. 2020;265:113538.
216. Pulerwitz J, Barker G. Measuring Attitudes toward Gender Norms among Young Men in Brazil: Development and Psychometric Evaluation of the GEM Scale. Men and Masculinities - MEN MASC. 2007;10:322-38.
217. Bengtsson TT. Performing Hypermasculinity:Experiences with Confined Young Offenders. Men and Masculinities. 2016;19(4):410-28.
218. Totten M. Girlfriend abuse as a form of masculinity construction among violent, marginal male youth. Men and Masculinities. 2003;6(1):70-92.
219. Fonner VA, Ridgeway K, van der Straten A, Lorenzetti L, Dinh N, Rodolph M, et al. Safety and efficacy of long-acting injectable cabotegravir as preexposure prophylaxis to prevent HIV acquisition. Aids. 2023;37(6):957-66.
220. Gomez A, Loar R, England Kramer A. The impact of market segmentation and social marketing on uptake of preventive programmes: the example of voluntary medical male circumcision. A literature review. Gates Open Res. 2018;2:68.
221. Rimal RN, Brown J, Mkandawire G, Folda L, Böse K, Creel AH. Audience segmentation as a social-marketing tool in health promotion: use of the risk perception attitude framework in HIV prevention in Malawi. Am J Public Health. 2009;99(12):2224-9.
222. Sgaier SK, Eletskaya M, Engl E, Mugurungi O, Tambatamba B, Ncube G, et al. A case study for a psychographic-behavioral segmentation approach for targeted demand generation in voluntary medical male circumcision. Elife. 2017;6.
223. Zulu EM, Dodoo FN, Chika-Ezee A. Sexual risk-taking in the slums of Nairobi, Kenya, 1993-8. Popul Stud (Camb). 2002;56(3):311-23.
224. Greif MJ, Dodoo FN, Jayaraman A. Urbanisation, poverty and sexual behaviour: the tale of five African cities. Urban Stud. 2011;48(5):947-57.

225. Wenzel SL, Tucker JS, Elliott MN, Hambarsoomians K, Perlman J, Becker K, et al. Prevalence and co-occurrence of violence, substance use and disorder, and HIV risk behavior: a comparison of sheltered and low-income housed women in Los Angeles County. Prev Med. 2004;39(3):617-24.
226. Aidala A, Cross JE, Stall R, Harre D, Sumartojo E. Housing status and HIV risk behaviors: implications for prevention and policy. AIDS Behav. 2005;9(3):251-65.
227. Douglas I, Alam K, Maghenda M, McDonnell Y, McLean L, Campbell J. Unjust waters: climate change, flooding and the urban poor in Africa. Environment and Urbanization. 2008;20(1):187-205.
228. Naidoo K, Manyangadze T, Lokotola CL. Primary care disaster management for extreme weather events, South Africa. 2022. 2022;14(1).
229. Surratt HL, Inciardi JA. HIV risk, seropositivity and predictors of infection among homeless and non-homeless women sex workers in Miami, Florida, USA. AIDS Care. 2004;16(5):594-604.
230. Weir BW, Bard RS, O'Brien K, Casciato CJ, Stark MJ. Uncovering patterns of HIV risk through multiple housing measures. AIDS Behav. 2007;11(6 Suppl):31-44.
231. Eaton L, Flisher AJ, Aarø LE. Unsafe sexual behaviour in South African youth. Social Science & Medicine. 2003;56(1):149-65.
232. Statistics South Africa. Labour Market Dynamics in South Africa, 2022. Pretoria; 2022.
233. Hove M, Ngwerume, E.T., Muchemwa, C.,. The Urban Crisis in Sub-Saharan Africa: A Threat to Human Security and Sustainable Development. Stability. 2013;2(7):1-14.
234. Brockerhoff M, Biddlecom AE. Migration, Sexual Behavior and the Risk of HIV in Kenya. International Migration Review. 1999;33(4):833-56.
235. Sambisa W, Stokes CS. Rural/Urban Residence, Migration, HIV/AIDS, and Safe Sex Practices among Men in Zimbabwe. Rural Sociology. 2006;71:183-211.
236. Coleman JS. Social Capital in the Creation of Human Capital. American Journal of Sociology. 1988;94:S95-S120.
237. Dodoo F, Tempenis M. Gender, Power, and Reproduction: Rural-Urban Differences in the Relationship Between Fertility Goals and Contraceptive Use in Kenya*. Rural Sociology. 2009;67:46-70.
238. Greif MJ, Nii-Amoo Dodoo F. Internal migration to Nairobi's slums: linking migrant streams to sexual risk behavior. Health Place. 2011;17(1):86-93.
239. Gibbs A, Sikweyiya Y, Jewkes R. 'Men value their dignity': securing respect and identity construction in urban informal settlements in South Africa. Glob Health Action. 2014;7:23676.
240. Krisch M, Averdijk M, Valdebenito S, Eisner M. Sex Trade Among Youth: A Global Review of the Prevalence, Contexts and Correlates of Transactional Sex Among the General Population of Youth. Adolescent Research Review. 2019;4(2):115-34.
241. Van Duynhoven YT, Nagelkerke NJ, Van De Laar MJ. Reliability of self-reported sexual histories: test-retest and interpartner comparison in a sexually transmitted diseases clinic. Sex Transm Dis. 1999;26(1):33-42.
242. Fenton KA, Johnson AM, McManus S, Erens B. Measuring sexual behaviour: methodological challenges in survey research. Sexually Transmitted Infections. 2001;77(2):84-92.
243. Thomas L. Love, sex, and the modern girl in 1930s Southern Africa. In: Cole J, Thomas, L.,, editor. Love in Africa. Chicago: Chicago University Press; 2009. p. 31–57.
244. Cole J, Thomas, L., , editor. Love in Africa. Chicago: University of Chicago Press; 2009.
245. Fleming PJ, McCleary-Sills J, Morton M, Levtov R, Heilman B, Barker G. Risk factors for men's lifetime perpetration of physical violence against intimate partners: results from the international men and gender equality survey (IMAGES) in eight countries. PLoS One. 2015;10(3):e0118639.
246. Fleming PJ, Gruskin S, Rojo F, Dworkin SL. Men's violence against women and men are inter-related: Recommendations for simultaneous intervention. Soc Sci Med. 2015;146:249-56.
247. Malamuth NM, Linz D, Heavey CL, Barnes G, Acker M. Using the confluence model of sexual aggression to predict men's conflict with women: a 10-year follow-up study. J Pers Soc Psychol. 1995;69(2):353-69.

248. Malamuth NM. The confluence model of sexual aggression: Feminist and evolutionary perspectives. Sex, power, conflict: Evolutionary and feminist perspectives. New York, NY, US: Oxford University Press; 1996. p. 269-95.
249. Jewkes R, Dunkle K, Koss MP, Levin JB, Nduna M, Jama N, et al. Rape perpetration by young, rural South African men: Prevalence, patterns and risk factors. Soc Sci Med. 2006;63(11):2949-61.
250. Jewkes R, Abrahams N. The epidemiology of rape and sexual coercion in South Africa: an overview. Social Science & Medicine. 2002;55(7):1231-44.
251. Brown J, Sorrell J, Raffaelli M. An exploratory study of constructions of masculinity, sexuality and HIV/AIDS in Namibia, Southern Africa. Cult Health Sex. 2005;7(6):585-98.
252. Ragnarsson A, Townsend L, Ekström AM, Chopra M, Thorson A. The construction of an idealised urban masculinity among men with concurrent sexual partners in a South African township. Glob Health Action. 2010;3.
253. Nyanzi S, Nyanzi-Wakholi B, Kalina B. Male Promiscuity:The Negotiation of Masculinities by Motorbike Taxi-Riders in Masaka, Uganda. Men and Masculinities. 2009;12(1):73-89.
254. Siu GE, Seeley J, Wight D. Dividuality, masculine respectability and reputation: how masculinity affects men's uptake of HIV treatment in rural eastern Uganda. Soc Sci Med. 2013;89:45-52.
255. Sommer M, Likindikoki S, Kaaya S. "Bend a fish when the fish is not yet dry": adolescent boys' perceptions of sexual risk in Tanzania. Arch Sex Behav. 2015;44(3):583-95.
256. Ganle JK. Hegemonic Masculinity, HIV/AIDS Risk Perception, and Sexual Behavior Change Among Young People in Ghana. Qual Health Res. 2016;26(6):763-81.
257. Howard-Merrill L, Wamoyi J, Nyato D, Kyegombe N, Heise L, Buller AM. 'I trap her with a CD, then tomorrow find her with a big old man who bought her a smart phone'. Constructions of masculinities and transactional sex: a qualitative study from North-Western Tanzania. Cult Health Sex. 2020:1-14.
258. Population Council. Building Girls' Protective Assets: A Collection of Tools for Program Design.

. New York; 2016.
259. Brouard P, Crewe M. Sweetening the deal? Sugar daddies, sugar mummies, sugar babies and HIV in contemporary South Africa. Agenda. 2012;26(4):48-56.
260. Khazan O. The Blessor's Curse: How sugar daddies and vaginal microbes created the world's largest HIV epidemic. The Atlantic. 2018.
261. Makholwa A. The Blessed Girl South Africa: Pan Macmillan South Africa; 2018.
262. Swann M. Economic strengthening for HIV prevention and risk reduction: a review of the evidence. AIDS Care. 2018;30(sup3):37-84.
263. Cluver LD, Orkin FM, Boyes ME, Sherr L. Cash plus care: social protection cumulatively mitigates HIV-risk behaviour among adolescents in South Africa. Aids. 2014;28 Suppl 3:S389-97.
264. 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(11):824-32.
265. Kim JC, Watts CH, Hargreaves JR, Ndhlovu LX, Phetla G, Morison LA, et al. Understanding the impact of a microfinance-based intervention on women's empowerment and the reduction of intimate partner violence in South Africa. Am J Public Health. 2007;97(10):1794-802.
266. Hallman K. Girls' Participatory Action Quantified Tools (G-PAQT) Kit. New York; 2016.
267. Saul J, Bachman G, Allen S, Toiv NF, Cooney C, Beamon T. The DREAMS core package of interventions: A comprehensive approach to preventing HIV among adolescent girls and young women. PLoS One. 2018;13(12):e0208167.
268. Mthiyane N, Baisley K, Chimbindi N, Zuma T, Okesola N, Dreyer J, et al. The association of exposure to DREAMS on sexually acquiring or transmitting HIV amongst adolescent girls and young women living in rural South Africa. AIDS. 2022;36(Supplement 1):S39-S49.

269. offering.; IIaS. Engaging men and boys as clients and partners, and enabling a gender equitable environment, to improve HIV/SRH outcomes: A systematic review of reviews.; 2024.
270. Roche AM, Freeman T. Brief interventions: good in theory but weak in practice. Drug Alcohol Rev. 2004;23(1):11-8.
271. van der Westhuizen C, Myers B, Malan M, Naledi T, Roelofse M, Stein DJ, et al. Implementation of a screening, brief intervention and referral to treatment programme for risky substance use in South African emergency centres: A mixed methods evaluation study. PLoS One. 2019;14(11):e0224951.
272. Myers B, Parry CDH, Morojele NK, Nkosi S, Shuper PA, Kekwaletswe CT, et al. "Moving Forward with Life": Acceptability of a Brief Alcohol Reduction Intervention for People Receiving Antiretroviral Therapy in South Africa. Int J Environ Res Public Health. 2020;17(16).
273. Parry CDH, Myers B, Londani M, Shuper PA, Janse van Rensburg C, Manda SOM, et al. Motivational interviewing and problem-solving therapy intervention for patients on antiretroviral therapy for HIV in Tshwane, South Africa: A randomized controlled trial to assess the impact on alcohol consumption. Addiction. 2023;118(11):2164-76.
274. Wechsberg WM, Luseno WK, Karg RS, Young S, Rodman N, Myers B, et al. Alcohol, cannabis, and methamphetamine use and other risk behaviours among Black and Coloured South African women: a small randomized trial in the Western Cape. Int J Drug Policy. 2008;19(2):130-9.
275. Pitpitan EV, Kalichman SC. Reducing HIV Risks in the Places Where People Drink: Prevention Interventions in Alcohol Venues. AIDS Behav. 2016;20 Suppl 1(0 1):S119-33.
276. Morojele NK, Kitleli N, Ngako K, Kekwaletswe CT, Nkosi S, Fritz K, et al. Feasibility and acceptability of a bar-based sexual risk reduction intervention for bar patrons in Tshwane, South Africa. Sahara j. 2014;11(1):1-9.
277. Buller AM, Peterman A, Ranganathan M, Bleile A, Hidrobo M, Heise L. A Mixed-Method Review of Cash Transfers and Intimate Partner Violence in Low- and Middle-Income Countries. The World Bank Research Observer. 2018;33(2):218-58.
278. Leight J, Cullen C, Ranganathan M, Yakubovich A. Effectiveness of community mobilisation and group-based interventions for preventing intimate partner violence against women in low- and middle-income countries: A systematic review and meta-analysis. J Glob Health. 2023;13:04115.
279. Pettifor A, Lippman SA, Gottert A, Suchindran CM, Selin A, Peacock D, et al. Community mobilization to modify harmful gender norms and reduce HIV risk: results from a community cluster randomized trial in South Africa. J Int AIDS Soc. 2018;21(7):e25134.

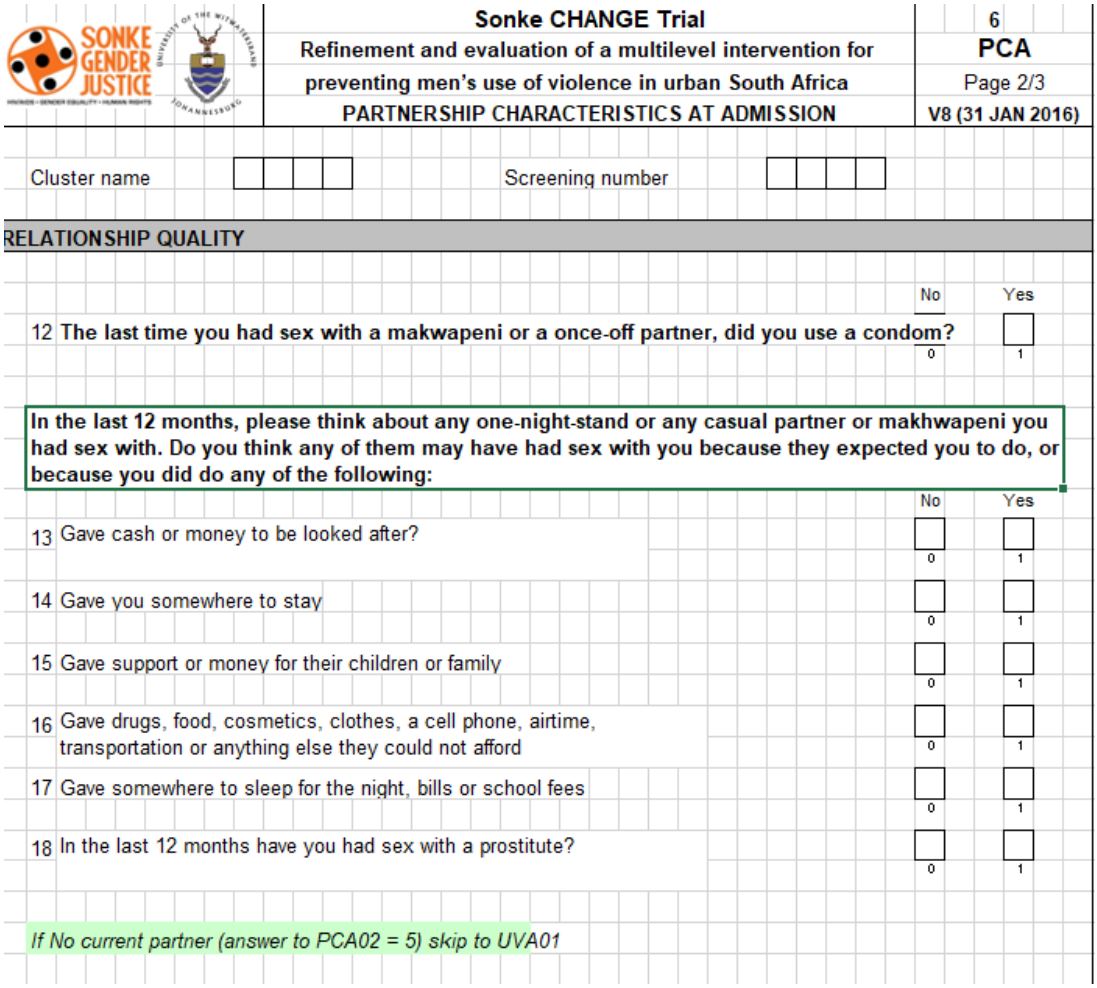
Appendices

Appendix 1: Questionnaire section on transactional sex (women), Stepping Stones-Creating Futures trial, primary study 1

313	In the past 12 months have you started or stayed in a relationship with a main partner so that you could receive any of the following?	Yes	No	
	a) Cash or money to be looked after	1	0	
	b) Somewhere to stay	1	0	
	c) Support or money for your children or family	1	0	
	d) Drugs, food, cosmetics, clothes, a cell phone, transportation or anything else you couldn't afford by yourself	1	0	

314	In the past 12 months please think about any man you had sex with just once or any casual partner or khwapheni. Did you have a relationship or sex with them because you expected to receive, or received any of the following:	YES	NO	
	a. Cash or money to be looked after	1	0	
	b. Somewhere to stay	1	0	
	c. Support or money for your children or family	1	0	
	d. Drugs, food, cosmetics, clothes, a cell phone, transportation or anything else you couldn't afford by yourself	1	0	
	e. Somewhere to sleep for the night, bills or school fees	1	0	
315	In the last 12 months have you done sex work or supported yourself from money you received because you had sex?	YES……1 NO……0		

Appendix 2: Questionnaire section on transactional sex (men), Sonke CHANGE baseline, primary study 2



	Sonke CHANGE Trial	6
SONKE GENDER JUSTICE	Refinement and evaluation of a multilevel intervention for preventing men's use of violence in urban South Africa	PCA
	PARTNERSHIP CHARACTERISTICS AT ADMISSION	Page 2/3
		V8 (31 JAN 2016)

Cluster name ☐☐☐☐ Screening number ☐☐☐☐

RELATIONSHIP QUALITY

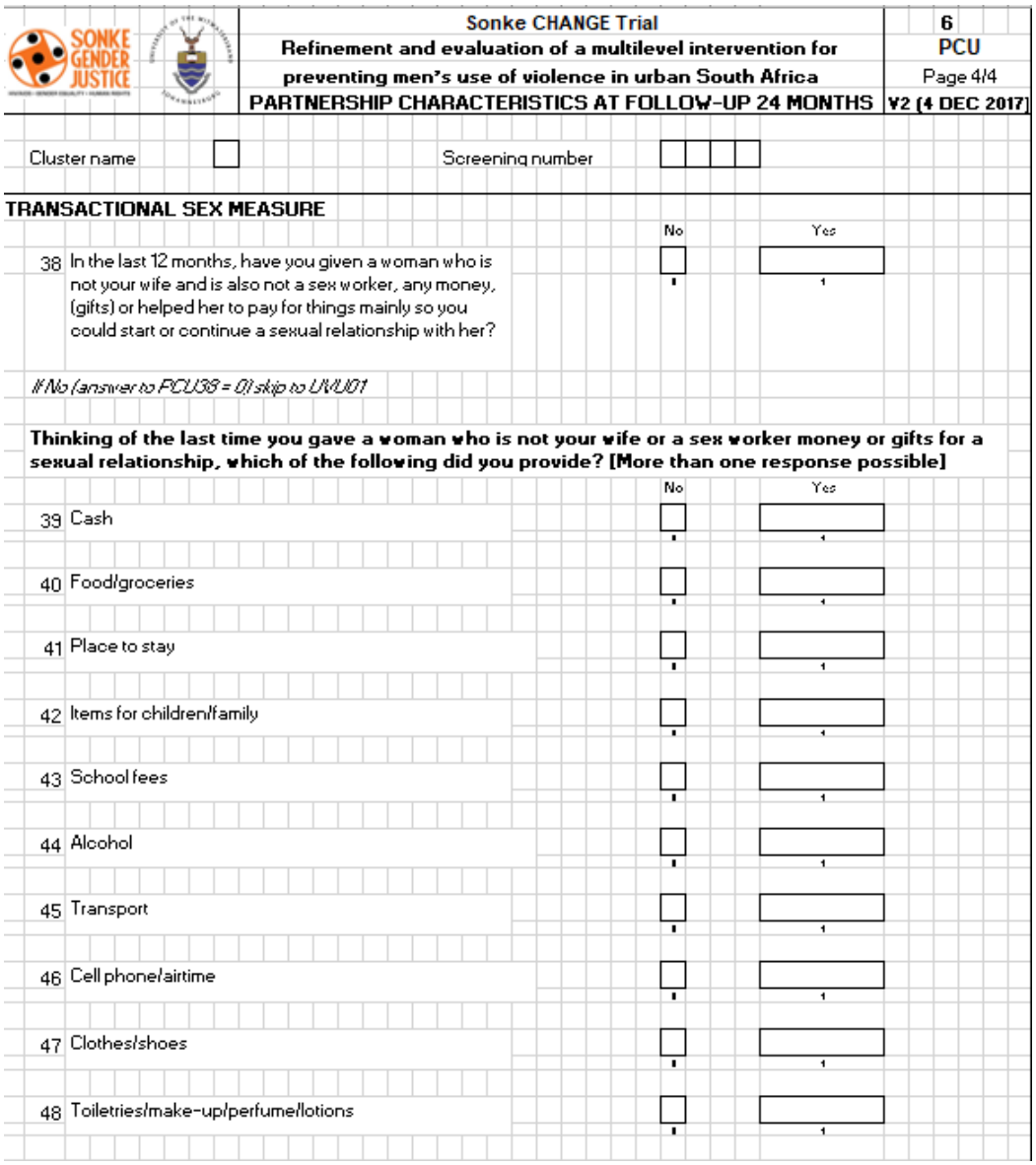
		No	Yes
12	**The last time you had sex with a makwapeni or a once-off partner, did you use a condom?**	0	1

In the last 12 months, please think about any one-night-stand or any casual partner or makhwapeni you had sex with. Do you think any of them may have had sex with you because they expected you to do, or because you did do any of the following:

		No	Yes
13	Gave cash or money to be looked after?	0	1
14	Gave you somewhere to stay	0	1
15	Gave support or money for their children or family	0	1
16	Gave drugs, food, cosmetics, clothes, a cell phone, airtime, transportation or anything else they could not afford	0	1
17	Gave somewhere to sleep for the night, bills or school fees	0	1
18	In the last 12 months have you had sex with a prostitute?	0	1

If No current partner (answer to PCA02 = 5) skip to UVA01

Appendix 3: Questionnaire section, Sonke CHANGE endline, primary study 2



Sonke CHANGE Trial	6
Refinement and evaluation of a multilevel intervention for preventing men's use of violence in urban South Africa	PCU
PARTNERSHIP CHARACTERISTICS AT FOLLOW-UP 24 MONTHS	Page 4/4
	V2 (4 DEC 2017)

Cluster name ☐ Screening number ☐☐☐☐

TRANSACTIONAL SEX MEASURE

		No	Yes
38	In the last 12 months, have you given a woman who is not your wife and is also not a sex worker, any money, (gifts) or helped her to pay for things mainly so you could start or continue a sexual relationship with her?	0	1

If No (answer to PCU38 = 0) skip to UVU01

Thinking of the last time you gave a woman who is not your wife or a sex worker money or gifts for a sexual relationship, which of the following did you provide? [More than one response possible]

		No	Yes
39	Cash	0	1
40	Food/groceries	0	1
41	Place to stay	0	1
42	Items for children/family	0	1
43	School fees	0	1
44	Alcohol	0	1
45	Transport	0	1
46	Cell phone/airtime	0	1
47	Clothes/shoes	0	1
48	Toiletries/make-up/perfume/lotions	0	1

Appendix 4: Ethical approval for this PhD

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Sarah Magni

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M180269

NAME: (Principal Investigator)	Sarah Magni
DEPARTMENT:	School of Public Health
PROJECT TITLE:	Transactional sex and its contribution to HIV risk in men and women in South Africa: understanding pathways
DATE CONSIDERED:	23/02/2018
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Nicola Christofides and Joyce Wamoyi
APPROVED BY:	Prof C Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	16/05/2018

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 301, Third floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in February and will therefore be due in the month of February each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

15 June 2018
Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix 5: Ethical approvals for the Stepping Stones-Creating Futures trial, primary study 1

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

19 August 2015

Mr A Gibbs
Private Bag x54001
Durban
4001
gibbs@ukzn.ac.za

Dear Mr Gibbs

PROTOCOL: Stepping Stones and creating futures intervention trial. Non-Degree. HEARD.
BREC REF: BFC043/15

The Biomedical Research Ethics Committee (BREC) has considered the abovementioned application.

The study was provisionally approved by sub-committee of BREC pending appropriate responses to queries raised. Your responses received on 09 July 2015 to BREC letter dated 02 June 2015 have been noted by the Biomedical Research Ethics Committee at a meeting held on 11 August 2015. The conditions have now been met and the study is given full ethics approval and may begin as from 19 August 2015.

This approval is valid for one year from **19 August 2015.** To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at http://research.ukzn.ac.za/ResearchEthics/BiomedicalResearchEthics.aspx.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

Page 2/...

SOUTH AFRICAN MEDICAL RESEARCH COUNCIL

ETHICS COMMITTEE

PO Box 19070, 7505 Tygerberg, South Africa
Francie van Zijl Drive, Parowvallei, 7500
Tel: +27 (0)21 938-0687; Fax: +27 (0) 866-854023
E-mail: adri.labuschagne@mrc.ac.za
http://www.mrc.ac.za/ethics/ethics.htm

5 August 2015

Prof Rachel Jewkes
Gender & Health Research Unit
MRC Pretoria

Dear Prof Jewkes

Protocol ID: EC006-2/2015
Protocol title: Stepping Stones and Creating Futures intervention trial
Meeting date: 28 July 2015

Thank you for your application to the Ethics Committee for an amendment, dated 9 July 2015. The Committee granted ethics approval for the amendment, with the request that in the participant information leaflet the words "compensation" and "compensate" be changed to "reimbursement/reimburse". Please submit the amended leaflet.

Wishing you well with your research.

Yours sincerely

PROF. D DU TOIT
CHAIRPERSON: MRC ETHICS COMMITTEE

Appendix 6: Ethical approval for the Sonke CHANGE trial, primary study 2

R14/49 Dr Nicola Christofides et al

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M150443

NAME: (Principal Investigator)	Dr Nicola Christofides et al
DEPARTMENT:	School of Public Health Wits Reproductive Health & HIV Institute Diepsloot,JHB
PROJECT TITLE:	Refinement and Evaluation of Multilevel Intervention for Preventing Men`s Use of Violence in Urban South Africa (CHANGE Trial)
DATE CONSIDERED:	24/04/2015
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	
APPROVED BY:	Professor P Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	22/07/2015

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate House, University.
I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**.

Principal Investigator Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix 7: AIDSImpact special issue: pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity and alcohol misuse

Taylor & Francis

AIDS Care

Psychological and Socio-medical Aspects of AIDS/HIV

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/caic20

AIDSImpact special issue: pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity and alcohol misuse

Sarah Magni, Abigail Hatcher, Andrew Gibbs, Joyce Wamoyi, Kristin Dunkle & Nicola Christofides

To cite this article: Sarah Magni, Abigail Hatcher, Andrew Gibbs, Joyce Wamoyi, Kristin Dunkle & Nicola Christofides (09 Feb 2024): AIDSImpact special issue: pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity and alcohol misuse, AIDS Care, DOI: 10.1080/09540121.2024.2307385

To link to this article: https://doi.org/10.1080/09540121.2024.2307385

Published online: 09 Feb 2024.

AIDS CARE
https://doi.org/10.1080/09540121.2024.2307085

AIDSImpact special issue: pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity and alcohol misuse

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[a]School of Public Health, Faculty of Health Sciences, University of Witwatersrand, Johannesburg, South Africa; [b]Genesis Analytics, Johannesburg, South Africa; [c]Department of Health Behavior, Gillings School of Global Public Health, University of North Carolina, Chapel Hill, NC, USA; [d]Gender and Health Research Unit, South African Medical Research Council, Pretoria, South Africa; [e]Centre for Rural Health, School of Nursing and Public Health, University of KwaZulu-Natal, Durban, South Africa; [f]Department of Psychology, Faculty of Life and Health Sciences, University of Exeter, Exeter, UK; [g]Institute of Global Health, University College London, London, UK; [h]Department of Sexual and Reproductive Health, National Institute for Medical Research, Mwanza, Tanzania

ABSTRACT

Transactional sex increases sub-Saharan African women's risk of HIV acquisition. We quantitatively explored the pathways contributing towards women's future engagement in transactional sex with casual partners and *khwapheni* (secret concurrent sex partners). We conducted secondary data analysis from a cluster randomised controlled trial in urban informal settlements in eThekwini Municipality, South Africa. Data were collected at enrolment (t0) and 24 months' later (t2) using self-completed questionnaires. Structural equation modelling (SEM) assessed pathways leading to transactional sex over two years. 677 women 18–35 years were enrolled and 80.5% (*n* = 545) were followed up. At t2, 44.6% of respondents reported transactional sex with a casual partner or *khwapheni*. The SEM demonstrated a small effect (d = 0.23) between transactional sex at t0 and at t2. Controlling for past transactional sex, main partner relationship control had a large effect size on future transactional sex (d = 0.80). Hazardous drinking had a medium effect size (d = 0.45) and food insecurity a small effect (d = 0.24). (RMSEA 0.03, 90%CI 0.02–0.04; CFI 0.97; TLI 0.96). HIV prevention programming should highlight current transactional sex but also address structural issues predicting future transactional sex, including food insecurity and alcohol misuse. Gender transformative interventions to reduce controlling behaviours in main relationships are worth investigating.

ARTICLE HISTORY
Received 17 July 2023
Accepted 10 January 2024

KEYWORDS
Transactional sex; relationship control; South Africa

SDG KEYWORDS: SDG 5: Gender equality

Introduction

Transactional sex increases women's vulnerability to HIV acquisition in sub-Saharan Africa, but more longitudinal studies are needed to establish the causal pathways between transactional sex and HIV (Wamoyi et al., 2016). Transactional sex is defined as a sexual relationship which is primarily motivated by financial or material exchange and which occurs outside of marriages or "formal" sex work (Chatterji et al., 2005; Fielding-Miller et al., 2017; Pettifor et al., 2004; Stoebenau et al., 2016). Women engaging in transactional sex are often less able to influence the timing and nature of sex (MacPhail & Campbell, 2001; Wojcicki & Malala, 2001), placing them at higher risk of HIV acquisition.

Reasons why women engage in transactional sex are not uniform (Stoebenau et al., 2016). Transactional sex can be driven by structural factors such as poverty and food insecurity (Greif, 2012), where women exchange sex to obtain basic needs (Kamndaya et al., 2016; Zembe et al., 2013). It can also be motivated by psychosocial factors, including aspirations for social mobility, a modern lifestyle and material consumer goods (Duby et al., 2021; Kamndaya et al., 2016; Leclerc-Madlala, 2003; Maganja et al., 2007; Ranganathan et al., 2018; Stoebenau et al., 2013; Wamoyi et al., 2010; Zembe et al., 2013). The practice is also driven by the intertwined nature of romantic notions of love and security (Bhana & Pattman, 2011; Hunter, 2010; Mojola, 2014).

Transactional sex occurs in different types of sexual relationships. Women in sub-Saharan Africa frequently report receiving gifts from their main partners (Jewkes et al., 2001; Kaufman & Stavros, 2004; MacPhail & Campbell, 2001). These gifts are demonstrations of love (Hunter, 2010). Although gifts may incentivise women to have sex,

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they are not the only reason women have these relationships (Kaufman & Stavros, 2004; MacPhail & Campbell, 2001). Transactional sex is often reported with non-primary partners, including *kbwapheni* [concurrent sexual partnership which is hidden from a main partner (Jewkes et al., 2002)] and casual partners. Sex with casual partners is exchanged for a variety of reasons such as a place to stay for the night (Wojcicki & Malala, 2001), a lift (Kaufman & Stavros, 2004) or in appreciation of alcoholic drinks (Wojcicki, 2002).

Factors associated with transactional sex in women include younger age, household hunger and lower socioeconomic status, low education, having a partner five or more years older and alcohol use (Choudhry et al., 2015; Duby et al., 2021; Okigbo et al., 2014; Pascoe et al., 2015). However, there are two gaps in the knowledge base which would be useful to fill in order to improve HIV policy and programming for women.

Quantitative research on transactional sex pathways using longitudinal data has not, to our knowledge, been adequately explored. This means that frequently HIV programming addresses one reason for transactional sex, at the expense of the others (Stoebenau et al., 2016). For example, in South Africa, one "sugar daddies" campaign, which highlighted the issue of cross-generational sex in exchange for gifts or money (South African Government, 2012), focused on sex for improved social status only, neglecting the other reasons described in the literature (Stoebenau et al., 2016). Secondly, little research has explored the relationship between controlling behaviour by a main partner and women's engagement in transactional sex.

This paper aims to quantitatively explore the pathways which contribute towards women's engagement in transactional sex with *kbwapheni* and casual partners in South Africa. Specifically, we explored women's experiences of their main partner's controlling behaviour in the pathway.

Materials and methods

Design

Data were drawn from a two-arm cluster randomised controlled trial (CRCT) in urban informal settlements in eThekwini Municipality, South Africa (Gibbs et al., 2017). An estimated 3.4 million people live in eThekwini municipality, about 30% of whom are unemployed (Statistics South Africa, 2021). At a cluster level, eligibility was defined as urban informal settlements in the eThekwini Municipality, areas where the implementing partner, Project Empower, had determined it was safe to work. Informality was defined as not having formal service provision within the home. Clusters ($n = 34$) were informal settlements, with organically occurring boundaries.

In each cluster ~20 men and ~20 women were recruited. Women and men aged between 18 and 30, who were out of school, not in formal work, normally resident in an informal settlement, and able to communicate in English, isiXhosa or isiZulu were eligible (Gibbs et al., 2017). Data were collected from participants at baseline (t0; September 2015–September 2016) and 24 months later (t2; March–October 2018). Some 677 women aged 18–35 years were enrolled and 80.5% ($n = 545$) were followed up two years later.

The CRCT evaluated Stepping Stones and Creating Futures, two separate interventions designed to transform gender attitudes and strengthen livelihoods. Further information on the study design is available elsewhere (Gibbs et al., 2017). After providing written informed consent, questionnaires in English, isiZulu and isiXhosa were self-completed on mobile phones (Gibbs et al., 2017). For this analysis, only women's data were included.

The primary study was approved by the Biomedical Research Ethics Committee (BREC) at the University of KwaZulu-Natal, Durban, South Africa (BFC043/15) and the South African Medical Research Council Ethics Committee (EC006–2/2015). Secondary data analysis was approved by the University of the Witwatersrand (M180269). All participants provided written informed consent. Data were de-identified prior to analysis.

Measures

We measured past year transactional sex using questions adapted from those previously used (Jewkes et al., 2012). Participants were asked: "In the past 12 months please think about any man you had sex with just once or any casual partner or *kbwapheni*. Did you have a relationship or sex with them because you expected to receive, or received any of the following?". Examples of answer options are: "Somewhere to sleep for the night, bills or school fees" and "Cash or money to be looked after". Any transactional sex was defined as a positive answer to one or more of the five questions (Jewkes et al., 2012). A sum score ranging from 0 to 5 was created (Cronbach's alpha = 0.79). A score closer to five indicated a higher intensity of transactional sex engagement. Participants who had not had sex in the past 12 months were coded as 0. Alcohol use was assessed using the Alcohol Use Disorder Identification Test (AUDIT) scale (Saunders et al., 1993). Ten items asked about past year alcohol use, with scores summed. AUDIT demonstrated strong internal reliability (Cronbach's alpha = 0.81).

Eight items from the adapted sexual relationship power scale (SPRS) (Jewkes et al., 2010; Pulerwitz et al.,

2000), asked about controlling behaviours with the respondent's current or most recent main partner. Examples of the items, scored using a four level Likert scale, are: "when he wants sex, he expects me to agree" and "he tells me who I can spend time with". This demonstrated good internal reliability (Cronbach's alpha = 0.75). The scale was treated as a continuous score (range 0–24) with higher scores indicating more controlling behaviours by a main partner. We constructed a latent variable for main partner's controlling behaviour using the eight items of the SPRS score and tested this using confirmatory factor analysis [for which the data fit the latent construct in a strong manner: root-mean-square error of approximation (RMSEA) = 0.029; comparative fit index (CFI) = 0. 969 and Tucker-Lewis Index (TLI) = 0.958]. Socio-demographic variables considered included: age (continuous, per year) and education (highest level completed). Household food insecurity in the past month was assessed with three items: how often in the past month was there no food to eat, any member of your household goes to sleep hungry, and not eating for whole day and night, because there was no money or food (Deitchler et al., 2010). A direct sum was derived (range 0–9) with higher scores indicating more food insecurity. A dichotomous variable for intervention and control groups was included.

Statistical analysis

Data were analysed in Stata version 17 (StataCorp, 2015). Sociodemographic characteristics of the sample were presented using frequencies and percentages. We compared the characteristics of those followed up and those lost to follow up at 24 months. We compared categorical variables using Pearson's Chi-squared test.

We used logistic regression to estimate crude odds ratios (ORs) and adjusted ORs (aORs), for transactional sex at t2, controlling for age, education, food insecurity, main partners' controlling behaviours, hazardous drinking, and transactional sex at t0 using the survey commands in Stata to account for clustering. We report ORs, aORs, 95% confidence intervals (CIs), and p-values.

We conducted structural equation modelling (SEM) and sem builder command. The continuous outcome score was transactional sex (0–5) with a casual partner or *khwapheni* at t2. We built the SEM using theoretical assumptions about pathways and controlled for education, food security, intervention/control arm and clustering at t0. We included food insecurity at t2 as we hypothesised that new instances of food insecurity would be an important pathway for ongoing transactional sex. We fitted the SEM to these data using maximum likelihood missing value estimates. We then assessed Goodness of Fit Measures for model fit.

Results

At baseline, 677 participants were recruited into the study and at t2, 80.5% (545) participants were followed up. The mean age of participants at t2 was 26.2 years (SD = 3.7). Over half (297/545, 54.5%) were food insecure. Most (461/545, 84.6%) had a sexual partner that they did not live with and 16.3% (89/545) were currently studying. Those retained in the study at t2 were significantly less likely to cohabit with their partners and more likely to be in the control arm (Table 1).

At t2, 44.6%, (243/545) reported any transactional sex with a *khwapheni* or casual partner in the previous year (95%CI 0.40–0.49). Nearly a third (169/545, 31.0%) of women reported having had sex for cash or money to be looked after. About 15% (86/479, 15.8%) reported transactional sex for somewhere to stay. Some 22.2% (121/545) reported transactional sex to support their children or family and 22.9% (125/545) for various items including, drugs, cosmetics and clothes. Nearly a fifth (93/479, 17.1%) said they received somewhere to sleep for the night, bills or school fees.

Table 2 shows that transactional sex was significantly higher in women reporting food insecurity, having higher relationship control in a main partnership, and drinking hazardous levels. More women who reported t0 transactional sex engaged in transactional sex at t2 (58.2% vs 41.8%, < 0.001).

Table 1. Sociodemographic characteristics of those retained and loss to follow-up over two years.

	Retained at t2	Lost to follow-up t2	
	n (%)	n (%)	p Value
Sociodemographic characteristics			
Age in years (n = 677)			
16–24	308 (56.5)	80 (60.6)	
25–35	237 (43.5)	52 (39.4)	0.38
Food security (n = 677)			
Food secure	197 (36.2)	46 (34.9)	
Food insecure	348 (63.9)	86 (65.2)	0.78
Relationship status (n = 677)			
Cohabiting	79 (14.5)	34 (25.8)	
Not living together	466 (85.5)	98(74.2)	0.00
Behaviours			
Relationship control (n = 677)			
Lower control by main partner	331 (60.7)	72 (54.6)	
Higher control by main partner	214 (39.3)	60 (45.5)	0.18
Alcohol use (n = 634)			
Non-hazardous alcohol use	392 (76.6)	101 (82.8)	
Hazardous alcohol use	120 (23.4)	21 (17.2)	0.14
Intervention			
Intervention arm	268 (49.7)	70 (59.8)	0.01
Control arm	285 (52.3)	53 (40.2)	

Table 2. Associations between sociodemographic factors, behavioural factors and intervention/control group and transactional sex in women, t2 (%).

	Had any transactional sex in the past 12 months (t2)		
	Yes: n (%)	No: n (%)	p Value
Sociodemographic characteristics			
Age in years (n = 545)			
18–24	82 (42.7)	110 (57.3)	0.52
25–35	161 (45.6)	192 (54.4)	
Education (n = 545)			
Not currently studying	287 (45.4)	249 (54.6)	0.38
Currently studying	36 (40.5)	53 (59.6)	
Food security (n = 545)			
Food insecure	157 (52.9)	140 (47.1)	<0.001
Food secure	86 (34.7)	162 (65.3)	
Relationship status (n = 545)			
Not living together	199 (43.2)	262 (56.8)	0.13
Cohabiting	44 (52.4)	40 (47.6)	
Behaviours			
Relationship control (n = 545)			
Lower control by main partner	130 (36.3)	228 (63.7)	<0.001
Higher control by main partner	113 (60.4)	74 (39.6)	
Alcohol use (n = 465)			
Non-hazardous alcohol use	132 (36.6)	229 (63.4)	<0.001
Hazardous alcohol use	67 (66.4)	37 (35.6)	
Transactional sex at t0 (n = 479)			
No transactional sex at t0	83 (34.2)	160 (65.8)	<0.001
Transactional sex at t0	135 (58.2)	97 (41.8)	
Intervention arm (n = 545)			
Control arm	125 (43.9)	160 (56.1)	0.72
Treatment arm	118 (45.4)	142 (54.6)	

Women who reported higher relationship control by their main partner at t0 had 6% higher odds of engaging in transactional sex at t2. Hazardous drinkers had 4% higher odds of engaging in t2 transactional sex. Women who engaged in t0 transactional sex had significantly higher odds of having had any transactional sex at t2 (aOR 1.9, 95% CI 1.19–3.05) than those who did not report t0 transactional sex (Table 3).

Our SEM works through three pathways, in addition to controlling for t0 engagement in transactional sex and sociodemographic factors. Figure 1 shows that there is a significant and medium effect between engaging in any transactional sex at t0 and transactional sex at t2. Controlling for past transactional sex, we found that relationship control by a main partner had a large effect size on future transactional sex with a casual partner or *khwapheni* ($d = 0.60$), while hazardous drinking had a medium effect size ($d = 0.45$) and food insecurity a small effect size ($d = 0.24$), (RMSEA 0.03, 90%CI: 0.02–0.04; CFI 0.97; TLI 0.96).

Discussion

This study is, to our knowledge, the first to quantitatively explore the pathways contributing to women's future engagement in transactional sex with a *khwapheni* or casual partner. We found that it is not just previous engagement in transactional sex which predicts future transactional sex. Consistent with other literature (Cluver et al., 2011; Dunkle et al., 2004; Greif, 2012; Kamndaya et al., 2016; Magni et al., 2015), this study found that social and structural factors are important pathways to future engagement in transactional sex. A novel finding is that higher relationship control in a main relationship is associated with transactional sex with a casual partner or *khwapheni*.

Prevalence of transactional sex with a *khwapheni* or casual partner in the past year was high with just over 40% of women aged 18–35 years reporting past year transactional sex. This is substantially higher than the 13.7% prevalence reported in 15–24 year-olds in five districts in South Africa (Duby et al., 2021). Although the measure of transactional sex was the same, we restricted transactional sex to casual partners or *khwapheni* in line recent guidance (Wamoyi et al., 2019). This study was conducted in one district only, with high unemployment, whereas Duby et al.'s study was conducted in five districts, not all of which comprised informal settlements.

The most common reason that women in this study gave for engaging in transactional sex was for cash or money to be looked after (35.3%). Although it is possible that women may be using the money received for luxury items, these findings suggest that material

Table 3. t0 factors associated with transactional sex at t2, $n = 448$.

	Unadjusted odds ratio	95% CI	p Value	Adjusted odds ratio	95% CI	p Value
Age in years t0	1.02	0.97–1.07	0.428	0.88	0.82–1.04	0.52
Completed high school education t0	0.53	0.34–0.72	<0.001	0.66	0.46–1.18	0.115
Food insecure t0	1.13	1.06–1.21	<0.001	1.11	1.02–1.22	0.018
Cohabitating t0	0.75	0.47–1.21	0.343			
Controlling behaviours by main partner t0	1.11	1.06–1.16	<0.001	1.06	1.00–1.12	0.05
Hazardous drinking t0	1.08	1.04–1.11	<0.001	1.04	1.00–1.09	0.05
Transactional sex t0	2.68	1.85–3.89	<0.001	1.90	1.19–3.05	0.008
Treatment arm	1.06	0.76–1.49	0.721			

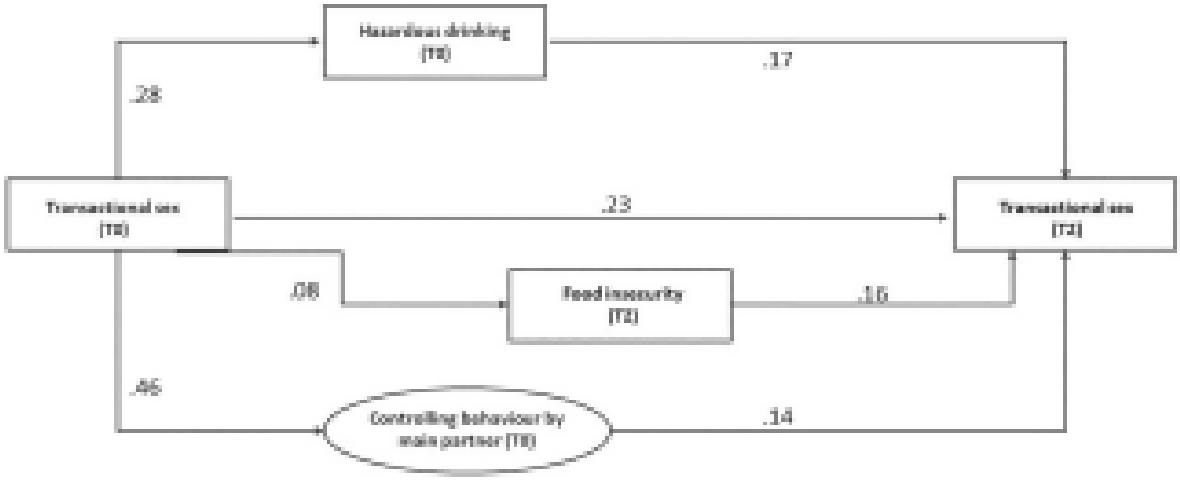

Figure 1. Structural equation model for pathways between controlling behaviours in main relationships, food insecurity, hazardous alcohol use, and transactional sex.

hardship and a lack of basic necessities seems to be driving a high proportion of transactional sex. The SEM demonstrates that controlling for baseline food insecurity, new food insecurity is an important pathway to future transactional sex. This is consistent with findings that food insecurity is associated with transactional sex (Cluver et al., 2011; Weiser et al., 2007) and the paradigm of transactional sex for "basic needs" described in the literature (Stoebenau et al., 2016).

Higher main partner relationship control is associated with transactional sex with a casual partner or *khwapheni*. Where main partners are aware of other sexual relationships women have, they may feel jealous and exert higher relationship control. There are two other potential explanations. Firstly, women in main relationships with high degrees of financial control may have to engage in transactional sex for basic needs. Alternatively, women in controlling relationships may attempt to assert their agency by choosing with whom, and partially, what the terms are, for a transactional sexual relationship. Another study found that young women reported finding sexual relationships with transactional partners stimulating (Duby et al., 2021). There may also be other reasons why women engage in transactional relationships with *khwapheni*. For instance, they may be seeking out expressions of love (Stoebenau et al., 2016) which they may not receive in their main relationship. Our data did not unpack these emotional pathways, but these would be worthwhile to explore in future studies.

Our finding that hazardous drinking is an important pathway contributing to transactional sex is consistent with other South African research (Magni et al., 2015). This may be because alcohol is a common and desired form of currency in transactional relationships (Pitpitan et al., 2014). Especially in taverns, it is widely understood that when men buy women alcoholic drinks it is likely to end in sex (Townsend et al., 2011; Watt et al., 2012).

Implications for policy and programming

The findings from this research have several important implications for transactional sex policy and programming.

Firstly, initial engagement in transactional sex needs to be addressed. However, it is critical that interventions do not treat all women who engage in the practice as homogenous. Programming needs to move beyond telling women to avoid "sugar daddies" on the assumption that the reason all women engage in transactional sex is to gain material goods. Understanding the underlying factors why women engage in transactional sex is an important first step. The next is developing tailored risk-reduction programmes to address these factors.

Secondly, to disrupt transactional sex pathways, interventions need to address food insecurity and behaviour simultaneously. Interventions which support women around job skills and savings can improve women's livelihoods, however the Stepping Stones and Creating Futures intervention while significantly improving young women's livelihoods did not see this translate into any impact on women's engagement in transactional sex at follow-up (Gibbs et al., 2020). This suggests that factors such as emotions and gender norms are also important to address in effectively reducing transactional sex.

Relationship dynamics with a main partner can influence the extent to which women engage in future transactional sex. This novel finding suggests that interventions need to address women's main partners in addition to their transactional sex partners. Gender transformative interventions aimed at couples, such as Indashyikirwa, have shown promise in reducing interpersonal violence (Dunkle et al., 2020) and could be adapted for South Africa.

Interventions addressing constructions of gender need to be implemented in conjunction with those to reduce entrenched poverty in women. Where women have controlling main relationships, it is unlikely that they will be able to keep much of their money. Without an alternative means of income, they are unlikely to escape the transactional sex cycle. Cash transfers which have shown promise in young women (Cluver et al., 2016), may be a more appropriate intervention to disrupt the transactional sex cycle where women have controlling main partners. An alternative may be to reconsider the policies on provision of food parcels or other food security assurances.

Finally, it is important to consider hazardous drinking. Brief interventions offer a promising way to address hazardous drinking in South Africa (Kalichman et al., 2007). However, if, as postulated, hazardous drinking in women is related to a wish to defy gender norms and to increase agency (Watt et al., 2012; Wolff et al., 2006), these alone are unlikely to be efficacious.

Limitations

Although this study makes use of rich panel data, the results of should be interpreted in light of its limitations. Data were self-reported. This may have resulted in respondent bias in reporting transactional sex. We aimed to limit this by asking participants to insert data themselves, but given widespread campaigns against "sugar daddies" it is possible that internalised sense of shame around these behaviours led to under- or skewed reporting of motives. That said, we measured transactional sex behaviours rather than measuring the labels such as "sugar daddies" or "blessers". Given that this study was conducted with women aged 18–30 years in one area, the findings are not generalisable to other age groups or regions. This study comprised secondary data analysis and the research questions were not designed *a priori*. With only two timepoints, we were unable to explore the bidirectional relationship between hazardous drinking and transactional sex in our SEM. Longitudinal panel data among this population is an area for future study.

Acknowledgements

The authors thank the participants in the studies who gave their time and information.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by UK Government's Department for International Development: [Grant Number What Works To Prevent Violence?].

References

Bhana, D., & Pattman, R. (2011). Girls want money, boys want virgins: The materiality of love amongst South African township youth in the context of HIV and AIDS. *Culture, Health & Sexuality, 13*(8), 961–972. https://doi.org/10.1080/13691058.2011.576770

Chatterji, M., Murray, N., London, D., & Anglewicz, P. (2005). The factors influencing transactional sex among young men and women in 12 sub-Saharan African countries. *Social Biology, 52*(1-2), 56–72. https://doi.org/10.1080/19485565.2005.9989099

Choudhry, V., Ambresin, A. E., Nyakato, V. N., & Agardh, A. (2015). Transactional sex and HIV risks - Evidence from a cross-sectional national survey among young people in Uganda. *Global Health Action, 8*(1), 27249. https://doi.org/10.3402/gha.v8.27249

Cluver, L., Orkin, M., Boyes, M., Gardner, F., & Meinck, F. (2011). Transactional sex amongst AIDS-orphaned and AIDS-affected adolescents predicted by abuse and extreme poverty. *JAIDS Journal of Acquired Immune Deficiency Syndromes, 58*(3), 336–343. https://doi.org/10.1097/QAI.0b013e31822f0d82

Cluver, L. D., Orkin, F. M., Yakubovich, A. R., & Sherr, L. (2016). Combination social protection for reducing HIV-risk behavior among adolescents in South Africa. *JAIDS Journal of Acquired Immune Deficiency Syndromes, 72*(1), 96–104. https://doi.org/10.1097/QAI.0000000000000958

Deitchler, M., Ballard, T., Swindale, A., & Coates, J. (2010). *Validation of a measure of household hunger for cross-cultural use*. Washington, DC: Food and Nutrition Technical Assistance II Project (FANTA-2), FHI 360.

Duby, Z., Jonas, K., McClinton Appollis, T., Maruping, K., Vanleeuw, L., Kuo, C., & Mathews, C. (2021). From survival to glamour: Motivations for engaging in transactional sex and relationships among adolescent girls and young women in South Africa. *AIDS and Behavior, 25*(10), 3238–3254. https://doi.org/10.1007/s10461-021-03281-z

Dunkle, K., Stern, E., Chatterji, S., & Heise, L. (2020). Effective prevention of intimate partner violence through couples training: A randomised controlled trial of Indashyikirwa in Rwanda. *BMJ Global Health, 5*(12), e002439. https://doi.org/10.1136/bmjgh-2020-002439

Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., & Harlow, S. D. (2004). Transactional sex among women in Soweto, South Africa: Prevalence,

risk factors and association with HIV infection. *Social Science & Medicine*, 59(8), 1581–1592. https://doi.org/10.1016/j.socscimed.2004.02.003

Fielding-Miller, R., Dunkle, K. L., Hadley, C., Cooper, H. L., & Windle, M. (2017). Agency as a mediator in the pathway from transactional sex to HIV among pregnant women in Swaziland: A multigroup path analysis. *Journal of the International AIDS Society*, *20*(1), 21554. https://doi.org/10.7448/IAS.20.1.21554

Gibbs, A., Washington, L., Abdelatif, N., Chirwa, E., Willan, S., Shai, N., Sikweyiya, Y., Mkhwanazi, S., Ntini, N., & Jewkes, R. (2020). Stepping stones and creating futures intervention to prevent intimate partner violence among young people: Cluster randomized controlled trial. *Journal of Adolescent Health*, *66*(3), 323–335. https://doi.org/10.1016/j.jadohealth.2019.10.004

Gibbs, A., Washington, L., Willan, S., Ntini, N., Khumalo, T., Mhatha, N., Sikweyiya, Y., Shai, N., Chirwa, E., Strauss, M., Ferrari, G., & Jewkes, R. (2017). The stepping stones and creating futures intervention to prevent intimate partner violence and HIV-risk behaviours in Durban, South Africa: Study protocol for a cluster randomised control trial, and baseline characteristics. *BMC Public Health*, *17*(1), 336. https://doi.org/10.1186/s12889-017-4223-x

Greif, M. J. (2012). Housing, medical, and food deprivation in poor urban contexts: Implications for multiple sexual partnerships and transactional sex in Nairobi's slums. *Health & Place*, *18*(2), 400–407. https://doi.org/10.1016/j.healthplace.2011.12.008

Hunter, M. (2010). *Love in the time of AIDS. Inequality, gender and rights in South Africa*. University of KwaZulu-Natal Press.

Jewkes, R., Morrell, R., Sikweyiya, Y., Dunkle, K., & Penn-Kekana, L. (2012). Transactional relationships and sex with a woman in prostitution: Prevalence and patterns in a representative sample of South African men. *BMC Public Health*, *12*(1), 325. https://doi.org/10.1186/1471-2458-12-325

Jewkes, R., Vundule, C., Maforah, F., & Jordaan, E. (2001). Relationship dynamics and teenage pregnancy in South Africa. *Social Science & Medicine*, *52*(5), 733–744. https://doi.org/10.1016/S0277-9536(00)00177-5

Jewkes, R. K., Dunkle, K., Nduna, M., & Shai, N. (2010). Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: A cohort study. *Lancet*, *376*(9734), 41–48. https://doi.org/10.1016/S0140-6736(10)60548-X

Jewkes, R. K., Nduna, M., Jama, N., Dunkle, K. L., & Levin, J. B. (2002). *Stendya, roll-ons and kit and runs: Using indigenous typology to measure number of sexual partners*. Paper presented at the XIVth International Conference on AIDS, Barcelona, Jul 7-12, 2002. (Abstract TuPpE2069).

Kalichman, S. C., Simbayi, L. C., Vermaak, R., Cain, D., Jooste, S., & Peltzer, K. (2007). HIV/AIDS risk reduction counseling for alcohol using sexually transmitted infections clinic patients in Cape Town, South Africa. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *44*(5), 594–600. https://doi.org/10.1097/QAI.0b013e3180415e07

Kamndaya, M., Vearey, J., Thomas, L., Kabiru, C. W., & Kazembe, L. N. (2016). The role of material deprivation and consumerism in the decisions to engage in transactional sex among young people in the urban slums of Blantyre, Malawi. *Global Public Health*, *11*(3), 295–308. https://doi.org/10.1080/17441692.2015.1014393

Kaufman, C. E., & Stavros, E. S. (2004). 'Bus fare please': The economics of sex and gifts among young people in urban South Africa. *Culture, Health & Sexuality*, *6*(5), 377–391. https://doi.org/10.1080/13691050410001680492. http://www.jstor.org/stable/4005305

Leclerc-Madlala, S. (2003). Transactional sex and the pursuit of modernity. *Social Dynamics*, *29*(2), 213–233. https://doi.org/10.1080/02533950308628681

MacPhail, C., & Campbell, C. (2001). 'I think condoms are good but, aai, I hate those things': Condom use among adolescents and young people in a Southern African township. *Social Science & Medicine*, *52*(11), 1613–1627. https://doi.org/10.1016/S0277-9536(00)00272-0

Maganja, R. K., Maman, S., Groves, A., & Mbwambo, J. K. (2007). Skinning the goat and pulling the load: Transactional sex among youth in Dar es Salaam, Tanzania. *AIDS Care*, *19*(8), 974–981. https://doi.org/10.1080/09540120701294286

Magni, S., Christofides, N., Johnson, S., & Weiner, R. (2015). Alcohol use and transactional sex among women in South Africa: Results from a nationally representative survey. *PLoS One*, *10*(12), e0145326. https://doi.org/10.1371/journal.pone.0145326

Mojola, S. A. (2014). *Love, money, and HIV: Becoming a modern African woman in the age of AIDS*. University of California Press.

Okigbo, C. C., McCarraher, D. R., Chen, M., & Pack, A. (2014). Risk factors for transactional sex among young females in post-conflict Liberia. *African Journal of Reproductive Health*, *18*(3), 133–141.

Pascoe, S. J. S., Langhaug, L. F., Mavhu, W., Hargreaves, J., Jaffar, S., Hayes, R., & Cowan, F. M. (2015). Poverty, food insufficiency and HIV infection and sexual behaviour among young rural Zimbabwean women. *PLoS One*, *10*(1), e0115290–e0115290. https://doi.org/10.1371/journal.pone.0115290

Pettifor, A. E., Measham, D. M., Rees, H. V., & Padian, N. S. (2004). Sexual power and HIV risk, South Africa. *Emerging Infectious Diseases*, *10*(11), 1996–2004. https://doi.org/10.3201/eid1011.040252

Pitpitan, E. V., Kalichman, S. C., Eaton, L. A., Watt, M. H., Sikkema, K. J., Skinner, D., Pieterse, D., & Cain, D. (2014). Men (and women) as "sellers" of sex in alcohol-serving venues in Cape Town, South Africa. *Prevention Science*, *15*(3), 296–308. https://doi.org/10.1007/s11121-013-0381-y

Pulerwitz, J., Gortmaker, S. L., & DeJong, W. (2000). Measuring sexual relationship power in HIV/STD research. *Sex Roles*, *42*(7), 637–660. https://doi.org/10.1023/A:1007051506972

Ranganathan, M., Heise, L., MacPhail, C., Stöckl, H., Silverwood, R. J., Kahn, K., Selin, A., Xavier Gómez-Olivé, F., Watts, C., & Pettifor, A. (2018). 'It's because I like things … it's a status and he buys me airtime': Exploring the role of transactional sex in young women's consumption patterns in rural South Africa (secondary findings from HPTN 068). *Reproductive Health*, *15*(1), 102. https://doi.org/10.1186/s12978-018-0539-y

Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative

project on early detection of persons with harmful alcohol consumption–II. *Addiction, 88*(6), 791–804. https://doi.org/10.1111/j.1360-0443.1993.tb02093.x

South African Government. (2012). *KwaZulu-Natal MECs launch campaign against 'Sugar Daddies'*.

StataCorp. (2015). *Stata statistical software: Release 14*. StataCorp.

Statistics South Africa. (2021). *Ethekwini*. Retrieved November 20, from http://www.statssa.gov.za/?page_id=1021&id=ethekwini-municipality

Stoebenau, K., Heise, L., Wamoyi, J., & Bobrova, N. (2016). Revisiting the understanding of "transactional sex" in sub-Saharan Africa: A review and synthesis of the literature. *Social Science & Medicine, 168*, 186–197. https://doi.org/10.1016/j.socscimed.2016.09.023

Stoebenau, K., Nair, R. C., Rambeloson, V., Rakotoarison, P. G., Razafintsalama, V., & Labonté, R. (2013). Consuming sex: The association between modern goods, lifestyles and sexual behaviour among youth in Madagascar. *Globalization and Health, 9*(1), 13. https://doi.org/10.1186/1744-8603-9-13

Townsend, L., Ragnarsson, A., Mathews, C., Johnston, L. G., Ekström, A. M., Thorson, A., & Chopra, M. (2011). "Taking care of business": alcohol as currency in transactional sexual relationships among players in Cape Town, South Africa. *Qualitative Health Research, 21*(1), 41–50. https://doi.org/10.1177/1049732310378296

Wamoyi, J., Ranganathan, M., Kyegombe, N., & Stoebenau, K. (2019). Improving the measurement of transactional Sex in Sub-Saharan Africa: A critical review. *JAIDS Journal of Acquired Immune Deficiency Syndromes, 80*(4), 367–374. https://doi.org/10.1097/QAI.0000000000001928

Wamoyi, J., Stobeanau, K., Bobrova, N., Abramsky, T., & Watts, C. (2016). Transactional sex and risk for HIV infection in sub-Saharan Africa: A systematic review and meta-analysis. *Journal of the International AIDS Society, 19*(1), 20992. https://doi.org/10.7448/IAS.19.1.20992

Wamoyi, J., Wight, D., Plummer, M., Mshana, G. H., & Ross, D. (2010). Transactional sex amongst young people in rural northern Tanzania: An ethnography of young women's motivations and negotiation. *Reproductive Health, 7*(1), 2. https://doi.org/10.1186/1742-4755-7-2

Watt, M. H., Aunon, F. M., Skinner, D., Sikkema, K. J., Kalichman, S. C., & Pieterse, D. (2012). "Because he has bought for her, he wants to sleep with her": Alcohol as a currency for sexual exchange in South African drinking venues. *Social Science & Medicine, 74*(7), 1005–1012. https://doi.org/10.1016/j.socscimed.2011.12.022

Weiser, S. D., Leiter, K., Bangsberg, D. R., Butler, L. M., Percy-de Korte, F., Hlanze, Z., Phaladze, N., Iacopino, V., & Heisler, M. (2007). Food insufficiency is associated with high-risk sexual behavior among women in Botswana and Swaziland. *PLoS Medicine, 4*(10), 1589–1597; discussion 1598. https://doi.org/10.1371/journal.pmed.0040260

Wojcicki, J. M. (2002). "She drank his money": survival sex and the problem of violence in taverns in Gauteng province, South Africa. *Medical Anthropology Quarterly, 16*(3), 267–293. https://doi.org/10.1525/maq.2002.16.3.267

Wojcicki, J. M., & Malala, J. (2001). Condom use, power and HIV/AIDS risk: Sex-workers bargain for survival in Hillbrow/Joubert Park/Berea, Johannesburg. *Social Science & Medicine, 53*(1), 99–121. https://doi.org/10.1016/S0277-9536(00)00315-4

Wolff, B., Busza, J., Bufumbo, L., & Whitworth, J. (2006). Women who fall by the roadside: Gender, sexual risk and alcohol in rural Uganda. *Addiction, 101*(9), 1277–1284. https://doi.org/10.1111/j.1360-0443.2006.01516.x

Zembe, Y. Z., Townsend, L., Thorson, A., & Ekström, A. M. (2013). "Money talks, bullshit walks" interrogating notions of consumption and survival sex among young women engaging in transactional sex in post-apartheid South Africa: A qualitative enquiry. *Globalization and Health, 9*(1), 28. https://doi.org/10.1186/1744-8603-9-28

Appendix 8: Predictors and patterns of transactional sex with casual partners among adult men living in an informal urban area, South Africa

AIDS and Behavior
https://doi.org/10.1007/s10461-020-02818-0

ORIGINAL PAPER

Predictors and Patterns of Transactional Sex with Casual Partners Among Adult Men Living in an Informal Urban Area, South Africa

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Abstract
Few studies have explored the relationship between transactional sex and HIV in adult men, with even fewer exploring the predictors of providing money or goods in exchange for sex. This study aimed to characterise the predictors and patterns of transactional sex in adult men in an urban informal area in South Africa. We used baseline, cross-sectional data from a study of 2406 men aged 18–40 years from an urban informal area. Past year transactional sex was assessed through questions adapted from those used previously. Controlling behaviour was measured using an adapted Sexual Relationship Power Scale. Multivariable logistic regression was used to determine associations between transactional sex and other potential explanatory variables. Nearly half (47%) of respondents who had ever had sex reported at least one type of transactional sex with a casual partner in the past year. A third of men provided support or money for a sex partner's family, 30% provided cash and 28% provided somewhere to stay. Controlling for other factors, men with higher levels of controlling behaviour had nearly double the odds of engaging in transactional sex. Men reporting three or more sexual partners had significantly higher odds of engaging in transactional sex. Hazardous drinkers had 33% higher odds of engaging in transactional sex. Men's provision of money or goods in exchange for sex with women is related to other high-risk behaviours, such as multiple sexual partners, hazardous drinking and controlling behaviour. To address transactional sex-related HIV risks, programming should address harmful masculinities, including relationship control.

Keywords HIV prevention · Transactional sex · Masculinity · Relationship control · South Africa

Introduction

Transactional sex usually refers to a sexual relationship which is primarily motivated by actual or anticipated gain [1]. The relationship between transactional sex and HIV infection in women has been well documented [1–4]. Although one study has demonstrated an association between transactional sex and HIV status in men [5], a systematic review and meta-analysis found no association [4]. In this study, transactional sex is defined as "non-commercial, non-marital sexual relationships motivated by implicit assumption that sex is exchanged for material goods or other benefits" [6].

Transactional sex almost always refers to women as the receivers of money or goods and men as the providers thereof [1, 3, 6]. In line with Connell's Theory of Gender and Power [7], literature suggests that men and women expect that men play a provider role. This shared expectation is central to transactional relationships [6, 8, 9]. Other than playing the role of a provider, little is known about what contributes to or motivates the "provider" to engage in transactional sex.

Only two studies have examined the factors associated with transactional sex in men in sub-Saharan Africa [9, 10]. Dunkle et al. investigated the factors associated with

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Published online: 03 March 2020

transactional sex in young men (15–26 years) in rural villages in Eastern Cape province and found that transactional sex was associated with higher socio-economic status, more adverse childhood experiences, more lifetime sexual partners, and alcohol use [10]. Jewkes et al. measured transactional sex in men aged 18–49 years from two provinces in South Africa. Transactional sex was more common in men with lower education levels, those who had low (but some) income and those aged 25–34 years [9].

The limited research focus in men restricts the extent to which transactional sex can be understood [9]. By only providing data for young women, existing literature inadvertently places the locus of control to alter sexual relationship dynamics that are widely outside of their control on women. This is particularly important in South Africa where there is a large focus on HIV prevention programming for adolescent girls and young women, despite increasing knowledge that their relationships are highly transactional in nature and are largely controlled by male sexual partners [11].

There is a clear gap in understanding the predictors of transactional sex in adult men from urban informal areas in South Africa. Urban informal areas comprise informal settlements [12] which are often under-resourced and lacking some of the basic necessities such as formal housing and water and sanitation [13]. This is critical because the 2012 South African seroprevalence survey demonstrated that HIV prevalence in informal urban areas was significantly higher than in formal urban areas or rural areas [13]. The aim of this paper is to characterise the predictors and patterns of transactional sex, or the provision of money or gifts in exchange for sex, with casual sexual partners or makhwapheni in adult men in an informal urban area in South Africa.

Methods

Design

Baseline data were drawn from a cluster randomised controlled trial in a peri-urban setting near Johannesburg, South Africa. The area where this study was conducted is made up of 13 "extensions" and many people reside in government-subsidised housing or informal shacks. Many residents lack access to basic services such as running water, sewage and rubbish removal. There are no exact population figures, but it is estimated that there are between a quarter and half a million residents in this area, many of whom are migrants from other African countries [14]. Two-thousand-four-hundred and six male volunteers aged 18–40 years of age, normally resident in the community, were recruited between January and July 2016. There were 18 clusters which represented different geographic neighbourhoods in the peri-urban setting with 120–150 male participants per cluster [14].

After recruitment, participants signed written informed consent prior to being interviewed. Questionnaires with inbuilt logic and skip patterns, were self-completed on tablets with audio assist. Research assistants were available to provide support to participants as they completed the detailed questionnaire. Further information on the study procedures are available elsewhere [14]. We present data from 2189 men who reported having sex at least once.

Measures

The University of the Witwatersrand's Human Research Ethics Committee (Medical) approved the study.

Past year transactional sex, or provision of money or goods in exchange for sex, was assessed through five questions adapted from those previously used in South Africa [9]. Per recent guidance on transactional sex measurement, questions were asked in relation to non-marital sexual partner(s) [15, 16], namely makhwapheni or casual partners. Participants were asked whether they thought a casual partner or makhwapheni had sex with them in the past 12 months primarily because she may receive a range of items (e.g. cell phone, gifts, food, a place to stay) from the respondent. Transactional sex was defined as a positive answer to one or more of the five questions [9]. The variable was dichotomised into no transactional sex and one or more types of transactional sex.

Based on previous research [10, 17], socio-demographic variables considered a priori as potential covariates included: age (continuous, per year), education (dichotomised into completed Grade 11 or less and completed Grade 12 or higher), food security (score dichotomised into food secure and food insecure [18]), time in the community (dichotomised closest to the sample mean of 7 years); and relationship status (cohabiting and not living together). Childhood trauma was measured using fifteen items from the Childhood Trauma Questionnaire [19] (Cronbach's alpha = 0.83) and was dichotomised into no childhood trauma and one or more childhood traumas.

We considered one attitudinal covariate based on the literature. Support for gender equitable attitudes was measured using nine items adapted for South Africa [20] from the Gender Equitable Men Scale [21]. Examples of the items, scored using a four level Likert scale, are: "I think a woman should obey her husband" and "I think a woman cannot refuse to have sex with her husband" (Cronbach's alpha = 0.85). Three levels were created: low, medium and high support for equitable gender norms.

Behaviours we measured included relationship control [22], hazardous alcohol use and multiple sexual partners (MSP) [10]. Relationship control was measured using a nine item scale derived from the Sexual Relationship Power Scale [22] and adapted for South Africa in previous

studies [23, 24]. Sample items included "I won't let my partner wear certain things" and "I tell my partner who she can spend time with" (Cronbach's alpha = 0.71). This scale was scored as a four-level categorical variable and higher scores indicated more controlling behaviour. It was dichotomised around the midpoint of the scale measurement [19]. Alcohol use was assessed using the Alcohol Use Disorders (AUDIT) scale (Cronbach's alpha = 0.81) and dichotomised into hazardous and non-hazardous drinking. A score of eight or more was considered hazardous [25]. MSP (less than or more than three in the past 12 months) was also included.

Analysis

All analyses were conducted in Stata v14 [26]. The pweight (probability weight) command was used to address clustering by neighbourhood to account for the fact that men from the same neighbourhoods may be similar. We present the sample description (Table 1) and patterns of transactional sex (Table 2) using frequencies and percentages. To understand the predictors of transactional sex in men, we developed a model using backwards stepwise, multivariable logistic regression analysis (Table 3). Sociodemographic and other relevant variables (experience of childhood trauma, attitudes to gender norms and behaviours) which were

Table 1 Sample description and associations between sociodemographic, attitudinal and behavioural factors and transactional sex in men who had ever had sex (%)

	Respondents who had ever had sex	Had any transactional sex in the past 12 months (n = 2117)		χ^2	P value
	n (%)	Yes, n (%)	No, n (%)		
Sociodemographic characteristics					
Age in years (n = 2189)					
18–27	1153 (52.67)	568 (56.57)	554 (49.78)		
28–40	1036 (47.33)	436 (43.43)	559 (50.22)	9.79	< 0.05
Completed high school education (n = 2093)					
Grade 12 or above	928 (44.34)	388 (41.01)	521 (48.06)	10.15	< 0.05
Food security (n = 2189)					
Food insecure	710 (32.43)	345 (34.36)	329 (29.56)	5.61	< 0.05
Time in the community (n = 2189)					
≤ 7 years	1096 (50.07)	477 (47.51)	577 (51.84)		
> 7 years	1093 (49.93)	527 (52.49)	536 (48.16)	3.96	< 0.05
Relationship status (n = 2169)					
Cohabiting	869 (40.06)	395 (39.74)	446 (40.29)		
Not living together	1300 (59.94)	599 (60.26)	661 (59.71)	0.07	> 0.1
Housing type (n = 2054)					
Own house	1356 (66.02)	629 (67.56)	688 (64.72)		
Own shack	244 (11.88)	104 (11.17)	131 (12.32)		
Rented shack	352 (17.14)	147 (15.79)	196 (18.44)		
Rented room	102 (4.97)	51 (5.48)	48 (4.52)	44.02	> 0.1
Past experiences					
Childhood trauma (n = 2189)					
One or more experiences	986 (45.04)	495 (49.30)	454 (40.79)	12.48	< 0.001
Attitudes					
Support for equitable gender norms (n = 2116)					
Low	1516 (71.64)	759 (78.01)	709 (65.11)		
Moderate	235 (11.11)	93 (9.56)	140 (12.86)		
High	365 (17.25)	121 (12.44)	240 (22.04)	44.02	< 0.001
Behaviours					
Relationship control (n = 1815)					
Higher control	1018 (56.09)	560 (65.34)	424 (46.75)	61.78	< 0.001
Alcohol (n = 2132)					
Hazardous alcohol use	867 (40.67)	459 (46.69)	385 (35.39)	27.35	< 0.001
Number sexual partners in the past 12 months (n = 2189)					
3 or more	658 (30.06)	457 (45.52)	173 (15.54)	226.88	< 0.001

Table 2 Patterns of transactional sex with a casual partner in the past 12 months

Transactional sex	Number	Percentage
Gave cash or money to be looked after	647	29.97
Gave somewhere to stay	613	28.34
Gave support or money for their children or family	709	32.84
Gave drugs, food, cosmetics, clothes, a cell phone, airtime, transportation or anything else they could not afford	537	24.92
Gave somewhere to sleep for the night, bills or school fees	513	23.82

Table 3 Factors associated with transactional sex, $n = 1631$

	Unadjusted odds ratio	95% CI	P value	Adjusted odds ratio	95% CI	P value
Age in years	0.97	0.95–0.99	<0.001	1.0	0.97–1.02	>0.1
Completed high school education	0.75	0.63–0.90	<0.05	0.86	0.67–1.09	>0.1
Food secure	0.80	0.67–0.96	<0.05	0.89	0.68–1.15	>0.1
Time in the community > 7 years	1.19	1.00–1.41	<0.05	1.31	1.03–1.67	<0.05
Multiple childhood traumas	1.59	1.23–2.07	<0.001	1.09	0.75–1.58	>0.1
Support for equitable gender norms						
High Support	Ref			Ref		
Moderate support	1.32	0.94–1.85	>0.1	0.97	0.60–1.56	>0.1
Low support	2.12	1.67–2.70	<0.001	1.10	0.77–1.57	>0.1
Controlling behaviours	2.15	1.77–2.60	<0.001	1.88	1.43–2.47	<0.001
Hazardous drinking	1.60	1.34–1.91	<0.001	1.34	1.04–1.71	<0.05
≥ 3 sexual partners in past 12 months	4.54	3.70–5.57	<0.001	3.86	2.92–5.10	<0.001

selected on the basis of theoretical relevance and being independently associated with transactional sex (P value < 0.1 in the bivariate analysis), were included in the model. The results of the final logistic regression models are reported using Adjusted Odds Ratios (AORs) and 95% confidence intervals (CIs).

Results

The mean age of men who had ever had sex was 27.7 years (SD = 5.6). Some 44% ($n = 928$) had completed high school and nearly a third (32.4%) were classified as food insecure. Sixty percent had a sexual partner who they did not live with. Nearly two thirds (66.8%) lived in their own house. Just under half (47%, $n = 1004$) had transactional sex in the year preceding the survey.

Table 1 shows that prevalence of transactional sex was higher in men aged 28–40 years, those who had completed Grade 11 or below and those who were food insecure. There were also significant relationships between transactional sex and, time in the community, childhood trauma, inequitable gender norms, relationship control, hazardous drinking and MSP.

Respondents were asked whether any past-year casual partners had sex with them because they *expected to receive, or did receive*, something from them. Table 2 shows that 30% of men who had sex reported having provided cash or money to look after their sex partner and 28% said they gave a sex partner somewhere to stay. A third (32.8%) reported having provided support or money for a sex partner's children or family. Provision of goods like drugs, cell phones or airtime was reported by 25%. Some 24% said that they provided somewhere for their sex partner to sleep or money for school fees.

Table 3 shows the unadjusted and adjusted results from the logistic regression analysis. Compared with men who had lived in the community for seven years or less, those who lived in the community for more than seven years had higher odds of transactional sex. Men reporting greater relationship control had nearly double the odds of engaging in transactional sex than those with lower levels of relationship control (AOR = 1.88, 95% CI 1.43–2.47). Hazardous drinkers had 34% higher odds of engaging in transactional sex than non-hazardous drinkers. Men reporting three or more sexual partners had significantly higher odds of having had any transactional sex (AOR 3.86, 95% CI 2.92–5.10) than those with two or fewer sexual partners in the preceding year.

Discussion

Nearly half (47%) of men in an informal South African settlement reported engaging in transactional sex in the past 12 months, suggesting transactional sex is a common practice in this setting. This study found that men reported provision of money or goods in exchange for sex for a variety of reasons. Men who had three or more sexual partners in the previous year, those who drank at a hazardous level, those with controlling behaviours and those who had lived in the community for 7 or more years had higher odds of engaging in transactional sex.

Prevalence of transactional sex in this study was significantly higher than the 2007 study with young men (17.7%) [10]. There are several plausible reasons for this difference. Firstly, this study was conducted in a peri-urban informal setting where income disparities, which are associated with transactional sex, are higher than in rural settings, where the 2007 study was conducted [10]. Secondly, this study comprised older participants than the 2007 study of 15–26-year-olds. Other research has found that transactional sex is more common in older men (aged 25–34 years) [9]. A third possibility is that reporting on expectations of "providing" may be more common in 2016 than nine years ago. This is may be due to the intense media coverage of "blessers" [27], the term used on social media in South Africa to describe men who offer money or gifts for sexual relationships with younger partners [28].

Prevalence in this study however, was lower than the 66% prevalence in the 2012 study with men aged 18–49 years [9]. It is possible that this is related to a slight difference in measurement of transactional sex. The 2012 study asked about transactional sex in both main partners and makhwapheni, whereas this study asked about transactional sex in relation to casual partners only. By including main partners, it is possible that the 2012 study may have over-estimated prevalence of transactional sex, and that this accounts for the difference between the two studies. Another potential reason is the rising cost of living, making transactional sex more expensive currently than in the previous study.

The high levels of transactional sex in this setting could be explained by gender norms and constructions of masculinities. This is especially true where men report higher levels of controlling behaviours and more sexual partners. It is possible that men in this informal settlement are trying to fulfil the gender norm of men as providers for their sexual partners [29]. The male provider role is normative in many parts of the world and is an accepted way of enacting hegemonic masculinity [7, 30]. Historically in South Africa, being able to provide as a man has been a prerequisite for marriage, with men only getting married once they could establish a homestead [29]. With low marriage levels in this study, it is plausible that many men feel they would not have had the opportunity for relationships if they did not fulfil this provider role [29] and when they do act as a provider, they should be rewarded with sex [9].

Our findings suggest a large number of men think that their casual partners had sex with them because they provided, *or felt they were expected to provide*, a wide range of goods including support, money or a place to stay for their sexual partner or her family. However, since the questions required men to speculate on their sexual partners motives for having sex with them, we are unable to definitively state that the provider role is the reason large numbers of men have transactional sex.

It is possible that men are engaging in transactional sex for sexual pleasure [31]. However, we suggest that the reason many men from this urban informal area engage in transactional sex is to exert power and control as described in Connell's Theory of Gender and Power [7]. Research has demonstrated that where power dynamics do not exist, such as where men are poor and unemployed, men may try to assert their masculinity in other ways, such as though sexual behaviour, hazardous drinking and violence [32, 33].

Consistent with other research with men in South Africa [34], our analysis found that men who were hazardous drinkers had higher odds of engaging in transactional sex. This is likely due to alcohol affecting risk perception, particularly in a tavern-type environment [35, 36]. In line with other studies [37], we also found that there was an association between MSP and transactional sex. We suggest that men in this informal settlement are exerting their masculinities through MSP and that transactional sex is one way for these men to have several casual partners in this setting.

The argument that men are using transactional sex to assert their masculinity is bolstered by our finding that the likelihood of engaging in transactional sex was higher in men with high levels of controlling behaviour. Transactional sex can lead to a power imbalance in relationships, for instance women who receive money or goods often have to accept sex on the provider's terms e.g. without a condom [38, 39]. However, our research suggests that men with controlling relationship attitudes have higher odds of transactional sex. This is in line with Dunkle et al. who suggest that transactional sex in main and casual relationships is part of a broader scale of gendered power and control [10]. Taken together, this suggests that the relationship between masculinity and controlling behaviour is bi-directional. Men with hyper-masculine beliefs and behaviour are more likely to engage in transactional sex and men engaging in transactional sex may use this as a means to control the terms around sex.

Other factors associated with transactional sex in men identified in the literature are: childhood trauma [40] and

attitudes towards gender equitable norms [41, 42]. Gibbs et al. found that past year transactional sex was associated with childhood experience of emotional, physical and sexual abuse [43]. Men who have inequitable gender beliefs or attitudes or control their partners are more likely to engage in transactional sex [24, 41, 42]. Although we measured and included these variables in our analysis, neither were significant in our final model.

This paper has contributed new knowledge to a gap in the literature around the predictors and patterns of transactional sex in adult men in an urban informal area in South Africa. However, there are several limitations. Firstly, this study was a cross-sectional study which made use of questions which required men to report their behaviour. Secondly, our questions required men to speculate about the motives of their sexual partners. It is possible that this may have resulted in inaccurate reporting. Response bias, comprising under or over-reporting, either deliberately, or through misconstruing women's intentions, is a recognised issue in transactional sex research. Thirdly, social desirability bias in relation to reporting of transactional sex may be present. Although self-complete questionnaires were used to try and reduce this, respondents may still have over- or under-reported transactional sex depending on whether they thought that it was normal for a man to "provide" or socially unacceptable to engage in transactional sexual relationships. Finally, this study did not explore the reasons why men reported engaging in transactional sex. Jewkes et al. suggest that measuring motivations for sexual relationships in those who "provide" gifts or money in exchange for sex (usually men) is difficult. This is because those involved in the partnership may have different motivations [9]. Despite the challenges, exploring motivations would be a useful addition to future studies with men.

Implications for Policy and Practice

Women in sub-Saharan Africa remain at higher risk for HIV infection than their male counterparts. Transactional sex is one of the drivers of HIV infection but literature on the subject has largely focused on women. Unintentionally this may place responsibility to change sexual relationship dynamics, which are largely outside of their control, on women. This study is different in that it explores the patterns and predictors of transactional sex, or provision of money or goods in exchange for sex, in the providers (men).

The findings from this study suggest that rather than HIV prevention interventions focusing solely on trying to stop transactional sex, programmes should address transactional sex in the context of provider norms, masculinity and the concept of control of women in relationships. Interventions like Stepping Stones [44] have been successful in shifting harmful gender norms in men, although these interventions may need to be adapted for older men in informal areas. Participants should be required to critically reflect on relationship control and how this contributes to HIV risk through transactional sex. Interventions to reduce risk of HIV through transactional sex in men need to also address MSP and hazardous alcohol use.

Conclusion

Prevalence of transactional sex with a casual partner is common in the informal setting in which this study was conducted. Predictors include hazardous drinking, having MSP and exhibiting greater relationship control. To address the HIV risk related to transactional sex, programmes should address issues pertaining to harmful masculinities. Motivations for engaging in transactional sex in men should be further explored.

Acknowledgements The Sonke CHANGE Trial was funded by the What Works to Prevent Violence? A Global Programme on Violence Against Women and Girls funded by the United Kingdom Government's Department for International Development. This study was supported by funding from the South African Medical Research Council's Office of AIDS and TB Research.

Author Contributions SM, AH, JW and NC conceived and designed the experiments. SM analysed the data. SM, AH, JW and NC wrote the paper. All authors have read and approved the final manuscript.

Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

References

1. Dunkle KL, Jewkes RK, Brown HC, Gray GE, McIntryre JA, Harlow SD. Transactional sex among women in Soweto, South Africa: prevalence, risk factors and association with HIV infection. Soc Sci Med. 2004;59(8):1581–92.
2. Kilburn K, Ranganathan M, Stoner MCD, Hughes JP, MacPhail C, Agyei Y, et al. Transactional sex and incident HIV infection in a cohort of young women from rural South Africa. AIDS (London, England). 2018;32(12):1669–777.
3. Ranganathan M, Heise L, Pettifor A, Silverwood RJ, Selin A, MacPhail C, et al. Transactional sex among young women in rural South Africa: prevalence, mediators and association with HIV infection. J Int AIDS Soc. 2016;19(1):20749.
4. Wamoyi J, Stobeanau K, Bobrova N, Abramsky T, Watts C. Transactional sex and risk for HIV infection in sub-Saharan Africa: a systematic review and meta-analysis. J Int AIDS Soc. 2016;19(1):20992.
5. Choudhry V, Ambresin AE, Nyakato VN, Agardh A. Transactional sex and HIV risks—evidence from a cross-sectional national survey among young people in Uganda. Global Health Action. 2015;8:27249.

6. Stoebenau K, Heise L, Wamoyi J, Bobrova N. Revisiting the understanding of "transactional sex" in sub-Saharan Africa: a review and synthesis of the literature. Soc Sci Med. 1982;2016(168):186–97.
7. Connell R. Gender and power. Stanford, CA: Stanford University Press; 1987.
8. Stoebenau K, Kyegombe N, Bingenheimer JB, Ddumba-Nyanzi I, Mulindwa J. Developing experimental vignettes to identify gender norms associated with transactional sex for adolescent girls and young women in Central Uganda. J Adolesc Health. 2019;64(4):S60–S6666.
9. Jewkes R, Morrell R, Sikweyiya Y, Dunkle K, Penn-Kekana L. Transactional relationships and sex with a woman in prostitution: prevalence and patterns in a representative sample of South African men. BMC Public Health. 2012;12:325.
10. Dunkle KL, Jewkes R, Nduna M, Jama N, Levin J, Sikweyiya Y, et al. Transactional sex with casual and main partners among young South African men in the rural Eastern Cape: prevalence, predictors, and associations with gender-based violence. Soc Sci Med. 2007;65(6):1235–48.
11. Council P. Male partners of adolescent girls and young women: relationship characteristics and HIV risk—findings from DREAMS implementation science research. Washington, DC: DREAMS Results Brief; 2018.
12. Statistics South Africa. Census 2001: investigation into appropriate definitions of urban and rural areas for South Africa: Discussion document/Statistics South Africa. Pretoria, South Africa.
13. Shisana O, Rehle T, Simbayi LC, Zuma K, Jooste S, Zungu N, Labadarios D, Onoya D, et al. South African National HIV Prevalence, Incidence and Behaviour Survey, 2012. Cape Town: HSRC Press; 2014.
14. Christofides NJ, Hatcher AM, Pino A, Rebombo D, McBride RS, Anderson A, et al. A cluster randomised controlled trial to determine the effect of community mobilisation and advocacy on men's use of violence in periurban South Africa: study protocol. BMJ Open. 2018;8(3):e017579.
15. Wamoyi J, Ranganathan M, Kyegombe N, Stoebenau K. Improving the measurement of transactional sex in Sub-Saharan Africa: a critical review. JAIDS J Acquir Immune Defic Syndr. 2019;80(4):367–74.
16. Wamoyi JSK, Kyegombe N, Heise L, Ranganathan M. STRIVE Technical Brief: Measuring transactional sex and HIV risk. London; 2017.
17. Gibbs A, Hatcher A, Jewkes R, Sikweyiya Y, Washington L, Dunkle K, et al. Associations between lifetime traumatic experiences and HIV-risk behaviors among young men living in informal settlements in South Africa: a cross-sectional analysis and structural equation model. J Acquir Immune Defic Syndr. 2019;81(2):193–201.
18. Deitchler M, Ballard T, Swindale A, Coates J. Validation of a measure of household hunger for cross-cultural use. Washington, DC: Food and Nutrition Technical Assistance II Project (FANTA-2), Academy for Educational Development; 2010.
19. Bernstein DP, Stein JA, Newcomb MD, Walker E, Pogge D, Ahluvalia T, et al. Development and validation of a brief screening version of the Childhood Trauma Questionnaire. Child Abuse Neglect. 2003;27(2):169–90.
20. Jewkes R, Morrell R. Gender and sexuality: emerging perspectives from the heterosexual epidemic in South Africa and implications for HIV risk and prevention. J Int AIDS Soc. 2010;13:6.
21. Pulerwitz J, Barker G. Measuring attitudes toward gender norms among young men in Brazil: development and psychometric evaluation of the GEM Scale. Men Masc. 2008;10(3):322–38.
22. Pulerwitz J, Gortmaker SL, DeJong W. Measuring sexual relationship power in HIV/STD research. Sex Roles. 2000;42(7):637–60.
23. Jewkes RK, Dunkle K, Nduna M, Shai N. Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: a cohort study. Lancet (London, England). 2010;376(9734):41–8.
24. Kaufman MR, Shefer T, Crawford M, Simbayi LC, Kalichman SC. Gender attitudes, sexual power, HIV risk: a model for understanding HIV risk behavior of South African men. AIDS Care. 2008;20(4):434–41.
25. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the alcohol use disorders identification test (AUDIT): WHO Collaborative Project on early detection of persons with harmful alcohol consumption—II. Addiction (Abingdon, England). 1993;88(6):791–804.
26. StataCorp. Stata Statistical Software: Release 14. College Station, TX; 2015.
27. Mampane JN. Exploring the "Blesser and Blessee" phenomenon: young women, transactional sex, and HIV in rural South Africa. SAGE Open. 2018;8(4):2158244018806343.
28. Dube Y. Social media fuels transactional sex. The Chronicle. 2016;2016:23.
29. Hunter M. Love in the time of AIDS: inequality, gender and right in South Africa. Pietermaritzburg: University of KwaZulu-Natal Press; 2010.
30. Wentzell E. 'I help her, she helps me:' Mexican men performing masculinity through transactional sex. Sexualities. 2014;17(7):856–71.
31. Wamoyi J, Buller AM, Nyato D, Kyegombe N, Meiksin R, Heise L. "Eat and you will be eaten": a qualitative study exploring costs and benefits of age-disparate sexual relationships in Tanzania and Uganda: implications for girls' sexual and reproductive health interventions. Reprod Health. 2018;15(1):207.
32. Hatcher AM, Colvin CJ, Ndlovu N, Dworkin SL. Intimate partner violence among rural South African men: alcohol use, sexual decision-making, and partner communication. Culture Health Sex. 2014;16(9):1023–39.
33. Fleming PJ, DiClemente RJ, Barrington C. Masculinity and HIV: dimensions of masculine norms that contribute to men's HIV-related sexual behaviors. AIDS Behav. 2016;20(4):788–98.
34. Bello B, Moultrie H, Somji A, Chersich MF, Watts C, Delany-Moretlwe S. Alcohol use and sexual risk behaviour among men and women in inner-city Johannesburg, South Africa. BMC Public Health. 2017;17(Suppl 3):548.
35. Morojele NK, Kachieng'a MA, Mokoko E, Nkoko MA, Parry CD, Nkowane AM, et al. Alcohol use and sexual behaviour among risky drinkers and bar and shebeen patrons in Gauteng province, South Africa. Soc Sci Med. 2006;62(1):217–27.
36. Rich EP, Nkosi S, Morojele NK. Masculinities, alcohol consumption, and sexual risk behavior among male tavern attendees: a qualitative study in North West Province. South Africa Psychol Men Masc. 2015;16(4):382–92.
37. Onoya D, Zuma K, Zungu N, Shisana O, Mehlomakhulu V. Determinants of multiple sexual partnerships in South Africa. J Public Health (Oxford, England). 2015;37(1):97–106.
38. Meekers D, Calves AE. 'Main' girlfriends, girlfriends, marriage, and money: the social context of HIV risk behaviour in sub-Saharan Africa. Health Transit Rev. 1997;7(Suppl):361–75.
39. 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(11):1613–27.
40. Gibbs A, Hatcher AM, Jewkes R, Sikweyiya Y, Washington L, Dunkle K, Magni S, Peacock D, Khumalo M, Christofides N (accepted for publication). Associations between lifetime traumatic experiences and HIV-risk behaviours amongst young men living in informal settlements in South Africa: a cross-sectional analysis and structural equation model. JAIDS.

41. Shannon K, Leiter K, Phaladze N, Hlanze Z, Tsai AC, Heisler M, et al. Gender inequity norms are associated with increased male-perpetrated rape and sexual risks for HIV infection in Botswana and Swaziland. PLoS ONE. 2012;7(1):e28739.
42. Jewkes R, Morrell R. Hegemonic masculinity, violence, and gender equality: using latent class analysis to investigate the origins and correlates of differences between men. Men Masc. 2017. https://doi.org/10.1177/1097184X17696171.
43. Gibbs A, Dunkle K, Washington L, Willan S, Shai N, Jewkes R. Childhood traumas as a risk factor for HIV-risk behaviours amongst young women and men living in urban informal settlements in South Africa: a cross-sectional study. PLoS ONE. 2018;13(4):e0195369.
44. 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 randomised controlled trial. BMJ (Clin Res ed). 2008;337:a506.

Appendix 9: Author contributions

Paper	Author contribution
Magni, S., Abdelatif, N., Hatcher, A., Wamoyi, J., and Christofides, N. *Masculinities, engagement in transactional sex, alcohol misuse and violence: a latent class analysis of young adult men*. In submission	SM and NC conceived the presented idea. SM undertook the latent class analysis and other data analysis under the guidance of NA. SM wrote the manuscript. NC, AH and JW contributed to the interpretation of results. All authors discussed the results and supported the final manuscript.
Magni, S. Hatcher, A. Gibbs, A. Wamoyi, J. Dunkle, K. Christofides, N. *AIDSImpact special issue: pathways to transactional sex among peri-urban South African women: the role of relationship control, food insecurity, and alcohol misuse*. AIDS Care, 2024: 9:1-8.	SM, AH and NC devised the paper. SM undertook the analysis, supported by AH who verified the results. SM took the lead in writing the manuscript. AG and KD made the data available. All authors (AH, AG, JW, KD and NC) provided critical feedback and helped shape the discussion and manuscript.
Magni, S., Hatcher, A.M., Wamoyi, J., Christofides, N. *Predictors and Patterns of Transactional Sex with Casual Partners Among Adult Men Living in an Informal Urban Area, South Africa*. AIDS and Behavior. 2020; 24, 2616–2623.	SM conceptualised the paper with input from AH, JW and NC. SM led on the analysis. And manuscript writing. AH, JW and NC provided significant input into the results and helped to shape the discussion and implications. All authors approved the manuscript.

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