

SELECTIVE PARTICIPATION IN A RDS SURVEY AMONG MSM IN CEARÁ, BRAZIL: A QUALITATIVE AND QUANTITATIVE ASSESSMENT

PARTICIPAÇÃO SELETIVA EM UM INQUÉRITO RDS ENTRE HSH NO CEARÁ, BRASIL: AVALIAÇÃO QUALI-QUANTITATIVA

Ligia Regina FS Kerr¹, Carl Kendall², Marta K Pontes³, Guilherme L Werneck⁴, Willi McFarland⁵,
Maeve B Mello⁶, Telma A Martins⁷, Raimunda Hermelinda M Macena⁸

ABSTRACT

Introduction: Respondent Driven Sampling (RDS) was used to conduct a biological and behavioral surveillance survey (BBSS) in Fortaleza, Brazil in 2005 among men who have sex with men (MSM). The study recruited many more MSM of lower social classes than Time Location Sampling and Snowball Sampling studies conducted in Fortaleza previously by the study team. Although poorer MSM are arguably more important for public health purposes, a surveillance method should provide information about all of the MSM population at risk. **Objective:** to explore reasons for low participation of higher social class MSM in the BBSS. **Methods:** RDS was used to recruit 406 MSM in Fortaleza, 2005. Data were analysed using the RDSAT to adjust for network size and recruitment patterns. A small-scale qualitative debriefing with eight higher social economic status (SES) MSM and staff from two Brazilian NGOs was also conducted to understand why they did not participate in the cross-sectional study. **Results:** of the 406 participants, more than half (56.1%) of MSM were less than 25 years old. Only 7.0% were of high SES. This paper found that the differential recruitment of higher social classes is due to: siting of the offices in a poor downtown area, insufficient incentives, NGOs associated with lower SES MSM, lack of solidarity among MSM, traditional class and wealth divides, fear of discrimination, and concerns about testing in general and the confidentiality of test results in particular. Because network links between high and low SES MSM appear to be minimal, the failure should not be attributed solely to RDS's networking sampling methodology. **Conclusion:** operational, cultural, and socio-economic factors are barriers to the participation of high SES MSM. Strategies to enhance representativeness include additional formative research to explore the inclusiveness of networks, strategies to respond to the needs of higher SES MSM and encourage participation. **Keywords:** RDS, MSM, HIV, AIDS, hard-to-reach population, STD

RESUMO

Introdução: o método *Respondent Driven Sampling* (RDS) foi utilizado para realizar a vigilância comportamental de segunda geração (BSS), em Fortaleza, Brasil, em 2005, entre homens que fazem sexo com homens (HSH). O estudo recrutou mais HSH de classes sociais mais pobres do que os estudos usando *Time Location Sampling* e *Snowball* no mesmo município previamente. Embora HSH de classe social mais baixa sejam tidos como de maior importância em saúde pública, os métodos de vigilância devem prover informações a respeito de toda esta população sob risco. **Objetivo:** explorar as razões para a baixa participação dos HSH de classe social mais elevada no BSS. **Métodos:** RDS foi utilizado para recrutar 406 HSH em Fortaleza, em 2005. Os dados foram analisados utilizando o *software* RDSAT para ajustar para o tamanho da rede social e padrões de recrutamento. Um estudo qualitativo de *debriefing* em pequena escala com oito HSH de maior *status* socioeconômico (SSE) e ativistas de duas ONGs também foi conduzido para entender por que estes HSH não participaram do estudo transversal. **Resultados:** dos 406 participantes, mais da metade (56,1%) tinha menos de 25 anos. Apenas 7,0% dos HSH recrutados eram de SSE alto. Este trabalho constatou que a diferença na representação de classe social mais elevada foi devida à: localização dos locais de estudo em uma área pobre, incentivos insuficientes, ONGs foram associadas com HSH de SSE menor, falta de solidariedade entre os HSH, diferenças de classe social e riqueza, medo de discriminação, preocupações sobre testes, em geral, e à confidencialidade dos resultados dos testes, em particular. Porque as conexões entre as redes dos HSH de SSE alto e baixo parecem ser mínimas, a falha do recrutamento não pode ser atribuída somente à metodologia RDS de amostragem em redes. **Conclusão:** fatores operacionais, culturais e socioeconômicos foram barreiras para a participação de HSH de SSE alto. Estratégias para aumentar a representatividade dos mesmos incluem pesquisa formativa adicional para explorar o quanto as redes são inclusivas e as estratégias para responder às necessidades dos HSH de SSE alto e encorajar sua participação.

Palavras-chave: RDS, HSH, HIV, aids, população de difícil acesso, DST

INTRODUCTION

Aids cases among men who have sex with men (MSM) account for 50% of total cases reported to the State Health Office

in Ceará, Northeastern Brazil. More than half of those cases occurred among MSM with low levels of education, strongly correlated with low socioeconomic status (SES). To better monitor seroprevalence and risk behaviors among this population, we conducted four Behavioral Surveillance Surveys (BSS) to date in Fortaleza, capital of Ceará State, where most of the aids cases are concentrated. These surveys were carried out in 1995, 1998, 2002, and 2005. However, different sampling methodologies were employed to study this hard-to-reach population¹². In 1995 and 1998 we used snowball sampling (SB), in 2002 we used Time-Location Sampling (TLS) and SB sampling on 33.2% and 66.8% of the sample, respectively, and in 2005 we used Respondent Driven Sampling (RDS)^{13,14}.

Each method used for behavioral surveillance of MSM in Fortaleza was recommended at the time. SB sampling may ease recruitment; however, it cannot be considered representative. TLS selects visible participants, however, segments of the population that are truly hidden will be excluded. The third method, RDS, was developed more recently for studies in hidden and hard-to-reach popula-

¹ Universidade Federal do Ceará. Departamento de Saúde Comunitária.

² Center for Global Health Equity and Department of Community Health. Tulane University School of Public Health and Tropical Medicine – USA.

³ Departamento de Psicologia. Universidade Federal do Ceará. Departamento de Saúde Comunitária.

⁴ Universidade do Estado do Rio de Janeiro. Instituto de Medicina Social.

⁵ Institute for Global Health, University of California – USA

⁶ ICICT, Fundação Oswaldo Cruz, Rio de Janeiro.

⁷ Secretaria de Saúde do Estado do Ceará.

⁸ Universidade Federal do Ceará. Faculdade de Medicina.

This research was supported by the following grants: CAPES/BEX 3495/06-0, CAPES/PROCAD 204056, the Brazilian Ministry of Health/Department of SDT, AIDS and Viral Hepatitis, and by the U.S. HHS Centers for Disease Control and Prevention (CDC), Division of Global HIV/AIDS under Cooperative Agreement 5U62PS923163. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of CDC.

tions that are networked, potentially reaching a wider range of individuals than the other two sampling strategies^{1,2,5,7,8,10,12,15,16,18-20,20-23}. Similar to the SB sampling, RDS is a chain referral method, but unlike SB, it claims to produce unbiased population estimates by adjusting for relative network sizes and the connections between recruiters and their recruitees. RDS works by reducing the number of recruits that any one individual can bring into the study. As in snowball sampling, the sample starts when a small number of MSM, known to the study investigators are recruited as seeds. These seeds receive two or three numbered coupons that can be split into two pieces. When the recruited participant arrives at the study site with his piece of the coupon it must match the coupon number of the recruiter. Thus a chain can be formed from recruiter to recruited. When successfully implemented this produces long chains of recruits, with a smaller and smaller selection bias associated with the original seed. Participants are asked to recruit other MSM matching certain criteria, thus they are the fieldworkers in the study, and thus “respondent-driven”.

The experience of implementing RDS with MSM in Fortaleza resulted in a sample with different social and economic characteristics when compared to those reached with the other methods. For example, in 1995, 1998 and 2002, men from higher social-economic strata were overrepresented in the sample¹². On the other hand, lower social class men MSM who were not found in the previous surveys were represented in RDS in a similar proportion to the city’s population distribution by socioeconomic status (SES). It is important to mention that by criteria associated with sampling methods for hard-to-reach populations, the RDS survey we conducted was successful: we reached our sample size within a two month period, values of variables stabilized quickly and the findings fall in ranges that add credibility. However, since social class distribution was so different across the surveys, we conducted a debriefing to follow-up the original surveillance survey.

OBJECTIVE

To explore reasons for low participation of higher social class MSM in the BBSS.

METHODS

In 2005, between October 10th and November 23rd, a survey was conducted among men who reported sex with men (MSM) in Fortaleza, followed by a qualitative debriefing.

The main study

A cross-sectional BSS study was carried out using RDS sampling methods. Two NGOs collaborated in the study: the Grupo de Apoio a Prevenção da Aids (GAPA-CE), and the Grupo de Resistência Asa Branca (GRAB). The two organizations hosted the study, collected the data, and participated in the analysis and this follow-up study.

Study population and recruitment methods

Four hundred and six (406) men aged 14 and over and who reported having oral or anal sex with other men in the past 12 months participated in the study. Following a formative assessment, the

recruitment process began with ten men who served as seeds and belonged to each of the five different social and economic status (SES) Brazilian Criteria for Purchasing Power classes⁴. All men recruited were provided with two coupons to recruit two other MSM from their personal networks.

Each individual received US\$5.00 for his interview and another US\$5.00 for each participant recruited by him and who returned to complete the interview.

Participants were interviewed in the NGO offices located in two buildings in downtown Fortaleza. Respondents could attend or call a number printed on the coupons to make an appointment. Voluntary HIV rapid testing was provided to all participants, with pre and posttest counseling.

Data collection

A questionnaire based on the Behavior Surveillance Survey was utilized with all men³. The questions were classified into eight topics: 1) socio-economic and demographic data; 2) sexual behavior; 3) sexual identity; 4) history of HIV testing; 5) violence and discrimination; 6) information about relationship to the recruiter; and network size (needed for statistical adjustment to produce population estimates).

Analyses

Data were analyzed using the software RDSAT developed specifically for RDS to adjust for network size and recruitment pattern⁶. We described the samples using mean and proportions. We further described recruitment patterns using homophily* between recruiter and recruitee and the mean size of the social network for specific variables of interest. We also classified the participants according to economic class.

Debriefing methods

In response to initial findings, we conducted a small-scale qualitative debriefing exercise with MSM and staff from GAPA-CE and GRAB (**Table 1**). The debriefing exercise included group interviews with staff and eight individual interviews conducted by staff members and the first author with non-participant higher SES MSM. These eight interviews were conducted in panel, with the four staff from the two NGOs present for all interviews.

Interviews were open-ended and conversational in style. A semi-structured guide was developed to manage the interviews and guarantee all topics were covered. The topics were: 1) What were the reasons for participating in the study?; 2) How were decisions made about coupons?; 3) Why so little testing?; 4) Were men reluctant to participate because of disclosure issues (serostatus, sexual orientation)?; 5) Were there characteristics of the sites chosen that affected participation?; 6) Were there issues associated with the size of the incentive?; 7) Were there differences in the social and sexual networks of higher and lower SES MSM?

All interviews and debriefing exercises were recorded and transcribed. Words and phrases used in the local MSM vocabulary were

* Homophily is a measure of the similarity of recruiters and recruits and needs to be measured and used to adjust RDS estimations.

Table 1 – NGO Staff and MSM Community Members Interviewed

Identification	Age	Race	Occupation	Role in the Study
FR	50	White	Retired	Interviewer
H	40	Black	Health agent	Interviewer
Ad	33	White	Psychologist	Interviewer
AX	31	White	Health educator	Interviewer
V	65	White	Retired	Community member
IG	60	Mulato	Actor	Community member
R	30	White	Psychologist	Community member
PC	43	Mulato	Nursing assistance	Community member
M	33	Mulato	Philosopher	Community member
Ab	26	Mulato	Engineer	Community member
J	27	White	Sociologist	Community member
E	48	White	Social worker	Community member

clarified with staff. The transcribed text was reviewed for content and themes. Guide topics were summarized and conclusions discussed with members of the research team. The transcripts and subsequent discussions were shared with all study team members. Four meetings were held with study staff. The meetings provided a forum to discuss themes relating to the research questions in the original research guide and determine new, emerging themes. The findings are illustrated with quotes from the interviews. These quotes were selected because they characterized the main positions shared by participants in the qualitative study, especially when they seemed to capture a particularly revealing issue¹¹.

RESULTS

Quantitative findings

Although this study focuses on the qualitative investigation, several findings from the quantitative study are relevant for interpretation of the qualitative data. **Table 2** shows crude (C) and adjusted (A) characteristics of participants. The mean age of the sample was 27 years. Two hundred and five men (C: 50.5% and A: 46.9%) had at least a high school education, 330 (C: 81.3% and A: 78.9%) were single, 227 (C: 55.9% and A: 66.3%) were from low social class. The majority were recruited by a friend (C: 72.2% and A: 76.2%) and 12.1% (A: 10.8%) were recruited by a very close friend. The majority self-identified as “gay” (C: 63.3% and A: 48.7%). but, 27.3% (A: 33.3%) had both male and female sex partners in the past six months. When asked about their HIV testing history, 61.1% (A: 55.5%) reported ever being tested and 34.5% (A: 55.0%) reported being tested in the past 12 months. Of those who ever tested, 58.1% (A: 54.4%) returned for results.

More than half (C: 63.3% and 62.3%) reported being discriminated against in the past 12 months with 17.5% (A: 13.1%) reported being discriminated against explicitly because of sexual orientation.

Table 3 shows homophily scores and adjusted and unadjusted average network size by specific variables. Homophily was not

high for any particular variable, arguing that the sample mixed MSM with different characteristics.

Qualitative findings

The qualitative findings fall into 6 main themes. Some were embedded in the research guide, and some emerged during individual and group discussions: 1) Reasons to participate in the study; 2) Reasons for class A/B to participate in the study; 3) Siting and the public identity of the NGO; 4) Social networking among high social class individuals; 5) Reasons for giving out coupons; 6) Reasons to take the HIV test.

Reasons to people in general to participate

The most common reason offered to not participate was time, including the press of daily business, especially for wealthier individuals. This man, like many, works out of town and did not participate in the study:

“In fact... I was working somewhere inland...I used to spend the week working there, so what would I do to choose someone? (A, class B, 26 years old).”

This was discussing recruitment, however it also relates to participating in the study. Weekend hours were available at the study sites, but limited compared to weekday hours. The site was closed on Sunday, and closed early on Saturday.

Another reason concerned the time and commitment required to participate in the study. Commitment for this non-participant implied that stability – in several dimensions – was important to participate in the study.

“I could not commit myself, because I think that when you commit yourself, you have to comply with it...but my life was in a mess [talking about work] and I did not assume it [to participate in the study and recruit other MSM]. I thought it would be better to be out [to not participate of the study] (R, class B, 30 years old).”

Feeling stressed about work or relationships elevated participation in a new study, into a major effort. Respondents needed to identify some friends, explain the study to them, respond to questions, including suspicion of the study goals, who would interview them, what to do about testing, and having to approach many individuals before finding two to enroll in the study.

Reasons for higher social class to participate

Participants believed that people who belong to higher social classes were not interested in the general concerns of the gay community or MSM, especially of lower social classes. Respondents often described the members of social classes A and B in disdainful terms, as individuals preoccupied with money and consumer behavior: about brands of cars, perfumes and clothes.

[Reporting in the words of a richer MSM] “The reason why I am worth [something] is because I drive the latest imported car and how much society values me can be recognized because I wear expensive clothes” [Reporting in his own words] and in their world the cigarette brand, the beverage brand and so on is very important. All of them must mention the perfume, the disgusting smell of perfume they are wearing (E, class B, 48 years old).”

Another issue that was repeatedly mentioned was the fact that many MSM are afraid of the prejudice they will encounter (with

Table 2 – Characteristics of MSM and their network in Fortaleza

Variable	Crude n (%)	Adjusted %	Adjusted 95% CI
Age group (years)			
< 20	78 (20.4)	29.5	21.7 – 35.7
21 – 25	115 (30.0)	26.6	20.5 – 32.0
26 – 30	(19.6)	19.0	14.4 – 24.3
31 – 35	50 (13.0)	11.5	7.5 – 15.8
36 – 40	32 (8.4)	5.9	3.7 – 9.1
> 40	33 (8.6)	7.5	5.0 – 11.8
Highest education level attained			
None or incomplete elementary school	92 (22.7)	29.0	21.5 – 36.0
Elementary school or incomplete high school	91 (22.4)	24.1	17.5 – 30.7
High school or more	205 (50.5)	46.9	39.6 – 55.0
Economic class			
High (A/B)	53 (13.0)	7.0	4.4 – 10.5
Middle (C)	126 (31.0)	26.7	20.7 – 34.0
Low (D/E)	227 (55.9)	66.3	58.2 – 72.6
Relationship with recruiter			
Personal friend	49 (12.1)	10.8	7.5 – 14.3
Friend	293 (72.2)	76.2	71.0 – 80.8
Acquaintance	48 (11.8)	12.0	8.4 – 16.5
Stranger	5 (1.2)	.9	.3 – 1.8
Self identified as			
Gay, homosexual	257 (63.3)	48.7	39.9 – 56.5
Bisexual	94 (23.1)	29.7	23.5 – 38.0
Man	46 (11.3)	20.3	12.5 – 28.2
Other	5 (1.2)	1.3	.2 – 2.6
Family knowledge about sexual orientation			
Yes	232 (57.1)	49.4	42.5 – 55.6
No	148 (36.4)	48.2	41.4 – 54.5
Don't know	24 (5.9)	2.4	1.5 – 5.0
Ever tested for HIV			
Tested for HIV in last 12 months	248 (61.1)	55.5	50.7 – 63.1
Returned to get test results	140 (34.5)	55.0	45.1 – 65.6
Yes	236 (58.1)	54.4	43.7 – 64.6
No	9 (2.2)	.6	.7 – 2.6
N/A	160 (39.4)	45.0	34.2 – 54.9
Have you been discriminated against in the past 12 months?			
Yes	257 (63.3)	62.3	55.1 – 67.9
Yes because I'm homosexual	71 (17.5)	13.1	9.4 – 17.2

implications for their better-known family members) for being homosexuals, so they avoid situations - such as these NGOs - that might provide public evidence that they are MSM. These men often come from wealthy families, and their continuing relations with their family are the basis of their status.

“Everybody believes that the families think they behave well and so on, and are not fags. Everything is concealed. They believe that the other people do not know anything. In the hospitals, or in their jobs, there is an agreement; nobody talks about the subject, so that nobody is hurt (E, Class B, 48 years old).”

Location and Identification of the NGO with MSM

The two sites where the interviews took place were also seen as a factor for the low participation of class A and B in the research.

The NGOs serve as both social and political organizations, and promote MSM positive messages. As such they attract MSM who are public about their identities and have a visible profile in the community. Also, they are located in the downtown area, a poorer neighborhood, most visited by lower social class MSM.

“I agree with him, he said there is also the issue concerned with the setting they are used to [referring to locales where class A&B MSM meet], which is completely different from the interview place, and even to leave work or their house and come here.... is ... totally different, so this is one of the things, it is a setting completely apart from their natural habitat ...it is really fussiness, it is fussiness from A class with B, C and E (M, class B, 33 years old).”

The last quote raises the important issue of sero status, since the NGOs are associated with HIV positive support groups. Their

Table 3 – Homophily and network size of MSM in Fortaleza

Variable	Homophily	Adjusted Average Network Size	Unadjusted Average Network Size
Age group (yrs)			
< 20	.088	4.15	26.27
21 – 25	.183	6.40	16.75
26 – 30	.019	5.49	14.12
31 – 35	-.077	5.41	16.83
36 – 40	.099	7.22	22.68
> 40	.094	5.06	15.52
Social class			
Low	.015	4.67	11.75
Middle	.158	6.01	26.41
High	.128	8.74	25.45
Education			
None or incomplete elementary school	.162	4.57	11.28
Elementary school of incomplete high school	-.105	5.08	25.86
High school or more	.191	5.65	17.53
Perceived sexual orientation			
Gay	.547	6.70	21.81
Bisexual	.280	4.41	12.37
Heterosexual	.406	3.19	10.48
Other	-1.0	5.56	11.40
Sexual preference			
Only male	.505	6.82	22.89
Only female	.149	3.39	8.35
Both male and female	.136	4.55	13.73
Relationship with recruiter			
Personal friend	.092	6.21	31.02
Friend	.009	5.15	13.81
Acquaintance	.119	4.94	9.80
Stranger	-1.0	7.41	8.60
Ever tested for HIV			
No	.031	4.82	17.15
Yes	.194	5.80	19.00
Tested for HIV last year			
No	-.035	5.43	16.35
Yes	.064	5.96	20.95

activist role in the epidemic connects the NGO and its members to seropositivity. “Guilt by association” may be sufficient to keep social class A & B away.

Another issue was the difficulty and danger of coming downtown, finding parking and participating in the study. Downtown is crowded during the day, and parking is difficult to find. At night, or even during the day, crime is a very real possibility.

In RDS, an incentive is normally required for participation. Among the higher SES individuals who participated in the study, many did not return to collect their incentive, an indication that either the sums involved were too small, or the site was a barrier. For lower SES individuals the incentives did seem an important reason for participation.

High Social Class Networks

Some of those interviewed believe that high SES individuals prefer to have no direct contact with low social class MSM, selecting venues and groups that discriminate against lower SES MSM.

“They [wealthy MSM] are people who can speak four languages, who travel to Europe, who buy clothes there... They are all between thirty five and fifty and have no children.” (E, class B, 48 years old).

“Some of them accept me very well, but some of them put me completely aside... my participation is sporadic... I get an invitation only two or three times a year. (They come out) only at times in the ghettos, or when they are in the ghetto apartments” (E, class B, 48 years old).

On the other hand, some of them say that it is not that high social class individuals do not visit places where they mix with other social classes. The difference is that when high SES MSM frequent these venues they go there looking for something specific.

“Yes, they do go to a party, on a very special day, they can go there a day as an outsider, a very special DJ or some kind of event like that ... during the “Divine” celebration (a gay night club in Fortaleza), the mix is the biggest. You can see very big imported cars and so on, but they stay in their ghettos, four or six of them, without mixing with the rest of humanity. They are what we usu-

ally call faces and mouths, always dressed in the latest fashion, but they do not mix. Occasionally, they may fuck someone, but then the person does not exist in their context” (E, class B, 48 years old).

Reasons for giving out (or not giving out) the coupons

The primary reasons for selecting recruits to distribute the coupons were friendship and availability of time of the person who was going to be selected to participate in the interview. In one case there was no relationship between recruiter and recruitee, violating an assumption of RDS and a study eligibility criterion. In this case, the original recruiter brokered the recruitees for his recruit.

“I made my choice not because he had some spare time to come here or was available to listen to my request, but because he was the friend I was more attached to at that moment, he was closer to me, it was real friendship (AB, class B, 26 years old).”

Reasons to take the HIV test

Only 15% of participants tested. When asked about testing, and reasons not to test, respondents focused on fear of the result, stigma and discrimination. Some mentioned issues of confidentiality, but always returned to stigma and the fear of discovering that they were seropositive. Not knowing was preferable, and in this logic discrimination would not occur. Although the availability of anti-retrovirals is meant to normalize the disease, several respondents rejected that notion and the concomitant reason for testing. Respondents reported that the campaign from the Health Office was changing the public’s attitude about aids but also making men less concerned about prevention and about testing. Some mentioned that testing is no longer necessary.

“...because of the way people react towards him [the HIV+ person]; it is the result of prejudice, people who sometimes do not know anything about HIV, but who despise him, people who do not even want to sit down in places where they [HIV+ person] had been. I have seen a person who stood up, because someone said: for God’s sake, do not sit there (PC, class B, 43 years old).”

“I think that this new campaign from the Health Office is absurd. It is OK to show HIV+ people, but to say that it is easy to live with the illness.... and do not show the other side.... the medicines, the sequelae....; they only show people with a good appearance, different from what happens to most of them [HIV+], so the campaign is quite weird, because it gives the idea that if they show people like that, it means they live like that, and surely I am going to believe them, because in case I get the disease I can live for years and years, as it shows there: “seropositive for 25 years”, beautiful people, rosy faces. I think this is quite wrong (J, 27 years old)”.

An issue in patterns of visiting the site was also important for being tested and receiving the results. The most common pattern was for a recruiter to complete his interview and almost immediately recruit his two recruitees. The original recruiter would accompany them back to the NGO to complete their interviews, and then accompany them to the health posts to receive the incentives all together. This environment with friends was not considered an appropriate time to receive the bad news of seropositivity. Men felt

that they could not mask their reaction from their friends and they would not be able to control disclosure.

“...at this place where the tests are done, we have the service, the secrecy, as it is meant to be, but then when the objective is research, what happens in the other situation, how can I manage [comparing a health unit where he feels safer, anonymous with the environment of the research where he felt exposed to his friends in case he got a positive test]?” (A, class B, 33 years old).

DISCUSSION

Within the world of surveillance in hard to reach populations this survey of risk behaviors for HIV in MSM in Fortaleza was successful. However, the differences between SES distributions among the SB and TLS performed previously and RDS surveys are disconcerting. Another paper addresses this difference across rounds¹², but we wish to explore this difference further here. Of course, any sampling methodology risks generating a non-representative sample, and certainly SES distribution is not the sole criteria by which samples are judged. However, understanding how this difference was created operationally provides insight into the implementation of RDS and factors which contribute to the generalizability of the outcomes found.

This study provided some of the reasons for the lack of participation of higher SES individuals also found elsewhere⁹. Siting of the offices in poor downtown areas, insufficient incentives, NGO’s associated with lower SES MSM, lack of solidarity with the gay movement represented by the NGOs, traditional class and wealth separation, fear of discrimination, and concerns about testing in general and the confidentiality of test results were discussed as issues. Certainly several of these issues can be addressed through logistics, for example, a new periurban interview site can be used, or new arrangements for testing developed.

Incentives are a critical element in RDS to provide motivation for recruitment and participation in the survey⁶. It is unclear if a cash incentive could be raised high enough to overcome resistance in social classes A and B (or otherwise distort the study through masking) or even if other means exist to provide motivation or reduce resistance among those men.

Testing was a universal concern that crossed high and low socioeconomic classes. Testing was conducted offsite and was anonymous. However, participants still expressed concern that their friends or the NGO would find out about their test results. First, participants felt that since this was a research project results could be disclosed. Second, legal and operational concerns seemed to influence testing. Tests were conducted separately from the interview at the NGO offices because Brazilian health regulations mandate that HIV testing can only be performed in a health unit¹⁷. This adds an additional organization and increases worries about confidentiality. Additionally the downtown clinic is associated with a poor clientele, and might be a disincentive for wealthier study participants.

The divergence between the social class composition of this study and previous studies is considerable, as mentioned previously. The evidence from the qualitative component potentially explains the low homophily in these groups. The nature of relation-

ships in the networks between higher social class MSM and lower social class MSM may be non-reciprocal, i.e. higher social status MSM may recruit lower social status MSM, but lower social status MSM did not successfully recruit higher status men. Why? First social status may influence the relationship among MSM, by putting the higher status male in a position to recruit, but not be recruited. Second, while the incentive may encourage lower status MSM, it may be too little for higher status men. We have evidence of this in the fact that many of the higher status men in the study didn't show up to claim their secondary incentive.

As has been pointed out numerous times, there is no single group of MSM, and network ties across large social and geographical boundaries are likely to be limited. Where male homosexual behaviour is ghettoized, networks may be multiplex, open and extensive. However, this does not appear to be the case in Fortaleza, and links across social class and age groups may be quite limited. In that case one could argue that there are several important component networks or even separate networks among MSM in Fortaleza, and the results we achieved, rather than reflecting a failure of RDS to provide a representative sample, reflect the state of MSM networks in Fortaleza. Recruiting high SES MSM could be accomplished in several ways, from adding a site tailored to high SES MSM, to adding additional high SES seeds, to providing a mix of incentives, to providing a mobile site since this option worked in previous surveys, to conducting separate studies in different SES MSM populations. While multiple studies would satisfy academic interests in the organization of MSM in Fortaleza, from a routine surveillance point of view, conducting a single survey would be the preferred option.

All sampling methods are subject to operational flaws: inadequate mapping or determination of sampling areas; residential anomalies; security issues, fieldworker malfeasance; etc. With respect to location of the interview venue, in settings where cell phones are plentiful, each recruitee could either attend the site or call and make an appointment to attend a mutually agreed location, removing site as an impediment, as in Uganda¹⁷. With respect to organization of MSM, the very real separation by class among MSM in Fortaleza was captured by RDS. The fact that the public health definition of "risk community" (i. e., MSM who practice unsafe sex) is not concordant with an actual community is found in any science that uses ordinary language to discuss its key concepts. Here we might argue that multiple RDS studies are required to provide a representative sample, or that the appropriate target sample should be one that is epidemiological significant.

Overall, well-developed pre-surveillance assessment – formative research – which has not been sufficiently emphasized either in BSS or RDS is required to explore these issues. This research needs to focus on a range of practical issues and study logistics, but also on properties of the networks that recruitment will take place in.

CONCLUSION

Operational, cultural, and socio-economic factors are barriers to the participation of high SES MSM. Strategies to enhance re-

presentativeness include additional formative research to explore the inclusiveness of networks, strategies to respond to the needs of higher SES MSM and encourage participation.

REFERENCES

1. Abdul-Quader AS, Heckathorn DD, McKnight C, Bramson H, Nemeth C, Sabin K et al. Effectiveness of Respondent-Driven Sampling for Recruiting Drug Users in New York City: Findings from a Pilot Study. *J Urban Health* 2006 May; 83(3): 459-76.
2. Abdul-Quader AS, Heckathorn DD, Sabin K, Saidel T. Implementation and analysis of respondent driven sampling: lessons learned from the field. *J Urban Health* 2006 Nov; 83(6 Suppl): i1-i5.
3. Amon J, Brown T, Hogle J, MacNeil J, Magnani R, Mills S et al. Behavioral Surveillance Survey (BSS): guidelines for repeated behavioral surveys in population at risk of HIV. 1 ed. Arlington: Family Health International; 2000.
4. Associação Brasileira de Empresas de Pesquisa (ABEP). Critério de Classificação Econômica Brasil 2008. Associação Brasileira de Empresas de Pesquisa (ABEP) 2008 Available from: URL: <http://www.abep.org/novo/Content.aspx?ContentID=302>.
5. Evans AR, Hart GJ, Mole R, Mercer CH, Parutis V, Gerry CJ et al. Central and East European migrant men who have sex with men in London: a comparison of recruitment methods. *BMC Med Res Methodol* 2011 May 17; 11(1): 69.
6. Heckathorn D. Respondent Driven Sampling. 21-9-2010. Online Source.
7. Heckathorn DD. Respondent-driven sampling: a new approach to the study of hidden populations. *Social problems* 1997; 44(2): 174-99.
8. Heckathorn DD. Respondent-driven sampling II: deriving valid population estimates from chain-referral samples of hidden populations. *Social problems* 2002; 49(1): 11-34.
9. Iguchi MY, Ober AJ, Berry SH, Fain T, Heckathorn DD, Gorbach PM et al. Simultaneous recruitment of drug users and men who have sex with men in the United States and Russia using respondent-driven sampling: sampling methods and implications. *J Urban Health* 2009 Jul; 86 Suppl 1: 5-31.
10. Johnston LG, Trummal A, Lohmus L, Ravalepik A. Efficacy of convenience sampling through the internet versus respondent driven sampling among males who have sex with males in Tallinn and Harju County, Estonia: challenges reaching a hidden population. *AIDS Care* 2009 Sep; 21(9): 1195-202.
11. Kendall C, Afaible-Munsuz A, Speizer I, Avery A, Schmidt N, Santelli J. Understanding pregnancy in a population of inner-city women in New Orleans--results of qualitative research. *Soc Sci Med* 2005 Jan; 60(2): 297-311.
12. Kendall C, Kerr LR, Gondim RC, Werneck GL, Macena RH, Pontes MK et al. An empirical comparison of respondent-driven sampling, time location sampling, and snowball sampling for behavioral surveillance in men who have sex with men, Fortaleza, Brazil. *AIDS Behav* 2008 Jul; 12(4 Suppl): S97-104.

13. Kerr-Pontes LR, Gondim R, Mota RS, Martins TA, Wypij D. Self-reported sexual behaviour and HIV risk taking among men who have sex with men in Fortaleza, Brazil. *AIDS* 1999 Apr 16; 13(6): 709-17.
14. Kerr-Pontes LR, Kendall C, Pontes MK, Macena RH, Mello M, McFarland W. Avaliação de Comportamento de populações Vulneráveis: Propostas de Monitoramento. Selective Participation in RDS in a survey in Ceará, Brazil: XVIII Congresso Mundial de Epidemiologia e VII Congresso Brasileiro de Epidemiologia da ABRASCO; 2008.
15. Magnani R, Sabin K, Saidel T, Heckathorn D. Review of sampling hard-to-reach and hidden populations for HIV surveillance. *AIDS* 2005 May; 19(Suppl 2): S67-S72.
16. Malekinejad M, Johnston LG, Kendall C, Kerr LR, Rifkin MR, Rutherford GW. Using respondent-driven sampling methodology for HIV biological and behavioral surveillance in international settings: a systematic review. *AIDS Behav* 2008 Jul; 12(4 Suppl): S105-S130.
17. Ministério da Saúde - Secretaria de Vigilância em Saúde. Portaria SVS/MS N° 151, de 14 de outubro de 2009. Ministerio da Saúde - Secretaria de Vigilância em Saúde 2009 October 14 Available from: URL: http://www.aids.gov.br/sites/default/files/portaria151_2009.pdf.
18. Paz-Bailey G, Jacobson JO, Guardado ME, Hernandez FM, Nieto AI, Estrada M et al. How many men who have sex with men and female sex workers live in El Salvador? Using respondent-driven sampling and capture-recapture to estimate population sizes. *Sex Transm Infect* 2011 Jun; 87(4): 279-82.
19. Ramirez-Valles J, Heckathorn DD, Vazquez R, Diaz RM, Campbell RT. From networks to populations: the development and application of respondent-driven sampling among IDUs and Latino gay men. *AIDS Behav* 2005 Dec; 9(4): 387-402.
20. Raymond HF, Kajubi P, Kanya MR, Rutherford GW, Mandel JS, McFarland W. Correlates of Unprotected Receptive Anal Intercourse Among Gay and Bisexual Men: Kampala, Uganda. *AIDS Behav* 2009 Jun 3.
21. Reisner SL, Mimiaga MJ, Johnson CV, Bland S, Case P, Safren SA et al. What makes a respondent-driven sampling “seed” productive? Example of finding at-risk Massachusetts men who have sex with men. *J Urban Health* 2010 May; 87(3): 467-79.
22. Salganik MJ, Heckathorn DD. Sampling and estimation in hidden populations using respondent-driven sampling. *Soc Method* 2004; 34(1): 193-240.
23. Salganik M. Variance estimation, design effects, and sample size calculations for respondent-driven sampling. *J Urban Health* 2006 Nov 1; 83(Supl 1): 98-112.

Endereço para correspondência:**LIGIA REGINA FRANCO SANSIGOLO KERR**

Universidade Federal do Ceará
Departamento de Saúde Comunitária
Rua José Vilar de Andrade, 2005 casa 12 – Sapiranga
CEP: 60.833-096 – Fortaleza, CE, Brasil
Phone/fax: 55-85-3472-7544
E-mail: ligiakerr@gmail.com ou ligia@ufc.br

Recebido em: 03.12.2011

Aprovado em: 23.12.2011