

## SHORT REPORT

# Misconceptions about HIV infection in Kinshasa (Democratic Republic of Congo): a case-control study on knowledge, attitudes and practices

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► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/sextrans-2014-051734>).

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Received 18 June 2014

Revised 13 October 2014

Accepted 2 November 2014

Published Online First

22 November 2014



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**To cite:** Carlos S, Martínez-González M Á, Burgueño E, et al. *Sex Transm Infect* 2015;**91**:334–337.

## ABSTRACT

**Objectives** To evaluate the prevalence of HIV-related misconceptions in an outpatient centre of Kinshasa (Democratic Republic of Congo) and analyse the association between these beliefs and HIV infection.

**Methods** A case-control study was carried out from December 2010 until June 2012. We assessed 1630 participants aged 15–49 attending a primary outpatient centre in Kinshasa: 762 HIV Voluntary Counselling and Testing attendees and 868 blood donors. A 59-item questionnaire about knowledge, attitudes and practice was administered during a face-to-face interview, followed by an HIV test. Cases and controls were respondents with a newly diagnosed HIV-positive or HIV-negative test, respectively. Unconditional logistic regression was used to analyse the association between misconceptions and HIV seropositivity.

**Results** 274 cases and 1340 controls were recruited. Cases were more likely than controls to have a low socioeconomic status, no education, to be divorced/separated or widowed. An association was found between the following variables and HIV seropositivity: having a poor HIV knowledge (adjusted OR=2.79; 95% CI 1.43 to 5.45), not knowing a virus is the cause of AIDS (adjusted OR=2.03; 95% CI 1.38 to 2.98) and reporting more than three HIV-transmission-related misconceptions (adjusted OR=3.30; 95% CI 1.64 to 6.64), such as thinking an HIV-positive person cannot look healthy and that HIV is transmitted by sorcery, God's punishment, a kiss on the mouth, mosquitoes, coughs/sneezes or undercooked food.

**Conclusions** Despite having access to healthcare services, there are still many people in Kinshasa that have HIV-related misconceptions that increase their HIV risk. Our findings underscore the need for a culturally adapted and gender-orientated basic HIV information into Congolese HIV prevention programmes.

## INTRODUCTION

The Democratic Republic of the Congo (DRC) was one of the first countries in which HIV infections were registered. Today over 2 million people still suffer from this disease in Congo, a country with a prevalence of 1.2% in the general population, 1.6% for women and 0.6% for men.<sup>1</sup>

The main HIV transmission route in Congo is heterosexual contact.<sup>2</sup> Sexual behaviours have been linked to HIV-related misconceptions.<sup>3</sup> Studies that

have analysed the prevalence of misconceptions in Congo have mainly been qualitative and previous to the introduction of antiretrovirals.<sup>4–9</sup>

We quantitatively evaluated the HIV knowledge of local people in Kinshasa and studied its association with HIV seropositivity.

## METHODS

From December 2010 to June 2012, we carried out a prospective case-control study at a referral hospital in Kinshasa. The study participants were people aged 15–49 attending the outpatient centre for HIV voluntary counselling testing (VCT) or blood donation. Participants with a previous HIV-positive test and pregnant women were excluded. Cases were VCT attendees/blood donors with an incident HIV-positive test over the study period. Controls were recruited from the same source population but tested negative for HIV. Based on the around 1000 annual candidates, with near 15% being HIV-positive, and considering the adjustments for about 10 confounding variables, we were confident that the final sample size would provide sufficient statistical power.

Before the HIV test, participants completed a questionnaire during a face-to-face interview to evaluate HIV-related knowledge, attitudes and sexual behaviours. Afterwards, the presence of anti-HIV antibodies was analysed using the Determine HIV-1/2 test and DoubleCheckGold and Unigold if positive.

Statistical analysis was done with Stata12.0. Participants with 'indeterminate' HIV results were excluded. Multivariate unconditional logistic regression was used.

The study was approved by the corresponding Ethics Committees (CE/010/04). Oral informed consent was obtained.

## RESULTS

All but two eligible participants were included in the study: 274 cases and 1340 controls (see online supplementary figure 1). Most participants were 25–49 years old and the median age of the cases (34.9, 14.8 to 49.8; 13.4) was higher than that of the controls (27.2, 14.7 to 49.8; 10.8). Cases were more likely to be women, but no statistical association with HIV-positivity was found for this variable (table 1). The great majority of the cases came from the VCT group, which was strongly associated with receiving a

**Table 1** Characteristics of cases and controls and beliefs associated with HIV-positivity

	Cases (N=274) (%)	Controls (N=1340) (%)	Multivariate adjusted model* OR (95% CI)
<b>Sociodemographic characteristics</b>			
Age (25–49 years vs 15–19 years)	86.5	63.8	2.43 (1.21 to 4.86)
Sex (women vs men)	52.9	27.3	1.18 (0.84 to 1.67)
Study group (Voluntary Counselling and Testing vs blood donors)	81.7	39.5	7.6 (5.12 to 11.29)
Socioeconomic status (low vs high)	47.1	32.7	2.10 (1.02 to 4.37)
Education level (no studies/illiterate vs high education level)	12.0	3.2	4.10 (1.88 to 8.94)
Religion (Revivalist/Awakening Church‡ vs others)	62.0	48.4	1.44 (1.05 to 1.97)
<b>Marital status</b>			
Separated/divorced vs single	9.6	1.6	3.56 (1.79 to 7.07)
Widowed vs single	11.4	0.5	10.64 (4.24 to 26.69)
			<b>Adjusted ORs (95% CI)†</b>
<b>HIV knowledge and information</b>			
Little/no AIDS knowledge	75.5	61.6	2.20 (1.11 to 4.37)
Unaware of the viral origin of AIDS	25.5	14.4	1.21 (0.77 to 1.90)
Believe that little information on HIV prevention is available in Kinshasa	47.4	34.7	1.10 (0.78 to 1.56)
<b>Misconceptions about HIV and its transmission</b>			
Believe that someone with HIV cannot look healthy	48.5	35.6	1.62 (1.18 to 2.23)
Believe that HIV is transmitted by sorcery	39.4	33.7	0.99 (0.71 to 1.37)
Believe that HIV is a punishment from God	25.5	28.0	0.76 (0.53 to 1.08)
Believe that HIV is transmitted when someone infected kisses you on the mouth	21.9	16.6	1.08 (0.73 to 1.60)
Believe that HIV is transmitted by mosquito bites	15.7	9.3	1.81 (1.12 to 2.93)
4–7 misconceptions about HIV transmission§	8.4	3.7	2.39 (1.16 to 4.93)
<b>Attitudes related to condom use</b>			
Believe that condoms avoid HIV infection	33.9	39.5	0.85 (0.62 to 1.17)
Believe that there is no risk in having multiple partners if condom is used	44.2	49.3	0.83 (0.61 to 1.13)
Would use condoms to prevent HIV	34.4	58.6	0.58 (0.42 to 0.80)
Would use condoms if they were infected	38.6	55.5	0.77 (0.56 to 1.06)
Would use condoms if partner was infected	21.6	37.2	0.64 (0.45 to 0.91)
High personal HIV risk perception	40.1	9.6	4.92 (3.39 to 7.14)

\*Logistic regression model simultaneously adjusting for all the sociodemographic characteristics.

†All ORs are adjusted for age, sex, study group (VCT, BD), education, socioeconomic status, religion and marital status.

‡Revivalist Church ('Eglise de réveil'): Revivalist churches are groups that are often led by independent or self-proclaimed pastors. Although Congolese are mainly Christians, this church is found throughout the Congolese territory and is well consolidated.

§Misconceptions and myths (sum)='HIV is transmitted by sorcery' + 'HIV is a punishment from God' + 'HIV is transmitted by a kiss on the mouth' + 'HIV is transmitted by mosquito bites' + 'HIV is transmitted when someone infected coughs or sneezes' + 'HIV is transmitted in undercooked food' + 'People with HIV cannot look healthy'.

BD, blood donors; VCT, voluntary counselling and testing.

positive HIV diagnosis. In addition, having a low socioeconomic status, no education or being illiterate, belonging to the Revivalist/Awakening Church and being separated/divorced and widowed were associated with HIV infection.

Overall, most participants showed a poor HIV/AIDS knowledge and a high prevalence of HIV-related misconceptions was observed, such as believing HIV-positive people cannot look healthy or that HIV is a punishment from God or is transmitted by sorcery, mosquitoes or kissing on the mouth (table 1). An independent association was found between having little or no AIDS knowledge and being HIV-positive, being unaware of the viral origin and having 1–3 or 4–7 misconceptions about HIV transmission. Regarding HIV prevention, when knowledge about condom efficacy was evaluated, over one-third of the participants believed condoms completely avoid HIV, a misconception that was less prevalent among cases. A high percentage of the participants believed there is no risk in having multiple partners if condom is always used, with no significant differences between cases and controls. Regarding individual HIV risk perception, reporting a high risk was strongly associated with HIV-positivity. However, they were less likely to use condoms to prevent HIV, regardless of whether they/their partner were infected.

## DISCUSSION

To the best of our knowledge, this is the first quantitative study to analyse the association between HIV-related misconceptions and HIV status in Congo. We detected a high prevalence of HIV-related misconceptions in Kinshasa and a positive association between these and HIV infection.

In agreement with previous Congolese studies, most participants had heard of AIDS. However, 64% of our respondents acknowledged having little/no HIV knowledge, which was more prevalent in cases.

Around 15% of the participants were unaware of the viral basis of AIDS, which was associated with an HIV-positive test. This has never been evaluated in Congo and has only been addressed in a handful of African studies. Given that infectious origin of AIDS was first described three decades ago, providing this basic information should be a priority. Also, erroneous beliefs involving supernatural forces were particularly prevalent among both cases and controls. The 2007 DRC-Demographic Health Survey reported that half of the respondents held this belief, and the recently published 2014 survey keeps showing that near the same percentage continue to believe in supernatural transmission.<sup>1</sup> These misconceptions are similarly prevalent in Ghana and South Africa, and even more in other African

countries.<sup>3 10</sup> Scepticism about the role of infectious agents leads people to believe that HIV can only be cured by traditional healers and not by antiretrovirals. We need to be aware of these beliefs in order to develop culturally adapted HIV information. Moreover, as religion is an important part of daily life in Kinshasa,<sup>11</sup> close collaboration between religious leaders and HIV prevention programmes is necessary to ensure success.

Another highly prevalent misconception was believing that an HIV-positive individual is visibly unhealthy. Nearly half of the cases held this, a significantly larger proportion than in the control group. The 2014 DRC Health Survey reveals that around 30% of 15–24 year olds do not know that a healthy person can be seropositive.<sup>1</sup> If people believe that only those visibly unhealthy can transmit HIV, the infection risk can increase. Around 10% of our participants believed that HIV could be transmitted by mosquitoes (more cases than controls). Comparing with previous data from Kinshasa,<sup>4 5</sup> the prevalence of misconceptions has decreased considerably.

Regarding the misconceptions we found about HIV prevention, it is important to consider them in condom promotion campaigns in Africa, where the prevalence of multiple partnerships is on the rise in some countries and condom use is inconsistent.<sup>12</sup> Indeed, only around 30% of our HIV-positive cases said they would use a condom if they/their partner were infected.

Basic socio-demographic determinants also need to be considered. First, education is crucial to change misconceptions. Cases were more likely to have no education or primary education only, and reported more misconceptions than controls. It is thus crucial that accurate information reaches people from all educational levels.

In addition, the economic context must also be considered: some African studies have shown that a high education level is sometimes linked to HIV-related risk behaviours or even a higher rate of infection,<sup>1</sup> as those with the highest economic status may have a higher frequency of premarital sex or access to commercial sex.

Another factor that must be considered is sex: women in sub-Saharan Africa are particularly vulnerable to HIV due to low socioeconomic status/educational level, few job opportunities, limited access to health services or forced sex, frequently associated with an increased HIV risk.<sup>2</sup> As cases in our study were mostly women, special attention should be paid to this group when developing prevention campaigns.

All these findings, and the fact that around 40% of participants consider that little information on HIV prevention is available in Kinshasa (more cases than controls), underscore the need for culturally adapted and gender-orientated basic information in Congolese HIV prevention programmes. Current HIV campaigns in Congo do not include any messages to clear up common misconceptions. This information should be provided in Lingala, the language people use to speak about intimate/taboo issues. The most effective information channels must also be identified. Most of our respondents, particularly cases, had regular access to a radio/TV, which could both be used to send preventive messages. Visits to health services for VCT/blood donation provide useful opportunities to inform about HIV/AIDS, to offer testing and provide antiretrovirals for those who test positive.

The present study has some limitations. The study population is probably not representative of the general population, especially VCT attendees that are likely to be at higher risk of HIV and potentially have a better HIV knowledge. However, even in our participants we observed a low level of knowledge, which

would likely have been poorer still if we had recruited from a general, non-HIV-specific health clinic. Nonetheless, what made them think they were at risk should be further analysed. On the other hand, family replacement blood donors are more similar to the general population because the only reason for going to the health centre is that they are requested to do so to give back the blood used by their relatives. Second, our study is based on self-reporting. Nonetheless, under-reporting was probably low as same-sex interviewers and private rooms were available. Also, retrospective responses could have led to recall bias; however, most questions were specific enough to reduce errors. Lastly, we did not use a validated scale to measure HIV knowledge. The HIV-Knowledge-27-Scale, specifically suited to sub-Saharan populations, was not available when we implemented our questionnaire.

Despite these limitations, our study has several strengths. This is the first analytic study in the DRC to evaluate knowledge, attitudes and sexual behaviour of individuals newly diagnosed with HIV. Also, it has assessed many HIV-related aspects not considered in other Congolese studies. Finally, we had a high response rate and recruited 1614 Congolese, a sufficiently large sample with which to estimate relevant adjusted associations.

This study provides evidence of the high prevalence of HIV-related misconceptions and their association with HIV. There remains a great need to challenge these misconceptions, tackling them one by one, through media/HIV campaigns and hospital visits. People that attend health services are useful participants in which to evaluate HIV-related knowledge and behaviours as they can transmit preventive messages to people within their community without access to health facilities, influencing knowledge and behaviour.

**Handling editor** Jackie A Cassell

**Acknowledgements** We wish to express our gratitude to the Institute for Culture and Society (ICS) and to the University of Navarra for financial support for the study (PIUNA 12458071) and for all the bibliography facilitated. We are indebted to Monkole Hospital for their scientific and logistical support for this study and to the Ethical Committees of Monkole Hospital and the University of Navarra for granting permission to perform the study. We thank the interviewers and laboratory technicians for their essential help in the recruitment and diagnosis of the study participants, and the participants who generously gave their time to participate in this study. We also thank Ángel Vizcay, Clément Passabosc, Sonia Laspalas and Carolina Lupo for their assistance in data entry; Alfredo Gea and Estefanía Toledo for their kind cooperation with the statistical analyses; Mark Sefton (the language editor) and Leyre Ovalle for their English revision of the manuscript; and Carlos Beltramo, Alfonso Osorio, María Calatrava and Gabriel Reina for their valuable comments.

**Contributors** SC, the study principal investigator, supervised all phases of the study, conducted literature review, the statistical analyses and wrote the first draft of the manuscript. MAM-G contributed to statistical analyses and writing the paper. EB, the local study coordinator, participated in all the phases of the activity, helped with the questionnaire's translation and helped write the article. CL-dB helped with statistical analyses and helped write the article. MR-C provided advice on ethical aspects and helped write the article. AN helped with the questionnaire's translation and with the local activities and revised the manuscript. LT helped with the questionnaire's translation, contributed to ethical aspects and revised the manuscript. PT helped with the questionnaire's translation and with the local activities and revised the manuscript. PL contributed to the questionnaire development and critically revised the manuscript. Jdl helped with the study design as well as other epidemiological aspects, statistical analyses and helped write the article. All authors read and approved the final manuscript.

**Funding** This study was supported by the University of Navarra (PIUNA 12458071 and ICS) and has received the Dolores Trigo Award from the Alumni Association of the Faculty of Pharmacy of Santiago de Compostela (Spain).

**Competing interests** None.

**Ethics approval** Monkole and University of Navarra Ethical Committee (CE/010/04).

**Provenance and peer review** Not commissioned; externally peer reviewed.

## REFERENCES

- 1 Ministère du Plan et Suivi de la Mise en oeuvre de la Révolution de la Modernité (MPSMRM), Ministère de la Santé Publique (MSP) et ICF International. *Enquête Démographique et de Santé en République Démocratique du Congo 2013–2014*. Rockville, Maryland, USA: MPSMRM, MSP et ICF International, 2014.
- 2 RDC. Programme National Multisectoriel de Lutte contre le Sida (PNMLS). Rapport d'activité sur la riposte au VIH/sida en R.D.Congo. 2012.
- 3 Tenkorang EY. Myths and misconceptions about HIV transmission in Ghana: what are the drivers? *Cult Health Sex* 2013;15:296–310.
- 4 Bertrand JT, Makani B, Hassig SE, *et al.* AIDS-related knowledge, sexual behaviour, and condom use among men and women in Kinshasa, Zaire. *Am J Public Health* 1991;81:53–8.
- 5 Rind P. Misconceptions about HIV transmission are common in Kinshasa. *Int Fam Plan Perspect* 1991;17:78–9.
- 6 Irwin K, Bertrand J, Mibandumba N, *et al.* Knowledge, attitudes and beliefs about HIV infection and AIDS among healthy factory workers and their wives, Kinshasa, Zaire. *Soc Sci Med* 1991;32:917–30.
- 7 Kamenga M, Ryder RW, Jingu M, *et al.* Evidence of marked sexual behaviour change associated with low HIV-1 seroconversion in 149 married couples with discordant HIV-1 serostatus: experience at an HIV counselling center in Zaire. *AIDS* 1991;5:61–7.
- 8 Ryder RW, Kamenga C, Jingu M, *et al.* Pregnancy and HIV-1 incidence in 178 married couples with discordant HIV-1 serostatus: additional experience at an HIV-1 counselling centre in the Democratic Republic of the Congo. *Trop Med Int Health* 2000;5:482–7.
- 9 Kabamba Mulongo L, Schirvel C, Mukalay A, *et al.* Understanding couples attitudes on prenatal HIV testing in the Democratic Republic of Congo. *Rev Epidemiol Sante Publique* 2011;59:379–83.
- 10 Mishra V, Agrawal P, Alva S, *et al.* *Changes in HIV-Related Knowledge and Behaviors in Sub-Saharan Africa*. DHS Comparative Reports No. 24. Calverton, Maryland, USA: ICF Macro, 2009.
- 11 Maman S, Cathcart R, Burkhardt G, *et al.* The role of religion in HIV-positive women's disclosure experiences and coping strategies in Kinshasa, Democratic Republic of Congo. *Soc Sci Med* 2009;68:965–70.
- 12 UNAIDS. *Report on the Global AIDS epidemic*. 2013.

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*Sex Transm Infect* 2015 91: 334-337 originally published online November 21, 2014  
doi: 10.1136/sextrans-2014-051734

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