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## Original article

# Risk behavior score: a practical approach for assessing risk among MSM in Brazil

**Gustavo Machado Rocha<sup>a,\*</sup>, Lígia Regina Franco Sansigolo Kerr<sup>b</sup>, Carl Kendall<sup>c</sup>,  
Mark Drew Crosland Guimarães<sup>d</sup>**

<sup>a</sup> Federal University of São João Del-Rei, Divinópolis, Brazil

<sup>b</sup> Department of Community Health, Federal University of Ceará, Fortaleza, Brazil

<sup>c</sup> Department of Global Community Health and Behavioral Sciences, Tulane University School of Public Health and Tropical Medicine, New Orleans, USA

<sup>d</sup> Department of Preventive and Social Medicine, Federal University of Minas Gerais, Belo Horizonte, Brazil

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### ABSTRACT

HIV/AIDS epidemic is not well controlled, and multiple sexual behavior factors help explain high rates of HIV infection among men who have sex with men (MSM). This article proposes to exam the use of a potential risk behavior score for HIV infection, based on the type and number of sexual partners, and condom use, and their associated factors in a sample of MSM in Brazil. A cross sectional RDS (Respondent Driven Sampling) study was performed among 3738 MSM aged 18+ years old from ten Brazilian cities. The risk behavior score was composed by the number of male partners and anal condom use in the last year with steady, casual, and commercial partners. Most participants were 25+ years old (58.1%), non-white (83.1%), and single (84.9%). Final weighted ordinal logistic model showed that age  $\leq$  25 years old ( $p = 0.037$ ), homosexual or bisexual identity ( $p < 0.001$ ), sexual initiation before 15-year-old ( $p < 0.001$ ), having sex with men only in the last 12 months ( $p < 0.001$ ), frequent alcohol and illicit drug use ( $p < 0.001$ ), and use of local sites to meet sexual partners in the last month were independently associated with higher scores of risky behavior. Specific strategies should be developed aimed at the MSM population. Additionally, pre-exposed prophylaxis (Prep) should be considered for those at higher score as a strategy for reducing risk for HIV infection in this population.

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\* Corresponding author.

E-mail address: [gusrocha.mg@gmail.com](mailto:gusrocha.mg@gmail.com) (G.M. Rocha).

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## Introduction

Recent data from the Joint United Nations Programme on HIV/AIDS (UNAIDS) indicate stable or declining rates of HIV infection worldwide.<sup>1</sup> However, the HIV epidemic is not well controlled in many regions, especially among key populations, including young men who have sex with men (MSM), among which HIV prevalence and incidence rates are higher than in the general population irrespective of the world region.<sup>2</sup> Although determinants of HIV transmission are multifactorial, sexual behavior factors still play a major role among MSM, including type of sexual practices,<sup>3</sup> lack of condom use, number and type of sexual partnerships, concurrency, and age of sexual initiation.<sup>4,5</sup> These factors may help explain the high rates of HIV infection among MSM worldwide, especially in countries with concentrated epidemics.

Due to the complexity of the dynamics of HIV transmission, complete assessment of sexual risk behavior may be difficult and, when based solely on only one characteristic (e.g. condom use), estimates may often be imprecise and underestimated.<sup>6</sup> In general, number of possible HIV exposures, which reflects risk of infection, depends not only on the number of unprotected sexual acts, but also on the number and characteristics of sex partners. It is not uncommon to find lack of statistical associations of single indicators of risky behavior with HIV infection among key populations.<sup>7,8</sup> Although methodological issues are always potential explanations (e.g. lack of statistical power, poor measurements, study design), these components may not sufficiently reflect risk behavior when analyzed separately.<sup>9</sup> Moreover, these behaviors are most likely statistically correlated and therefore, it may not be reasonable to analyze them separately as independent variables.<sup>6,9</sup>

Social networks and pattern of contacts of HIV infected individuals may also play an important role in the transmission chain.<sup>10</sup> Frequent unprotected sexual contacts with one partner, who is not infected with HIV, does not confer much risk to the individual. Similarly, a high number of sexual partners potentially increases the chances of someone having sex with recent HIV-infected partners with high infectivity due to high viral load in early infection stage.<sup>11</sup> For example,<sup>4</sup> assessing the incidence of HIV among MSM by a meta-analysis of 12 studies in China have shown that syphilis infection (relative risk [RR] = 3.33), multiple sexual partners (RR = 2.81) and unprotected receptive anal sex in the last six months (RR = 3.88) were significant risk factors that accounted for HIV seroconversion among MSM.

Thus, it is reasonable to examine sexual risk behavior not only through a single indicator (e.g., condom use), but rather through a combination of variables, including number and type of sexual partnerships, condom use in different types of sexual practices, and some characteristics of sexual partners.<sup>12</sup> This would enable a better assessment of an overall sexual risk behavior among key populations, with potential benefits for improved screening for HIV, and prevention and treatment efforts. This article proposes to exam the use of a potential score of sexual risk behavior for HIV infection, based on the type and number of sexual partners, condom use, and

their associated factors in a sample of men who have sex with men in ten Brazilian cities.

## Material and methods

### Study design

This work is embedded in the project entitled “behavior, attitudes, practices and prevalence of HIV and syphilis among men who have sex with men (MSM) in 10 Brazilian cities”.<sup>13</sup> This is a cross-sectional study whose primary objective was to establish a baseline to be used for monitoring the HIV epidemic, including sexual risk behavior, among a national sample of MSM in the country. The project was approved by the Research Ethical Committee of the Federal University of Ceará, and by The National Council on Ethics in Research (CONEP 14494/2008). Participants were asked to sign a written informed consent and data collection occurred between October 2008 and June 2009.

### Population and procedures

Participants were MSM aged 18 years old or more residing in the following cities: Manaus, Recife, Salvador, Belo Horizonte, Rio de Janeiro, Santos, Curitiba, Itajaí, Brasília, and Campo Grande. The cities were previously chosen by the Department of STD, AIDS and Viral Hepatitis (DSAVH), Ministry of Health, considering regional, socioeconomic, and cultural diversity. Eligible participants should have had at least one sexual relationship with another man in the 12 months preceding the interview.

To obtain the desired sample size at each center, set a priori between 250 and 350 participants per city by the DSAVH, Respondent Driven Sampling (RDS)<sup>14,15</sup> was used to recruit participants, previously described.<sup>13</sup> The first recruiters, named seeds, were selected during a preliminary formative research (focus groups and semi-structured interviews) according to age and schooling. In each municipality, each initial seed received three non-falsifiable coupons to distribute to their acquaintances within their social network. Individuals who came to the study sites with a valid coupon and who met the inclusion criteria comprised the first wave of the study, each receiving three new coupons. Thereafter, similar subsequent procedures were carried out until the planned sample size was reached in each city.

Data collection was conducted through face-to-face interviews with a structured standardized questionnaire which contained questions on sociodemographic data, sexual behavior and drug use, network and social context, health care, access to condoms and sources of information about sexually transmitted infections. In addition to the interview, participants were also invited to undergo HIV and syphilis testing, using rapid testing standard procedures at the time of data collection, as recommended by the DSAVH.<sup>16</sup>

### Outcome and explanatory variables

For this analysis, risk behavior for HIV infection was defined as a composite score based on the following variables: (a)

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