



Presumptive Treatment and Syndromic Management of Sexually Transmitted Infections (STIs): An Annotated Bibliography

April 2007

www.vale.edu/cira/parivartan

Purpose and Search History

The purpose of this literature search was to explore the available literature on presumptive treatment and syndromic management for sexually transmitted infections (STIs), both for sex workers and other populations. The annotated bibliography was generated through the systematic search of several online databases including PubMed, Medline, PsycInfo, and Global Health. The search terms used include the following:

- STI/STD
- presumptive treatment
- prophylactic treatment
- mass treatment
- epidemiologic treatment
- STD control
- sex work
- STI treatment
- STI management

Summary of findings

Presumptive treatment, or presumptive periodic treatment (PPT), of sexually transmitted infections (STIs), is the administration of an antibiotic, usually azithromycin (1g) to a population or core target group not based on symptoms, signs or laboratory tests, but based on their group's likelihood of having an STI. Other terms used in place of "presumptive treatment" include "mass treatment", "epidemiologic treatment" and "prophylactic treatment". Only bacterial STIs, typically Gonorrhoea, Chlamydia, *T vaginalis* and *C Trachomatis* can be treated presumptively; viral STIs such as Herpes or HIV cannot be treated in this way. The rationale for presumptive treatment of female sex workers is based upon the assumptions that (1) they are frequently exposed to STIs given the nature of their work and working conditions, and that (2) STIs are often asymptomatic and difficult to diagnose without the use of laboratory tests. Presumptive treatment is generally believed to be an intervention used to reduce prevalence of a disease only when baseline prevalence rates in the population are quite high. Significant reduction in prevalence was not seen in instances where presumptive treatment was used in a population with already low prevalence of disease. Presumptive treatment is also not seen as a long term intervention, but rather a short term intervention to rapidly reduce prevalence in a population. Many papers noted that PPT should be coupled with other long term interventions such as better STD case management or improved clinical services in order to keep prevalence low in the long term. Study results have also shown that PPT in core groups including sex workers can also help to reduce prevalence of STDs beyond the core group, such as among clients and the general population.

Syndromic management (based on nation-wide or WHO standards) among sex workers alone was found by most studies to have low PPV and sensitivity, indicating that many asymptomatic cases go undiagnosed using this method alone. A combination of syndromic management and PPT may be the best approach to reducing the prevalence of STI in a population of sex workers. One study found that since prevalence among first time clinic attendees is usually quite high, presumptive treatment should be used, but at follow-up visits syndromic management may be the most effective and appropriate approach.

Annotated Bibliography

Behets, F. M. T. F., J. R. Rasolofomanana, et al. (2003). "Evidence-based treatment guidelines for sexually transmitted infections developed with and for female sex workers." Tropical Medicine & International Health 8(3): 251-258.

Abstract: *Background* Sex work is frequently one of the few options women in low-income countries have to generate income for themselves and their families. Treating and preventing sexually transmitted infections (STIs) among sex workers (SWs) is critical to protect the health of the women and their communities; it is also a cost-effective way to slow the spread of HIV. Outside occasional research settings however, SWs in low-income countries rarely have access to effective STI diagnosis. *Objectives* To develop adequate, affordable, and acceptable STI control strategies for SWs. *Methods* In collaboration with SWs we evaluated STIs and associated demographic, behavioural, and clinical characteristics in SWs living in two cities in Madagascar. Two months post-treatment and counselling, incident STIs and associated factors were determined. Evidence-based STI management guidelines were developed with SW representatives. *Results* At baseline, two of 986 SWs were HIV(+); 77.5% of the SWs in Antananarivo and 73.5% in Tamatave had at least one curable STI. Two months post-treatment, 64.9% of 458 SWs in Antananarivo and 57.4% of 481 women in Tamatave had at least one STI. The selected guidelines include speculum exams; syphilis treatment based on serologic screening; presumptive treatment for gonorrhoea, chlamydia, and trichomoniasis during initial visits, and individual risk-based treatment during 3-monthly follow-up visits. SWs were enthusiastic, productive partners. *Conclusions* A major HIV epidemic can still be averted in Madagascar but effective STI control is needed nationwide. SWs and health professionals valued the participatory research and decision-making process. Similar approaches should be pursued in other resource-poor settings where sex work and STIs are common and appropriate STI diagnostics lacking.

Notes: In this study, data were collected on sexually transmitted infections (confirmed by laboratory diagnosis), demographics, behavioral and clinical characteristics of FSWs in three regions of Madagascar. Data was collected at an initial visit and two follow up visits at 3 and 6 months after the first. Clinical decision models were developed using factors found to be associated with STI (in multivariate analysis). These models were then used along with perspectives of SW representatives in a 3-day workshop to develop national guidelines. It was reported by SW representatives that presumptive STI treatment was acceptable as long as a thorough explanation was given to SWs about the treatment by both the clinician and by peer educators. Presumptive treatment (azithromycin and ciprofloxacin) was given at the initial visit because of the high prevalence of gonococcal, chlamydial and trichomonas infection in this population. It was not given at the follow up visits, however, because of concern over "negative psychological reactions when SWs repeatedly receive the same treatment." Individual risk assessment was used instead at these follow up visits to determine if treatment was necessary. Additionally, economic analyses did not show periodic presumptive treatment to be beneficial in terms of reducing STI prevalence.

Cowan F, Hargrove J. (2005) "The Appropriateness of Core Group Interventions Using Presumptive Periodic Treatment Among Rural Zimbabwean Women Who Exchange Sex for Gifts or Money." JAIDS. 38(2):202-207.

Abstract: To map the characteristics of rural based sex workers in Zimbabwe with regard to

demographics, mobility, behavior, HIV and sexually transmitted infection (STI) prevalence, to explore the appropriateness and feasibility of presumptive periodic treatment (PPT) for bacterial STIs as an HIV prevention intervention among these women, and to compare tolerability of 2 PPT regimens (1 g of azithromycin and 2 g of metronidazole +/- 500 mg of ciprofloxacin). Five commercial farms and 2 mines in Mashonaland West, Zimbabwe. Three hundred sixty-three sex workers were recruited and completed a structured interviewer-administered questionnaire. Each participant had blood tested for antibody to HIV, herpes simplex virus 2 (HSV-2), and syphilis; urine tested for *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG); and a vaginal swab tested for *Trichomonas vaginalis* (TV). Women were randomly assigned to receive a single dose of 1 of 2 PPT regimens and then followed to assess rates of side effects and reinfection. The overall prevalence of antibody to HIV was 55.7% (95% confidence interval [CI]: 50.6-60.9) and that of HSV-2 was 80.8% (95% CI: 76.7-84.9). The prevalence of CT and NG was low (CT = 1.7%, 95% CI: 0.3-3.0); (NG = 1.9%, 95% CI: 0.5-3.4), with a much higher prevalence of TV (TV = 19.3%, 95% CI: 15.2-23.4). Prevalence of CT, NG, and TV was appreciably reduced 1 month after PPT but rose to pretreatment levels at the 2- and 3-month visits. The rate of moderate or severe side effects after PPT was low, but it was higher in the women who received ciprofloxacin in addition to azithromycin and metronidazole ($P = 0.007$). It was feasible to access women who reported exchanging money or gifts for sex in rural communities, although many of these women engaged in sex work only infrequently. The prevalence of bacterial STIs was low, suggesting that PPT may not be an appropriate intervention in this setting. Rapid reinfection after PPT suggests that this needs to be given at monthly intervals to reduce prevalence of STIs.

Notes: This is a feasibility study to assess the appropriateness of administering presumptive periodic treatment for bacterial STIs, to compare the acceptability of two different PPT regimens (*group 1*: azithromycin 1 g, ciprofloxacin 500 mg and metronidazole 2 g, compared with *group 2*: azithromycin 1 g and metronidazole 2 g), and to determine rates of re-infection with a treatable STI after single dose PPT. Treatment group 1 was chosen to be investigated because the addition of ciprofloxacin is significantly less likely to result in the development of gonococcal drug resistance than treatment group 2. At baseline, specimens were collected for STI testing and all women were randomized to treatment groups and given the appropriate therapy. At day 3 and 7 after PPT they were followed up for side effects of the treatment, and then were followed up for signs of re-infection 1, 2 and 3 months after treatment. Results showed that 37% of the women in group 1 had complained of mild, moderate, or severe side effects at day 3, as compared to 31% of women from group 2, but there was no difference in the rate of mild, moderate or severe side effects at day 7. The addition of ciprofloxacin to the regimen (group 1) resulted in significantly greater gastrointestinal side effects, which could affect adherence to the treatment. Prevalence of *Chlamydia*, gonorrhea, and *Trichomonas vaginalis* at 1 month after PPT was lower than baseline prevalence. Prevalence had increased by 2 and 3 months, but at 3 months the prevalence was still below baseline level. Authors note that prevalence levels increased by 3 months despite free provision of syndromic case management for symptomatic STIs for men and women in the study community. The authors also note that issues of power restricted them from comparing effects of the two treatment regimens. PPT was probably not an appropriate intervention for this community of sex workers in Zimbabwe given the low prevalence of bacterial STIs.

Day, S. and H. Ward (1997). "Sex workers and the control of sexually transmitted disease." Genitourinary Medicine 73(3): 161-168.

Abstract: *Objectives:* To describe and assess measures to control sexually transmitted diseases (STDs) among sex workers and their partners. *Methods:* A review of medical, historical and social literature, focusing on selected cases. *Results:* Measures to control disease in sex workers today are often prompted by concerns about HIV transmission. However, the literature shows that prostitution varies from one place and time to another, together with the risk of sexually transmitted disease. A broad social definition of prostitution rather than a narrow reference to levels of sexual activity is important for effective disease control, as an understanding of the relation between social disadvantage and sexual activity enables the provision of occupational services that sex workers actually want and use. Social prejudice and legal sanctions cause some sex workers and their partners to avoid even the most appropriate and accessible specialist services. Therefore targeted programmes can only complement, and not replace, general measures to control STDs, which are developed for other social groups or the local population as a whole. *Conclusions:* Sex workers and sex work differ from one place to another and so a single model for STD control is inappropriate. None the less, occupational health risks suggest a general need for specialist services. Where these do not compound the disadvantages that sex workers already suffer, medical services are likely to offer significant benefits in prevention, early diagnosis, and treatment of STDs. As the stigma of prostitution leads many people to remain invisible to services, a general health infrastructure and anti-discriminatory measures will be equally important to effective disease control.

Notes: This article reviews literature on medical, social, and historical issues surrounding sex work. Authors conclude that sex work is too varied for one model of STD control to be recommended. They feel that many interventions which rely upon promoting risk reduction activities tend to ignore the social situation of prostitutes. The poverty and stigma prostitutes have to deal with prevent them from benefiting from such activities.

Desai, V. K., J. K. Kosambiya, et al. (2003). "Prevalence of sexually transmitted infections and performance of STI syndromes against aetiological diagnosis, in female sex workers of red light area in Surat, India." Sex Transm Infect 79(2): 111-115.

Abstract: *Objectives:* To measure prevalence of selected sexually transmitted infections (STI) and HIV among female sex workers (SWs) in the red light area of Surat, India, and to evaluate the performance of STI syndrome guidelines (for general population women in India) in this group against the standard aetiological diagnosis of STIs by laboratory methods. *Methods:* In a cross sectional study, 124 out of an estimated total of 500 SWs were mobilised to a health camp near the red light area during 2000. After obtaining consent, a behavioural questionnaire was administered, followed by clinical examination and specimen collection for different STIs. 118 SWs completed all aspects of the survey. HIV testing was unlinked and anonymous. *Results:* The mean number of different sexual partners of SWs per day was five. 94.9% reported consistent condom use with the clients. 58.5% of SWs had no symptoms related to STDs at the time of examination. Reported symptoms included lower abdominal pain (19.5%), abnormal vaginal discharge (12.7%), painful sexual intercourse (12.7%), painful micturition (11.0%), itching around the genital area (10.2%), and genital ulcer (5.9%). The prevalence of STI "syndromes" were vaginal discharge syndrome 51.7%, pain in lower abdomen 19.5%, enlarged inguinal lymph nodes 11.9%, and genital ulcer 5.9%. Based on the laboratory reports (excluding HIV tests), 62 (52.5%) SWs did not have any of the four tested STIs. Prevalence of laboratory confirmed STIs were syphilis 22.7% (based on reactive syphilis serology tests), gonorrhoea 16.9%, genital chlamydial infection 8.5%, and trichomoniasis 14.4%. HIV prevalence was

43.2%. The performance of Indian recommended treatment guidelines for vaginal discharge syndrome (VDS) and genital ulcer syndrome (GUS) against aetiological diagnosis was poor. *Conclusion:* Prevalence of different STIs and HIV among the FSWs in the Surat red light area is high despite high reported condom use with clients. Syndromic case management is missing a large number of asymptomatic cases and providing treatment in the absence of disease. Therefore, it is necessary to explore alternative strategies for control of STIs in female sex workers. STI services need to be improved.

Notes: Prevalence data was collected on 124 sex workers from the red light area of Surat, India. These women were mobilized to attend a health camp where they were given a clinical examination and specimens were collected for laboratory testing of STIs (syphilis, gonorrhoea, Chlamydia, trichomoniasis, HIV and cervicitis). A behavioral interview was also conducted. Prevalence of one or more of these infections was 47.5% in the sample. Syphilis had the highest prevalence followed by gonorrhoea, Chlamydia and trichomoniasis. Sensitivity, specificity and PPV was calculated to evaluate Indian syndromic management guidelines for VDS and GUS. They found that sensitivity for VDS to detect STIs was okay (60 to 80%), but that specificity was low (50 to 55%). PPV was very low (11% to 25%). Sensitivity of GUS to detect syphilis was low at 14.8% but specificity was high at 96.7%, the PPV was 57.1%. Authors concluded that syndromic management of STIs results in a high number of asymptomatic cases going undetected and so alternative strategies for STI control need to be explored.

Diallo, M. O., P. D. Ghys, et al. (1998). "Evaluation of simple diagnostic algorithms for Neisseria gonorrhoeae and Chlamydia trachomatis cervical infections in female sex workers in Abidjan, Cote d'Ivoire." Sexually Transmitted Infections 74(1S) Supplement(1): 106S-111S.

Abstract: Objective: To generate simple algorithms for the diagnosis of cervical infection with *Neisseria gonorrhoeae* or *Chlamydia trachomatis* in female sex workers in Abidjan, Cote d'Ivoire and to evaluate their validity. Methods: From October 1992 to the end of June 1993, female sex workers were interviewed and clinically examined at a confidential clinic. *N gonorrhoeae* was cultured on modified Thayer-Martin medium and *C trachomatis* was detected by polymerase chain reaction. The associations of gonococcal or chlamydial cervical infection with sociodemographic, behavioural, clinical, and biological factors were assessed and three algorithms were generated. The validity parameters of these diagnostic algorithms were calculated and compared to those of standard algorithms and mass treatment. Results: Among 683 women, cervical infection was present in 239 (35%). The sensitivity of an algorithm incorporating sociodemographic and behavioural factors and symptoms, of an algorithm incorporating clinical signs and simple laboratory tests, and of a combined algorithm was 83%, 86%, and 79% respectively while the specificity was 32%, 44%, and 54%, and the positive predictive value 40%, 46%, and 48% respectively. A standard algorithm incorporating only the symptom vaginal discharge, and a standard algorithm requiring both the symptom vaginal discharge and the presence of an endocervical mucopurulent discharge on examination had a sensitivity of 44% and 18%, a specificity of 75% and 95%, and a positive predictive value of 49% and 67% respectively. Conclusions: The algorithms generated in this study may be useful for the control of cervical infections in female sex workers in resource poor settings in the absence of rapid, inexpensive, and accurate laboratory tests for the diagnosis of cervical infections.

Notes: A cross sectional study of female sex workers in Abidjan Cote D'Ivoire was conducted to evaluate diagnostic algorithms for the detection of gonorrhea and chlamydia infection. Information was collected on behavioral and demographic factors as well as symptoms. A speculum examination was done and cervical samples were collected to culture and detect *N gonorrhoeae* and *C trachomatis*. Associations between various factors and infection with either gonorrhea or Chlamydia were evaluated. These factors were classified into risk markers and reported signs and symptoms. These factors were then used to generate 3 diagnostic algorithms for the diagnosis of cervical gonorrheal or chlamydial infection. Algorithm A was one to be used in a situation where a clinical examination cannot be performed. Risk scores which take into account risk markers and symptoms are used to classify women as either having a high risk score or a low risk score. Women with a high risk score were considered infected. Algorithm B was to be used when participants would be undergoing a speculum examination and was generated based on clinical signs and microscopy results. Algorithm C was a combination of the above two algorithms, but details are not provided. Sensitivity, specificity and positive predictive value (PPV) was calculated for the evaluation of these algorithms using the gold standard of cervical infection diagnosis. Results are presented above in abstract. Authors argue that an ideal diagnostic algorithm for patients would be both very sensitive and specific, rather than a screening test which is typically just sensitive and not very specific. For sex workers who are at high risk for spreading infection, a highly sensitive algorithm is more important than one with high specificity because it is more important to capture all cases of infection even if some proportion of women might be treated inappropriately in the process. Among first time clinic attendees, prevalence is typically very high therefore a highly sensitive algorithm should be used or even mass treatment. However for periodic screening visits one algorithm is not clearly better than another, therefore available resources should be considered to determine the appropriate strategy.

Horizons Research Summary. (2002). "Estimating the Cost and Effectiveness of Different STI Management Strategies for Sex Workers in Madagascar." The Population Council.

Abstract: None

Notes: In 2002 a study was conducted in 3 cities of Madagascar which found that almost 2/3 of female sex workers were infected with an STI, but few were infected with HIV. Given the link between STIs and HIV transmission, affordable STI management strategies were needed to keep the HIV infection rate low. Prior to this assessment, the most common approach to STI treatment in the local health centers was syndromic management. Syndromic management is okay to use with the general population for treatment of ulcerative disease, but is not appropriate for FSWs given that many are multiply infected with different STIs and are asymptomatic. A risk assessment tool was proposed where women's risk profiles are examined using information on symptoms, age, number of sex partners etc to determine treatment. The cost-effectiveness of three approaches to STI management was determined: (1) syndromic management (SM), (2) syndromic management and risk assessment (RA), (3) lab evaluation and risk assessment. They also examined the cost-effectiveness of follow-up visits at the time intervals of every 30 days and every 90 days. Separate models were used syphilis, cervical infections (gonorrhea and Chlamydia) and vaginal infections (trichomoniasis and bacterial vaginosis); all were modeled over a 12 month period. The key findings were as follows:

Syndromic management and risk assessment was the most cost-effective. Use of lab tests is equally effective in reducing prevalence but was 300 times more expensive. More frequent

follow (30 days) was not any more effective in reducing prevalence of STI than 90 day follow up, but was more expensive. The results of the analysis were used to develop a new protocol for STI management among FSW with the Ministry of Health. The protocol recommended that clinicians use a combination of diagnostic techniques depending on the type of STI. For syphilis they recommended laboratory tests given that for syphilis the tests are cheap and quick. They recommended that gonorrhea, Chlamydia and trichomoniasis be treated presumptively at the first visit but at follow up a combination of risk assessment and syndromic management should be used. For chancroid and bacterial vaginosis syndromic management and risk assessment should be used. They also changed the interval of follow up from 30 days to 90 days. Authors conclude that the use of cost-effectiveness modeling is a very helpful way in finding approaches to STI management.

Kaul, R., J. Kimani, et al. (2004). "Monthly Antibiotic Chemoprophylaxis and Incidence of Sexually Transmitted Infections and HIV-1 Infection in Kenyan Sex Workers: A Randomized Controlled Trial." *JAMA* 291(21): 2555-2562.

Abstract: *Context* Sexually transmitted infections (STIs) are common in female sex workers (FSWs) and may enhance susceptibility to infection with human immunodeficiency virus type 1 (HIV-1). *Objective* To examine regular antibiotic prophylaxis in FSWs as a strategy for reducing the incidence of bacterial STIs and HIV-1. *Design, Setting, and Participants* Randomized, double-blind, placebo-controlled trial conducted between 1998-2002 among FSWs in an urban slum area of Nairobi, Kenya. Of 890 FSWs screened, 466 who were seronegative for HIV-1 infection were enrolled and randomly assigned to receive azithromycin (n = 230) or placebo (n = 236). Groups were well matched at baseline for sexual risk taking and STI rates. *Intervention* Monthly oral administration of 1 g of azithromycin or identical placebo, as directly observed therapy. All participants were provided with free condoms, risk-reduction counseling, and STI case management. *Main Outcome Measures* The primary study end point was incidence of HIV-1 infection. Secondary end points were the incidence of STIs due to *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Trichomonas vaginalis*, *Treponema pallidum*, and *Haemophilus ducreyi*, as well as bacterial vaginosis. Analysis of herpes simplex virus type 2 (HSV-2) infection was performed post hoc. *Results* Seventy-three percent of participants (n = 341) were followed up for 2 or more years or until they reached an administrative trial end point. Incidence of HIV-1 did not differ between treatment and placebo groups (4% [19 cases per 473 person-years of follow-up] vs 3.2% [16 cases per 495 person-years of follow-up] rate ratio [RR], 1.2; 95% CI, 0.6-2.5). Incident HIV-1 infection was associated with preceding infection with *N gonorrhoeae* (rate ratio [RR], 4.9; 95% CI, 1.7-14.3) or *C trachomatis* (RR, 3.0; 95% CI, 1.1-8.9). There was a reduced incidence in the treatment group of infection with *N gonorrhoeae* (RR, 0.46; 95% CI, 0.31-0.68), *C trachomatis* (RR, 0.38; 95% CI, 0.26-0.57), and *T vaginalis* (RR, 0.56; 95% CI, 0.40-0.78). The seroprevalence of HSV-2 infection at enrollment was 72.7%, and HSV-2 infection at baseline was independently associated with HIV-1 acquisition (RR, 6.3; 95% CI, 1.5-27.1). *Conclusions* Despite an association between bacterial STIs and acquisition of HIV-1 infection, the addition of monthly azithromycin prophylaxis to established HIV-1 risk reduction strategies substantially reduced the incidence of STIs but did not reduce the incidence of HIV-1. Prevalent HSV-2 infection may have been an important cofactor in acquisition of HIV-1. **Notes:** Authors of this study hypothesized that prevention of bacterial STIs through presumptive treatment would reduce the incidence of HIV-1 in the cohort. They conducted a randomized, double-blind placebo controlled trial where women were either given treatment (1 g

azithromycin) or placebo monthly and were assessed for the endpoints of HIV-1 infection and incidence of a number of bacterial STIs. Women in the two groups were matched at baseline for sexual risk taking and STI rates to control for confounding, and analysis was based on intention to treat. Results showed no difference in HIV-1 infection between the two study groups (RR 1.2), however there was a significant reduction of gonorrhea, C trachomatis, Chlamydia and T vaginalis incidence in the treatment group, as confirmed by laboratory diagnosis. Most of these infections were asymptomatic. There was no reduction in the incidence of syphilis, bacterial vaginosis, or colonization by candida species. The duration of gonorrhea and C trachomatis infections was shorter in the treatment group than in placebo. Although there was no difference in HIV-1 infection between the two study groups, there was an association between HIV seroconversion and infection with gonorrhea or C. trachomatis. Authors note that since the association between STI infection and HIV infection may be correlated to measured and unmeasured biological and behavioral risk factors, the association may be confounded. After adjusting for these confounding variables the association between STI and HIV still did not change. Authors try to explain the lack of difference in HIV incidence between treatment and placebo group by suggesting that the standard of care for all persons in the study was much higher than baseline level of care and this could have reduced the fraction of seroconversions.

Levine, W. C., R. Revollo, et al. (1998). "Decline in sexually transmitted disease prevalence in female Bolivian sex workers: impact of an HIV prevention project." *AIDS* 12(14): 1899-1906.

Abstract: Objective: To implement an HIV prevention intervention among female commercial sex workers (CSW), and to monitor key outcomes using routinely collected clinical and laboratory data. Design: Cross-sectional and longitudinal analysis of data from an open-enrollment cohort. Setting: One public sexually transmitted disease (STD) clinic and about 25 brothels in La Paz, Bolivia. Participants: A total of 508 female CSW who work at brothels and attend a public STD clinic. Intervention: Improved STD clinical care, supported by periodic laboratory testing, and behavioral interventions performed by a local non-governmental organization. Main outcome measures: Prevalence of gonorrhea, syphilis (reactive plasma eagin titer $\geq 1 : 16$), genital ulcer disease, chlamydial infection, and trichomoniasis; self-reported condom use in the previous month; and HIV seroprevalence. Results: From 1992 through 1995, prevalence of gonorrhea among CSW declined from 25.8 to 9.9% ($P < 0.001$), syphilis from 14.9 to 8.7% ($P = 0.02$), and genital ulcer disease from 5.7 to 1.3% ($P = 0.006$); trends in prevalence of chlamydial infection and trichomoniasis were not significant. Self-reported condom use during vaginal sex in the past month increased from 36.3 to 72.5% ($P < 0.001$). In a multivariate analysis, condom use was inversely associated with gonorrhea [odds ratio (OR), 0.63; 95% confidence interval (CI), 0.41-0.97], syphilis (OR, 0.39; 95% CI, 0.23-0.64), and trichomoniasis (OR, 0.44; 95% CI, 0.32-0.71). In 1995, HIV seroprevalence among CSW was 0.1%.

Conclusion: Effective prevention interventions for female CSW can be implemented through public services and non-governmental organizations while HIV rates are still low, and key outcomes can be monitored using data obtained from periodic screening examinations.

Notes: Results of an HIV/STD prevention program implemented in La Paz, Bolivia are reported here. Prevalence of STD and self-reported condom use was determined through periodic interviews, speculum examinations and rapid screening tests integrated into routine visits every three months by CSW to the health department. Women were prescribed presumptive treatment for both syphilis and chancroid if they had a non-vesicular genital ulcer. They were also

presumptively treated for gonorrhoea if gram stain results showed evidence of gonococcal infection. Women were treated 1 week later at follow-up if lab test results showed infection. These project services were integrated into all health department STD services, and all staff were given the same training.

Mayaud, P and D McCormick. (2001). "Interventions Against Sexually Transmitted Infections (STI) To Prevent HIV Infection." Br Med Bull. 58(1):129-153.

Abstract: STIs have taken on a more important role with the advent of the HIV/AIDS epidemic, and there is good evidence that their control can reduce HIV transmission. The challenge is not just to develop new interventions, but to identify barriers to the effective implementation of existing tools, and to devise ways to overcome these barriers. This 'scaling-up' of effective strategies will require an international and a multisectoral approach. It will require the formation of new partnerships between the private and public sectors and between governments and the communities they represent.

Notes: This paper reviews studies which have examined the role of STI prevention and control and its effect on HIV infection. In reviewing STI control approaches the authors examine mass treatment of populations or presumptive treatment of targeted high risk groups. Targeted treatment is based on the concept of "core" groups and the epidemiologic synergy between STI and HIV infection. They note that given the nature of the targeted core groups interventions of this nature must consider the social and economic forces which create these groups. They reference the Lesedi project in the South African mining community as a successful intervention program which reduced the prevalence of gonococcal and Chlamydia infections and GUD among women, and also reduced general symptomatic STIs among miners in the intervention area as compared to miners further away.

Ngugi, E. N., K. Fonck, et al. (2000). "A randomized, placebo-controlled trial of monthly azithromycin prophylaxis to prevent sexually transmitted infections and HIV-1 in Kenyan sex workers: study design and baseline findings." International Journal of STD & AIDS 11: 804-811.

Abstract: Our objectives were to describe the baseline findings of a trial of antibiotic prophylaxis to prevent sexually transmitted infections (STIs) and HIV-1 in a cohort of Nairobi female sex workers (FSWs). A questionnaire was administered and a medical examination was performed. HIV-negative women were randomly assigned to either one gram azithromycin or placebo monthly. Mean age of the 318 women was 32 years, mean duration of sex work 7 years and mean number of clients was 4 per day. High-risk behaviour was frequent: 14% practiced anal intercourse, 23% sex during menses, and 3% used intravenous drugs. While 20% reported condom use with all clients, 37% never use condoms. However, STI prevalence was relatively low: HIV-1 27%, bacterial vaginosis 46%, *Trichomonas vaginalis* 13%, *Neisseria gonorrhoeae* 8%, *Chlamydia trachomatis* 7%, syphilis 6% and cervical intraepithelial neoplasia (CIN) 3%. It appears feasible to access a population of high-risk FSWs in Nairobi with prevention programmes, including a proposed trial of HIV prevention through STI chemoprophylaxis.

Notes: This paper describes the baseline characteristics of women who were enrolled in the randomized controlled trial of STI chemoprophylaxis in Nairobi, Kenya. The results of the actual RCT are discussed above in the Kaul et al study.

Ndoye, I., S. Mboup, et al. (1998). "Diagnosis of sexually transmitted infections in female prostitutes in Dakar, Senegal." Sexually Transmitted Infections 74(1S) Supplement(1): 112S-117S.

Abstract: Objective: To study the validity and performance of a number of rapid indicators for the diagnosis of sexually transmitted infections (STIs) in female prostitutes in Dakar, Senegal; characteristics of these indicators were rapidly obtainable, easy to perform, accurate, useful at district level, and reasonable cost., Methods: An STI prevalence study in female prostitutes (n = 374) seen at the STD clinic in Dakar, Senegal was done; a history, clinical examination, simple laboratory tests, and "gold standard" microbiological tests were performed. For a number of sociodemographic data, actual or past symptoms of STI, clinical signs, and rapid laboratory tests, validity variables, performance characteristics, and likelihood ratios for detection of gonococcal or chlamydial cervical infection were determined., Results: Cervical infection (chlamydial or gonococcal) was present in 24.9% of prostitutes; 46% had trichomoniasis and 29.4% had syphilis. Young age, abnormal vaginal discharge, endocervical mucopus, a positive leucocyte esterase test on urine, and 10 or more leucocytes in Gram stained smears of vaginal, cervical, or urine samples were significantly associated with cervical STI. Some of the rapid indicators had high sensitivity, others high specificity but none had acceptable overall validity. None of the indicators had at the same time a sensitivity above 50% and a positive predictive value above twice the background prevalence of cervical infection. 10 or more leucocytes in the cervical smear had a likelihood ratio of 1.83 increasing pretest probability of 24.9% to post-test probability of 38%, the best result obtained by any of the rapid indicators., Conclusions: Rapid indicators of cervical STIs are insufficiently valid, which largely restricts their usefulness to high STI prevalence situations for instance, in prostitute populations and in STD patient management. **Notes:** This study was among FSWs in Dakar, Senegal who are required to register with authorities and present to STI clinics regularly for screening exams. Women who presented to a city clinic from March 13 to 29th, 1990 were included in the study. The objective of the study was to determine if rapid indicators of STI in these women were easily obtainable, easy to perform, accurate, useful and have a reasonable cost. Indicators were (a) demographic variables, (b) actual or past STI symptoms obtained through history taking; (c) signs based on clinical examination; (d) rapid laboratory tests. All women were asked about past and current symptoms and were given a speculum examination. Cervical specimens, urine and blood samples were collected. Results of rapid indicators were compared with results of laboratory diagnosis; and sensitivity, specificity and PPV were calculated. No indicators had high sensitivity and high specificity and so are not very useful. Authors say that if they "arbitrarily accept" that the PPV of a rapid indicator should be at least double the prevalence of infection (yielding a PPV of at least 50% in this study) and have a sensitivity of at least 50%, none of the rapid indicators are acceptable.

O'Farrell , N. Oula, R, et al.(2006) "Periodic Presumptive Treatment for Cervical Infections in Service Women in 3 Border Provinces of Laos." Sexually Transmitted Diseases. 33(9): 558-564.

Abstract: Objectives: The objectives of this study were to determine whether periodic presumptive treatment (PPT) for sexually transmitted infections (STIs) in service women could be implemented in 3 border provinces of Laos and whether its implementation was associated with a reduction in the prevalence of cervical infections. *Study Design:* Four hundred forty-two service women were interviewed using a standardized questionnaire in 3 border provinces at

baseline (day 1) and 419 3 months (day 90) later. Azithromycin at a dosage of 1 g was administered at monthly intervals over 3 months in Khammouane province, on days 1, 30, and 90 in Oudomxai and days 1, 60, and 90 in Savannakhet. Urine samples were collected at baseline and day 90 for gonorrhea and chlamydia testing. *Results:* Baseline samples showed very high levels of both gonorrhea and/or chlamydia of 42.7% in Oudomxai, 39.9% in Khammouane, and 22.7% in Savannakhet. At day 90, after 2 or 3 rounds of PPT, these were, respectively, 12.3%, 21.9%, and 17.0%. Overall, the prevalence of any cervical infection decreased by 45% from 32.4% (95% confidence interval [CI] _ 28.1–36.9) at day 1 to 18.0% (95% CI _ 14.5–22.1) at day 90 ($P < 0.001$).

Conclusions: Lower prevalences of cervical infections were observed after 2 to 3 rounds of PPT. The optimal time between rounds of PPT is uncertain, but while these high STI rates prevail, a 1- to 2-month gap is recommended. After the introduction of this PPT project, costs of STI drugs reduced 5-fold making PPT a sustainable intervention in Laos for service women until user-friendly services are developed.

Notes: Sentinel surveillance in Laos has shown that STI prevalence among service women is quite high (“service women” is the term used by female sex workers in Laos as it is deemed more acceptable). This may be due to the fact that there are no STI clinics or clinicians with specialties in STI management that these women can go to, and that many have to seek care from gynecologists with little or no experience in dealing with STIs. However, despite high STI prevalence, HIV prevalence is low, even in high risk groups. Periodic presumptive treatment was implemented in 3 provinces of Laos after approval from the Ministry of Health. Mapping was used to determine where service women were likely to be found. Once these locations were identified (bars, hotels, etc) service women were recruited into the study if they met the criteria of being over the age of 15 and they had access to clients. All subjects in the study were given 1 g azithromycin to treat GC/CT infections. Presumptive treatment for syphilis was not given because of the low prevalence of syphilis in this community. A standardized questionnaire was also administered to collect information on demographics and sexual behavior. It was originally planned that in all three provinces PPT would be administered monthly and urine specimens would be collected on days 1 and 90. However, due to staff shortages in two of the provinces the second and third round PPT regimens were not administered. Reported 100% (consistent) condom use with regular partners in the past month varied between the provinces from 41.8% in Oudomxai on day 1 to 90.8% in Savannakhet on day 90. The largest drop in the prevalence of GC/CT between day 1 and day 90 was seen in Oudomxai (0.35) followed by Khammouane (0.55) and Savannakhet (0.75) with an overall reduction of 0.55 ($P < 0.001$). The study shows that after PPT, high baseline prevalence levels of GC/CT were lowered significantly. The overall prevalence in Oudomxai was 75%, 45% in Khammouane, and 25% in Savannakhet. The variation in changes in prevalence between provinces could not be explained by differences in characteristics of services women nor by the differences in administration of PPT treatments between the three provinces. Authors believe that variation in mobility of service women in the three provinces could explain the variance in prevalence change. There was no control group in this study, and authors note that other confounding factors could have affected results including seasonal differences or secular trends and variations in condom availability.

Steen, R. Dallabetta, G. (1999) “The Use of Epidemiologic Mass Treatment and Syndrome Management for Sexually Transmitted Disease Control.” *Sex Transm Dis* 26(4): S12-S20.

Abstract: Background: Epidemiologic mass treatment and syndrome management are two sexually transmitted disease (STD) control strategies that are receiving increased attention

internationally. The former is a population-based intervention, whereas the latter attempts to improve the quality and efficiency of clinic-based STD case management. Methods: The published literature on these subjects was reviewed. Results: Epidemiologic mass treatment refers to treatment of whole communities (mass treatment) or high-risk subgroups within communities (targeted presumptive treatment) based on high STD prevalence rates. Syndrome management overcomes many obstacles to provision of quality STD case management by basing treatment decisions on recognition of easily identifiable syndromes. Experience with application of these strategies is summarized, and their possible use as STD control measures in communities with similar conditions is discussed. Conclusions: Epidemiologic mass treatment may be an effective approach to rapidly reduce STD transmission in high prevalence communities, especially when high-risk core groups are effectively reached. Once high prevalence rates are brought down, however, longer term strategies, including improved STD case management, are essential to maintain reduced rates.

Notes: In this paper, epidemiologic treatment has been defined as presumptive treatment of individuals or populations with a high likelihood of having disease. Treatment is dependent on increased risk of exposure rather than signs, symptoms or laboratory test results. A variety of terminology has been used for this approach to treatment including mass treatment, selective mass treatment, presumptive treatment, etc. The paper reviews various instances where epidemiologic treatment has been used worldwide. Greenland is noted as one of the first places where mass treatment was used. Unmarried men and women aged 15 to 30 years old and others believed to be at high risk were treated for syphilis. This was done to reduce the high prevalence of gonorrhea the nation was facing. Prevalence was reduced up to 50 to 70% in some parts of the country, but as soon as the mass treatment intervention was stopped the rates returned to initial levels. Other studies have shown that focusing mass treatment efforts on a core group such as sex workers has been found to reduce transmission beyond the core group. In Surabaya, Indonesia where syphilis was endemic among prostitutes, periodic presumptive treatment reduced prevalence from 87% in 1952 to 1.5% in 1992. Authors note that mass treatment is useful for reducing prevalence in an outbreak, but that periodic presumptive treatment may be necessary for maintaining low prevalence in endemic areas. Table 2 shows criteria to consider when finding appropriate target groups for targeted presumptive treatment for STI infection. Some of these criteria include access to population, disease prevalence, reinfection rate, HIV transmission risk, intervention sustainability, cost effectiveness, and adverse reactions to the drugs. Authors conclude with the point that epidemiologic treatment “cannot stand on its own as an STD control intervention.” They stress the idea that epidemiologic treatment is a temporary measure to reduce prevalence and that it should be coupled with other interventions such as improved STD services or increased levels of condom use so that levels of STD prevalence can be kept low in the long term.

Steen, R. P. M., B. E. A. M. D. M. Vuylsteke, et al. (2000). "Evidence of Declining STD Prevalence in a South African Mining Community Following a Core-Group Intervention." Sexually Transmitted Diseases 27(1): 1-8.

Abstract: Objectives: To reduce the prevalence of curable sexually transmitted diseases (STDs) in a South African mining community through provision of STD treatment services, including periodic presumptive treatment and prevention education to a core group of high-risk women living in areas around the mines. Methods: Women at high risk for STDs attended a mobile

clinic monthly for examination and counseling, and were treated presumptively for bacterial STDs with a directly observed 1-g dose of azithromycin. Gonococcal and chlamydial infection rates were measured by urine ligase chain reaction, and genital ulcers were assessed by clinical examination. Changes in STD prevalence among local miners were assessed through comparison of prevalence in two cross-sectional samples of miners taken 9 months apart, and through routine disease surveillance at mine health facilities. Results: During the first 9 months of the intervention, 407 women used the services. Baseline prevalence of *Neisseria gonorrhoeae* and/or *Chlamydia trachomatis* in women was 24.9%; 9.7% of these women had clinical evidence of genital ulcer disease (GUD). The proportion of women with incident gonococcal or chlamydial infections at the first monthly return visit (69% follow-up rate) was 12.3%, and genital ulcers were found in 4.4% of these women. In the miner population, the prevalence of *N gonorrhoeae* and/or *C trachomatis* was 10.9% at baseline and 6.2% at the 9-month follow-up examination ($P < 0.001$). The prevalence of GUD by clinical examination was 5.8% at baseline and 1.3% at follow-up examination ($P < 0.001$). Rates of symptomatic STDs seen at mine health facilities decreased among miners in the intervention area compared with miners living farther from the site and with less exposure to the project. Discussion: Provision of STD treatment services to a core group of high-risk women may significantly reduce their burden of disease, and may contribute to a reduction in community STD prevalence. In the absence of sensitive and affordable screening tests for STDs in women, periodic presumptive treatment coupled with prevention education is a feasible approach to providing STD services in this population. **Notes:** Strategies that have been used to rapidly lower STD prevalence include 1) treatment of general population groups, and 2) more selective presumptive treatment of core groups with high rates of both STDs and sexual partner change. This study was intervention linked one which targeted high risk women in a mining town who often engage in commercial sex with miners in the area who live in single-sex hostels. These high risk women were referred to mobile clinics where if enrolled in the study were asked to return monthly for treatment visits. At enrollment a standardized questionnaire was administered and specimens were collected for STD testing. All participants were given presumptive treatment with one 1-g dose of azithromycin under direct observation. Azithromycin was chosen for its activity against *C trachomatis*, *N gonorrhoeae*, and *Haemophilus ducreyi*, which were common pathogens in the community. At follow up visits women were given a risk behavior assessment (information collected on sex partners, condom use etc) an examination, and urine was collected for testing. For all measured STDs, rates were significantly lower at follow up visits than at baseline. Prevalence of all infections were significantly lower than at baseline when the interval between visits was less than 1.3 months. The results of this intervention research suggest that provision of effective curative and preventive services to high-risk women may have a significant impact on STD rates in these women and on community STD prevalence. Despite its short duration, the study reported here offers evidence of the utility of a core-group approach to STD control, and information on what may constitute feasible and effective STD services for high-risk women. Other epidemiologic evidence also suggests that general-population mass treatment has an advantage over clinic-based care because people with asymptomatic or minimally symptomatic infections are reached.

Steen R, Dallabetta G. (2003) "Sexually Transmitted Infection Control with Sex Workers: Regular Screening and Presumptive Treatment Augment Efforts to Reduce Risk and Vulnerability." Reproductive Health Matters. 11(22): 74-90.

Abstract: Sex workers have high rates of sexually transmitted infections (STIs), many of them

easily curable with antibiotics. STIs as co-factors and frequent unprotected exposure put sex workers at high risk of acquiring HIV and transmitting STIs and HIV to clients and other partners. Eliminating STIs reduces the efficiency of HIV transmission in the highest-risk commercial sex contacts—those where condoms are not used. This paper reviews two STI treatment strategies that have proven effective with female sex workers and their clients. 1) Clinical services with regular screening have reported increases in condom use and reductions in STI and HIV prevalence. Such services include a strong peer education and empowerment component, emphasize consistent condom use, provide effective treatment for both symptomatic and asymptomatic STIs, and begin to address larger social, economic and human rights issues that increase vulnerability and risk. 2) Presumptive treatment of sex workers, a form of epidemiologic treatment, can be an effective short-term measure to rapidly reduce STI rates. Once prevalence rates are brought down, however, other longer-term strategies are required. Effective preventive and curative STI services for sex workers are key to the control of sexually transmitted infections, including HIV, and are highly synergistic with other HIV prevention efforts.

Notes: This paper reviews STI prevention strategies which target the reduction of STI transmission among commercial sex networks. Strategies reviewed included both regular screening coupled with clinical services and also presumptive treatment of sex workers. The paper described presumptive treatment as treatment of individuals or populations with a high likelihood of having disease, in this case a high risk for sexually transmitted infections. The treatment is not given based on symptoms of infection or laboratory diagnosis but rather based on increased risk of exposure. Presumptive treatment given on a periodic basis to a targeted population has been shown to be effective in lowering STI prevalence rapidly in that population; and this can have an effect on the health of the broader population. The most commonly used treatment is 1 gram (single dose) of Azithromycin which can treat bacterial infections including gonorrhoea, chlamydia, chancroid, and incubating (early) syphilis. Studies have shown that ulcerative diseases respond more rapidly and are controlled more easily by presumptive treatment than non-ulcerative diseases. Depending on both the drugs used, dosage and treatment intervals, antibiotics can have some prophylactic effect. Careful monitoring of resistant infection must be done with any antibiotic regimen, as antibiotic treatment can potentially select for more resistant organisms given the high rate of exposure sex workers usually have. The authors note that although presumptive treatments can achieve a rapid reduction of STI prevalence, they cannot maintain low prevalence without other primary prevention and case management measures.

Wawer, M. J., N. K. Sewankambo, et al. (1999). "Control of sexually transmitted diseases for AIDS prevention in Uganda: a randomised community trial." The Lancet 353: 525-535.

Abstract: *Background* The study tested the hypothesis that community-level control of sexually transmitted disease (STD) would result in lower incidence of HIV-1 infection in comparison with control communities. *Methods* This randomised, controlled, single-masked, community-based trial of intensive STD control, via homebased mass antibiotic treatment, took place in Rakai District, Uganda. Ten community clusters were randomly assigned to intervention or control groups. All consenting residents aged 15–59 years were enrolled; visited in the home every 10 months; interviewed; asked to provide biological samples for assessment of HIV-1 infection and STDs; and were provided with mass treatment (azithromycin, ciprofloxacin, metronidazole in the intervention group, vitamins/anthelmintic drug in the control). Intention-to-

treat analyses used multivariate, paired, cluster-adjusted rate ratios. *Findings* The baseline prevalence of HIV-1 infection was 15.9%. 6602 HIV-1-negative individuals were enrolled in the intervention group and 6124 in the control group. 75.0% of intervention-group and 72.6% of control-group participants provided at least one follow-up sample for HIV-1 testing. At enrolment, the two treatment groups were similar in STD prevalence rates. At 20-month follow-up, the prevalences of syphilis (352/6238 [5.6%] vs 359/5284 [6.8%]; rate ratio 0.80 [95% CI 0.71–0.89]) and trichomoniasis (182/1968 [9.3%] vs 261/1815 [14.4%]; rate ratio 0.59 [0.38–0.91]) were significantly lower in the intervention group than in the control group. The incidence of HIV-1 infection was 1.5 per 100 person-years in both groups (rate ratio 0.97 [0.81–1.16]). In pregnant women, the follow-up prevalences of trichomoniasis, bacterial vaginosis, gonorrhoea, and chlamydia infection were significantly lower in the intervention group than in the control group. No effect of the intervention on incidence of HIV-1 infection was observed in pregnant women or in stratified analyses. *Interpretation* We observed no effect of the STD intervention on the incidence of HIV-1 infection. In the Rakai population, a substantial proportion of HIV-1 acquisition appears to occur independently of treatable STD cofactors.

Notes: This study did not take place among sex workers but among the general population of Rakai, Uganda. Ten community clusters, each comprised of 4 to 7 contiguous villages were randomly assigned to one of two treatment groups: (1) mass STD treatment or (2) mass anthelmintic (drugs to kill intestinal parasites), vitamin, and iron-folate treatment. Participants were masked to treatment but project personnel were not. STD prevalence rates were similar between the two groups at baseline. Prevalence of gonorrhea and Chlamydia were fairly low at baseline. At 20-month follow-up, both groups saw a reduction in syphilis and trichomoniasis, but the intervention group had significantly lower prevalence reduction. Prevalence of trichomoniasis, gonorrhea, bacterial vaginosis, and Chlamydia among pregnant women was lower in the intervention group as well. HIV infection did not differ between the two groups. There was no evidence of adverse effects on vaginal ecology caused by administration of mass treatment (no significant vaginal candidosis, and actually a decrease in bacterial vaginosis). Authors noted that ethically mandated STD services offered to all participants in the control group may have caused convergence of effect of the treatment intervention. The stage of the HIV epidemic in Uganda (mature HIV-1 epidemic) could have compromised the study's ability to show the affect of STD treatment on HIV acquisition. At such a late stage of the epidemic, STD probably does not contribute much to HIV acquisition.

Wi, T., V. Mesola, et al. (1998). "Syndromic approach to detection of gonococcal and chlamydial infections among female sex workers in two Philippine cities." Sexually Transmitted Infections 74(1S) Supplement(1): 118S-122S.

Abstract: Background: In many developing countries, STD control efforts often involve registration and periodic examinations of female sex workers (FSW). Non-availability of sensitive and specific diagnostic tests frequently constrain this approach., Methods: A model for detection of Chlamydia trachomatis or Neisseria gonorrhoeae in FSW on the basis of risk assessment and examination was developed from data gathered in Manila and evaluated in a second city (Cebu) in the Republic of the Philippines., Results: Gonococcal or chlamydial cervical infection was found in 23.3% of FSW in Manila and 37.0% in Cebu. Unregistered and younger FSW had greatest risk of chlamydial infection and/or gonorrhoea in both cities. In Manila, where gynecologists performed the pelvic examinations, signs of cervical mucopus or cervical motion, uterine or cervical motion tenderness in women under <25 years old or

unregistered had positive predictive value (PPV) of 0.60 and sensitivity of 42.1% for cervical infection. In Cebu, where women were not examined by gynaecologists, the same model had high PPV, but a sensitivity of only 12.3%. Conclusions: Experience and training of clinicians undoubtedly can influence the yield of examination in syndromic management of cervical infection. Nevertheless, inexpensive and diagnostic tests are needed for detection of cervical infection in this population.

Notes: FSWs attending clinics in Manila and Cebu were screened for Chlamydia and gonorrhea through examination and were also given standardized interviews. The data from the women in Manila was used to develop a simple model for identifying women with highest prevalence these infections and the data from the women from Cebu were used to test this model. The model included signs of cervical mucopus or motion or tenderness, and uterine motion or tenderness in women less than 25 years old or women who were unregistered. Results indicated that the model had a positive predictive value of 0.60 and sensitivity of 42.1% for cervical infection for women in Manila and high PPV but low sensitivity (12.3%) for women in Cebu.

Wi T, Ramos ER. (2006) "STI declines among sex workers and clients following outreach, one time presumptive treatment, and regular screening of sex workers in the Philippines." Sexually Transmitted Infections. 82:386-391.

Abstract: *Objectives:* This intervention linked research aimed to reduce prevalence of *Neisseria gonorrhoeae* (Ng) and *Chlamydia trachomatis* (Ct) among female sex workers by means of one round of presumptive treatment (PT), and improved prevention and screening services. *Methods:* A single round of PT (azithromycin 1 g) was given to all female sex workers reached during a 1 month period of enhanced outreach activity. Routine sexually transmitted infection (STI) screening services were successfully introduced for two groups of unregistered sex workers who work in brothels (BSWs) and on the street (SSWs). No changes were made to existing screening methods for registered sex workers (RSWs) or lower risk guest relations officers (GROs). Cross sectional prevalence of Ng and Ct was measured by PCR on three occasions, and stratified by type of sex work. Ng/Ct prevalence was assessed twice in clients of BSWs. *Results:* Prevalence of Ng and/or Ct at baseline, 1 month post-PT, and 7 months post-PT was BSWs: 52%, 27%, 23%; SSWs: 41%, 25%, 28%; RSWs: 36%, 26%, 34%; GROs: 20%, 6%, 24%, respectively. Ng/Ct declines 1 month post-PT were significant for all groups. 6 months later prevalence remained low for BSWs ($p < 0.001$), and SSWs ($p = 0.05$), but had returned to pre-intervention levels for the other groups. Prevalence of Ng/Ct among clients of BSWs declined from 28% early in the intervention to 15% ($p = 0.03$) 6 months later. *Conclusions:* In this commercial sex setting, one round of PT had a short term impact on Ng/Ct prevalence. Longer term maintenance of STI control requires ongoing access to effective preventive and curative services.

Notes: Registered sex workers were recruited from Angeles City in the Philippines. They were given a single round of presumptive treatment (1g azithromycin), those with signs or symptoms of vaginitis or genital ulcer disease were also additionally treated based on national guidelines. Condom promotion and education was also given at the clinic encounter. The second phase of the intervention was to strengthen clinical services by improving existing screening methods used with registered sex workers, and by establishing additional satellite clinics for unregistered sex workers. Three rounds of a cross sectional behavioral survey were conducted at the time of presumptive treatment, at 1 month after treatment, and at 7 months after treatment, urine samples for STD testing were also collected. Results showed that differences in prevalence from baseline were significant for all groups of sex workers (guest relations officers, registered establishment

based, brothel based and street based sex workers) in round 2 of the survey, but only significant for brothel and street based sex workers in round 3 (7 months). Among clients of BSWs sampled 1 month after the PT (n=100) and again 6 months later (n=100), Ng/Ct prevalence declined 46%, from 27.6% to 15.0%. Key findings of this paper are: 1) one time presumptive treatment may help to quickly reduce Ng/Ct prevalence in commercial sex networks but is not sufficient for long term STI control, ongoing services including outreach, 2) condom promotion, and STI screening appear to be important for sustaining STI control, 3) and effective interventions with sex workers can have a broader public health impact.

Other Relevant Materials of Interest

Steen, R., G. Dallabetta, et al. (2004). "Antibiotic Chemoprophylaxis and HIV Infection in Kenyan Sex Workers." JAMA 292(8): 921-.
(Letter to Editor)

Kaul, R. and S. Moses (2004). "Antibiotic Chemoprophylaxis and HIV Infection in Kenyan Sex Workers--Reply." JAMA 292(8): 921-a-922.
(In Reply)