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U.S. Department of Justice

Office of Justice Programs

Office of the General Counsel

*Washington, D.C. 20531*

MAR 0 8 2013

Re: OJP FOIA No. 13-00139

This letter responds to your Freedom of Information Act/Privacy Act request for "an electronic copy of the Statement of Work for the grant/contract let by the Office of Justice Programs for the National Institute of Justice, to Interdisciplinary Scientific Research, Federal Award ID 2003IJCX1036, performance period 9/1/2003 through 8/31/2005, funding amount $264,026." You further requested "a copy of the final report associated with the grant/contract."

The Office of Justice Programs (OJP) has conducted a search of its records and enclosed is a copy of one document, consisting of 30 pages, that is appropriate for release in full and without excisions. Please note that you can retrieve a copy of the final report at the following website: https://www.ncjrs.gov/pdffiles1/nij/grants/218253.pdf. This completes the processing of your request by the Office of Justice Programs.

Sincerely,

Dorothy A. Lee

Dorothy A. Lee
Paralegal Specialist

Enclosures

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**Clients of Prostitute Women: Deterrence, Prevalence, Characteristics, and Violence**

Purpose and Goals

Prostitute women are victims of physical and sexual violence at exceedingly high rates. Recent research indicates that prostitute women have the highest murder rate of any population of women ever studied. The available evidence suggests that male clients of prostitute women make up the bulk of the perpetrators. Prostitute murders are among the most difficult to solve, and in recent decades many local jurisdictions have mounted expensive and lengthy investigations of such homicides, often without resolution. In addition, vice operations against clients are more resource intensive than those against prostitutes, and these activities represent nontrivial resource commitments for many local law enforcement agencies across the country. Furthermore, there is a need to understand the men who drive an industry that causes a considerable nuisance to the community and supports illegal drug markets. In this project, we will address large gaps in knowledge about clients to enhance efforts to curb prostitution and develop profiles of violent clients.

The goals of this project are to:

1) Assess the specific deterrent effect of arrest for patronizing a prostitute;

2) Estimate the prevalence of clients overall and the subset of clients who are violent toward prostitutes;

3) Compare clients with the general population of men in terms of demographics and geography; and

4) Compare clients who are violent toward prostitute women with clients overall in terms of demographics, geography, and criminal history.

Background and Relevant Literature

Prostitute women, particularly those who work on the street, experience extremely high levels of physical and sexual violence from their clients (1-6). Prostitute women are many more times likely to be raped than demographically similar nonprostitute women (3). Moreover, prostitute women have the highest murder rate of any population of women or occupation ever studied (7). The estimated murder rate for active prostitutes in an open cohort of 1,633 prostitute women in Colorado Springs from 1967 to 1999 is 226 per 100,000 person years (7). This rate is almost 18 times higher than that for the age- and race-matched general population of women in the US. In Colorado Springs, nearly all of the murdered women were killed while soliciting on the street. Similarly, 84% of known prostitute women murdered in the UK in the 1990s worked on the streets (8). Prostitutes' observed murder rate, along with empirical estimates of the prevalence and career length of prostitute women (9), suggest that 1% of prostitutes are murdered in their prostitution careers and that 3% of female homicide victims in the US in recent decades were prostitutes (7).

Male clients perpetrate a very large proportion of the lethal and nonlethal violence experienced by prostitute women (4, 10-15). For instance, clients were the suspected perpetrators in 64% of the 86 murders of known prostitute women in Canada between 1992 and 1998 (16). Moreover, clients who are serial murderers may account for a disproportionate fraction of prostitute murders (17-22).

Prostitute murders are difficult to investigate and solve for a variety of reasons. Lowman and Fraser (4) identified a number of factors, including: 1) the death scene is often not available—rather, investigators typically have only the body dump site; 2) in the context of street prostitution, both perpetrator and victim are usually anonymous to each other as well as others in

the area, and typically there are no witnesses to their interaction; 3) there are few means to link perpetrator and victim given the nature of their contact; 4) any available witnesses (such as other prostitutes, drug users, or homeless persons) usually are, or are perceived to be, unreliable; and 5) when investigations cross jurisdictions (e.g., with victims and/or dump sites in multiple jurisdictions), interagency cooperation can become problematic. Across North America, these challenges have produced lengthy, costly, and often unsuccessful investigations of prostitute homicides (18, 19, 21, 23).

Vice operations against clients represent a nontrivial commitment of police resources. Between 1991 and 2000, approximately 20,000 arrests of males for prostitution and commercialized vice were made each year in the US (24). Sting operations against clients tend to be more resource intensive than those against prostitutes because additional personnel and equipment are needed to maintain decoy safety and pursue suspects who flee in vehicles.

Street prostitution creates other problems for communities, including traffic, litter, tarnished images of neighborhoods, and propositioning of those not involved with prostitution (e.g., 25, 26). Street prostitution also sustains, in part, illegal drug markets and the crime and violence connected to such activities (e.g., 27, 28).

Despite the role clients play in undermining public safety and order, relatively little is known about them. The following paragraphs summarize the current literature on this population in relation to each of our goals in turn.

1) *Assessing the specific deterrent effect of arrest for patronizing a prostitute*

Low rearrest rates for patronizing prostitutes (e.g., 2% of men arrested for patronizing in Vancouver between 1986 and 1992 were arrested twice in that period) have been interpreted as indicating the specific deterrent effect of arrest (29). However, the low rearrest rates may

actually reflect the intermittency of client stings and the relatively large size of the client population. Apprehending clients is much like ticketing speeding drivers – many people commit the offense on a regular basis, but violators are usually apprehended only as a result of proactive police efforts to cite a sample of offenders. Similarly, some evaluators of "john schools" (deferred adjudication programs for arrested clients that emphasize the risks and consequences of prostitution) have reported low recidivism rates for program participants (30, 31). These figures are difficult to interpret because the observation periods were not clearly specified in the evaluation reports, no data on the intensity of vice operations (e.g., number of arrests) and client population size over time were presented, and the evaluations do not consistently show rearrest rates for comparison periods before or after the intervention. Anecdotal reports suggest that various interventions, such as publishing and/or broadcasting arrested clients' names and pictures, impounding arrested clients' vehicles and charging large sums to owners to retrieve them, and john schools, do not decrease demand for, or recidivism to, prostitution (31-33). Persons (34) contends that shaming clients (through publishing/broadcasting arrested clients' names/pictures, etc.) is unlikely to be an effective deterrent to future patronizing since such publicity effectively labels them as clients to the community at large, thereby reducing inhibitions to reoffend.

Research on the specific deterrent effect of arrest for other offenses shows mixed findings. Smith and Gartin (35) compared the police records of adolescent males in Racine, Wisconsin, born in 1949 who were contacted by the police regarding some illegal behavior and not arrested with those who were arrested. The researchers found that boys arrested at first contact were somewhat less likely to be contacted by the police (for any type of offense until age

25, in 1964) than those initially contacted but not arrested by the police. The analyses controlled for the boys' ages at first contact and seriousness of the offense at that contact.

In the 1980s Lawrence Sherman and his colleagues conducted randomized experiments of police responses to domestic violence incidents in several US cities (36). They found that arresting lower status men in domestic assault incidents actually increased the likelihood of their perpetrating subsequent domestic violence compared to lower status men who were simply warned or asked to leave the premises for a cooling-off period. For higher status men, however, arrest decreased the likelihood of subsequent domestic violence relative to the other interventions.

Gold and colleagues (37, 38) assessed the consequences of apprehension per se in two studies. The first study involved 20 pairs of adolescents drawn from a probability sample of youth in Flint, Michigan, in 1961. The second study involved 35 pairs of adolescent boys who participated in the National Survey of Youth. In both studies, one youth in each pair had been arrested, and the adolescents in a pair were matched in terms of age, race, sex (for the first study), and number of self-reported offenses prior to the date of the arrested youth's arrest. The results for both studies indicated that arrested adolescents committed, on average, about one offense more than non-arrested adolescents after the date of the arrest. However, data from the second study showed that 63% of the arrested boys were merely warned and released, with no further prosecution. In sum, prior research on the specific deterrent effect of arrest does not clearly indicate the direction or magnitude of such effects.

2) *Estimating the prevalence of clients*

Existing estimates of the prevalence of clients are based on national probability sample household surveys. Our analyses of the 1988-1996 General Social Surveys (GSS; 39) and the

1992 National Health and Social Life Survey (NHSLS; 40) show that 0.5% of adult men and 1.1% men aged 18 to 59 in the US, respectively, reported paying for sex in the last 12 months. In ten European countries' surveys (Denmark, Finland, France, Germany, Great Britain, Netherlands, Norway, Portugal, Spain, Switzerland) in the 1980s and 1990s, the percentage of heterosexual men aged 18-49 reporting they had paid for sex in the last year ranged between 0.5% (Great Britain) and 9.9% (Spain) (41-43). Many surveys include questions about whether respondents have ever paid for sex. Such lifetime reports are not useful for ascertaining recent behavior. In addition, lifetime reports are more likely to reflect respondents' patronizing prostitutes in other countries. For example, in the NHSLS, self-reported lifetime patronizing behavior is associated with military service (44).

Unfortunately, survey estimates of client prevalence are plagued by underreporting. Multiple randomized experiments show that men substantially—even dramatically—underreport contact with prostitutes in self-administered questionnaires (as used in the GSS and NHSLS) compared to audio computer-assisted self-interviewing (ACASI), which is thought to promote accurate reporting (45, 46). For instance, in a national probability sample of males aged 15-19 in the US, respondents were four times more likely to report contact with prostitutes with ACASI than self-administered questionnaires. Additional evidence for underreporting comes from the observation that men are more likely to acknowledge patronizing prostitutes on repeated questioning in surveys (47).

Another shortcoming of the survey estimates of client prevalence is that they do not pertain specifically to clients of street prostitutes-- that is, those responsible for most of the violence in prostitution. Surveys of john school participants in California, Nevada, Oregon, and Edmonton, Alberta, indicate that approximately 2% acknowledge having used threats or force

when having sex with prostitutes or women generally (48, 49). However, it seems likely that men would also underreport violent behavior against women, weakening confidence in these estimates.

3) *Comparing clients with the general population of men*

Prior research on clients of prostitutes has almost exclusively been based on nonprobability samples (often employing convenience sampling or strong self-selection biases) and many such studies have not focused on or included clients of street prostitutes (50-68). Hence, such samples cannot be regarded as representative of the overall client population. Only a few studies have involved samples of clients that, while not probability samples, can be considered to be somewhat representative of clients of street prostitutes.

Monto and colleagues (48, 69) described the self-reported characteristics of 1,342 arrested clients who attended john schools in California, Nevada, and Oregon. However, john school participants included first offenders only and a significant fraction of first offenders opt not to attend john schools. Respondents in a probability sample of 998 street prostitutes in Los Angeles in 1990-1991 reported on the characteristics of their last client (70). The response rate was 61-89% depending on the definition of eligibility. Fifty-nine percent of clients were new (i.e., the respondent had not had sex with him previously), and 10% of the encounters involved the client and prostitute sharing alcohol and/or drugs. The researchers also profiled the demographic characteristics of clients. Given that highly active clients visit multiple prostitutes, it may be that these summaries reflect a certain proportion of duplicated clients. In addition, Lowman and colleagues (71, 72) summarized the characteristics of samples of clients of street prostitutes prosecuted (a subset of those arrested) in the 1980s and 1990s in Vancouver, British Columbia. Although these studies involved more appropriate designs for sampling clients, none

involved comparing client characteristics with those of men in the general population of the corresponding communities. The lack of comparison makes it difficult to know whether clients differ from other men.

The only attempts to make such comparisons have involved nonprobability samples (59) and the GSS and NHSLS survey data. The latter showed that heterosexual men who acknowledge paying for sex in the last year closely resemble those who deny contact with prostitutes in terms of age, race, education, employment, and income (47). However, between the two surveys, only 28 men admitted paying for sex in the last year. Given this small number acknowledging such behavior (and the high degree of underreporting), such results must be considered preliminary.

4) *Comparing clients who are violent toward prostitute women with clients overall*

Several studies in the UK, Canada, and US have characterized violent clients. In a sample of 22 prostitute murderers in the UK, 50% had prior convictions for physical and/or sexual violence (14). Lowman and Fraser (4) described 76 murderers and rapists of prostitutes found in Vancouver, British Columbia, police records between 1975 and 1993. Their mean age was 27-29 (range = 18-46), 82-89% were white, and 25-39% were married. Lowman and Fraser noted the similarity in age and race between these violent clients and clients in their earlier analyses who were prosecuted for patronizing (71). Another source of information on violent clients are bad date lists (or "ugly mug" lists), which are lists of clients who have assaulted, robbed, threatened or otherwise harmed prostitutes (14). Prostitutes report incidents involving violent clients to list compilers (typically social or health service agencies or prostitute organizations). Lowman and Fraser (4) found the age distribution was similar for bad dates, murderers and rapists of prostitutes, and prosecuted clients, but bad dates were less likely than

the others to be white. This latter result might be due to geographically limited coverage of Vancouver's bad date lists. In addition, 85-90% of bad date reports and prostitute murder and rape cases in Vancouver and southeast England (including London) involved single perpetrators (4, 73).

With support from NIJ, Dudek (17) described the characteristics of 75 prostitute murderers in the US between 1985 and 2000. The sample was based on information furnished by the FBI's National Center for Analysis of Violent Crime and case materials requested from law enforcement agencies across the US; cases from 21 states and the District of Columbia were included. Eighty-three percent of the murderers solicited sex from their victims before killing them. Fifty-one percent were previously acquainted with the victim, 38% were regular clients of the victim, and 58% met the victim in a known vice area. Offenders' mean age was 34 years, 47% were black, 43% were white, and 23% were married. Twenty-six percent were homeless, 48% had unskilled occupations, and crime was the main source of income for 8%.

Ninety percent of the offenders in Dudek's sample had a juvenile arrest history (based on $\underline{n} = 21$). In terms of adult criminal history, 62% had been arrested for a violent offense, 67% for a sexual offense, 10% for prostitution, and 91% for any offense. Ninety-eight percent frequented known vice areas and 84% were known or suspected drug users. Forty-eight percent of the murders involved a car, and 81% of the offenders in these cases used late model cars (i.e., more than 3 years old). Nearly all (96%) resided in the same local area as that of the murder; the mean distance between perpetrator's home and the location where he encountered the victim was 3.9 miles.

These studies did not involve comparing the characteristics of violent clients with those of clients overall (except for the age and race comparisons in Vancouver). Such comparisons

would enhance profiles of violent clients by identifying characteristics that might differentiate violent clients from clients in general. In their sample of john school participants, Busch and colleagues (48) found that the strongest correlates of self-reported use/threat of force to obtain sex from a woman were the reported number of sex partners in the last 12 months and the frequency of commercial sex in the last 12 months (both $r = .15$). This suggests that violent clients may be more active figures in prostitution markets than typical clients, and thereby easier to identify in surveillance.

Research methodology and data analysis

1) *Assessing the specific deterrent effect of arrest for patronizing a prostitute*

If an arrest for patronizing a prostitute provides a specific deterrent from patronizing further, the rate of rearrest should be lower than the rate of initial arrest for clients identified through other means who have not yet been arrested, with all other factors equal. We have a unique data set that permits investigation of this issue.

Data. John Potterat, Stephen Muth, and their colleagues collected various data on clients of prostitute women in Colorado Springs, Colorado, when they led the STD/HIV control program for the El Paso County Department of Health and Environment. The data were used initially for monitoring the local spread of sexually transmitted diseases (STD) and HIV through prostitution. The data have since been made non-identifiable (anonymous) and the large data sets in which the client data are embedded are being used by Potterat, Muth, Brewer, and their colleagues in ongoing epidemiologic research funded by grants from the National Institutes of Health.

The data currently are stored in separate databases, with data on individuals who appear in the different databases linkable by various anonymous code numbers. Much work remains to

consolidate these data into a single database on clients. There are four sources of data on clients in Colorado Springs: a) arrests; b) clients who participated in a study of prostitutes, their clients, and others thought to be at high risk for HIV (74); c) clients presenting for HIV testing at the health department; and d) clients involved in some way with STD investigations (which involve health department staff interviewing infected persons to elicit their sexual partners, who are notified of their exposure to disease and offered examination and treatment).

The arrest data include 1,346 men arrested between 1970 and 2000 by the Colorado Springs Police Department for patronizing a prostitute. Nine of these men were arrested multiple times for patronizing in this period (8 were arrested twice, and one was arrested three times). The study of prostitutes, their clients, and others at risk for HIV was conducted between 1988 and 1991. The sample includes 194 men who had recently patronized a prostitute woman (based on self-report, observation, or prostitute report), four of whom were arrested during the 1970-2000 period. Among the more than 21,000 persons who tested for HIV with the health department between 1985 and 2000, 836 were men who acknowledged paying a prostitute woman for sex. Fourteen of these clients were arrested for patronizing a prostitute during the 1970-2000 period. STD investigations from 1994 to 2000 identified approximately 200 clients of prostitutes (the precise number requires more elaborate querying of the database). Twelve of these men were arrested for patronizing a prostitute during the 1970-2000 period. Our analysis will determine whether arrest precedes or follows detection by the health department for each of the clients who appear in both the arrest database and one of the three other databases. The original linking of men who appear in the different databases was achieved through the health department staff's in-depth knowledge of the community and persons involved in commercial sex, supplemented by the use of sophisticated matching algorithms with nominal and

demographic data. One limitation of our research on the specific deterrent effect of arrest, shared with prior research on the topic (35, 36), is that we use officially recorded arrests/police contacts as our outcome measure instead of some more sensitive measure of continued patronizing behavior.

Analysis. Our first task will be to create a single database of unduplicated clients with cleaned data on the relevant variables (most of these data have not been used for scientific purposes previously). The resulting database will include information for each client on year of birth, race, military status (whether in military), residential location (by latitude and longitude, with random noise added to maintain non-identifiability), whether detected through each of the four data sources, and year of detection (if any) by each source (for those with rearrests, year of each arrest).

We will compute the annual incidence rate of arrest (number of arrests per 100,000 person years of observation) for those clients first detected by the health department and the annual incidence rate of rearrest for those clients first identified through arrest. We will compute 95% confidence intervals for each rate with the numerator (the number of arrests or rearrests) treated as a Poisson variable, and test whether the rates are significantly different. The observation period for each client will be from the date of first detection (by arrest, study participation, HIV testing, or STD investigation) through 2000, or the year that a client reaches his race- and birth year-specific life expectancy (based on figures from the Centers for Disease Control and Prevention's National Center for Health Statistics, www.cdc.gov/nchs), whichever comes first. Any client who is arrested or who appears in any of the 3 other health department databases at an age above his life expectancy will be included in the analyses through the latest year he is recorded in the database. We will calculate the initial arrest and rearrest rates for the

overall 1970-2000 period as well as for the 1985-2000 period (when the years of first detection are comparable for those first discovered through arrest or non-arrest means).

These analyses are based on the assumption that clients first identified through arrest and those first identified through other means have similar levels of death and outmigration from the Colorado Springs metropolitan area. We will assess the comparability of clients first detected through arrest with those first detected by the health department in terms of their demographics by computing the appropriate measures and tests of differences between the two sets of clients. Given the mixed results in the literature on the specific deterrent effect of arrest, we speculate that any difference in rates we observe may be relatively small.

2) *Estimating the prevalence of clients*

Capture-recapture methods are often used to estimate the size of populations that are difficult or impossible to find and count (75). Given men's extreme underreporting of contact with prostitutes in surveys, we will use data on men observed patronizing prostitutes and capture-recapture techniques to estimate the prevalence of clients. The classic capture-recapture study design involves taking multiple independent samples of the population. Capture-recapture estimates of population size from such data are based on the degree to which the same individuals appear in different samples (reflecting the completeness of the samples) relative to the total number of individuals sampled. Another basic capture-recapture approach involves observing one sample of individuals over a period of time and noting the number of times each individual in the sample is encountered or "captured". Features of the frequency distribution of captures can indicate the number of individuals in the population not observed, thus providing the means to estimate the overall population size. Both types of capture-recapture study design

have been used for estimating the size of particular human populations, such as drug users, prostitutes, and other elusive populations (9, 76-79).

Arrest data and bad date lists constitute one sample capture-recapture data. That is, each type of data includes information with which to construct a frequency distribution of client "captures" (number of times a client (or violent client) was observed patronizing). Arrested clients appear to be representative of clients of street prostitutes. In most communities, vice operations against street prostitutes and their clients tend to be complaint-driven (33, 71; Det. Edward Draper, King County Sheriff's Office, personal communication, March 8, 2001), which means that stings are generally conducted in areas experiencing the greatest prostitution activity. It is also difficult for clients to detect police decoys in stings. In many jurisdictions, decoys may deny being police officers without any harm to the case (33, 71; Det. Edward Draper, King County Sheriff's Office, personal communication, March 8, 2001). In addition, police report little discretion in which clients are ultimately arrested (Det. Edward Draper, King County Sheriff's Office, personal communication, March 8, 2001; 71).

Similarly, violent clients recorded in bad date lists seem to be representative of violent clients overall. The smaller number of violent clients, relative to clients overall, is suggested by the high percentage (17-30%) of clients in bad date lists who had previously been reported to the list or were known to the police (4, 73). Most violent incidents perpetrated by clients against prostitutes are not reported to the bad date list in communities that have such lists (4, 73). However, the bad date lists provide broad coverage of violent clients in the areas where bad date lists operate because the reporting prostitutes serve as many independent observers of this subpopulation.

Data. We have already obtained data on prostitution arrests from three states (California, Florida, and New York) as well as several other metropolitan areas (Colorado Springs, Indianapolis, Kansas City, King County [Washington], and Minneapolis/St. Paul). Appendix D includes a full description of these data. The time periods for the data vary across the states and metropolitan areas, ranging from 3 to 30 years. We estimate that at least 500,000 individuals are included in these arrest data, including approximately 165,000 clients. With the exception of the California data, all arrestees were originally identified and unduplicated (linking arrests of the same individual) with fingerprints.

We have requested arrest data from the appropriate criminal justice agency in each state of the Union and the District of Columbia. To date, 11 states have not responded to our inquiries. Individual-level arrest data (i.e., data on individual arrests that allow unduplication of individual arrestees) are not available from 15 states (either such data are not public, not available for research purposes, or not compiled at the state level). We will continue our efforts to obtain data from seven of the states that may have individual level arrest data but have not shared them with us yet, including Connecticut, Georgia, Illinois, Massachusetts, Missouri, Texas, and Virginia. We also will request arrest data from law enforcement agencies in the Portland, Oregon, metropolitan area and all local jurisdictions in Washington state that conduct vice operations against clients (agencies in Clark, King, Pierce, Snohomish, and Spokane counties). We are collecting arrest data from St. Paul on an ongoing basis via the St. Paul Police Department's web site (http://www.stpaul.gov/depts/police/ prostitution.html).

We will estimate the prevalence of violent clients in Tacoma (Pierce County), Washington, from information on clients reported to the bad date list compiled by the Tacoma Urban League (TUL). TUL's bad date list began in November, 1998, and continues as an

ongoing program. The TUL bad date list includes approximately 450 reports and about 40% of the reports include enough information (typically a vehicle license plate number and demographics) to determine whether the reported client has been observed previously. We will enter these data into a relational database that we will create in Microsoft Access to facilitate analysis. We will also seek to obtain bad date list data from Danzine, a nonprofit organization in Portland, Oregon, that also collects detailed reports on violent clients. (Other cities in Washington state have bad date lists, but the agencies that compile them do not gather information sufficient to identify clients reported multiple times).

Analysis. We will first develop databases in Microsoft Access for each of the different arrest data sets. These databases will organize the data in a standardized way across jurisdictions that will permit our analyses for goals 2, 3, and 4. Currently, the data sets are in a variety of formats (mostly text files with diverse and sometimes hierarchical structures) and some files are very large (e.g., the New York data are in a 398 MB file).

We have developed a capture-recapture statistical method that is tailored to the analytic challenges that client arrest data present (see Appendix E for a draft manuscript that describes our method fully). As noted earlier, the rate of rearrest is low for clients. Therefore, to obtain a reasonable number of "recaptures" (rearrests), observation periods of several years may be required. In addition, when extended observation periods are used, estimation methods must account for migration into and out of the community under study to prevent biasing estimates, given the significant geographic mobility in the contemporary US. Existing capture-recapture techniques are not designed for making prevalence estimates from sparse data (relatively few recaptures) on such open populations.

In brief, our method involves estimating the probability a client is arrested during a certain period of time from the probability of rearrest given an initial arrest. This probability of being arrested can be adjusted to reflect any deterrent or escalatory effect of arrest. Our approach explicitly accounts for population turnover during the observation period and the intermittency of arrests. By combining these and other factors, the method produces an estimate of the population size, and a confidence interval based on the bootstrap can be constructed around the estimate.

We have applied our method to client arrest data from Vancouver, Canada. For the two years including 1986 and 1987, 521 different men were arrested for patronizing, and 11 of these were arrested twice in the period (71). For the 7-years between 1986 and 1992, 2,001 different men were arrested, and 44 of these were arrested twice in the period (29). These data lack information on the date of each arrest during the observation periods, and thus are more limited than the data we have for US communities. Nonetheless, with our approach, we estimated that 2% of men (11,094) in the Vancouver metropolitan area had patronized a street prostitute in the two-year period. For the 7-year period, our estimate of client prevalence in the general population of men in the Vancouver metropolitan area was 7% (39,458). This latter estimate is higher than the self-reported *lifetime* prevalence of clients (4%) in a 1984 Canadian national population survey (80)—another indication of men's underreporting of contact with prostitutes.

We will apply our statistical method to estimate client prevalence, incorporating any deterrence factor indicated by our work on goal 1, and compare the estimates with those from "closed population" methods for sparse capture-recapture data (81, 82). We will compute prevalence estimates for states when we have data on all clients arrested in a state. When we have information on clients' cities of residence and the data pertain to all arresting agencies in a

metropolitan area, we will estimate prevalence of clients residing in the particular metropolitan area. If we have data from only one of the arresting agencies in a metropolitan area (e.g., Minneapolis in the 1990s), we will estimate the prevalence of clients in the arresting agency's jurisdiction by excluding those arrested clients who reside outside of the agency's jurisdiction.

We anticipate computing prevalence estimates for 1 or 2 year observation periods when the data for a state or metropolitan area include a sufficient number of rearrests. For metropolitan areas with relatively few client arrests, we may extend the observation period to 5 or more years to accumulate enough rearrests for stable estimates of population size. Within these constraints and time periods of the data, we intend to standardize observation periods across states and metropolitan areas as much as possible. We will use figures from the US Census Bureau (www.census.gov) to estimate population turnover (particularly outmigration and death) and general population size for the particular geographic units (metropolitan areas and states) in our analyses. In some jurisdictions, charge information does not distinguish between clients and prostitutes (there are always separate charge codes for pimps, procurers, and madams). In these situations, transvestite or male prostitutes could be confused for clients if all arrested males were considered clients. Thus, when it is not clear which arrested males are clients, we will define clients as men arrested on days when at least two men are arrested for prostitution and when more males are arrested than females. Such conditions imply the police conducted client stings on those days, rather than prostitute stings that netted transvestite or male prostitutes.

Our analyses of the bad date list data will parallel those of the arrest data. In most cases the bad date list data lack information on clients' cities of residence. Therefore, we will adjust

downward prevalence estimates of violent clients for an area proportional to the percentage of clients arrested in that area who do not reside in that area.

Based on our analysis of the data from Vancouver, Canada, we hypothesize that the estimated prevalence from arrest data will be substantially higher than that based on the national probability survey data (GSS and NHSLS) discussed earlier. Client stings usually represent a sampling of prostitution strolls (areas of street prostitution) in a community. Capture-recapture methods that rely on such sampling would result, in the worst case scenario, in underestimating prevalence (if clients tended not to visit multiple strolls). However, intensive field observations indicate that clients do tend to visit multiple strolls systematically (83). Thus, it is likely that arrest data which are based on client stings conducted at only some of the strolls in a community produce adequate sampling.

3) *Comparing clients with the general population of men*

We will compare the clients in the arrest data (described in the previous section and Appendix C) with the general population of men in the states/metropolitan areas corresponding to the different arrest data sets. Our comparisons will focus on basic demographics and geography. For each geographic area (state or metropolitan area) we study and for each characteristic we compare, we will calculate descriptive statistics for the client sample and general population and report a one-sample test for a difference between the sample and population mean, proportion, or categorical distribution (84). The time periods for these comparisons will correspond to those used for the prevalence analyses. For interval scale variables, we will calculate a z-score represented by: (client sample mean - area population mean) / population standard deviation. This score will show how the typical client compares to the local area general population of men on the variable. Then, for an overall summary of the

magnitude of differences between clients and the general population, we will compute the median, unweighted mean, weighted (separately by client sample size and state/metropolitan area population size) mean z-score. For each comparison involving proportions, we will calculate the median, unweighted mean, and weighted mean ratio between the sample and population proportions and signed difference between these proportions. For categorical distributions we will report on overall differences between client and general population distributions through the index of dissimilarity and particular categorical proportions. We will use other measures of the magnitude of differences between clients and the general population for geographic variables (see below), but these will also be summarized across metropolitan areas with medians and unweighted and weighted means.

The demographic variables to be compared in one or more states/metropolitan areas are: age, race, income, education, marital status, and number of children. We will estimate an arrested client's income from the median income of his residence's block group as indicated in census figures. We will also compare the age of Minneapolis and St. Paul clients' vehicles with national data from the National Household Transportation Survey (a national household probability sample survey conducted in 1990, 1995, and 2001; http://nhts.ornl.gov/2001/index.shtml).

Our analyses of geographical differences will involve comparing clients and the general population in terms of location in and dispersion throughout particular metropolitan areas. For those data sets with address information, we will first compute the percentage of clients who reside outside of the metropolitan area of interest and then code the latitude and longitude of client residences and locations of arrest for those clients who reside in the area. Then, for each area, we will calculate the population centroid (mean longitudinal/latitudinal coordinates of

persons' residences) for arrested clients and the general population (using population-weighted block group centroids in the calculations; data to be obtained from Spatial Insights).

To compare clients' "average" residential location with that of the general population, we will test the significance of the difference between client and general population centroids using a bivariate normal distribution. In essence, this test indicates whether clients' centroid falls within the bivariate normal confidence ellipse (at some level of confidence) around the general population centroid. To indicate the magnitude of these differences, we will compute the ratio of a) the distance between client and general population centroids to b) the mean distance to the general population centroid for the general population. To compare the degree of spatial dispersion between clients and the general population, we will test whether clients' mean distance to their centroid differs from the mean distance to the general population centroid for the general population (one-sample z-test). Our measure of the magnitude of differences in dispersion will be the ratio of a) clients' mean distance to their centroid to b) the mean distance to the general population centroid for the general population. Furthermore, for each area, we will also display graphically the population centroid, bivariate confidence ellipse around that centroid, and rotational boxplot (a 360 degree series of overlapping box plots of the distance of persons to a particular centroid) (85) for arrested clients and for the general population.

These analyses will show whether the small differences in some of these variables between clients and the general population found in previous, although limited, survey research are corroborated by arrest data.

4) *Comparing clients who are violent toward prostitute women with clients overall*

Data. We have data on the demographics, criminal history, and geography of approximately 100 clients who murdered prostitutes and will gather such data on hundreds of

additional violent clients. The data we already have include: a) Dudek's 75 prostitute murderers (cases between 1985-2000 in 21 states and the District of Columbia) (17); b) 30 Chicago homicides between 1965 and 1995 in which prostitute women were killed by clients (86); publicly available at www.icpsr.umich.edu); and c) approximately 10 homicides of prostitute women by clients in St. Louis, 1985-1995 (quantitative and police narrative data from the St. Louis Homicide Project, directed by Richard Rosenfeld and Scott H. Decker, University of Missouri-St. Louis; estimated number of relevant homicides based on proportion of murder victims who are women (http://www.cdc.gov/ncipc/wisqars/) and the proportion of women murdered in the US who are prostitutes (7).

We will also seek to identify other clients who are violent toward prostitutes by searching books and web sites on serial murderers (found through our ongoing searches of the published literature and the World Wide Web) and systematically searching databases of US newspapers. These databases are the NewsBank Retrospective (1970-1991) and the NewsBank NewsFile Collection (1992-present). Both databases include news articles from over 500 regional and national newspapers in the US. Our keywords for searching these databases will include "prostitute" paired with each of "murder", "rape", and "assault". Two hours of our preliminary searching in the NewsBank NewsFile Collection yielded approximately 20 different clients charged with murdering prostitutes (from about 10% of the articles retrieved by using "prostitute" and "murder" as keywords). This will be a valuable source of data on violent clients, as prosecutions for violence against prostitutes tend to be well-publicized in local media. We will glean as much information as possible on the demographics, criminal history, and geography of prosecuted violent clients from these news accounts. Then we will contact the criminal justice agency for the state in which these offenders committed the crimes and in which

they resided (if different) and request the criminal history record for each of these men. In most cases, according to state laws, these records will show convictions only but also include additional information on basic demographics and geography.

The bad date list data from Tacoma (and Portland if we obtain them in full) also contain information about violent clients' characteristics. These data include the age and race of violent clients (reported by the victimized prostitutes) as well as geography (location of incident and zip code of vehicle owner [available for free from the Washington state Department of Licensing if a license plate number is provided]).

We have full data on the in-state arrest histories for clients arrested in Florida and New York. We will also obtain full in-state conviction histories for all arrested clients in Washington state (we will access these data by searching free public databases at the King County Courthouse in Seattle).

Analysis. The first task in analyzing the data on violent clients identified through means other than the bad date lists will be to unduplicate such clients, as the same client might appear in more than one data source. For those data sets in which violent clients are anonymous (Dudek's murderers and the Chicago and St. Louis prostitute homicides), we will use clients' demographics and characteristics of the arrest, victim, and incident to detect violent clients appearing in more than one data source.

We will perform three types of analysis on the violent clients identified through means other than the bad date lists. The first, and most direct, approach involves comparing violent clients with clients arrested in the same metropolitan areas in which violent clients committed their violent offenses against prostitutes. These analyses will be limited to the extent that the geographic coverage of our client arrest data falls short of that for violent clients we identify

throughout the US. We will be able to compare violent clients with clients arrested in the corresponding communities on at least the following variables:

- age, income, and race
- height, weight, and body mass index
- criminal history (any offense and any violent, sexual, domestic violence, prostitution, and drug offense, respectively) and number of past criminal offenses (overall and for violent, sexual, domestic violence, prostitution, and drug offenses, respectively)
- residence in the local metropolitan area, distance between residence and general population centroid (for local residents), and distance between residence and arrest location (for arrested clients)/location where victim encountered (for violent clients) (for local residents).

The criminal history variables will be constructed for three periods in a client's life: whole adult criminal history, before his first prostitution arrest (for arrested clients)/first arrest for violence against prostitutes (for violent clients), and after his first prostitution arrest (for arrested clients)/first arrest for violence against prostitutes (for violent clients). For those clients with multiple victims, we will use the mean distance between his residence and the locations where he encountered each of his victims.

For each of the interval scale variables, we will compute a z-score that compares a violent client with local clients overall on that variable: (violent client value – mean of local arrested clients) / standard deviation of local arrested clients. We will then calculate summary statistics for these z-scores across violent clients and test the significance of the mean z-score's departure from 0. For each categorical variable, we will aggregate violent clients' observed values and compare them with expected values based on summing expectations from the distribution of local arrested clients corresponding to each violent client. We will use the chi-square goodness

of fit test to assess differences between the observed and expected values and compare the magnitude of differences with the measures discussed for goal 3.

Second, we will include all violent clients in a series of somewhat less direct comparisons with clients overall. These analyses are based on the assumption that the difference between clients overall and the local general population should be roughly the same for those areas in which we have arrest data and those for which we do not. In this set of analyses, we will compare violent clients and clients overall on most of the variables listed in the previous paragraph (excluding height, weight, body mass index, criminal history variables, residence in local metropolitan area, and distance between residence and arrest/violent incident location), as well as marital status and education. We will compute z-scores and observed and expected categorical distributions as described in the previous paragraph, except that we will use census figures for the local general male population in calculating population means and standard deviations for the z-scores and expected values for the categorical variables. The results from these analyses can then be compared with the results from goal 3 that summarize measures across areas for arrested clients overall. In effect, these analyses use local general population characteristics as the reference point for comparing violent clients and clients overall.

The third, and least direct, approach will allow violent clients and clients overall to be compared on variables excluded from the second approach (height, weight, body mass index, criminal history variables, residence in local metropolitan area, and distance between residence and arrest/violent incident location), as well as vehicle age. Relative to the other variables, these variables are less likely to vary substantially across different areas in the US and through the period studied in this project. For each variable, we will pool violent clients and compare

them with arrested clients, pooled across all arrest data sets, using the statistical techniques described earlier (z-scores, one-sample z-test about a mean, chi-square goodness of fit test, etc.).

Our analyses of the bad date list data from Tacoma (and Portland if we obtain them) will compare the characteristics of unduplicated violent clients (as reported by the victimized prostitutes) with clients arrested in the corresponding metropolitan areas. These characteristics will include age, race, residence in the local metropolitan area, distance from violent client residence to population centroid (based on zip code centroids for bad date clients who reside in the local area), and distance between violent client residence and incident location (also based on zip code centroids). We also will compare bad date clients with Minneapolis and St. Paul clients in terms of vehicle age.

It is difficult to anticipate the results for goal 4. We suspect that violent clients may have more extensive criminal histories and tend to be of lower socioeconomic status than clients in general.

Products

We will produce all interim and final progress reports on schedule. We will report our research to the scientific and law enforcement communities at conferences and through articles in peer-reviewed scientific journals in criminology and criminal justice. We expect to produce one paper for each of our goals. We will send relevant papers and reports to all law enforcement and other agencies that have cooperated with us and will work with NIJ to disseminate new information to law enforcement agencies throughout the US. In addition, we will post summaries of our results on the Interdisciplinary Scientific Research web site. Finally, we will deliver all data to NIJ for archiving, with a few exceptions. We do not intend to submit to NIJ those data that are already publicly available on web sites and data that include

identifiable information. We have already entered into to confidentiality agreements with some of the agencies that provided arrest data that prohibit us from releasing the data to anyone else. However, we will seek to negotiate amended agreements with these agencies that would allow us to share non-identifiable information from these data sets.

Implications for Policy and Practice

Our large-scale national study of clients has several major implications for criminal justice policy and practice. First, we will provide one of the few sound estimates of the specific deterrent effect of arrest and the only estimate to date for any offense that usually requires proactive policing to apprehend offenders. This knowledge may help assess the effectiveness of vice operations against clients in curbing street prostitution. However, we recognize that specific deterrence is only one part of deterrence, and that arrests and convictions may serve a critical role in general deterrence (deterring persons from committing crimes out of fear of arrest and conviction).

Second, our project will provide the first reliable estimates of the prevalence of clients (aside from our preliminary estimate for Vancouver, Canada) and the only estimate to date of the prevalence of violent clients. Knowledge of the prevalence of clients will define the scope of the prostitution problem. But even beyond concern with prostitution itself, by knowing the prevalence of violent clients, police may be better able to put limits on number of persons considered to be potential suspects when investigating violent crimes perpetrated against prostitute women. A number of prostitute serial homicide investigations included tens of thousands to millions of persons as potential suspects, severely hampering the efficiency of these investigations (23).

Third, our project will yield the first comprehensive and broadly representative characterization of clients involved in street prostitution in the US. Our analyses will also provide the first comparisons of clients' characteristics with those of men overall in the corresponding communities, indicating possible correlates of patronizing street prostitutes. Such information may stimulate further research for developing other interventions, oriented toward law enforcement and education, to prevent this behavior.

Finally, our analyses will expand on existing knowledge of the characteristics of violent clients in the US by examining a much larger sample of violent clients than has been studied previously in the US and by making the first comparisons of violent clients with clients overall in the US. The findings should help refine and provide a firmer foundation for profiling violent clients. Police investigators could use such profiles in covert or overt surveillance of prostitution strolls to identify the subset of clients most likely to commit violent crimes against prostitutes. By prioritizing such individuals for further surveillance and/or interrogation, police departments can make the best possible use of limited investigative resources.

Staff and Research Management Plan

Appendix F shows the project timeline. As the project director and principal investigator, Dr. Brewer will assume overall scientific, administrative, and fiscal responsibility for the successful completion of this project. He will ensure that the research goals are met in a timely manner with scientific integrity. Dr. Brewer will coordinate the work of the consultants, write the IRB application, obtain additional data for goals 2-4, help design the database for the Tacoma bad date data, conduct the newspaper database searches, perform the data analyses for goals 1, 3, and 4, work with Dr. Roberts in analyzing data for goal 2, and lead the reporting of the research as primary author of project reports and manuscripts.

Dr. Dudek will extract from his data the relevant information about clients who murdered prostitutes and send these data to Dr. Brewer. Dr. Dudek will advise Dr. Brewer on issues related to prostitute homicide investigations and violent clients. He will also provide feedback on analyses related to goal 4 (comparing violent clients with clients overall).

Ms. Hargrove will supervise the data entry and organization of the Tacoma bad date lists. Ms. Hargrove will advise Dr. Brewer on historical details of the data set as well as on issues related to violent clients. She will also provide feedback on analyses related to goal 4.

Mr. Muth will provide critical data management services for this project. He will create a database on Colorado Springs clients for goal 1, develop a database for the Tacoma bad date data, import the arrest data into MS Access, geocode addresses in these data, perform analyses in support of goals 3 and 4, and advise Dr. Brewer on all data originating in Colorado Springs.

Mr. Potterat will advise Dr. Brewer on the various data sets from Colorado Springs and issues related to the prevalence and characteristics of clients given his lengthy experience in working with this population.

Dr. Roberts will carry out the most technical aspects of the analyses related to goal 2 (estimating prevalence of clients), modifying the analytic approach as necessary to the circumstances. He will also advise Dr. Brewer on all other statistical aspects of the project and contribute to reports and articles that describe work on all goals. All consultants will contribute to reports and articles related to the goals on which they work.

Our team has the computer software and hardware needed to perform all the data management and analysis tasks for this project. Dr. Brewer also has full access to the University of Washington library system (including electronic holdings and databases) as an affiliate faculty member.