

Male sex workers in Dhaka, Bangladesh: Risk reduction through effective intervention

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Abstract

Objective: To use behavioural surveillance to measure effectiveness of an HIV prevention intervention for male sex workers (MSWs) in Dhaka, Bangladesh.

Design: Repeated cross-sectional quantitative surveys, supplemented by qualitative research.

Methods: With information from a qualitative study of men who have sex with men (MSM), the first wave of behavioural surveillance was conducted in 1998-99, prior to the full implementation of an intervention. This was a convenience sample taken at mapped cruising sites of 207 MSWs and 200 non-sex working MSM. The second wave, conducted after the intervention expanded, was a probability sample of 582 MSWs only, taken with a time-location, take-all strategy. The primary analysis compared MSWs reporting different levels of exposure to the intervention during the second wave of the survey. Supplementary analysis used matched historical controls.

Results: Analysis revealed significant effects of increasing intervention exposure on consistent condom use for anal intercourse, condom buying and condom carrying; also a significant improvement in any condom use for oral sex. Similar improvement was evident with personal partners, except for those engaging in vaginal sex. The most significant factor associated with consistent condom use was the buying of condoms (OR 77.8) and with buying, participation in the intervention (OR 7.4).

Conclusions: Data from the Bangladesh behavioural surveillance demonstrate the impact of a behavioural intervention on MSWs in Dhaka. Nonetheless, overall condom

use remains low. MSWs in Bangladesh remain at high risk in an environment with high levels of syphilis, but continuing low HIV prevalence.

Introduction

Male sex workers (MSWs) comprise an important group at risk of HIV infection in South Asia. There are few published studies about their HIV or STD prevalence, numbers, socio-demographic characteristics or risk behaviors [1, 2], although there is a growing literature on the more general category of men who have sex with men (MSM) in S. Asia [3,4,5,6]. Most published studies are concerned with describing behavioural risk and issues of identity and gender, but we have found none that evaluates or describes HIV prevention interventions. In Bangladesh, however, considerable progress has been made in research, prevention, HIV/syphilis and behavioral surveillance surveys (BSS) among MSM in general and among MSWs in particular. BSS are repeated quantitative surveys carried out in specific populations to track changes in the frequency of behavioural risk factors associated with the spread of HIV infection [7]. The methodology of BSS is semi-standardized and allows comparison across countries and between samples within a country. Probability sampling, once established in sentinel populations, permits comparisons across years and can examine the effects of exposure to an intervention or to a package of interventions in a particular location.

In 2000, the National HIV/STD Surveillance documented HIV prevalence of zero (95% confidence interval (CI), 0-0.9%) and syphilis at 9.7% (TPHA and RPR positive, 95% CI, 7.0-13.0%) among MSWs in Dhaka. Similar levels were found among non-sex worker MSM, i.e. zero HIV prevalence (95% CI, 0-1.3 and syphilis prevalence of 12.8% (95% CI, 9.1-17.3) [8]. This situation is appropriate for demonstrating the potential

effects of targeted interventions among high risk groups with little or no HIV but an apparently high potential for an epidemic.

This paper presents selected results of several studies on MSWs in Dhaka conducted between 1998 and 2000. The first was a qualitative, life history interview study and the following two were quantitative surveys using BSS methodology. Results from the third study, i.e. the second wave of the National HIV Behavioural Surveillance, allow an assessment of the effectiveness of interventions among these MSW. While it is recognized that control of all confounding factors is not possible through cross-sectional comparisons of non-experimental intervention designs, in the absence of randomization and control groups, practical methods to assess effectiveness must be demonstrated to enable decision-making for policy makers, donors and implementers. Triangulation or using multiple data sources and types that consistently show strong and specific effects, establishing temporal and logical plausibility, the strength of the association and observed outcome, and showing a 'dose-response' relationship have been noted as important criteria for assessing observational intervention studies [9,10]. Other problems remain, such as establishing comparability between treatment and control groups and eliminating competing hypotheses to explain the outcome. Each of the major elements of good impact evaluation practice will be discussed in relation to the available data and analysis.

Methods

Participants and Sampling

In the first qualitative study, 316 MSM were recruited through personal networks of 6 trained interviewers associated with a community-based organization in Dhaka (the Bandhu Social Welfare Society, hereafter called Bandhu). Of these, 47%, or 147 were MSWs, defined as currently selling sex for cash. Gift exchanges were not considered commercial unless cash was also involved as a mode of making a living. Interviews were audio-taped in private and consisted of a structured discussion of critical life events, sexuality development, knowledge, and practices. Results from the first qualitative study are presented as a brief introduction to the socio-cultural setting in which this intervention took place.

The second study, which was the first wave of BSS, consisted of a convenience sample of 407 MSM in Dhaka, of whom 207 were current MSWs (defined as selling sex for cash within the past week). This was obtained at 43 locations around the city during May, 1998. Most men were interviewed at or near cruising sites (public locations at which men can find potential sexual partners), such as parks and shrines. The questionnaire aimed at eliciting risk factors, current knowledge, source of knowledge, and utilization of services.

The third study, the second wave of BSS, consisted of a probability sample of 582 MSWs only (no non-sex working MSM were included as the aim was to assess only those at highest risk) at mapped cruising sites in Dhaka. Inclusion criteria for sex worker status were the same as in the previous studies. The sampling method was a two-stage cluster approach using a time-location design at the first stage and take-all at the second stage. Fifty-two primary sampling units (PSUs) at 50 locations were designated following ward-by-ward mapping of the city by men associated with Bandhu and local guides. The resultant sample randomly selected 32 PSUs from which all MSWs were to be interviewed within a 4 hour period between 6 PM and 10 PM. Out of the 737 eligible respondents who were present at the chosen sites during the designated time, some left before being interviewed (15.9%) and others refused (1.6%); 17.5% did not complete their interviews. An additional 7.7% (of 787 seen during interviewing) were duplicates, having been previously interviewed at another time during the survey. These were noted and not taken.

The timing of these studies is important to the evaluation of impact. The first qualitative study took place before any intervention targeted for MSWs was in place, between January and April 1998. The Bandhu Social Welfare Society project is based on a community empowerment model, according to the strategies of Naz Foundation International (Mackay, T. An evaluation of the work of Naz Foundation International and two of its partner projects:Reference DFRC/IN0031,JSI/DFID,Nov.1999). This model aims at creating safe spaces for men with marginalized sexualities, where social

interactions and bonding through educational and social meetings can take place, accompanied by outreach by peer educators, condom and lubrication distribution, and, wherever possible, sexual health clinics with testing and counseling capacity. The first wave of BSS was conducted shortly after Bandhu developed a meeting space, had begun to conduct outreach in nine cruising areas of Dhaka and just as their clinic was being established, in May 1998. By the time of the second wave of BSS during February-March, 2000, Bandhu had outreach workers at 14 cruising sites in Dhaka as well as one fixed clinic and the sponsorship of another mobile clinic in one additional location. Condoms were sold at subsidized prices at the meeting place as well as by outreach workers, but lubrication was not yet available. The clinic operated for 3-4 hours three times per week and offered subsidized services and medicine.

Only one other smaller community-based organization had also begun to conduct outreach to MSWs in another location in Dhaka, but their territory did not overlap with those of Bandhu and they did not have clinic facilities or sell condoms. One of their sites was included in the sample, but 15 interviews taken at that site have been omitted from the analysis, as have another 8 interviews with missing critical information. This reduced the usable sample to 559 from 582.

Data analysis

Analysis of the texts of the first study consisted of a database listing of primary demographic characteristics of respondents and a thematic analysis of major issues

related to knowledge, concepts, identities, and risk. Simple descriptive statistics of the sample of MSWs are presented here with a brief discussion of pertinent background material.

Analysis of the first BSS consisted of descriptive statistics using SAS 6.03. Analysis of the second BSS took the design effect of cluster sampling into account through the use of Stata 6 for all analyses. Comparisons were conducted between groups of MSWs reporting exposure and non-exposure to different aspects of the intervention. Using multiple logistic regression, variables found to be significantly associated with reduced risk behaviors or utilization of prevention services on univariate analysis (by Pearson's designed adjusted chi square for proportions and design adjusted t-tests for means), were entered and assessed. Odds ratios are reported to summarize results. Only probability levels of .01 or less were considered significant.

In order to strengthen our interpretation of the results, two additional analyses were conducted. One consisted of a constructed sample of MSWs from the 1998 survey matched by cruising site and age, to serve as historical controls for the final sample of those interviewed in 1999-2000. The second was a sensitivity analysis, here presenting only the worst case scenario, using all the men who were lost to interviewers due to refusal or walking away prior to interview. Although some of the latter were certainly due to their having found clients while the interviewers were busy with other MSWs, some may have also been refusals. As nothing was known about these lost-to-interview

MSWs, it was important to refute any possibility that they may have avoided the interview because they were educated to use condoms but did not. Therefore, records for these men were added for each site and calculated as if they had been exposed to the intervention but had not adopted any condom use at all. Design effects were accounted for throughout these analyses. This sensitivity analysis had a sample size of 695.

Results

The first life history study revealed that most, but not all, of the men selling sex considered themselves to be *kothis*. The term refers to a feminized male who feels like and enjoys sex as if he were a woman. *Kothis* generally prefer to be penetrated than to penetrate and this preference is what signals stigmatization in the hegemonic patriarchal construction of masculinity in S. Asia [11]. Although some non-*kothi* sex workers may cross-dress or wear make-up to signal their availability in cruising sites, many do not display blatantly feminine traits. In general, *kothis* dominate the commercial sex scene, in numbers and visibility. The term *panti* is their name for those who penetrate them, and comprise the majority of clients. On their part, *pantis* usually simply consider themselves men, with no specific term of designation. In actuality, sexual practices vary to some degree, with *kothis* sometimes being the penetrative partner and *pantis* at times being receptive. The term "gay" was rarely used and the term "homosexual" was poorly understood by the majority of respondents.

In this sample the 207 MSWs had lived in Dhaka for an average of 16.5 years, although 60% were originally migrants from rural areas. They averaged 7.6 years of education but 13% had never been to school (compared with an average of 9.9 years and 4% with no school at all among non-sex worker MSM). Finally, 61% said they had additional means of making a living, such as garment work, singing, dancing, etc. Familial and social pressures to marry are great, especially in the middle classes, and, with increasing age, it appears that a larger proportion of MSM agree to marriage. While 20% of the non-sex worker MSM were married, only 3% of the MSW were married in this sample. In both cases, the average age of married men was far greater at 36 years than those who were single, i.e. 22.3 years, further evidence that frequency of marriage increases with age.

The first wave of BSS revealed a similar sample profile of MSWs to the qualitative study, with a median age of 22 compared with a mean of 32 years among non-sex worker MSM. The MSWs averaged 8.3 years of education and 9% had never been to school (compared with an average of 12.1 years and 3% no school among the non-sex worker MSM). Only 3.4% of MSWs were married (48% among non-sex worker MSM) and 13% had sex with females (compared with 58% among non-sex worker MSM). In addition to selling sex, these MSWs also paid for sex (11% paid men and 5% paid women) and engaged in sex with personal (i.e. non-paying or paid) partners, 78% with men and 4% with women. More than half, 56%, of all sex acts with the last client, consisted of anal intercourse, the vast majority as receptive partners. Of all last sex acts with clients,

26% had been protected by condoms. Of all last sex acts with personal partners, for only 19% had condoms been used. When asked if they were carrying condoms, 18% were able to show them to interviewers. Respondents reported an average of 3 clients per week, and 10 partners per month, 48% of whom were new partners, implying considerable breadth of sexual networks. In addition, 3% had ever injected drugs while 7% said they knew their main partner was injecting.

In the second wave of BSS, consisting of MSWs only, the median age was 24 (range: 9-55). The average years of education among those who had attended school was 8.5 ± 3.56 and 8.4% (95% CI, 6.1-10.7) had never been to school. Most MSWs were single, 87.4% (95% CI, 82.4-88.9), but 13.3% (95% CI, 10.2-16.4) were married and less than 1% were separated, divorced or widowed. Many stated they had a main steady partner, 48% of whom were male, 15% female and 1% transgender. Self-identified *kothis*, who comprised 66% of all MSWs in this sample, were equally likely to be married and have other female partners as non-*kothi* MSWs. However, a far greater proportion of *kothis* than non-*kothis* had revealed their sexual practices to someone in their family, 23.2% (95% CI, 18.8-28.3) vs. 2.5% (95% CI, 1.3-4.7, $p=.000$).

These MSWs had been in sex work for an average of 8.9 years (95% CI, 8.4-9.5) and 24% had been selling sex for less than 5 years. The number of years in sex work ranged from 0.75 to 37 and the average age at starting sex work was 16 ± 3.4 . A third,

i.e. 34%, had started sex work before coming to Dhaka. A small percentage, 6.5% (95% CI, 4.1-8.9) was bonded, i.e, owed 100% of income from sex to a master or *dalal* who supplies housing and food, and 12.5% (95% CI, 9.4-15.7) were sleeping on the streets. Many MSWs had additional sources of income, yet for 46.2% (95% CI, 41.5-51.0) selling sex was the sole source of earnings. Among those with other sources of income, 15% were 'service holders' (a local term in Bangladesh designating wage earners, most commonly in government service), around 4-5% each tutors, pimps, businessmen, garment workers, shopkeepers, dancers, hotel boys, laborers and many other types of employment. The average income from selling sex the previous day was 105.24 Tk (95% CI, 95.6-114.9), considerably less than the average of 211 Tk earned by female sex workers in Dhaka during the same time period (US\$1= ~50 B Taka). However, the price per sex act was nearly double, at a mean of 23 Tk. The average number of clients during the last week was 6.19 (95% CI, 5.9-6.5), with a range from 1 to 45. The mean age of clients was 35.7 years (95% CI, 34.8-36.6), ranging from 16 to 85, with 15% over 45. The most common occupations of clients were service holders, businessmen, students, police and drivers, essentially the same list elicited from female sex workers. The respondents estimated that 3 out of their last 5 clients were married.

For the sake of assessing the impact on behavior of Bandhu's program, results from the second wave of BSS were analyzed comparatively. Three key exposure variables allowed for this assessment. These were: 1) whether an NGO outreach worker had come to the individual within the past month; and 2) whether the MSW had actively

participated in an HIV prevention program; and 3) how many times he had done so. Major variables to detect the proximate factors related to safer sex behavior were: 1) whether the MSW had purchased condoms in the past week; 2) if any of these had been bought in the past week from a Bandhu outreach worker; 3) how many they bought; and 4) whether the men had asked all of their clients the past week to use condoms. Major variables to assess safer sex practices in the past week with clients were: 1) number of MSWs consistently using condoms for anal sex; 2) number of MSWs using any condoms for oral sex; 3) proportion of all anal sex acts covered by condoms; and 4) proportion of oral sex acts covered by any condoms. Other factors were explored for their relation to safer sex: being raped by police or by *mastaans* (street thugs); being bonded; being homeless and sleeping in the streets; number of clients last week; currently injecting; income last week or month; marital status; years of education; age; years in Dhaka, and years in sex work.

Univariate analysis showed that 75.9% of the men (95% CI, 70.5-80.5) had been reached in the past month by NGO outreach workers, slightly over half of whom (55.4%) had also attended group meetings. Of those who attended meetings (42.4% of the sample, 95% CI, 37.4-47.5), nearly all, 99.2%, had been exposed to an outreach worker the previous month. The average number of group sessions attended was 2.4 (95% CI, 1.9-2.9) among those reached by outreach workers and only 0.1 (95% CI, .02-.17) among those who had not (T-test, -10.13, $p=.000$). Among all socio-demographic variables measured (age, marital status, years of education, years in

Dhaka, years in sex work, last month's income, last week's income, currently injecting, being homeless) none was significantly associated with participating in the HIV educational sessions except years in sex work. This association reached statistical significance at $p=.01$ with 9.3 years (95% CI, 8.6-10.0) among those who had attended vs. 8.0 years (95% CI, 7.2-8.8) among those who had not, but would not seem to be of functional significance to the issues at hand. Sexual practice variables (average number of penetrative acts -anal and oral- with clients the previous week) also did not differ significantly by attendance at meetings. Testing the same variables for their association with outreach workers also revealed no significant differences.

Table 1 shows the proportions of selected proximate and safer sex variables by participation in group social/educational sessions or by exposure to outreach workers in the past month. All variables show significant differences by exposure to outreach workers, with greater safety among the exposed. In addition, all variables show similar significant differences by participation in meetings.

Table 2 illustrates a significant and consistent dose-response effect of exposure to the group social/educational meetings as well as outreach alone compared with outreach plus any attendance at meetings. Increased participation in meetings was associated with significantly greater proportion of MSWs who always had protected anal intercourse in the last week, who used condoms for at least some oral sex in the last week, who bought condoms, who asked all clients to use condoms, who treated their

last bout of STD, who correctly understood that sex with males could transmit HIV, and who could show their condoms to interviewers. These data suggest that attending approximately three group meetings was required for positive behavior change to occur. The range of attendance spanned from 0 to 35 times. However, all of the men attending 3 or more meetings had also seen outreach workers in the past month. Examining the differential effects of outreach alone and combined outreach with meeting attendance shows a consistent and significantly greater effect of combined exposure, as does a similar analysis (not shown) with unexposed vs. outreach alone vs. outreach plus any meetings.

Other Sexual Partners

MSWs in Bangladesh and elsewhere, for example in Thailand [12], sometimes also purchase sex from male, female or transgender sex workers. In the past month, 13% had paid for sex with other men, 11% had bought from females, and a few, only 1%, had bought sex from transgender sex workers. Overall, 20.96% (95% CI 17.7, 24.2) had bought sex last month. Analysis of intervention effects on condom use with these partners was handicapped by small sample sizes in each cell (no exposure=13, outreach only=36, outreach plus meetings=73, total=122) and no association reached statistical significance. However, the direction of differences appeared to indicate a trend toward greater use with increasing exposure to the intervention. The proportions of MSWs who reported consistent condom use for anal intercourse was 3.9% (95% CI,

0.1-14.0) with no exposure, 15.8% (95% CI, 8.6-27.1) with outreach only, and 23.7% (95% CI, 15.6-34.3) with outreach plus meetings ($p=0.89$).

In addition, MSWs have personal sexual partners, sometimes in steady relationships (including marriage), as well as casual friends. These are defined for this study as non-commercial, i.e. not in exchange for cash. Among these MSWs, 80% had sex with at least one non-commercial partner last month; 76% with males, 15% with females and 1% with transgender partners. Most (71%, or 60/84) of the men who reported sex with females were married. Table 3 presents the relationships between different levels of exposure to the intervention and safer sex practices last time with personal partners. Because "last time" often includes multiple acts of intercourse, the question elicited condom use for any, some or all acts last time.

An additional stringent sensitivity analysis ($n=693$) was carried out to attempt to account for the men who were not interviewed. Using anal intercourse with clients as the key indicator, and assuming that all men missing interviews had been fully exposed to the intervention and had not adopted any condom use, yielded 1.2% (95% CI, 0.4-3.2) for those unexposed, 3.5% (95% CI, 2.3-5.3) among those with outreach only and 10.5% (95% CI, 7.8-14.1) among those having been exposed to outreach workers and meetings (Pearson's design based chi sq=5.7, $p=.01$). Further, an attempt was made to create historical controls from the previous BSS matched by cruising site and age. This exercise yielded a sample of 207 MSWs for each year, 1998 and 2000, with average

ages of 22.22 and 22.16 respectively (t -test=.146, p =.885). This comparison showed a significant difference in condom use between surveys. In 1998, 7.5% (95% CI, 4.8-11.3) of MSWs used any condoms for penetrative sex (oral or anal) with clients last time compared with 20.1% (95% CI, 12.8-29.9) in 2000 (p =.000). In addition, 8.8% (95% CI, 5.7-13.4) of MSWs in 1998 were able to show their condoms to interviewers, compared with 27.9% (95% CI, 18.5-39.7, p =.000) in 2000.

Finally, a multiple logistic regression was carried out to assess the major factors associated with improved condom use. The most significant factors associated with consistent condom use with clients in the past week for anal intercourse were: the buying of condoms (OR 77.8, 95% CI, 9.86-612.87, p =.000); being married (OR 3.0, 95% CI, 1.61-5.60, p =.001); fewer clients per week (OR, 0.71, 95% CI, 0.61-0.83, p =.000); and being homeless (OR 3.3, 95% CI, 1.42-7.89, p =.008). Of all homeless men ($n=70$), 30% were consistently using condoms in the past week for anal intercourse, but only 17% of the non-homeless had done the same (p =.008). A significantly lower average client number of 4.8 (95% CI, 4.5-5.2) among the safer MSWs vs. 6.5 (95% CI, 6.2-6.8) among the less safe could represent the result of the intervention or precede it, implying that those with more clients were less likely to be reached by Bandhu's outreach workers. However, a test of this hypothesis did not support it.

The most significant factors associated with buying condoms were increasing levels of exposure to Bandhu's intervention (OR 7.4, 95% CI 5.2-10.5, $p=.000$) and years of education (OR 1.13, 95% CI, 1.08-1.19, $p=.000$). In addition, more MSWs reported buying condoms from Bandhu (84%) than from any other source (67%).

Discussion

Studies such as this one have the major limitation of not being able to assure the control of confounding. The sub-samples did not differ in any measured socio-demographic factor, but, if an unmeasured factor existed to account for the effects seen, they remain unknowable. Competing hypotheses, in this case, are less difficult to refute as there were no government or NGO programs for MSWs working at the cruising sites in our sample, selling condoms or providing clinic services. Only a very limited public discussion had begun about AIDS and most people at that time, and probably now, were unaware there were MSWs in Dhaka. Yet, the strength of the evidence, examined in numerous ways, is consistent. It is clear that Bandhu's outreach to street-based MSWs is significantly associated with improved reported condom use as well as the readiness to use condoms as evidenced by their having condoms with them at the cruising sites.

It also appears that Bandhu has targeted, as intended, the poorer and more disadvantaged MSWs, as shown in the multiple logistic regression. Homeless, street-dwelling MSWs are poorer and less educated than the others, but, nonetheless, have

learned to protect themselves. Creating safe spaces for highly marginalized persons in which they have an opportunity to learn about their own vulnerability and options for safety in a non-threatening environment appears to complement outreach alone in an additive manner. Recent reports on interventions with MSM in difficult circumstances support this finding [13,14].

It must be stressed, however, that overall condom use among Dhaka's MSWs remains very low and is especially problematic for vaginal sex, as has been found elsewhere [15]. This is particularly difficult for married men. In S. Asia, where large numbers of families are destitute, sex work is an option for survival. Despite intense social, familial and religious pressures to marry, have children and avoid the shame of street-based prostitution, some men sell sex to a growing market. Bandhu's men's sexual health intervention has shown some early success, but the issues in Asian MSM projects are complex and sensitive, involving many very poor men who are married or otherwise have sex with women. In addition, self-identifications, such as *kothi*, may be useful to develop a sense of common interests, but may function to exclude many other men who sell sex and do not relate to the *kothi* networks.

The methodology of behavioural surveillance has as one of its aims the tracking of changes in HIV risk behaviors. Where circumstances of geography and coverage permit, this methodology could also help intervention implementers examine their effectiveness

and provide donors and country program managers with information needed to make investment decisions for HIV prevention.

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Table 1. Safer sex practices with clients among male sex workers (MSWs) by participation in HIV prevention program and exposure to outreach workers in last month

Safer sex practices in last week	Male sex workers in Dhaka (n=559)					
	Participates in HIV prevention program		P value	Reached by NGO outreach worker in last month		P value
	Yes % 95% CI (n=237)	No % 95% CI (n=322)		Yes % 95% CI (n=424)	No % 95% CI (n=135)	
MSWs using condoms for all anal intercourse (vs. some/none)	12.9 9.9-16.6	5.7 3.9-8.2	.0000	17.1 13.3-21.8	1.4 0.5-4.0	.004
MSWs using condoms for any oral sex (vs. none)	26.2 21.7-31.2	18.4 14.8-22.6	.0000	40.4 34.4-46.7	4.2 2.5-6.9	.0000
Mean % of acts of anal intercourse with condoms	63.7 59.4-68.1	29.5 25.4-33.6	.0000	54.2 50.5-57.9	12.0 5.6-18.3	.0000
Mean % of oral acts with condoms	30.7 26.5-34.8	16.1 12.4-19.9	.0000	26.1 22.2-30.1	10.2 5.1-15.2	.0000
MSWs who asked all clients to use condoms (vs. some/none)	22.3 17.9-27.5	12.9 10.0-16.5	.0000	33.9 29.3-38.9	1.3 0.7-2.4	.0000
MSWs who bought condoms	39.1 34.2-44.3	27.5 23.3-32.2	.0000	62.0 57.1-66.6	4.6 2.5-8.5	.0000
Mean number of condoms bought	13.2 11.9-14.6	6.9 5.7-8.1	.0000	12.1 10.4-13.5	1.7 0.9-2.6	.0000
MSWs who could show condoms to interviewers	36.8 31.7-42.2	19.3 16.0-23.0	.0000	54.5 49.5-59.5	1.6 0.9-2.8	.0000

Table 2. Dose-response effect of number of sessions attended and outreach vs. combined outreach plus meetings on safer sex practices and associated variables

Safer Sex Factor	Number of Times Participated in Bandhu Educational Sessions (n=558)			Exposure to No intervention (n=133) vs. Outreach Workers Last Month (n=189) vs. Outreach Plus Meeting Attendance (n=236) (total=558)			
	Did Mean 95% CI	Did not Mean 95% CI	P value ¹	No Exposure % 95% CI	Outreach Alone % 95% CI	Outreach plus meetings % 95% CI	P value ²
MSWs who had protected anal intercourse last week (vs.some/none)	3.2 2.5-3.9	1.5 1.1-2.0	.000	1.4 0.5-4.1	4.3 2.9-6.3	12.9 9.9-16.6	.0000
MSWs who used condoms for any oral intercourse last week (vs.none)	2.2 1.7-2.8	1.3 0.8-1.6	.001	4.2 2.5-6.9	14.2 10.6-18.8	26.3 21.8-31.3	.0000
MSWs who bought condoms last week	2.6 2.0-3.2	0.3 0.1-0.47	.000	4.7 2.5-8.5	22.9 18.8-27.6	39.3 34.3-44.4	.0000
MSWs who asked all clients to use condoms last week (vs.some/none)	3.0 2.4- 3.7	1.2 0.8-1.5	.000	1.3 0.7-2.4	11.7 8.8—15.3	22.4 17.9-27.6	.0000
MSWs who sought STD treatment last time	2.4 1.8-2.9	0.8 0.5-1.7	.000	11.5 9.0-14.7	18.1 13.8-23.4	31.1 26.0-36.7	.0001
MSWs who knew male-male sex spread HIV	2.4 1.9-2.9	0.7 0.3-1.2	.000	8.1 5.9-11.0	21.1 17.3-25.6	37.3 32.4-42.5	.0000
MSWs who could show condoms to interviewers	3.0 2.4-3.5	0.4 0.2-0.6	.000	1.6 0.9-2.8	17.7 14.4-21.7	36.9 31.8-42.5	.0000

¹ calculated with design adjusted t-test

² calculated with Pearson's design adjusted chi square

Table 3. Safer sex practice with personal partners by level of exposure to the intervention

Safer Sex Practice	With Personal (non-commercial) Partners			P value
	No exposure n=86	Outreach only n=157	Outreach and meetings n= 207	
MSWs who had fully protected anal intercourse last time (vs.some/none)	1.0 0.3-3.0	8.3 5.9-11.5	26.1 20.7-32.4	.000
MSWs who used condoms for any oral intercourse last time (vs.none)	0.6 0.1-2.2	6.8 4.5-10.2	12.6 9.0-17.3	.001
MSWs who used condoms for any vaginal intercourse last time (vs.none) N=84	1.2 0.2-9.3	3.6 1.1-11.6	18.1 10.6-29.1	0.168 ns
MSWs who asked all partners to use condoms last month (vs.some/none)	0.7 0.2-2.0	7.1 4.9-10.2	16.7 12.5-21.8	.0000