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PORTAL SURVEYS OF TIME-OUT DRINKING LOCATIONS

A Tool for Studying Binge Drinking and AOD Use

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Portal surveys, defined as assessments occurring proximal to the entry point to a high-risk locale and immediately on exit, can be used in different settings to measure characteristics and behavior of attendees at an event of interest. This methodology has been developed to assess alcohol and other drug (AOD) use at specific events and has included measuring intentions to use collected at entry and reported use on exit, as well as chemical tests for AOD consumption at both entrance and exit. Recent applications of the portal survey procedure to electronic music dance events that occur in established venues (e.g., bars or nightclubs) are discussed.

Keywords: *assessment methodology; young adults; rave; electronic music dance event (EMDE)*

Portal surveys are a form of intercept sampling specifically designed to capture at-risk individuals at the entrance to and exit from locales of increased alcohol and other drug (AOD) risk to characterize the attendees, their AOD use intentions, and their reported consumption along with physiological measures of AOD use. To qualify as a portal survey opportunity

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appropriate for measuring AOD use, the environment must present three components: (a) at least theoretically, be a venue associated with an increased risk of AOD consumption; (b) exist in a location that permits intercepting and assessing respondents before entry into and on exit from the setting; and (c) have respondents who enter and exit during a sufficient span of time to permit brief interviews and testing. This survey methodology can be used to study an array of problems and populations as the defining features of its utility are focused on the settings of interest and the risky behavior associated with the setting. Broader examples of portal survey applications include studies of binge drinking among American youth who cross the Mexico border (Lange, Lauer, and Voas 1999) and heavy drinking at college events (Sidewalk Survey). The foci of our previous and ongoing studies have involved young adults and college students, but the application of portal survey procedure can be useful in other populations and settings. For example, it is possible to study levels of alcohol consumption at large sporting events or drug use among concert attendees. Our goals in this current investigation are to better understand maladaptive drinking-and-drug-use behavior associated with electronic music dance events (EMDEs) and to identify possible avenues for on-site interventions.

The portal survey approach has increasing utility because it is less expensive than the more traditional case-finding modalities (e.g., random-digit dialing, mail surveys, clinical sampling, and school- or college-based surveys) and because data on binge drinking and AOD misuse are gathered proximal to the substance use. Portal surveys provide a number of advantages over more traditional survey systems. First, they allow temporal estimation of binge drinking and AOD use during a particular high-risk event and/or social setting. Second, procedures used in portal surveys allow estimation of AOD use based on both self-report and biological assays. Thus, recall bias and underreporting—potentially more problematic in situations involving heavy AOD use—are minimized. Third, given the close proximity of a survey team to the setting, it is possible to observe and evaluate social and environmental influences during the portal survey. Fourth, the portal survey methodology can use techniques that allow for anonymous data collection from subjects entering and exiting the settings. Finally, the portal survey is a particularly robust methodology for preevaluations and postevaluations used for intervention studies.

Although traditional case-finding methodologies have their relative advantages, there are several limitations relating to low response rates and nonresponses: issues surrounding parental consent in research involving minors; underrepresentation of ethnic minorities, males, and certain socio-economic groups; and the lack of inclusion of school dropouts and

noncollege students. In studies of AOD use and misuse, these biases often lead to underestimates of drug use and attenuation of risk-factor estimates (Anthony and Petronis 1995). Investigations by Miller et al. (1997) and Spooner and Flaherty (1993) found that not only is an intercept methodology (specifically street intercept) a feasible method as assessed by response rates and representativeness, it is also more cost efficient than are mail surveys and random-digit-dial methods. Miller et al. found that this method achieves more representative samples of underserved ethnic minorities (compared to samples obtained using telephone methods) and yields a much higher response rate (80.2% vs. 61.3% for the random-digit-dial survey). Spooner and Flaherty concluded that there is a lower susceptibility to volunteer bias using intercept methods and commented on the cost savings as compared to more traditional methods (e.g., telephone surveys).

Much of what we know about the utility of intercept surveys was derived from the intercept surveys conducted in market research. Public health studies employing social marketing theory have a history of success both in subject recruitment (e.g., Gries, Black, and Coster 1995; Black and Smith 1994) and as a mode for delivering brief interventions (e.g., Gries, Black, and Coster 1995; Green 1988; Lefebvre and Flora 1988). This current protocol advances what we know about the effectiveness of intercept sampling and demonstrates the feasibility of participant retention with this approach.

Most epidemiological and intervention information on AOD use is collected through self-report surveys. Such measures can be very useful in exploring the characteristics of individual AOD users and, to a limited extent, the characteristics of the environments conducive to AOD use. More direct studies of attitudes and expectancies immediately surrounding the consumption of drugs are difficult because illicit drugs cannot be administered ethically to experimental subjects. Bar labs offer the opportunity to study adult drinking behavior, but such studies present difficulties in achieving realism. Ethnographic observations of bar behavior produce important qualitative information but are less easily adapted for large-scale quantitative studies. It is possible, however, to contact young adults who are social substance users at events in which drugs and alcohol are likely to be readily available and consumed. This permits the study of youth who are dosing themselves under naturalistic circumstances by collecting self-report data and chemical-test data before and after attendance at events in which AOD use occurs.

Portal studies are generally limited to venues where patrons enter and leave at the same location, and they enter and leave over a sufficient time span to permit a modest-sized survey team to interview a large number of attendees. Where the exits are in the same locations as the entrances, research stations (tables and equipment used in the survey) can be maintained in the same

location throughout the event. Also, because the times of the entry and exit surveys may overlap (individuals leave while some are still entering), staffing costs can be minimized. However, it is also necessary for participants to arrive and depart during a time span that is sufficient to conduct interviews and biological tests. For example, we have attempted to employ the portal technique at athletic and theater events without success. Arenas and theaters empty rapidly, generally through multiple exits, making it impossible to contact and reinterview participants. Bars, dances, and events are especially suited for portal surveys because individuals enter and leave at varied times.

PORTAL SURVEYS AT THE BORDER

Portal surveys were conducted at the U.S.-Mexican border from 1997 to 2002 with support from the National Institute on Alcohol Abuse and Alcoholism (Grant No. R01-11913; Lange, Lauer, and Voas 1999). A total of 5,041 weekend, nighttime border crossers were interviewed as they entered and exited Mexico. Youth aged 18 to 25 years were recruited at the U.S. border between 10 p.m. and midnight on their way to a night of drinking in Tijuana. This setting is especially conducive to examining the drinking of young U.S. citizens because Mexico's drinking age is 18 years, and alcohol is very inexpensive across the border. An important feature of youthful cross-border drinking is that it is not simply an opportunity for these underage individuals to drink legally, but it is also an opportunity for youth of all ages to get drunk, relax normal restraints, and "blow off steam" (Lange and Voas 1998, 2000). In fact, 50% of the youth heading into Mexico indicated that they intended to get drunk, and postvisit breath tests determined that most succeeded (Lange and Voas 1997).

TIME-OUT EVENTS

The importance of developing a methodology for assessing AOD use in high-risk settings is related to the "time-out" theory of drinking, which emphasizes the relaxation of social controls that accompanies heavy drinking in certain settings. Lange, Voas, and Johnson (2002) reported that many of the young adults who crossed the border into Mexico not only were seeking bars where they could drink heavily but also were looking for locations where they could relax the usual normative behavior and "let it all hang out," suggesting that they were looking for a time-out experience. Time-out,

according to Listiak (1974, 13), is "a period of legitimate deviance from the demands of accountability and conformity, social control is relaxed and almost anything goes." Cavan (1966, 67) suggested that "what goes on in a bar is localized in time and place, and one need not anticipate being held accountable for one's conduct at some later time or in some later setting." This relaxation of responsibility for one's behavior and a perception of a relaxation of norms related to social behavior lead to what Listiak described in connection with community festivals as "a high degree of drunken boisterous behavior, often erupting into fights and brawls" (p. 19). He went on to say that many (time-out) events are marked by excessive drinking, illegal drinking, fighting, sexual looseness, and generally impulsive behavior. These and other forms of deviance are legitimated at certain times or for certain locations by an attitude of tolerance by police and other social control agencies.

In most U.S. bars, opportunities for such uncontrolled behavior are limited by social norms and outlet serving practices or admission rules. Patrons who exhibit drunken behavior that is disturbing to other guests are usually encouraged to leave the premises. However, the level of such control varies from bar to bar, depending on the level of supervision implemented by the proprietor. At some drinking venues, such as beach keg parties or fraternity parties, formal third-party supervision may be almost completely absent. In other settings, such as athletic events, the size and activity of the crowd may make supervision difficult.

EMDEs

This article provides an example of the specific procedures and issues relevant to conducting portal surveys in one specific setting at which the authors have conducted research: the EMDEs. EMDEs, which have emerged out of the rave scene, are characterized by electronically produced music, light shows, and intense physical dancing (Critcher 2000; Weir 2000; Randall 1992a, 1992b; Schwartz and Miller 1997). These events are particularly important to the study of young adult AOD use because they are locations where it is socially acceptable among attendees to mix drug use with music and dance (e.g., Arria et al. 2002; Yacoubian et al. 2003). As the visibility of the rave scene gradually diminished (Leinwand 2002), established clubs began to feature music and dance parties within their venues, resulting in the emergence of EMDEs. Such events vary in the extent to which alcohol or drugs are a feature of the environment; however, most youth and young

adults have some opportunity to obtain drugs in or near the event locations. In addition, many EMDEs appear to provide special opportunities for AOD use because they create the environment that produces time-out behavior. The loud music, frenetic dancing, and dark interior all contribute to the difficulty of supervising drug use and drunken behavior. Such environments are designed to promote an atmosphere in which normal behavioral limits may be relaxed to attract youth looking for a time-out experience.

Many EMDEs appear to exhibit the three key characteristics of time-out events: reduced supervision, increased AOD availability, and peer support for heavy AOD use. The reduced supervision not only allows heavy drinking but also permits drunken behavior that would not otherwise be accepted. Alcohol consumption is encouraged through ad-lib or "all you can drink" specials and by attendees at such events who tend to be heavy drinkers and drug users and provide strong peer support for AOD consumption. This setting is also of particular interest because the clientele are predominantly emerging adults, the greatest at-risk period for pathological AOD use and potential precursor to maladaptive drug use later in adulthood. Studying young adult AOD use in the context of EMDE also provides opportunity to explore the need for targeted preventive intervention. This article describes the application of the portal entry and exit survey technique to EMDEs.

METHOD

OVERVIEW

From April 2003 through September 2003, pilot surveys were conducted at six EMDEs. The primary objectives of this effort were to demonstrate that the portal survey technique can be applied to EMDEs and to gain preliminary evidence on the extent of AOD involvement among EMDE attendees (Miller et al. forthcoming). The EMDEs selected constituted a convenience sample constrained by an effort to obtain a broad set of examples of regularly scheduled events in two separate geographical locations (San Francisco and Baltimore). In concept, portal surveys can collect a random sample of attendees at any venue that will characterize the population that attends that particular type of EMDE. Because such events vary in the patrons they are designed to attract (i.e., African American events, gay events), the characterization of the total population that attends EMDEs will involve the collection of data on an appropriate sample of the major types of events. Future efforts are designed to collect typological information on all events and randomly select from the

entire pool of available venues and events those to be characterized through intercept surveys. The present study is designed to demonstrate the feasibility of the portal technique and the potential significance for AOD programs of the collection of information on the population of EMDE attendees.

A sample of 240 attendees was drawn from the six events located in four venues: three clubs (one location sampled twice) and one rented reception hall where two events were sampled. Four surveys were conducted on the West Coast in San Diego, California, and two on the East Coast in Baltimore. Breath tests and oral fluid drug assays were conducted at both entrance and exit to obtain biochemical analyses of the types of drugs used and the level of use. The response rates to the original approach for participation as the subjects entered the venue ranged from 82% to 90%. Groups of attendees were approached to participate rather than single individuals to ensure that refusals were not based on wanting to maintain an intact group. The average group size among those who agreed to participate was 2.3. From the 240 entry participants, we completed 215 exit assessments. The primary reason for losing 25 individuals from entrance to exit was that at one club that dismissed early (2 a.m.), attendees left simultaneously, and our survey staff was not adequate to handle the mass exodus. Nonetheless, this experience proved to be valuable in adapting the portal survey methods employed at the border to potential time-out events within the United States, and subsequent efforts will include additional exit staffing.

SURVEY STAFF

Most EMDEs have up to several hundred attendees; therefore, the number that can be captured in a portal survey is principally determined by the size of the survey staff. The size of the survey team is limited by the space available outside the entrance to the venue and by a need to limit the numbers to avoid having too strong a presence that might intimidate would-be respondents. Our targeted number of respondents was 50 a night. Thus, we established a survey staff composed of a survey manager, two interview team leaders, and four interviewers. The tasks associated with each role are uniquely different.

The survey manager is responsible for overseeing all the presurvey and postsurvey tasks in addition to supervising the team in the field. Before the survey, the manager develops survey sites by building relationships with event promoters and bar/club owners and managers, purchases supplies, buys and/or maintains equipment, and manages administrative issues associated with staff and program management. In addition, the survey manager gathers site- and event-specific information such as entry cover costs and the

general cost and types of beverages (alcoholic drinks and water). During the survey, a major task of the manager is to supervise staff and ensure adherence to survey procedures. The survey manager also must ensure that the staff and survey participants are safe. A log of unusual events is maintained, and where security is an issue, the survey manager generally arranges for assistance from the venue owner's security staff or, alternatively, hires security for the survey staff. The tasks following the survey range from processing the collected data, to administrative tasks involving the staff and survey, to new event and/or site selection.

The team leaders are responsible for the data being collected by the interviewers assigned to their team (generally, there are two teams working separately: two interviewers and one team leader). The team leaders arrive an hour before the event starts and a half-hour before the interview team arrives. Each team leader sets up a table on which he or she places lighted clipboards (needed given the low light at night around most venues), survey instruments, drug swabs, oral fluid test-tracking forms, shipment bags, pens, armbands, a table lamp, and a chair. Chairs are placed beside the processing tables for the participants. The team leaders assign subject numbers and supply the interviewers with the survey materials (questionnaires, armbands, drug swab kits, etc.), and they receive and complete the questionnaires and drug swab laboratory forms. In addition, they release the interview incentives to the interviewers, who in turn give the incentives to the survey participants.

The interviewers are responsible for subject selection, for winning the participation of those they randomly approach, and for completing each of the interview components. The interviewers are required to follow a pre-established random-selection procedure to reduce the likelihood of incorporating biases into the data set. Interviewers wear an apron in which they stock mouthpieces, breathalyzer equipment, pens, scissors, and a light.

STAFF RECRUITMENT

Hiring capable interviewers is critical to developing a strong survey team, as the role of an interviewer is unique and demanding. For portal surveys conducted at EMDEs, late-night and weekend hours for the survey work are especially demanding. For the club setting, the typical hours are 9 or 10 p.m. to 5 a.m. on weekend evenings. The setting may at first seem exciting and interesting, but the activities involve a routine that must be carefully adhered to and may become boring over time so that staff turnover could be high. Although all survey personnel are expected to follow detailed survey procedures, the portal surveys also require that survey personnel quickly establish

rapport with strangers (about 30 seconds to 1 minute) to convince individuals to delay their entry into a party setting. As with all survey work, hiring staff who are open, communicate easily, initiate a conversation with anyone, and are friendly and outgoing will facilitate the process. In addition, they must be focused and able to follow instructions, as well as be dependable and reliable. It is helpful to have individuals who take an interest in the research itself and are motivated to do a competent job for reasons other than just monetary compensation. Our experience suggests that those who have worked in the areas of sales, market research, and customer service and/or have worked as part of a team or with groups of people possess these skills and capabilities. Hiring and training are both time-consuming and costly; hence, it is important to choose the interviewing staff carefully and with the understanding they will need to learn the intricacies of conducting surveys for scientific research.

OBTAINING PERMISSION FOR SURVEYS

Before initiating a portal survey, it is important to make all of the key contacts needed to grant permission for conducting the survey. For EMDEs, there are two major groups responsible for the events. First, there are the organizers and promoters of the event. These individuals choose the type of music and event, hire the disc jockeys, advertise, and establish some rules/guidelines for the event. They may or may not be responsible for setting the hours and for the security for the event. A second group sharing responsibility for the behaviors on the premises is the venue managers and/or owners. These individuals may rent out the actual premises to the organizers/promoters for an evening, but they still have considerable risk associated with what happens on premises. Most of the regulations and laws that have been proposed for nightclub settings contain drug and/or alcohol use provisions directed at the owner of the venue and his or her manager for the venue, not the individual renting or operating the premises on one particular evening. For that reason, many owners/managers will control the security for events, establish the rules and regulations for the event, and generally be interested in research studies associated with their locations.

In preparation for conducting a portal survey, researchers need to contact the event organizers and venue managers to request their permission to conduct the survey outside their premises. In particular, it is helpful to enlist the support and cooperation of the security staff. For many event organizers and venue managers, involvement in research that is aimed at developing appropriate interventions for promoting safer club environments and reducing drug use on their premises is desirable, given the legal and regulatory concerns

they face. Furthermore, rapport can be built with the hosts if they are contacted both over the telephone and in person. In addition, the area outside of the venue should be assessed before the event to select appropriate areas where survey stations (a table and chairs) can be placed that (a) are proximal to the target venue, (b) do not obstruct the flow of traffic, and (c) preclude sampling of attendees at other venues in cases in which there are clusters of bars and clubs.

PARTICIPATION INCENTIVES

Intercept surveys, particularly with groups on their way to events, must generally be short (circa 5 minutes) to obtain a high participation rate. Our EMDE surveys had more questions and more components than do most sidewalk (Johnson et al. forthcoming) or roadside interviews (Voas et al. 1997); consequently, 10 to 15 minutes on entry and on exit were needed to complete the interviews and biological assay collections. In the border surveys, we were able to obtain 5-minute interviews with only candy as an incentive (Lange, Lauer, and Voas 1999). However, to compensate for the extended EMDE entry interview, randomly selected subjects were offered an incentive of \$5 on entry with the understanding that they could earn another \$10 on exit if they returned to the survey team and completed the exit survey. This recruitment incentive appeared to be sufficient as our recruitment rate was from 82% to 90% depending on location.

RECRUITMENT PROCEDURES

Intercepting and recruiting participants moving along a sidewalk, only some of whom are headed toward the event of interest, pose some unique problems. Informed consent to cooperate must be obtained quickly, so the content of the consent form and the interviewer's verbal approach must be brief yet highly informative so that the intended respondent(s) know exactly for whom the survey team works, what company/agency is funding the research, how they (the respondents) were selected, and what they will be required to do in the survey. Because these field environments are never quite the same from one site to the next, or even at the same event from night to night, the survey team must adapt the recruitment procedures to meet the needs of the changed environment while maintaining the random-selection procedures and safeguarding the subject's rights and well-being. Generally,

the adaptations are minor and lead to nondrastic change(s) in the preestablished survey procedures.

A central issue is how to ensure a random selection of event attendees. This generally involves two factors: a physical location and a time designation. The time for a new selection is determined by the point at which one of the two survey teams completes the previous interview and is ready for the next group. The physical location for contacting participants is generally handled by creating an artificial line on the path to the venue, which is transparent to the potential participants but marks the location for identifying the next group to be approached. Once the team leader determines that the interviewers in that team are prepared for the next group of respondents, the leader proceeds to the recruiting location and selects the first individual who steps on the predetermined recruiting line. That person defines the group to be recruited. That person may be the first or last person in the group to have crossed the line. The team leaders who do the recruiting are strongly advised to be sure to take the very first person crossing the line and to concentrate on watching the feet, rather than looking at faces, to minimize the possibility that they permit any bias in their selection. This helps eliminate the unintentional bias of selecting only those individuals who look approachable.

As noted, the person selected defines the group to be interviewed. All members of the group are included because experience has shown that individuals are not willing to stay behind if the rest of their friends are going on without them. In our pilot study, a group was considered qualified for the survey if the individual defining the group was at least 18 years of age, was willing to participate, and was attending the event of interest. Group members younger than 18 years were not interviewed because we could not obtain parental consent. Other members of the group who chose not to participate were excused but did not change the group designation. In most groups, all members participated; however, in some groups, they did not. Therefore, for some members, we had no questionnaire or test data.

DOCUMENTING REFUSALS

Interviewers are trained to document each refusal to participate, noting whether the refusal is the entire group they approached or one (or more) person(s) refusing within a consenting group. Whole-group refusals occur when the interviewer approaches the person who defines the group and cannot convince that person to participate. Individual refusals occur when the defining group member has agreed to participate but one or more individuals within the consenting group refuse to participate. In this circumstance, the group is

assigned a group number, and each person receives a unique individual number within the group, including the nonparticipants. Interviewers are trained to record (a) the time of the refusal; (b) the sex, ethnicity, and age of the person refusing; and (c) a brief description as to why he or she refused.

BIOLOGICAL TESTS

A strength of the portal survey technology is that research participants can be contacted before and after they enter the premises, and both self-report and biological assays for AOD use can be obtained. Self-reports permit the exploration of use before and during the event but may not be entirely reliable indicators of substance use. The portal survey system has been successful in documenting blood alcohol concentration (BAC) and recent drug exposure by providing a method for gathering a breath sample and saliva sample on entry, followed up by a second sample of each at the exit interview. A number of breath- and saliva-collection devices are available for this purpose. We collected the breath samples using the Intoxilyzer 400 manufactured by CMI in Owensboro, Kentucky, which is one of a number of handheld devices listed on the National Highway Traffic Safety Administration's qualified products list for evidential breath testers. To help ensure the participant's privacy, the instruments were specially configured to not display the participant's result in the field; instead, a sequence number was recorded by the interviewer on the respondent survey, and the test result was stored on an internal microchip, to be downloaded into a data file on return to the office.

We collected the saliva samples with the Intercept Oral Fluid Drug Test collection device, manufactured by OraSure Technologies, Inc., in Beaverton, Oregon, which is one of a number of devices available for that purpose. The collector consists of a swab on the end of a stick that the participant is instructed to place between the cheek and gum, swipe it back and forth a few times, and then let it rest between the gum and cheek for at least 2 minutes. A common kitchen timer was used to measure the 2-minute period. After 2 minutes had elapsed, the participant removed the swab from his or her mouth, placed it in the shipping vial, broke off the stick to which the swab was attached, and placed the cap on the vial. The vial was then handed to the team leader who labeled it and enclosed it in a shipping bag. The collection device was shipped to a certified laboratory for drug analysis to screen for the presence of the National Institute on Drug Abuse-5 drugs: cocaine, opiates (heroin), PCP, marijuana, and amphetamine (including ecstasy and methamphetamine). Negative results were reported in 24 hours. Positive results with verification were reported in 72 hours.

Reliable breath testing requires a substance-free mouth for 15 minutes preceding the administration of the test (including tobacco, gum, and soft drinks). The breath test was conducted immediately following the brief introductory interview on entry or after the welcome-back interview on exit, both of which contain a question related to breath-test readiness (substances consumed in the past 15 minutes). The breath test is followed by the saliva test, during which the self-administered portion of the interview is completed. Multitasking the data collection minimizes the amount of time the respondent is detained and maximizes participation.

PROVISIONS FOR ANONYMITY

For our portal surveys conducted at EMDEs, no identifying personal information was collected. To link biological tests and survey responses for each respondent, a unique identifier was generated that specified (a) the event, (b) the number of the group, (c) the individual number within the group, and (d) the total number of individuals in the group. At the entry interview, the respondent was provided with a hospital-type identity bracelet with that unique identifying number and was asked not to remove it while inside the event. Participants were given the option to wear it on the wrist or, to make it less conspicuous, on the ankle or belt loop. The ID number is matched to the entrance survey along with the breath-test device number and oral assay number from its chain of custody (COC) form, which follows the sample to the analysis laboratory. The COC form contains self-adhering preprinted tabs that contain the unique COC form ID number for each sample. Sticking that tab directly onto the respondent survey that contains the respondent ID eliminates possible errors in transcribing the numbers and allows the entry survey to be linked with the entry and exit biological drug tests. On exit from the venue, the unique ID on the wristband (or ankleband) is matched with the entry ID and recorded on the exit survey and on all forms for the breath tests and the oral assays. At no time are participants requested to give their names or any other personal identifying information.

DATA MANAGEMENT

The record forms used to control and match entry with exit data are shown in Figure 1. As noted, each participant is assigned an ID number built up from the event number, group number, and individual number within the group. That number is assigned and recorded on the control form and on the hospital-type bracelet by the interviewer. The control form also contains the interviewer's

initials, the date and time of the entry or exit interview, the breath-test sequence number, and the COC number of the saliva test. Also recorded on the entry form is information on anyone who is approached but refuses to participate, including identification of the group to which he or she belonged. Demographic information for nonparticipants also is estimated by the interviewer. At the exit interview, the ID number from the hospital-type bracelet is copied onto the exit form. In our pilot surveys, no significant objections to the bracelet were reported by the participants, although some elected to wear the bracelet on a belt loop or ankle rather than on the wrist.

The recruiting of participants for a portal survey is limited principally by the number of survey staff. Thus, under normal conditions, interviews are collected at a set rate per hour, independent of the actual number of people entering the EMDE venue. The number entering varies by the hour (earlier and later in the evening, there are fewer new attendees), and the characteristics of early versus late arrivals may be significantly different. Therefore, it is necessary to count all entrants as a function of time to weight the fixed number of cases per hour that can be collected by the research team. Furthermore, because the participants are recruited in groups, it is necessary to account for the lower within-group variance when analyzing the data by using SUDAAN or a similar analytical program that accounts for the impact of recruiting by groups on variance estimates.

RESULTS

This investigation sought to test the feasibility of the portal survey procedure as an assessment strategy to identify binge drinking and AOD use among attendees at EMDEs. A brief summary of the results related to the effectiveness of the methodology is outlined below. A full analysis of the data is provided in a report by Miller et al. (forthcoming).

RESPONSE RATES

The response rates to the initial approach to a potential participant entering the venue ranged from 70% to 92%, with one outlier (66%; Table 1). The average group size among those who agreed to participate was 2.3. From the 240 entry participants, we completed 219 (91%) of the exit assessments. Among the participants completing the entry interview, 21 failed to return for the exit interview, and for an additional 4 participants, there were missing

EXIT QUESTIONNAIRE														
ID# _____			Event # _____	Group Number _____	Individual Number _____	of _____	(Record from wrist band) _____	Interviewer: _____						
Date: _____ / _____ /2003 Time: _____ : _____ am pm Sensor # _____ BAC Sample #: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> CO C Form #: _____ Put COC Label Here Refused: Verbal Questions _____ , Questionnaire _____ , Breath Sample _____ , Saliva Sample _____ , All _____ Reason for refusal: _____														
ENTRANCE QUESTIONNAIRE														
ID# _____			Event # _____	Group Number _____	Individual# _____	of _____	(Put on wrist band) _____	Interviewer: _____						
Date: _____ / _____ /2003 Time: _____ : _____ am pm _____ AGREED How old are you? _____ Sensor # _____ COC Form #: _____ Put COC Label Here BAC Sample #: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>														
REFUSAL														
Non-Eligible	A	Male	Female	ge	Ethnicity									
					B	W	H	NA	A	H/PI				
UNDERAGE														
Number in Group	Group Refusal		B	Age/s	W	Age/s	H	Age/s	NA	Age/s	A	Age/s	H/PI	Age/s
	Males													
Females														
Reason:														
Reason	Individual Refusal													
	Sex	Age	Ethnicity, circle all that might apply					Circle Parts Refused						
M	F		B	W	H	NA	A	H/PI	V	Q	B	S	Full Survey	

Figure 1: Record Forms Used to Control and Match Entry With Exit Data

NOTE: BAC = blood alcohol concentration; COC = chain of custody; M = male; F = female; under "Ethnicity": B = Black; W = White; H = Hispanic; NA = Native American; A = Asian; H/PI = Hawaiian/Pacific Islander; under "Circle Parts Refused": V = verbal questions; Q = questionnaire; B = breath sample; S = saliva sample.

biological assay data. Consequently, a total of 25 participants are missing some or all data at exit.

SAMPLE CHARACTERISTICS

Table 2 contrasts the characteristics of the 240 participants at entrance with the 25 who were missing any exit assessments. Based on the 240 total

TABLE 1: Response Rates From the Six Events

Event	Total in Attendance	Total Approached/ Total Agreed	Response Rate
1	300	65/43	66
2	170	54/44	88
3	200	50/35	70
4	424	55/39	71
5	137	24/29	83
6	828	56/61	92

attendees, 31% were between the ages of 18 and 20 years, 39% were between the ages of 21 and 25 years, and 30% were 26 years and older. The age range was from 18 to 45 years. Males composed 60% of the sample. Our sample included 60% Whites, 25% African Americans, and smaller percentages of Native Americans (3.4%), Asians (5.2%), and Hawaiians/Pacific Islanders (3.4%). Approximately 16% of the sample was of Hispanic ethnicity. A total of 45% of the sample were full- or part-time students, 85% of the sample had either full- or part-time employment, and 9% were not employed and not students. Younger attendees were significantly more likely to be students. A greater proportion of the youngest attendees were female: 56% of the 18- to 20-year-olds, 40% of the 21- to 25-year-olds, and 21% of the 26+-year-olds.

DRUG AND ALCOHOL USE

At entrance, self-report data indicated that nearly 25% of all attendees had some stated intention to use drugs, whereas combined biological assay and self-report data revealed that, overall, 45% of the surveyed attendees had used some drug before arriving at the event. Biological assays from the six events revealed that drug use varied from a low of 13% to a high of 54% of the attendees. Marijuana was the most common type of (self-reported) drug used at entrance (27.5%). The bioassay reports of marijuana were lower (16.3%); however, the bioassay measurement of marijuana is not very sensitive because marijuana only resides in the saliva for 15 to 20 minutes. A significantly greater proportion (39%) of young attendees (aged 18-20 years) were likely to have drugs in their systems at entrance as compared to the older attendees: aged 21 to 25 years (20%) and 26+ years (28%). The proportion of attendees who were found positive for alcohol use based on the breath tests ranged from 17% to 44% in all but one event (which did not serve alcohol,

TABLE 2: Entry Characteristics

<i>Demographics</i>	<i>All Entering Participants (N = 240)</i>		<i>Entry Characteristics of Those Lost to Follow-Up (n = 15)</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Mean age	24.05	5.59	23.36	4.98 ^a
Male	143	59.6	14	56.0
Student ^b	104	43.3	11	44.0
Employed ^b	196	81.7	19	76.0
Race				
White	142	59.2	12	48.0
Black	60	25.0	9	36.0
Hispanic	38	15.8	2	16.0
Any alcohol and other drug	178	74.2	14	56.0

a. Standard deviation.

b. Full- or part-time.

11% positive for alcohol). Among those who were drinking, the average BAC at entrance was 0.057.

Exit data on drugs used at the event were also available from self-report and bioassay assessments. The type of drug use showed a wide range between sites from a low of 20% to a high of 52%. Again, the most commonly self-reported drug used was marijuana, with 13.3% reporting marijuana use, and bioassays revealing nearly the same percentage of marijuana use (12.9%). There was an increased use of MDMA (ecstasy) at the events, with 4.2% self-reporting and 4.6% testing positive on the bioassays. The proportion of attendees who tested positive for alcohol use increased at exit, ranging from 17% to 72% when all events were included and ranging from 45% to 72% when the event that did not serve alcohol was excluded. Among those who were drinking, the average BAC on exit was 0.076.

A comparison of AOD consumption at entrance and exit for attendees with all data revealed that less than 15% of attendees ($n = 27$) increased their drug use while on premises. Table 3 outlines the various arrays of AOD consumption at entry and exit. It is important to note that half of attendees had no change in AOD use from entry to exit, depicted by the numbers in bold. Also, the substance of greatest increase was alcohol, with nearly 8% of attendees arriving alcohol free but having consumed alcohol while on premises.

TABLE 3: Drug Use at Entry and Exit

Drug Use at Entry	Drug Use at Exit						
	No Alcohol or Drugs	Alcohol Only	Marijuana Only	Marijuana and Alcohol	Drug(s) ^a Only	Drug(s) ^a and Alcohol	Total (%)
No alcohol or drugs	29	18			1	4	52 (24.6)
Alcohol only	14	41		1		5	61 (28.9)
Marijuana only	4	1	8	2	1	1	17 (8.1)
Marijuana and alcohol	3	16	2	5	3	5	34 (16.1)
Drug(s) ^a only	2	4			8	4	18 (8.5)
Drug(s) ^a and alcohol	2	2	2	2	6	15	29 (13.7)
Total (%)	54 (25.6)	82 (38.9)	12 (5.7)	10 (4.7)	19 (9.0)	34 (16.1)	211

NOTE: Numbers in bold indicate no change in alcohol and other drug use from entry to exit.

a. This can include marijuana users; however, these drug users were either users of other drugs besides marijuana or polydrug users (including marijuana).

DISCUSSION

The strengths of the portal survey approach outlined in this investigation include (a) utility as a case-finding modality to identify high-risk drinking and AOD use among young adults in defined social settings, (b) confirmation of self-report data via biological assay data, and (c) identification of potential settings and strategies for preventive intervention. As a case-finding modality, we identified a high proportion of young adult drug users and heavy drinkers. We linked drinking and drug taking to the setting and clarified how much of the substances consumed actually occurred within the setting. Biological assays improved the precision of these estimates. This is of particular importance given the increased levels of AOD intoxication that could potentially bias the self-report estimates. In addition, the portal study of EMDE settings, similar to the studies of cross-border binge drinking, substantiates a need for preventive intervention in the setting to decrease the level of high-risk drinking and drug involvement and co-occurring hazards (e.g., victimization, driving under the influence).

Epidemiologically, there is a range of critical information that can be gained from the portal surveys: (a) the nature and extent of drug and alcohol involvement among young adult attendees of EMDEs; (b) the variation in drug and alcohol use among different racial and ethnic groups, across age and gender, as well as across the type of events and venues; (c) personal characteristics associated with varying degrees of drug involvement, including type of drugs used, co-occurring drug and alcohol use, and severity of drug

involvement; (d) the perceptions of attendees about the extent of AOD availability and use at the venue and their own intentions regarding drug use at the event; (e) their self-reported and measured drug use at the event; and (f) their experiences at the events, including victimization. This information will aid in guiding future secondary prevention efforts designed to identify and intervene on affected young adults.

Based on our preliminary findings from six events, clubs hosting EMDEs are good locations for identifying the 18- to 25-year-old population that includes both young people who are in college and young people who are working but not in college using portal survey methods. Although the majority of the attendees were male, the youngest age group was predominantly female. These preliminary findings indicate that the events and venues attract drug users at different rates and that drug use on premises can be measured and varies according to these settings. Thus, future work needs to examine more carefully the characteristics of events and venues that are most attractive to young drug users.

Not fully explored here were the harms associated with drug taking in the EMDE setting. Future directions in this line of research should include not only determining the severity of AOD use but also estimating the co-occurrence of AOD-related harm and identifying possible preventive intervention strategies that can be integrated into the portal survey to decrease AOD expectancies for the setting and actually reduce AOD use.

Three limitations of this work merit attention. First, the current oral fluid testing technology detects only the oral residue of marijuana from smoking within the past 15 to 20 minutes, whereas for all other drugs under study, the test reflects actual blood concentrations (which may have resulted from use over a longer period of time during the past 2 days). Therefore, the biological screen for marijuana is time limited and somewhat unreliable. This was evident in our preliminary data collection that yielded much higher proportions of marijuana by self-report compared to bioassay. In our simultaneous testing of drug use (self-report and bioassay), we have thus made the a priori decision that a positive report from either test will signal drug use. Emerging technologies in drug testing are exploring rapid and noninvasive (e.g., urine-testing) assessment techniques that can reliably detect systemic marijuana concentrations. Second, there is some debate over the procedures used to reconnect with respondents postevent. In the current program, we learned that it is valuable to give respondents incentives to return to the station with additional compensation as compared to the entry incentive. We also learned that the staffing at exit needs to be increased as the large number of attendees exit at the same time when the venue closes, creating a backup for exit processing. Of the 240 entry respondents, 25 were lost at follow-up, and at least

half of those losses were respondents who were not willing to wait at survey stations to complete their exit assessments. Future portal surveys will therefore include increased staff at exit. The additional personnel will increase the presence of survey staff, whose presence is easily camouflaged by the droves of attendees leaving the venue. Finally, although event participants were selected at random, the venue and events were not selected at random, and thus, the results are not generalizable to the population of EMDE attendees, only to those particular events. However, the primary purpose of this stage of research was to establish the feasibility of the portal methodology in the context of EMDEs. There is a cross-event variation among attendees, including features such as race, gender, and sexual orientation. The next stage of research will use random sampling with a larger sampling of venues and events and will include design variables to account for the clustered sample.

Portal survey methodology holds promise as an assessment and intervention strategy to be implemented near high-risk settings for binge drinking and drug use. Future lines of inquiry will assess the feasibility of integrating this methodology with preventive intervention strategies.

REFERENCES

Anthony, J. C., and K. R. Petronis. 1995. Early-onset drug use and risk of later drug problems. *Drug Alcohol Dependence* 40 (1): 9-15.

Arria, A., G. Yacoubian, E. Fost, and E. D. Wish. 2002. Ecstasy use among club rave attendees. *Archives of Pediatrics and Adolescent Medicine* 156:295-96.

Black, D. R., and M. A. Smith. 1994. Reducing alcohol consumption among university students: Recruitment and program design strategies based on social marketing theory. *Health Education Research* 9 (3): 375-84.

Cavan, S. 1966. *Liquor license: An ethnography of a bar*. Chicago: Aldine.

Critcher, C. 2000. "Still raving": Social reaction to ecstasy. *Leisure Studies* 19:145-62.

Green, E. C. 1988. A consumer intercept study of oral contraceptive users in the Dominican Republic. *Studies in Family Planning* 19 (2): 109-17.

Gries, J. A., D. R. Black, and D. C. Coster. 1995. Recruitment to a university alcohol program: Evaluation of social marketing theory and stepped approach model. *Preventive Medicine* 24 (4): 348-56.

Johnson, M. B., J. Lange, R. B. Voas, J. D. Clapp, and E. Lauer. Forthcoming. The sidewalk survey: A field methodology to measure late-night college drinking. *Evaluation Review*.

Lange, J., R. Voas, and M. Johnson. 2002. South of the border: A legal haven for underage drinking. *Addiction* 97 (9): 1195-203.

Lange, J. E., E. Lauer, and R. B. Voas. 1999. A survey of the San Diego-Tijuana cross-border binging: Methods and analysis. *Evaluation Review* 23 (4): 378-98.

Lange, J. E., and R. B. Voas. 1997. Longitudinal roadside survey design: An evaluation of potential avoidance of roadside surveys over time. In *41st annual proceedings of the Association*

for the Advancement of Automotive Medicine, 31-45. Orlando, FL: Association for the Advancement of Automotive Medicine.

_____. 1998. Partying in Tijuana: Mental representation's role in plans to get "drunk." *Alcoholism: Clinical and Experimental Research* 22 (suppl. 3): 67A.

_____. 2000. Youth escaping limits on drinking: Binging in Mexico. *Addiction* 95 (4): 521-28.

Lefebvre, R. C., and J. A. Flora. 1988. Social marketing and public health intervention. *Health Education Quarterly* 15 (3): 299-315.

Leinwand, D. 2002. Cities crack down on raves: Rising popularity prompts backlash over drug use. *USA TODAY*, November 13, A.01.

Listiak, A. 1974. Legitimate deviance and social class: Bar behavior during Grey Cup week. *Sociological Focus* 7 (3): 13-43.

Miller, B. A., C. D. M. Furr-Holden, R. B. Voas, and K. Bright. Forthcoming. Emerging adults' substance use and risky behaviors in club settings. *Journal of Drug Issues*.

Miller, K. W., L. B. Wilder, F. A. Stillman, and D. M. Becker. 1997. The feasibility of a street-intercept survey method in an African-American community. *American Journal of Public Health* 97 (4): 655-58.

Randall, T. 1992a. Ecstasy-fueled "rave" parties become dances of death for English youth. *Journal of the American Medical Association* 268:1505-6.

_____. 1992b. "Rave" scene, ecstasy use, leap Atlantic. *Journal of the American Medical Association* 268:1506.

Schwartz, R. H., and N. S. Miller. 1997. MDMA (ecstasy) and the rave: A review. *Pediatrics* 100 (4): 705-8.

Spooner, C., and B. Flaherty. 1993. Comparison of three data collection methodologies for the study of young illicit drug users. *Australian Journal of Public Health* 17 (3): 195-202.

Voas, R. B., J. Wells, D. Lestina, A. Williams, and M. Greene. 1997. Drinking and driving in the US: The 1996 National Roadside Survey. In *Proceedings of the 14th International Conference on Alcohol, Drugs and Traffic Safety—T97*, Annecy, 21-26 September 1997, ed. C. Mercier-Guyon, 1159-66. Annecy, France: Centre d'Etudes et de Recherches en Médecine du Trafic.

Weir, E. 2000. Raves: A review of the culture, the drugs and the prevention of harm. *Canadian Medical Association Journal* 162 (13): 1843-48.

Yacoubian, G., C. L. Boyle, C. A. Harding, and E. A. Loftus. 2003. Estimating the prevalence and perceived harm of ecstasy and other drugs among club rave attendees. *Journal of Drug Education* 33 (2): 187-96.

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