

Original article

## Street-based STD testing and treatment of homeless youth are feasible, acceptable and effective

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### Abstract

**Purpose:** Current Centers for Disease Control (CDC) guidelines recommend that sexually transmitted disease (STD) screening measures for high-risk populations such as homeless youth prioritize testing in out-of-clinic settings and incorporate new approaches to STD eradication, such as field-delivered testing and treatment and patient-delivered partner therapy (PDPT). Our non-medically trained research staff offered field-based STI testing, field-delivered therapy, and PDPT to homeless youth in the context of a longitudinal study.

**Methods:** A total of 218 ethnically diverse (34% female) 15–24-year-old homeless youth recruited from street sites in San Francisco completed an audio computer-administered self-interview survey and provided a first-void urine sample for testing for chlamydia (CT) and gonorrhea (GC). Youth testing positive were offered field-delivered therapy and PDPT. A random subset of 157 youth was followed prospectively, of whom 110 (70%) were interviewed and 87 (55%) retested at six months.

**Results:** At baseline, 99% of youth in the study consented to STI testing, of whom 6.9% and .9% tested positive for CT and GC, respectively. Ninety-four percent of positive youth were treated, 50% within one week. The incidence rate for CT was 6.3 per 100 person-years (95% confidence interval [CI]: 1.3–18.4) and for GC was 4.2 per 100 person-years (95% CI: .5–15.2). None of the youth treated by study staff and tested six months later ( $n = 6$ ) had CT or GC on follow-up testing (95% CI: 0–131.3).

**Conclusions:** Field-delivered testing and field-delivered therapy are feasible, acceptable and effective interventions for the diagnosis and treatment of STDs in homeless youth. These measures along with PDPT may decrease rates of subsequent reinfection. © 2006 Society for Adolescent Medicine. All rights reserved.

**Keywords:** Sexually transmitted diseases; Adolescent; Homeless youth; Chlamydia; Gonorrhea; Screening; Incidence

Many homeless youth engage in risky sexual behaviors [1]. However, rates of risk among homeless youth are not uniform. Youth sampled on the street and youth who are “literally homeless” (i.e., who had slept outdoors or with a stranger) report higher rates of risky behaviors such as survival sex (sex

in exchange for food, shelter, money or drugs) and are less likely to receive medical care or human immunodeficiency virus (HIV) testing than youth with a temporary housing alternative, such as a shelter [2–7]. These studies suggest that sexually transmitted disease (STD) and HIV prevention efforts need to focus more on youth who are least likely to be reached in clinics or shelters. Such efforts require the ability to identify homeless youth, work in the streets where youth can be recruited, and provide services in the field, such as urine-based specimen collection, test disclosure and treatment.

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Increased testing of high-risk populations, such as homeless youth, for both STDs and HIV has been proposed as a strategy to reduce HIV transmission [8,9]. Furthermore, testing of individuals in non-traditional settings has been recommended in order to access the highest-risk individuals, a disproportionate number of whom do not seek testing in conventional venues.

Nucleic acid amplification tests have facilitated STD screening in non-traditional settings such as detention centers or jails, entertainment venues, community organizations, Job Corps sites, high schools, shelters, and substance use treatment centers [10]. STD testing has been successfully conducted with homeless youth recruited from street settings [11–14]. The success of these studies at screening youth for STDs suggests that STD testing in the field is feasible, acceptable, and may be associated with higher rates of acceptance of STD screening.

The disadvantages of testing in non-clinic settings are the need to re-contact those with STDs, to assure treatment [10], and the need to treat hard-to-reach partners. Re-contacting homeless youth is particularly challenging because they often lead transient lifestyles and are frequently incarcerated, so that a patient may be incarcerated or may have left the city by the time a positive test is received. The need to re-contact youth can be addressed by intensive tracking and notification efforts. The need to document treatment and to treat partners can be addressed by field-delivered therapy protocols, patient-delivered partner therapy (PDPT), and single-dose treatment regimens, respectively [11,12,15,16].

The need to treat hard-to-reach partners was addressed in California through the passage of Senate Bill 648, which permits medical providers to offer PDPT to increase the likelihood that recent sex partners are treated for chlamydia (CT) [17]. PDPT reduced the rate of persistent or recurrent gonorrhea (GC) or CT in Seattle in a recently published study [18]. However, provider provision of PDPT is unevenly applied [19], perhaps in part due to its unclear legal status in many states [20]. PDPT is safe [17] and has recently been recommended by the Centers for Disease Control (CDC) [21].

We report here our experience providing not only field-based STD testing, but also field-delivered therapy and PDPT by non-medically trained former outreach workers. The data and experience reported here were collected as part of a longitudinal study of street youth in San Francisco, conducted from February 2004 to March 2005.

## Methods

### *Study staff*

Our project staff were researchers or former outreach workers with experience working with vulnerable youth, including homeless, injection drug using, and sexual minor-

ity youth. Staff were trained in the diagnosis and management of STDs and followed a clinical screening and treatment protocol under the authority of the research physician (C.L.A.) and County STD Control Officer (J.D.K.).

### *Sampling, recruitment and data collection*

Using an approach described elsewhere, we selected our list of recruitment locations based on a joint qualitative-quantitative assessment [22,23]. We compiled an initial list of venues using ethnographic interviews with youth, discussions with providers, and observation. We conducted brief street interviews with youth at each venue, collecting data regarding demographics, history of homelessness and involvement in street activities in anonymous five- to 10-minute surveys conducted with personal data assistants. From this assessment, a final list of 28 viable venues in three neighborhoods was compiled, based on the number of youth and proportion of young women at the site, and minimum safety requirements.

Study staff approached youth at the chosen sites and asked them to enroll in a youth health study. Youth were eligible if they were 15–24 years of age, reported having unstable housing, and were not under the influence of substances or emotionally distressed. Unstable housing was defined as having to stay at least two nights in the prior six months in a place that was not their home because they could not stay in their home or did not have a home, including staying in a shelter, outdoors, a squat, with a stranger, in a car, on public transportation, or in a hotel. Youth were not asked if they were “homeless” because this term was stigmatized in some youth populations.

There is no standard definition of “homeless youth” in the literature. Many studies rely at least in part upon access to services to define a homeless youth, a definition that is not operable in a street setting and which excludes non-service-accessing youth. Investigators often combine service usage with other definitions based on frequency or time homeless. These have varied as widely as having been homeless at least two nights in the past year [24], on the previous night [25], or once in the past 30 days [26].

Our definition was based on our prior ethnographic work in order to include youth at all phases of homelessness, from youth first spending time on the street to youth entrenched on the streets, to youth who are trying to exit the streets who may be going back and forth between being housed and not [27].

Study staff selected a random subset of the initial participants to enroll in a follow-up study for a second interview and STD test in six months.

Youth, including minors, provided written informed consent for participation. Minors who are aged 15 years and older and supporting themselves by any means can consent for their own medical care and for participation in research in California [28,29]. Participants completed an extensive

tracking form, including contact phone numbers and e-mail addresses, names and phone numbers of people they stay in touch with, frequent hangouts, and organizations or individuals from whom they receive services. Participants signed a permission-to-track form that allowed the research team to access information from other service providers for the purpose of subsequent follow-up and treatment if needed.

Participants completed an audio computer-administered self-interview (ACASI) survey and provided a first-void urine sample. Study staff offered participants condoms and a list of social and medical service providers as well as compensation for their time (\$20 at baseline for the ACASI survey and \$10 for the urine sample). The urine sample was collected in a Protect urine cup (Sierra Diagnostics, LLC; Sonora, CA), which preserves nucleic acid without refrigeration for up to one week. The San Francisco Department of Public Health laboratory tested the urine for GC and CT (BD Probe Tec; Franklin Lakes, NY).

#### *Management of positive test results*

When a positive STD test was received, study staff began immediate efforts to contact the infected youth using the information from the tracking form. Youth who were in San Francisco at the time they were contacted were offered field-delivered therapy (FDT) (single dose therapy with azithromycin [1 gm] for CT or cefpodoxime [200 mg] for GC) or were referred to free services for care. Youth receiving FDT were given standard risk-reduction counseling, including an explanation of their infection, how it had been contracted, and how to avoid re-infection, such as condom use and treatment of partners. Condoms were made available to youth at enrollment and at any subsequent contact with study staff. Youth receiving FDT were also offered PDPT for as many sex partners as they reported having over the prior three months. No data were collected regarding youth's perceptions of PDPT's acceptability or whether participants successfully delivered the PDPT to their partners.

*Follow-up data collection.* At six months, study staff contacted participants and re-tested them. If youth had left San Francisco at the time of follow-up, testing at a local clinic was facilitated or study staff requested that youth submit a urine specimen by mail [30]. Study staff received the follow-up test results from out-of-town clinics and assured appropriate treatment for cases.

*Statistical analysis.* We report simple frequencies for most variables. Prevalence of STIs at baseline is reported as percent positive. Incidence of STIs is reported as numbers of cases per 100 person-years of follow-up with 95% confidence intervals (CI) (using a Poisson distribution).

The study protocol was approved by the University of California San Francisco Committee for Human Research in 2004.

## **Results**

### *Sample*

We recruited 218 participants. The baseline sample was 34% female and 57% White, 21% African American, 6% Native American, 3% Latino, 1% Pacific Islander, and 8% Mixed (4% declined). The mean age was 20.5 years. The night before being interviewed, 63% of youth slept in a place not fit for human habitation (such as a street, park, beach, abandoned building, car, bus or van), 17% slept at a relative or friend's home, 15% slept in temporary housing (such as a shelter, mission, single-room occupancy [SRO] motel/hotel, or boarding house), 1% slept in a stranger or "John's" home, and 1% in jail (2% declined to respond). Eighty-nine percent reported first having unstable housing before their 18th birthday. Twenty-three percent reported having engaged in survival sex. Seventeen percent reported never having been tested for an STD. Twenty-two percent reported a prior history of an STD.

All youth were offered testing, of whom one refused. One test was not run because of mislabeling of the specimen. Fifteen (6.9%) of 216 youth tested positive for CT and two (.9%) of 216 tested positive for GC, for a total prevalence rate of GC or CT of 7.8% at baseline. Sixteen (94%) of seventeen youth with GC or CT were treated. Eleven elected to receive field-delivered therapy. Five were treated in a clinic, of whom three were treated at a clinic outside of the Bay Area. One participant with a positive test was not located. Fifty percent of positive youth were treated within one week, 31% more than a week later, and 19% more than a month after testing positive.

Of the 16 participants treated, five (31%) youth were documented to have received PDPT for their partners. Of those participants who were not given PDPT, two participants (13%) were each other's sex partners (both received FDT), five participants (31%) were treated elsewhere, and one (6%) participant had an incarcerated partner who could not be reached by PDPT. Study staff did not document whether the three (19%) remaining STI-positive participants received PDPT.

### *Incidence rate of STDs*

The randomly selected follow-up sample of 157 youth included 14 (8.24%) of the 17 youth positive for CT or GC at baseline. At an average of 6.6 months follow-up, 110 of 157 (70%) were located and interviewed, of whom 87 (79%) were tested. Seventy-one youth were re-tested by study staff, nine were tested at clinics local to the subject, and seven youth were tested using mail-in specimens. No longer being in the San Francisco Bay Area (and thus, not being accessible to study staff for urine-based testing) was the primary reason for not being re-tested. Four (4.6%) of those re-tested were positive for CT and two (2.3%) were positive for GC. One CT infection at follow-up was in an

untreated patient with CT at baseline. The incidence rate for CT in the follow-up sample was 6.3 per 100 person-years (95% CI: 1.3–18.4) and for GC was 4.2 per 100 person-years (95% CI: .5–15.2) (excluding the youth with CT who had not been treated at baseline).

Of the 14 youth positive at baseline who were included in the follow-up sample, 12 were treated at baseline, one was treated on follow-up, and one was never treated. Of those 12 youth who were treated at baseline, seven (58%) were re-interviewed on follow-up and six (50%) were re-tested. None of these youth were positive when re-tested (95% CI: 0–131.3).

## Discussion

Our project demonstrated that field-delivered testing and field-delivered therapy were feasible, acceptable, and effective interventions for the diagnosis and treatment of STDs in homeless youth, who are generally perceived as a hard-to-reach population. Ninety-nine percent of youth accepted testing. Ninety-four percent of positives were treated. Furthermore, the study suggests, though without a control group cannot prove, that PDPT may decrease re-infection rates with bacterial STDs in this high-risk population of homeless youth. Of the 12 tracked youth who were initially positive and treated at baseline, none of those tested at follow-up were positive, but the large confidence intervals for this finding preclude any conclusion. Our treatment outcomes compared favorably with published time to treatment (8–66% at one week) and rates of treatment (80–92%) for other populations by STD clinics [16,31].

We attribute our success in screening and treating youth to several factors. The first was our culturally competent staff, all of whom had significant experience working with street youth, with street outreach, or with street-based testing and tracking with high-risk adolescent youth populations. The second is the collaborative model between a University-based project and the Department of Public Health, which allowed us to more effectively track positives and, in particular, to confirm whether a youth who had tested positive for an STD had been treated. Thirdly, but no less importantly, was our relationship with programs that work with street youth in our city, particularly in the street outreach setting. Although we did not disclose the reason for which youth were being tracked, our alliance with these programs and their support of the study and its purpose was critical to successfully testing and treating youth. Finally, through knowledge of services beyond the San Francisco Bay Area, we were able to locate youth who required treatment but who had already traveled elsewhere. The availability of a signed permission-to-track form was critical to legitimating our request for help from these agencies to obtain current locating information.

There were important limitations to our experience. The first is that youth received significant compensation for

participation in the study (\$20) and an additional \$10 for provision of the urine sample. Traditional outreach programs are generally not able to offer such compensation for STD testing. We note that although testing was compensated, treatment was not. The second is the limited availability of field-delivered therapy protocols and PDPT protocols in other counties and states [19,20]. Third, the baseline prevalence of infection in our sample was modest and the prospective cohort relatively small such that without a comparison group, the true effectiveness of the field interventions, including PDPT, could not be compared with other models of STD screening and management in a similar population. This study was not powered or designed to test the effectiveness of PDPT in homeless youth, but our experience serves as a pilot study of such an intervention in a homeless population. Finally, we did not collect data on whether PDPT was delivered to partners or not, nor on obstacles, barriers and approaches to delivering therapy to partners from the point of view of participants. Future studies should include such measures.

The incidence rate of infections over our follow-up period and the incidence rates documented by Noell et al (annualized incidence of 12% in females and 7% in males) suggest that field-based STD testing and therapy of this population, particularly for chlamydia infection, would be a worthwhile intervention [13]. Measures that would improve street-based testing of homeless youth and other hard-to-reach populations include rapid testing for STDs and the extension of the legal status of PDPT to more states. Our findings lend some support, albeit very tentative, for the effectiveness of PDPT at decreasing the persistence or recurrence of STDs in this population and should encourage more extensive application of such a model in community-based settings.

In conclusion, the provision of street-based testing to homeless youth by outreach-level staff can feasibly be complemented by street-based provision of field-delivered therapy and PDPT. Such interventions may decrease youths' risk of re-infection with bacterial STDs, complications of untreated STDs, secondary transmission to others, and infection with HIV. In addition, our intervention provided treatment and referral services to youth (and their partners) who may be members of high-risk networks who might not otherwise access care, potentially facilitating their linkage to additional reproductive and sexual health services.

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