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**Title: Homonegativity, sexual violence and condom use with women in men who have sex with men and women in West Africa (CohMSM)**

**Short title: Homonegativity among MSM and sexual violence and HIV-risk behaviors with women**

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## **Introduction**

In West Africa countries, HIV prevalence is considerably higher among MSM compared to the general adult population [1–4]. Negative perceptions and attitudes regarding same-sex behaviours, so-called homonegativity, results in widespread marginalization, stigma and police brutality of MSM [2,5,6], in poorer access to health services and increased HIV-risk behaviors [2,5], and in internalized homonegativity which refers to self-hatred, shame and denial of one's own sexuality in a homosexual person [7]. The effect of internalized homonegativity on mental health and intimate partner violence (IPV) between MSM is widely documented in Western settings [8–12]. Internalized homonegativity has also been associated with HIV-positive status and with male-to-male HIV-risk behaviours in Sub-Saharan Africa [13,14]. While, IPV is known to be a driver for HIV transmission, in homosexual [15] and in heterosexual relationships [16]. Specific psychosocial issues may affect the subpopulation of men who have sex with men and women (MSMW) [17] when compared to men who are exclusively MSM (EMSM), such as higher internalized homonegativity [18–20], less community support [19,21], and stigma from EMSM, female partners or healthcare workers [17,22].

In Sub-Saharan Africa, where heteronormativity is very present [23], a high proportion of MSM also have female partners [24–29]. The complex interactions between HIV-risk behaviors, IPV, homonegativity and other psychosocial issues, referred to as a “syndemic” [30–32], has not been studied in detail for heterosexual partnerships of MSMW, despite being a potential bridge for HIV transmission to the general population [2].

We aimed to evaluate the extent of this risk for bridging HIV between MSM and women in West Africa and associated factors, with a special focus on the role of social and internalized homonegativity among MSMW on violence and sexual risk with female partners.

## **Methods**

### *Study design*

The CohMSM ANRS 12324 - Expertise France study was a prospective cohort study implemented in Bamako (Mali), Ouagadougou (Burkina Faso), Abidjan (Côte d'Ivoire) and Lomé (Togo), aiming to evaluate a quarterly HIV prevention package for MSM in community-based clinics [33–36]. Eligibility criteria were age  $\geq 18$  years and reporting at least one anal intercourse with a male partner in the previous 3 months. Demographic and socioeconomic data were collected once at baseline (M0) and psychosocial and behavioral data every 6 months (M0, M6, M12, M18, M24, M30). Participants provided written consent. The National Ethics Committees of Côte d'Ivoire (N°021/MSLS/CNER-dkn), Togo (N°008/2016/MSPSCAB/SG/DPML/CBRS), Burkina Faso (N°2015-3-037) and Mali (N°2015/32/CE/FMPOS) approved the study.

#### *Study population*

Only HIV-negative MSM who completed the questionnaire at baseline (M0) and at least one other questionnaire were included in the present analysis. Data of participants who seroconverted during follow-up were censored at the time of HIV seroconversion. The database was transformed in order to account for *ex-ante* (t-1) and *ex-post* (t) pairs data (called observations hereafter) for the same participant (i.e. M0-M6, M6-M12, etc.). We selected observations where in the *ex-ante* and/or *ex-post* data, a respondent matched our definition of an MSMW, *ie.* declaring a wife, girlfriend or a female casual partner.

#### *Outcomes (defined for the previous 6 months)*

- Perceived and internalized homonegativity : dichotomous variable using the median homonegativity score, measured from 11 and 8 assertions, respectively, assessing the participant's perception of social stigma of MSM and of his own same-sex behavior, using the scale developed by Ha et al [37].
- Perpetrating sexual violence on female partner(s): having used physical force, threats or psychological pressure to have sex with female partner(s).
- Experiencing sexual violence from female partner(s)

- Homonegative aggression : harassment, or verbal or physical aggression (teasing, glares, insults, stones throwing, beating) due to the participant's sexual orientation

*Time-varying variables (defined for the previous 6 months)*

- Inconsistent condom use with female partners : not always using a condom during vaginal or anal sex.
- Homonegative discrimination: feeling treated unfairly because of sexual orientation in general, by family, at work or school, at a party, in the street or another public space, or in public administration offices.
- Depression score (Patient Health Questionnaire (PHQ-9) [38]).
- Receiving support from family
- Self-defined homosexual or gay sexual orientation.

*Statistical analyses*

For each of the four outcomes of interest, bivariate analyses were performed to identify associations between the outcome at t with the same outcome at t-1, the three other outcomes at t, the time-varying variables and socioeconomic and demographic baseline characteristics. Variables with a p-value lower than 0.20 in these analyses were considered eligible for multivariate analysis. We implemented a 4-equation multivariate probit, which assumes that outcomes may be closely related and likely to influence each other, accounted for unobserved heterogeneity by allowing the correlation of error terms and offered more accurate estimates than using separate probit models [39]. All statistical analyses were performed using R software version 3.5.3.

## **Results**

### *Study population*

Seven hundred and two *ex-ante* – *ex-post* observations of MSMW (where a female partner was declared) corresponding to 1104 visits in total and 326 participants (*ie.* 56% of the total HIV-

negative CohMSM participants) were included. Table 1 provides sociodemographic and economic characteristics at baseline and psychosocial and behavioral data for all visits during follow-up.

### *Associated factors with outcomes of interest*

A positive trend existed between the two outcomes, perpetrating and experiencing sexual violence with female partners, at time t (figure 1, appendix 1). Internalized and perceived homonegativity and having depressive symptoms at time t-1 tended to lead to perpetrating sexual violence on female partners at time t (figure 1, appendix 2). At time t, perpetrating sexual violence on female partners was positively associated with inconsistent condom use with female partners. Experiencing homonegative aggression at time t was positively associated with internalized and perceived homonegativity, with experiencing homonegative discrimination at time t-1 and with perpetrating sexual violence on female partners at time t-1. A negative trend existed between homonegativity at time t and experiencing homonegative discrimination at time t-1.

## **Discussion**

### *Social and internalized homonegativity and violence with women*

Our study reported a high level of perceived and internalized homonegativity, as well as recent homonegative aggression and discrimination, which were declared in approximately one sixth of the study visits. This corroborates that same-sex behaviors are not well accepted socially [24,40–42], although not illegal, except in Togo [43]. Our study suggests a temporal escalation in homonegative experiences, with greater discrimination leading to aggression. Existing literature shows that social and internalized homonegativity and bisexual behaviors are associated with IPV among MSM [11,12,15,44–46]. Our study adds that internalized homonegativity also increases sexual IPV in heterosexual relationships of MSMW, these relationships in some cases possibly being driven by the difficulty in accepting one's homosexuality, social pressure, feeling of guilt regarding religion or family, and the desire to have children [24,47]. The current study also showed that depressive symptoms increased perpetrating sexual violence on female partners, as

observed in heterosexual men [48]. MSMW support should include activities to improve psychosocial health and to reduce internalized homonegativity.

### ***Risk of HIV bridging to women***

Perpetrating violence on female partners was associated with inconsistent condom use with female partners. Similarly in studies investigating heterosexual and homosexual relationships, perpetrating or experiencing IPV was shown to be associated with HIV sexual risk behaviors [49,50], and with increased HIV incidence in victimized women [16,51,52].

Thus, violence of MSMW with their female partners is an aggravating factor for the potential risk of HIV bridging between MSMW and women [17,53]. Indeed, half of participants included in the CohMSM cohort reported having female partners, which is in line with previous studies in MSM in sub-Saharan Africa [24–26,45,46,54–57], but higher than the proportions found among MSM in Western countries [58,59], probably due to the greater social pressure to lead a heterosexual lifestyle in the African context. Rates of inconsistent condom use with women among MSMW are worryingly high, something observed elsewhere in sub-Saharan Africa [24,26,28,54,56,60], and increased by violence (directly) and homonegativity (indirectly). In the present study, inconsistent condom use was similar with male and casual female partners, but twice as high with wives. This is possibly due to lower risk perception and less disclosure of MSM status to steady female partners [47] or to some MSMW's desire to have children, which is one reason to enter into a relationship with a female partner [17,28,53] especially for those who felt social norms of masculinity and fatherhood more strongly [61].

Although rates of inconsistent condom use with women among MSMW and in the general population are similar [28], female partners of MSMW are considered more vulnerable to HIV acquisition because of the high HIV prevalence in the MSM population [1]. In addition, sub-Saharan African MSMW might be especially concerned by more frequent STI and paid sex and less frequent HIV testing than EMSM [26,29,57]. However, MSMW are less concerned for other HIV-risk factors than EMSM, which includes less frequent sexual encounters, receptive anal sex

positioning and inconsistent condom use with male partners and lower HIV prevalence [25,35,54,57]. In Kenya, HIV bridging is infrequent between MSM and heterosexual networks and occurs more within these heterosexual networks than between these networks, as demonstrated by a phylogenetic study [62]. Therefore, the hypothesis of an HIV bridge between MSMW and women in Sub-Saharan Africa remains unclear.

### ***Limitations and strengths***

The main limitation of the present study is the uncertainty related to self-reporting behaviors and perceptions. Those with very high internalized homonegativity and secret MSM activity are most likely difficult to reach in community-based MSM research due to fear of disclosure [53], as well as those who are not connected to any MSM community. Our results are therefore not representative of the full population of MSMW in the study countries. To our knowledge, this is the first study to explore longitudinal relationships between sexual violence with female partners in particular and homonegativity among MSM in Africa, and their effect on condom use with female partners. Furthermore, our results add to current knowledge about the syndemic of violence (social and/or partner) and HIV among women and among MSM.

### ***Recommendations***

Given the high prevalence of HIV in West African MSM, together with widespread condom-less sex with women in MSMW, and the aggravating effect of social and internalized homonegativity, there is a need for more sociobehavioral research comparing MSMW with MSM. Sexual behaviors, IPV and partner characteristics, should be analyzed separately according to the partners' gender. This research would help in evaluating the risk of HIV bridging to women, in adapting HIV and IPV prevention strategies, and in designing specific support activities for MSMW, taking into account their female, MSM and MSMW partners.

Some MSMW's desire to have children and non-disclosure of same-sex activities may complicate recommending condom use in MSMW who have steady heterosexual relationships [28]. Frequent



HIV testing and PrEP use should be investigated as possible additional strategies to address HIV risk in heterosexual relationships of West African MSM [33].

The study's results pave the way for further research into the under-explored syndemic of homonegativity, IPV and HIV risk among MSMW. Such research would help efforts to advocate, from a public health perspective, against the existing homonegativity in West Africa and violence towards women.

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Marion FIORENTINO did the literature search, defined the research question, supervised data analysis, interpreted the data and wrote the manuscript. August EUBANKS analyzed and interpreted the data. Pierre-Julien COULAUD participated in data collection and critically revised the manuscript. Clotilde COUDERC participated in the cohort study's conception, design and data collection. Bintou Dembélé KEITA, Camille ANOMA, Elias DAH, Ephrem Mensah, participated in data collection. Daniela ROJAS-CASTRO participated in the cohort study's conception and design. Christian LAURENT, Luis SAGAON-TEYSSIER and Bruno SPIRE participated in the cohort study's conception and design conception and critically revised the manuscript. Luis SAGAON-TEYSSIER supervised data analysis.

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**Table 1** – Characteristics at baseline (326 participants) and during follow-up (1104 visits) in the CohMSM ANRS 12324-Expertise France study

<i>Demographic and socioeconomic characteristics at baseline</i>	Number of participants (%) or median [IQR]
<b>Age</b> (continuous)	24[19;29]
<b>Country</b>	
Cote d’Ivoire	59(18)
Mali	153(47)
Togo	51(16)
Burkina Faso	63(19)
<b>Educational level</b>	
Never went to school, Koranic school, Other	15(5)
Primary level	48(15)
Secondary level	140(43)
University	120(37)
<b>Had children</b>	
Yes (biological or adopted)	60(18)
No	263(81)
<b>Employment status</b>	
Student	142(44)
Professionally active	156(48)
Professionally inactive	15(5)
<b>Had to reduce food consumption or skip meals due to lack of money in the previous month</b>	
Yes, once or twice	61(19)
Yes, at least three times	51(16)
No, never	211(65)
<b>Distance to health center</b> (hours)	0.5[0;1]
<b>Median follow-up (months)</b>	18 [6-30]
<i>Behavioral and psychosocial variables during follow-up</i>	Number of visits from M0 to M30 (%)
<i>Sexual behaviors (in the previous 6 months)</i>	
<b>Had female sexual partners</b>	

None	236(21)
Only wife/girlfriend	565(51)
Only casual partner(s)	87(8)
Wife/girlfriend and casual partner(s)	216(20)
<b>Inconsistent condom use</b>	
<b>With female partners</b> during anal/vaginal sex	426(39)
With wife/girlfriend	393(57)
With casual female partner(s)	87(29)
<b>With male partners</b> during anal sex	427(40)
<b>HIV high-risk exposure with male partners</b> <sup>a</sup>	149(14)
<b>Sexual violence with female partners</b>	
Experiencing violence by female partner	87(8)
By wife/girlfriend	67(77)
By casual female partner(s)	18(21)
Perpetrating violence on female partners	62(6)
On wife/girlfriend	51(82)
On casual female partner(s)	10(16)
<i>Psychosocial characteristics (in the previous 6 months)</i>	
<b>Experiencing homonegative aggression</b>	128(12)
<b>Experiencing homonegative discrimination</b>	203(18)
<b>Internalized and perceived homonegativity</b> (score, 0-19)	13[9;17]
<b>Depression</b> (score, 0-22)	0[0;5]
<b>Sexual orientation</b>	
Heterosexual, bisexual	883(80)
Homosexual/gay	190(17)
Transsexual, other, did not want to be defined	30(3)
<b>Disclosure of same-sex sexual practices to wife/girlfriend</b>	
No	443(40)
Yes, and it was accepted	55(5)
Yes, but it was not well accepted or was rejected	11(1)
Not concerned <sup>b</sup>	584(53)
<b>Support from family</b>	
No support	110(10)
Only material support	120(11)
Only psychological support	126(12)
Both material and psychological support	738(68)

<sup>a</sup> High-risk exposure to HIV infection was defined as reporting inconsistent condom use during receptive anal intercourse with male partners of unknown or known positive HIV status. HIV seroconversion was significantly higher in these participants than in those with moderate risk exposure, as published elsewhere<sup>68</sup>.

<sup>b</sup> Not concerned: declared no wife/girlfriend in the previous 6 months.



**Figure 1 – Longitudinal syndemic of homonegativity and sexual violence on women**  
(multivariate probit analysis performed on 772 observations from 326 MSMW in the CohMSM ANRS 12324-Expertise France study)