Heterosexual STI/HIV Risk Assessment Among Bolivian Truck Drivers Using Mixed Methodology

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Abstract

In a study to evaluate knowledge, attitudes, and sex behaviors in an occupation that facilitates high HIV transmission globally, 71 Bolivian truck drivers participated in a multiple method needs assessment, in four phases. In all phases, majority of truckers reported contact with casual sex partners. Fifty-two percent of truckers in the qualitative phases reported having had a sexually transmitted infection (STI) and 27% indicated having anal sex with female partners. These data, combined with truckers demonstrating inconsistent STI/HIV knowledge and condom use, place Bolivian truck drivers and their spouses at risk for HIV/AIDS. Government and non-governmental organizations need to increase efforts to include this population in prevention programs.

Key Words: *Truck Drivers, Bolivia, Heterosexual Behavior, Mixed Methods, STI/HIV*

Introduction

Bolivia is a moderately sized, landlocked country surrounded by five other South American countries. The population in 2000 was over 8,300,000.[1] The life expectancy for males in 2001 was 61.5 years and 64.9 years for females. Seventy percent of Bolivia's citizens live in poverty.[2, 3] Two major ethnic groups reside in Bolivia: *Collas* are highlanders of Indian origin, *Cambas* are lowland Bolivians.

Bolivia's Ministry of Health (MOH) reported syphilis rate of 53.9 (per 100,000) and 72.2 for gonorrhea in 2000.[4] Schmunis and colleagues[5] ranked Bolivia's syphilis rates second out of eight South American countries. Bolivia's rates increased throughout the 1990's, but since 1998 have stayed level.[3, 6] Bolivia maintains a relatively low HIV/AIDS rate, but this gap is closing compared to neighboring countries. For example, the 1996 AIDS incidence rate in Bolivia was 1.1 (per 100,000); in neighboring Brazil and Peru the rates were 142.2 and 59.6 respectively. But the 2001 incidence rate was 6.8 in Bolivia, 17.9 in Brazil, and 24.7 in Peru.[7] There were an estimated 5,300 HIV infected Bolivians by the end of 2002. About 60% of newly infected HIV cases come from the province of Santa Cruz in east Bolivia.[8]

Long distance truck drivers have been implicated as HIV transmitters throughout the world. Several studies have been conducted concerning their high risk behaviors, majority of these in developing countries. Some studies document moderate or high HIV prevalence (as high as 56%) in the trucking population.[9-11] Studies demonstrating lower HIV prevalence in truck drivers still reveal high risk because of high sexually transmitted infection (STI) rates, sex with multiple partners, sex with injecting drug users, or sex with commercial sex workers (CSWs).[12-17]

The purpose of this study was to assess the knowledge, attitudes, and behaviors of truck drivers in eastern Bolivia, and to describe this baseline risk information. Power[18] mentions that needs assessments are useful for describing social contexts in order to conduct interventions, especially in sex behavioral settings. Qualitative methods are particularly useful in the design of interventions for mobile populations. There are an estimated 3,500 long distance truckers working in the eastern province of Santa Cruz alone.[19] It was hypothesized that this population would show as much risk behavior as truck drivers from other developing countries. This article discloses findings from 71 Bolivian truck driver participants. Four phases were utilized in this needs assessment, each one representing a different mode of inquiry, and three of which were qualitative techniques. The authors report assessment findings and discuss the concordance and difference in information gleaned by the different methods. These results were used to develop an intervention involving condom use workshops.[16]

Methods

Sites and Population Characteristics

Seventy-one male truckers, from six different research sites within 50 km of the city of *Santa Cruz de la Sierra* (the capital city of the easternmost province in Bolivia), participated in this needs assessment. The 2001 province population was 2,029,471.[20] Research sites were selected to maximize the diversity of settings in terms of route, cargo, ethnicity, and work schedule of truckers. The first site was a large, urban, open market in Santa Cruz. Truckers holding this route were likely to haul produce from *altiplano* (highland) farms. The second site was a neighboring, small city, 50 km north of Santa Cruz. It served as a refueling, maintenance, and rest stop for traffic arriving west from other national urban centers, and north along a huge network of agricultural businesses (mostly livestock, soy, and sugarcane). The third site was an outermost eastern *barrio* (neighborhood) of Santa Cruz, close to a large, municipal slaughterhouse. This location connected destinations east toward Brazil, in which timber, cattle, and soy are cultivated. The other three sites were different locations in the city of Santa Cruz, all of which offered truck parking where drivers searched potential job prospects, and rested or socialized.

Of the 71 participants, over half (39) were involved in one of the three qualitative phases. The fourth phase was a quantitative-based assessment and was completed by 32 participants. Only one of the 71 participants reported having sex with another male. Therefore, the focus of this study and the ensuing intervention dealt with heterosexual behavior.

The mean truck driver age was 36 years (phases I, II, and IV; range 20 - 56). Fifty-eight percent were *Colla* and 42% *Camba* (all phases). Seventy percent were married (phases I and IV). The respondents were predominantly Catholic (88% - phase IV).

Sampling and Data Collection

Two Bolivian, male health educators (BHE) were used to complete all phases of this needs assessment.

They had several years experience in reproductive family health projects or HIV counseling. The health workers were trained by the principal investigator in culling information from truckers, but were also helpful in tailoring interview items into Spanish and interpreting the findings.

Phase I interviews (April - May, 2000) were based on maximum variation sampling (methodical selection based on a wide range of characteristics) according to site, using 12 truck drivers.[21] Truckers were conveniently selected. The instrument used was a semi-structured format. Half of the truckers were asked specific questions about health access and the other half specific questions about sexual behavior, in order to identify gaps between health care practices, reported health problems, and services offered to the truckers. Conversations were tape recorded; average interview time was 27 minutes.

Phase II (November - December, 2000) utilized an open, in-depth interview scheme with ten truckers to explore use of language in discussing sexual behavior. Criterion sampling was used based on ethnicity (5 *Collas*, 5 *Cambas*).[21] Truckers were conveniently selected. Topics were embedded into open questions *a priori*. These "leads" (knowledge and attitudes of STI/HIV, sexual behavior, and occupational stressors) were lifted from a previous ethnographic trucker study.[17] Conversations were not tape recorded in this phase to maximize participant comfort and expression. Nor were phase II interviews timed, but generally took longer than phase I interviews nonetheless.

Phase III (May - June, 2001) was a series of focus groups to cull safe sex messages from topics that the truckers themselves considered important. Seventeen truckers participated in four focus groups; they were conveniently sampled.[21] Participants of the first three focus groups were compensated *Bs.*15 ($2.50 - see note [1]) for their time. BHE facilitated the focus groups and probed participants about sexual risk, condom use, and laboratory testing. Conversations were tape-recorded; average duration of the focus groups was 59 minutes.

Phase IV (September - December, 2001) was performed with three objectives in mind: To test the reliability of instrument indices, check logistics for quantitative surveying in this population, and to compare phase IV truckers' risk profile to those interviewed in the qualitative phases. To assess attitudes of condom use, several items were borrowed from an instrument already written in Spanish and available through the University of California in San Francisco.[22] That instrument crafted 25 items into a true/false/I don't know format. Examples of these inquiries included "Do you think that a condom can prevent a sexual infection?" and "Do you think a condom diminishes sexual pleasure?" Thirty-two participants were conveniently sampled from one site for these purposes.

None of the truck drivers repeated participation in more than one phase.

Validity and Reliability for Qualitative Phases

Qualitative internal validity is addressed through four techniques in this study.[23] First, a confirmation audit from five doctoral academic advisors determined that the product of inquiry was internally coherent. Second, peer debriefing was done with a neutral health specialist with several years experience in Bolivian HIV issues, and employed by a multinational nongovernmental organization (NGO) based in the capital city of La Paz. Third, prolonged engagement was used in which BHE, instead of the principal investigator, engaged the cultural bonds of trust for participant engagement. Lastly, there was data triangulation, in which truck driver participants, BHE, and principal investigator perceptions were confirmed with each other and with the quantitative survey results.

Qualitative reliability was assessed using two techniques. One was a dependability audit, a continuing evaluation process with advisors. The second was a reflexive journal which was used extensively along all points of the study.[23]

Data Analysis

Field notes and tape recordings were compiled for the qualitative phases. Relevant themes emerged from content analysis along three levels of inquiry. The first level was engaged after each participant interview or focus group event. The second level included a summation of themes within each phase. Level three was identification of similar themes between all three qualitative phases. The level three themes reported here are: Self-Reported STIs, Heterosexual sex partners, Knowledge and risk perception of STI/HIV, and Attitudes and Condom use. Data from phase IV were entered into Epi Info[24] and descriptive statistics are presented.

[1]. Salaries are reported in local currency then converted to dollar amounts at the June, 2000 exchange rate of one U.S. dollar per 6.10 *Bolivianos* (*Bs*.).

The Bolivian MOH approved this study in April, 2000. The ethics committee of the University of New Orleans granted approval of the methods. In all study phases, informed consent was explained and collected before conducting the interview.

Results

Table 1 shows demographic and occupational characteristics of truck drivers, by phase. Information from phase I revealed an average net salary of $363 per month (range $208 - $672), four times higher than the Bolivian per capita income.[25] International drivers were the highest wage earners (average $582/month) but were in the minority (17%- Phase I). Province-only drivers were the next highest paid ($361/month), followed by country-wide drivers ($275/month). Province drivers hauled agricultural products; international drivers hauled agricultural resources as well as consumable goods from more developed countries. Phase IV truckers revealed information about time spent on journeys, with the majority (65%) spending less than one week on the road at a time, 23% spending 1 to 4 weeks on the road at a time, and 13% were away from home for over one month at a time. Truck drivers worked an average of 11 years in this occupation. Most truck drivers were *transportista libre* (independent) and did not receive any health insurance or retirement/investment benefits. Those with organizational affiliation (companies or unions) received no health education or condoms through their organizations. Concerning education, 59% had some form of university/technical training beyond secondary school; 22% had no secondary school education (phase IV).

Self Reported STIs

Thirty-three percent of the phase I participants (n=12) answered affirmatively that they had an STI, but almost double (60%) in phase II (n=10) indicated this. Nine of 17 (53%) men from phase III reported having had some kind of STI. Therefore, of the 39 participants in the qualitative phases, when asked, about half (52%) mentioned that they had an STI in the past. In contrast, only 19% of phase IV (n=32) truckers reported having had an STI. There was more condom use with those who indicated having had an STI than those who did not report an STI (23% vs. 0%).

Sex Partners

In the phase I interviews nearly all participants spoke of prostitution (11 of 12), often in detail. For example, six of these 11 participants listed prices that prostitutes charge. Ten participants (91%) spoke of municipalities in which to find prostitutes. None of these locations were in urban areas. Five rural municipalities were repeatedly mentioned in which to find prostitutes, all on major highways to and from the city of Santa Cruz. Prostitutes were found in the words of one trucker *por la ruta tropical* (on the tropical route); another spoke of "the entire route". One of the locations was in an area called *Chaparé*, a notorious coca-leaf region in a neighboring western province. The truck drivers who mentioned this spot also remarked that it harbors military police (to control and monitor coca paste exportation) who also support prostitution. A few truckers mentioned the periodicity of prostitution, when prices and availability rise because of seasonal swings in agricultural commerce. One trucker remarked: *La prostitución esta creciendo por la pobreza* (prostitution is growing because of poverty- referring to an ongoing economic recession). Yet another trucker said that prostitutes are frequented as a means to forestall male initiated tendencies of rape.

Considering the detail of the testimonies about prostitution from phase I participants, only five (of 11) reported having contact with prostitutes. Of these five participants, three also mentioned sexual engagement with *chicas* (literally "girls", women outside of a night club, money-exchange environment). In addition, participants who did not indicate prostitute contact reported having sex with *chicas*.

Participants never mentioned the word 'prostitute' in the phase II interviews. *Mujeres conocidas* (known women), *cholitas*, *concubinas* (concubines), *conquistas* (conquests), *clandestinas* (hidden/underground women), *caroñas*, and *guaranitas* were terms used to label casual sex partners that emanated from phase II interviews. The term *caroña* was used specifically in talking about Brazilian females who, rather than charging money, exchange sex with truckers for excursions to and from Bolivia. Several of these terms imply unequal power structures; indeed, two of the terms listed by our respondents were labels for indigenous peoples (*cholita*, *guaranita*).

The focus groups reinforced the results from the first two phases that non-spousal sex is prevalent among this Bolivian trucking population. The terms that emerged from phase III were often connected to a language of transportation. Examples of terms used

to refer to these casual sex partners included *llanta auxilia* (spare tire), *sucursal* (branch office), and *repuesto* (spare part). Again, participants never mentioned the term 'prostitute' in the focus groups. The focus groups provided new information about sex partners because, for the first time in this assessment, discussion included relationships with spouses. Consequently, language shifted to references of mutually respectful relationships (in three of the four focus groups).

Phase IV confirmed the high proportion of truckers seeking casual sex partners (61%). Of those who reported contact, 46% mentioned they had sex with female friends or lovers, 31% with prostitutes or *chicas*, and 23% with other married women.

The type of heterosexual sex is important to note. Phase I and II tallies were compiled together since some participants were not asked this question. Forty percent of these truckers (n=22), when asked, engaged in oral sex and 27% in anal sex. However, only 13% of the phase IV (n=32) participants revealed that they engaged in oral sex or anal sex.

Knowledge and Risk Perception of STI/HIV

The majority of participants from all phases expressed some knowledge of AIDS, often expressing it as an *enfermedad mortal* (deadly disease). About 18% of participants in the first two phases (n=22) knew about HIV transmission. When asked if they could name different types of sexual diseases half of the phase I participants did so, though they were limited in scope (AIDS, chancroid, and gonorrhea). Again, about half of the phase II participants named types of sexual diseases, but these were wider in scope (AIDS, chancroid, gonorrhea, syphilis, warts, and symptoms for herpes). No one from any phase vocalized the acronym *VIH* (HIV), nor mentioned Chlamydia (note [2]).

All focus group participants expressed a high sense of susceptibility to STIs and AIDS. Few truckers from phase III focus groups knew of facilities or resources that offered HIV tests, treatment, or counseling information; they highly overestimated HIV test fees. Most respondents had a good idea of HIV transmission (sex or sharing needles), but others emphasized transmission based on hearsay, through "accidents" (blood transfusions after a crash), for example, or sex with some populations such as "transvestites" or "prostitutes" in Brazil. Knowledge concerning HIV transmission varied more between the focus groups than between participants in other phases.

In phase IV, 59% of the truckers perceived themselves at risk for HIV infection. Items showing inconsistent knowledge are shown in Table 2.

Condom Use and Attitudes About Condoms

All truck drivers (n=71) knew of condoms, but their voice concerning condom use was largely pessimistic. Truck drivers from all qualitative phases stated that the purpose of condoms was to prevent pregnancy (little mention of disease prevention). Testimonies included: "*Chicas* never have condoms"; "If I don't have condoms I won't look for prostitutes"; "Women complain that they hurt"; "I don't need to use them, I stay away from unknown women"; and "I've used them but they are messy (*se ensucia*)". Interestingly, most of the reasons behind condom use refusal emerged from phase II interviews. One participant, for example, said infections are transmitted by having a *pene marchitado* (flaccid penis) and therefore he did not use condoms for health reasons, insinuating that condoms cause limpness, thus STI transmission.

Attitudes were split concerning the benefits of condom use. In regards to STIs, puns emerged from the focus groups that also incorporated amounts and numbers. For example, *Cobran 30 después 150* (They charge *Bs*. 30, then *Bs*. 150) refers to a casual sex partner fee from which the client must also pay a second, larger fee for STI treatment. Concerning AIDS, there was unanimous sentiment of fatalism, commonly expressed by the phrase, *nadie está libre* (no one is free). One trucker put it this way, *SIDA es la palabra que frena* (AIDS is the word that puts the breaks on).

In two of the phase III focus groups expressions arose that condoms were not used with spouses because they (the spouses) would not enjoy sex (*no llega al orgasmo* [she doesn't orgasm], and *molestan la pareja* [condoms bother my partner]). Refusal was amplified in another focus group which vocalized a blatantly *macho* sentiment ("I will never use condoms", "I will not use condoms if she insists", and "it's the woman who takes care of the family"). At the other extreme, reference of mutual communication about condom use with spouses emerged from one focus group ("I'll use condoms if

[2]. Chlamydia was the most frequently diagnosed STI in one Santa Cruz, male-only, health clinic.[34]

she wants me to", "I can easily talk to her [about condoms]").

About half (53%) of the phase IV participants said that they used condoms sometime in their past. Table 2 shows the range of attitudes concerning condom use and HIV testing. Reliability testing of the attitudes of condom use demonstrated an acceptable alpha of .79.

Discussion

This study confirms reports that Bolivian long distance truck drivers are at risk for HIV transmission in spite of low regional or national HIV prevalence rates.[6, 8, 14] It highlights results taken from a series of interviews and focus groups to assess the need to intervene with this population. These results validate themes of risk found from other truck driver studies. Our results reveal a high STI prevalence history (as high as 52%), high proportions of multiple sex partner contact, and moderate levels of heterosexual anal sex. In addition, we demonstrate a gap between truckers' perceptions of risk, knowledge and behavior.

This article sheds light on a spectrum of casual sex partners who come in contact with the trucking population in Bolivia. In quantitative studies beyond these assessments, Sorensen[16] reported that 56% of 246 truckers had casual sex partner contact, but only 3% reported sex with prostitutes. Previous studies done in west Bolivia and Brazil show that 20% and 21% of truck drivers, respectively, had sex with prostitutes.[12, 14] This study excavates the assumption that prostitutes are the major source of casual sex for truckers and that prostitutes are a high STI/HIV risk population. On the contrary, in Bolivia, prostitutes show moderate and declining STI rates.[26] PAHO posted an HIV prevalence rate of only 0.004% in La Paz prostitutes, and 0.5% in Santa Cruz prostitutes.[4, 27] These data are extracted solely from urban, brothel-based CSWs and may not represent the networks of casual sex partners in which truck drivers circulate. Casual sex workers contacted by truckers are more likely to be unregistered and confront different living and health realities, partially to avoid police harassment or alcohol consumption obligations.[28, 29] There are no STI/HIV prevalence figures for these groups. Prevention efforts with prostitutes in urban centers, though apparently working, may not interface well with the trucking population.[26]

Another aspect of this study illuminates not only a health risk to truck drivers (and their spouses) through multiple types of casual sex partners, but also by type of sex. Considering the attention given to this occupation as a high risk population across the globe, relatively few studies document anal sex practices in truckers. Anal sex carries a higher potential of HIV transmission than vaginal sex for the receptive partner.[30, 31] Only 1% of east African truckers reported anal sex with female partners,[9] as did 3% of Indian truckers.[15] The qualitative assessments reported here suggest that about a quarter (27%) of Bolivian truck drivers engage in anal sex practices.

Anal sex behavior appears rooted in cultural and social norms. For example, in Peru, researchers reported that 36% of men recruited from health clinics reporting having anal sex with female partners.[32] Likewise, a sexual behavior survey in Brazil showed that 40% to 50% of those interviewed considered anal sex a normal part of intercourse.[33] In another study, 16% of male STI clients in Santa Cruz, Bolivia, reported having anal sex during their last sexual experience.[34] Rationale pertaining to Latin American men's higher involvement in anal intercourse with female partners include: pregnancy prevention (thus condom avoidance), virginity preservation, better perceived sensation, and the sentiment that, in a *machismo* culture, a man is expected to conquer in more than one way.[33]

In spite of the high reports of STI, multiple casual sex partners, and anal sex engagement, attitudes toward condom use were dismal in this trucking population. In general, condom use appears low in Bolivia. Only 7% of Bolivian men reported using condoms during their last sexual relation; in the province of Santa Cruz that figure decreased slightly to 6%.[35] However, truck drivers in developing countries seem to use condoms more often than the general male population, suggesting more risk perception and more prevention knowledge in this occupation. For example, two African studies showed moderate to high condom use figures at about 50%.[11, 36] In India, Rao et al.[15] reported a 37% condom use proportion in truckers. The problem persists in that condom use is not seen in a positive light and its use is inconsistent.

Limitations

One limitation to this investigation is lack of a seroprevalence component to verify STI self-reports. Participants in this setting may over-report STI occurrence since it seems to adhere to social norms in east Bolivian males. However, in phase II interviews, all participants who indicated a history of STI described symptoms, attaching some validity to their

reports. Similarly, the majority of truckers reported multiple sex partner contact. This may be an overestimate of the true picture; a participant may want to inflate his ability to acquire female sex partners in a *machismo* culture. Yet the rich language which labeled multiple partner types from phase II lends credence to the truckers' reports. Moreover, high risk behaviors reported across the different qualitative phases are validated through triangulation. Lastly, the high reports of STI and involvement with casual sex partners corroborate similar reports from the literature. For example, survey-based studies elsewhere demonstrated a 30% proportion of STI history in west Bolivian truckers, and 47% in Brazilian truckers.[12, 14]

Other limitations from this needs assessment include the small sample size and, because most phases were qualitative in nature, lack of capability to generalize to the entire Bolivian truck driving population. However, strategies to offset this include cultural engagement of trust between the local health workers and the participants, and the heterogeneous convenient sampling technique (transferability) used from phases I, II, and III. Cultural engagement strengthens internal validity and transferability reinforces external validity.[23]

Another limitation may be related to type II error, where education or ethnic differences could possibly explain inconsistencies in STI/HIV knowledge and condom use, but there was no such relation reported across the four phases. Indeed, Sorensen[16] found that neither education nor ethnicity had a significant influence on self reports of STI or condom use in a subsequent, quantitative survey involving 246 truck drivers.

Results Across Different Methodologies

In the qualitative phases (I, II, III), 52% of the truckers indicated that they had an STI. The quantitative phase (IV) showed 19%. A similar reporting phenomenon was found concerning anal sex, whereby the participants in the qualitative phases reported twice as much anal sex than those in the quantitative phase (27% vs. 13%). Our assessments not only compare with other regional studies but frame a possible range of behaviors and consequences depending on the method of inquiry.

Furthermore, we see evidence that the quality of information changed from one qualitative phase to another qualitative phase. For example, in passing from phase I to phase II respondents reported more variety in STI types or STI symptoms, a change of terms while talking of non-primary sex partners (from prostitutes to *chicas* or other local terms), an emergence of sexual power structure or *machismo* language, and rationalizations about condom refusal. In traversing to the phase III focus groups there was a shift to work-related language in describing casual sex partners, and an inclusion of the topic of spouses in the discussion.

The similar and validated themes between the four phases reported here are: 1) STI prevalence in the Bolivian trucker population, based on self reports, is moderate to high; 2) Truckers demonstrate a high proportion of multiple sex partner contact; 3) Truckers demonstrate inconsistent condom use and inconsistent STI/HIV knowledge; and 4) Truckers express poor condom use attitudes but a high self perceived risk of HIV infection. Needs assessments concerning sexual behavior can benefit from validation using mixed methodology. It is not uncommon to find studies that complement quantitative components with qualitative research. The results from this assessment go a step further demonstrating that different qualitative methods may reveal differences in information from the same population, while validating other information. The use of multiple qualitative techniques in future sexual behavior studies merits consideration.

Conclusion

This needs assessment supports previous studies about truck drivers and the high risk of HIV transmission. Further survey-based research with this population should be considered to confirm these assessments. This investigation demonstrates the need to channel funding to the Bolivian long distance trucking population, as well as their spouses, for future research, sex education, and accessible STI/HIV testing. The city of Santa Cruz did not have such a program at the time of this study.

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References

1. *Instituto Nacional de Estadistica* (INE) *de Bolivia*. [Country data]. Available at: http://www.ine.gov.bo/cgi-bin/PIWDIEPOB.EXE/. Accessed July 2003.
2. Pan American Health Organization (PAHO). Bolivia- Epidemiological fact sheet on HIV/AIDS and sexually transmitted infections, 2000 update. Available at: http://www.paho.org/english/sha/prfbol.htm. Accessed Jan 2001.
3. PAHO. Country Health Profile, Bolivia. Available at: http://www.paho.org/english/sha/prflbol.htm. Accessed July 2005.
4. Ministry of Health. *Informe de Vigilancia Epidemiológica*. Yearly disease frequencies. Available at: http://www.sns.gov/bo/bolsns/epi.htm. Accessed Nov 2004.
5. Schmunis G, Zicker F, Pinheiro F, et al. Risk for transfusion-transmitted infectious diseases in Central and South America. *Emerg Infect Dis.* 1998; 4(1): 5-11.
6. Joint United Nations Programme on HIV/AIDS (UNAIDS). *Análisis de la situación de la epidemia del VIH/SIDA y de la respuesta nacional en Bolivia*. La Paz Bolivia: *ONUSIDA*. 2000.
7. PAHO. AIDS surveillance in the Americas. Biannual report, 2002 June. Available at: http://www.paho.org/english/HCP/HCA/AIDSsurvjun02.pdf. Accessed July 2004.
8. UNAIDS. Bolivia: Epidemiological Fact Sheets on HIV/AIDS and Sexually transmitted Infections; 2002 Update. Available at: http://www.unaids.org/hivaidsinfo/statistics/fact_sheet/pdfs/Bolivia_en.pdf. Accessed July 2004.
9. Bwayo J, Plummer F, Omari M, et al. Human immunodeficiency virus infection in long- distance truck drivers in east Africa. *Arch Intern Med.* 1994; 154:1391-1396.
10. Carswell J, Lloyd G, Howells J. Prevalence of HIV-1 in east African lorrydrivers. *AIDS*. 1989; 3:759-761.
11. Ramjee G, Gouws E. Prevalence of HIV among truck drivers visiting sex workers in KwaZulu-Natal, South Africa. *Sex Transm Dis*. 2002; 29(1):44-49.
12. Lacerda R, Gravato N, McFarland W, et al. Truck drivers in Brazil: prevalence of HIV and other sexually transmitted diseases, risk behavior and potential for spread of infection. *AIDS*. 1997; 1(suppl 1):S15-S19.
13. Morris M, Podhisita C, Wawer MJ, et al. Bridge populations in the spread of HIV/AIDS in Thailand. *AIDS.* 1996; 10(11):1265-71.
14. Population Services International (PSI). *Evaluación de resultados proyecto AIDSMARK "por una Bolivia sin SIDA"*. [Organizational research report]. La Paz Bolivia: Aguilar & Asociados S.R.L. 2000.
15. Rao KS, Pilli RD, Rao AS, et al. Sexual lifestyle of long distance lorry drivers in India: questionnaire survey. *BMJ*. 1999; 318:162-163.
16. Sorensen W. Using Mixed Methodology to Assess High Risk Sexual behavior and Adult Stage among Bolivian Truck Drivers. [D. Phil dissertation; UMI No. AAT 311748]. Available at: http://louisdl.louislibraries.org/NOD/Pages/home.php .New Orleans, LA: University of New Orleans; 2003.
17. Stratford D, Ellerbrock TV, Akins JK, et al. Highway cowboys, old hands, and Christian truckers: Risk behavior for human immunodeficiency virus infection among long-haul truckers in Florida. *Soc Sci Med*. 2000; 50:737-749.
18. Power R. The application of qualitative research methods to the study of sexually transmitted infections. *Sex Transm Infect*. 2002; 78:87-89.
19.Carevic F, Sánchez JM. *Cosecha: Camiones hacen 220 mil viajes*. *El Deber*. [newspaper]. 25 April 2000; Economics section: 6.
20. INE. [Country data]. Available at: http://www.ine.gov.bo. Accessed Nov 2004.
21. Patton MQ. Qualitative evaluation and research methods. 2nd ed. Newbury Park, CA: Sage Publications. 1990.
22. UCSF. *Estudio del uso de condones 1991- Entrevista para hombres*. Available at: www.caps.ucsf.edu/projects/marinhombre.html. Accessed July 2000.
23. Tashakkori A, Teddlie C. Mixed Methodology. 1st ed. Thousand Oaks, CA: Sage Publications; 1998.
24. Epi Info, Version 6.04. [Computer program]. Stone Mountain, GA; Centers for Disease Control. 1996.
25. U.S. State Department. Country background: Bolivia, 1998 data. Available at: http://www.state.gov/www/background_notes/bolivia_0500_bgn.html. Accessed July 2001.
26.Levine W, Revollo R, Kaune V, et al. Decline in sexually transmitted disease prevalence in female Bolivian sex workers: impact of an HIV prevention project. AIDS. 1998; 12:1899-1906.
27. World Health Organization (WHO). Bolivia 2004 epidemiological fact sheet on HIV/AIDS and STIs. Available at: www.who.int/globalatlas/pdffactory/hiv/efs.pdfs/efs2004.bo.pdf. Accessed Nov 2004.
28. Diaz S. La Sala: Una experiencia diferente en la prevención de enfermedades de transmisión sexual y VIH/SIDA. [Organizational research report]. CARE for USAID/Bolivia. 1999.
29. Wright T. Gay organizations, NGOs, and the globalization of sexual identity: The case of Bolivia.

Journal of Latin American Anthropology. 2000;5(2):89-111.
30. Corey L, Sherris J. Acquired Immunodeficiency Syndrome. In: Sherris J, ed. Medical Microbiology. New York, NY: Elsevier; 1990:929-936.
31. Grosskurth H, Gray R, Hayes R, et al. Control of sexually transmitted diseases for HIV-1 prevention: understanding the implications of the Mwanza and Rakai trials. Lancet. 2000; 355(9219):1981-1987.
32. Sánchez J, Gotuzzo E, Escamilla J, et al. Gender differences in sexual practices and sexually transmitted infections among adults in Lima, Peru. Am J Public Health. 1996; 86(8):1098-1107.
33. Halperin D. HIV, STDs, anal sex and AIDS prevention policy in a northeastern Brazilian city. Int J STD AIDS. 1998; 9:294-298.
34. SexSalud [Organizational research report]. Santa Cruz Bolivia: HIVOS [Humanistisch Instituut voor Ontwikkelingssamenwerking]. 1999.
35. Demographic Health Survey. Bolivia: Encuesta Naciónal de demografia y salud. Calverton, MD: Macro International Inc. 1998.
36. Orubuloye I, Caldwell P, Caldwell J. The role of high-risk occupations in the spread of AIDS: Truck drivers and itinerant market women in Nigeria. Fam Plann Perspect. 1993; 19:43-48.

Table 1. Frequencies (%) of Participant Demographic Characteristics by Phase

	Phase I[a] n=12	Phase II[b] n=10	Phase III[c] n=17	Phase IV[d] n=32
Age				
mean	35	33	n/a	37
range	23 - 47	25 - 47		20 - 54
Ethnicity				
Colla	9 (75.0)	5 (50.0)	8 (47.1)	19 (59.0)
Camba	3 (25.0)	5 (50.0)	9 (52.9)	13 (41.0)
Marital status				
Married	10 (83.3)	n/a	n/a	21 (65.6)
Single or Divorced	2 (16.7)			11 (34.4)
Education				
< secondary school	n/a	n/a	n/a	7 (21.9)
secondary completed				6 (18.8)
some college/university				15 (46.9)
college graduate				4 (12.5)
Years experience as trucker				
0-4	2 (16.7)	n/a	n/a	12 (37.5)
5-10	3 (25.0)			7 (21.9)
>10	5 (41.7)			12 (37.5)
Unknown	2 (16.7)			1 (3.1)
Salary (monthly in dollars)				
0 - 163	0 (0.0)	n/a	n/a	7 (21.9)
164 - 327	6 (50.0)			6 (18.8)
328 - 492	4 (33.3)			15 (46.9)
493+	2 (16.7)			2 (6.3)
Unknown				2 (6.3)

a. semi-structured interviews
b. open ended interviews
c. focus groups
d. reliability testing

Table 2. Ranking and percentage of responses with "yes" or "agreement" from Phase IV participants; N=32.

Knowledge	%
1. An HIV infected person can transmit the virus through sexual contact	87.5
2. Condoms diminish the risk of HIV transmission	75.0
2. You can get any STI by using the same toilet as an infected person	75.0
3. Do you know where to get an HIV test?	71.9
4. You can get HIV from eating the food of an infected person	46.9
5. You can get HIV by hugging an infected person	43.8
6. HIV can be cured if one receives timely treatment	31.3
6. Condoms can cause cancer	31.3
7. Only sick people get AIDS	28.1
Risk Perception	
1. Do you think a person can avoid getting HIV/AIDS by changing his behavior?	81.3
2. To diminish the risk of getting HIV/AIDS, have you changed your behavior?	78.1
3. Do you think you are at risk for getting HIV?	59.4
4. Have you ever taken the HIV test?	6.3
Attitudes about Condoms: "Do you consider (the use of) condoms…"	
1. Important in avoiding sexually transmitted diseases?	87.5
1. Diminish the fear of pregnancy?	87.5
2. Something that deals with responsibility?	84.4
3. Easy to put on?	75.0
4. Easy to find and purchase?	68.6
5. Capable of diminishing sexual pleasure?	65.6
5. Something that your partner does not appreciate?	65.6
5. To be used only with prostitutes?	65.6
6. Risky because they can break?	59.4
7. Lack instructions on proper use?	46.9
8. Useless because they do not fit you?	40.6
9. Awkward because they can slip off when you withdrawal?	25.0
10. Against your religion?	18.8
11. Something that prolongs sexual pleasure?	15.6
12. Expensive?	9.4
Attitudes about HIV testing	
1. Testing is important if my partner wants me to get a test	84.4
2. It is easy to go through a testing procedure	65.6
3. Testing clinics are too far away	46.9
4. Testing takes a lot of time	40.6
5. It is difficult to find a testing clinic	37.5
6. The test is inexpensive	28.1