

Writing About Risk: Use of Daily Diaries in Understanding Drug-User Risk Behaviors

Thomas J. Stopka,^{1,5} Kristen W. Springer,² Kaveh Khoshnood,³ Susan Shaw,⁴ and Merrill Singer^{4,5}

Received Apr. 5, 2002; revised Sep. 26, 2003; accepted Oct. 1, 2003

As part of a larger syringe access and HIV risk study, a subsample of 23 current injection drug users completed daily diaries, highlighting activities related to syringe acquisition, use, and discard. Diaries have been previously utilized in a variety of psychological, public health, and nutrition studies to assess risk as well as correlated behaviors. We piloted the diary methodology in three northeastern U.S. cities (Hartford and New Haven, CT, and Springfield, MA) to learn about correlates of HIV risk. We discovered that the method provided advantages over several other qualitative and ethnographic methods. Results indicate that daily diaries elucidated (1) patterns of injection drug use, (2) sporadic and high-risk events, (3) HIV and hepatitis risk related to the syringe life cycle, and (4) emotional correlates of drug use. Furthermore, we witnessed an unexpected intervention effect that the diary may have in the lives of drug users.

KEY WORDS: Human immunodeficiency virus; injection drug users; qualitative; diaries; substance use.

INTRODUCTION

Understanding and assisting in lowering blood-borne disease transmission among injection drug users (IDUs) has been a major public health challenge for several decades. Many HIV prevention messages now targeted to IDUs are derived from qualitative research on day-to-day drug user behaviors in natural contexts (Koester and Hoffer, 1994; Needle *et al.*, 1998; Singer *et al.*, 1995). A number of different strate-

gies have been used to discover and describe HIV risk behaviors among injection drug users (Bourgois *et al.*, 1997; Carlson *et al.*, 1995; Grund *et al.*, 1991; Page, 1990; Singer *et al.*, 2000, 2001a; Sterk-Elifson, 1995; Trotter *et al.*, 2001). Commonly used qualitative approaches in drug and HIV/AIDS research are: participant observation, in-depth interviewing, cognitive tasks (e.g., free listings, pile sorts), and focus groups. These methods have contributed new insights into the micro- and macro-level contexts of risk behavior, the precise patterning of risk, underlying motivational and attitudinal factors of risk, potential pathways of HIV infection, and the structures of social relation that foster risky practices. These common methods, unless carried out repetitively over time, can suffer from having a limited scope as well as potential recall bias problems. For example, although focus groups offer rich and detailed information about drug use and daily life, this method is generally used at one specific point in time to query about current and past experiences and behaviors. Ethnography overcomes this limitation by emphasizing direct observation and participation in IDUs' lives over a longer period of time. This consistency and depth of

¹Hispanic Health Council, Hartford, Connecticut; present address: California DHS State Office of AIDS, Sacramento, California.

²Sociology Department, University of Wisconsin, Madison, Wisconsin.

³School of Medicine, Department of Epidemiology and Public Health, Yale University, New Haven, Connecticut.

⁴Center for Community Health Research, Hispanic Health Council, Hartford, Connecticut.

⁵Correspondence, other than requests for reprints, should be directed to Thomas Stopka, California Office of AIDS, 1616 Capitol Ave., Suite 616, P.O. Box 942732, MS 7700, Sacramento, California 94234-7320 (e-mail: tstopka@dhs.ca.gov); request for reprints should be directed to Merrill Singer, Hispanic Health Council, 175 Main St., Hartford, Connecticut 06106 (e-mail: anthro8566@aol.com).

observation is invaluable in describing behavior in context, documenting patterns of social interaction, and discovering potential risk (Singer *et al.*, 2001b). Ethnography, however, is very labor- and time-intensive for both researcher and participant (Trotter *et al.*, 2001). In the midst of a changing epidemic, traditional ethnography may, at times, prove too slow in reporting emergent risk practices. Moreover, even the most sensitive and hardworking ethnographer may never be directly privy to some aspects of study participants' lives or may not be present at critical moments when risk is most likely to take place (e.g., when an IDU's syringe breaks in the middle of the night).

The Syringe Access, Use and Discard (SAUD) Study, implemented in three northeastern U.S. cities (Hartford, CT, New Haven, CT, and Springfield, MA) used all of the qualitative methods just noted to assess factors that shape IDUs' ability to get sterile syringes, use them safely, and discard them in ways that do not enhance risk for others. As a means of overcoming some of the limitations of the other qualitative methods, we incorporated the use of diaries. IDU diaries provided an immediate multioccasion window into drug users' lives, often highlighting HIV risk behaviors, without necessitating the same amount of time required by the researcher for traditional ethnography. In this paper, we discuss the strengths and weaknesses of diary keeping with IDUs, the methodological challenges of diary keeping with this population, potential intervention effects, and ethical issues that are raised in using this approach.

BACKGROUND

Diaries, research tools that encourage participants to document their daily activities over the course of several days in their own words, have been used widely to gather information on general health-related behaviors (Verbrugge, 1980), health problems (Musil *et al.*, 1998), substance use (Fortenberry *et al.*, 1997; Neaigus *et al.*, 1994; Poikolainen and Karkkainen, 1983), alcohol-related problems (Cronin, 1996), sexual behavior (Coxon, 1996; Coxon *et al.*, 1993; Fortenberry *et al.*, 1997; Garry *et al.*, 2002; Leigh *et al.*, 1998), mood states (Larson *et al.*, 1986), dietary intake (Witschi, 1990), interactions between clients and health service providers (Verbrugge, 1980), and medical adherence (Brindle and Ludman, 1996).

Advantages of Diary Keeping

The advantages of diary keeping are numerous. As research instruments, diaries generally result in greater frequencies of reported behavior, especially of relatively commonplace behaviors, than do more traditional data collection methodologies. These greater frequencies are generally assumed to be more accurate than those provided in retrospective questionnaires (Leigh *et al.*, 1998). Because participants record events on the day they occur, sometimes within a short time after the events take place, the diary method can reduce forgetting and "telescoping," which plague retrospective interviews and may reduce the reliability of frequency estimates (Armstrong *et al.*, 1992; Feinberg and Tanur, 1983; Poikolainen and Karkkainen, 1983). If implemented for a sufficiently long period, a diary method can also capture important variations in behaviors (Leigh *et al.*, 1998). Furthermore, diaries may be able to better capture sensitive information than other methodologies (Huby, 1997). Finally, diaries give a better sense of the rich context that surrounds behaviors of interest and provide a better understanding of the natural flow of various behaviors and their interrelatedness (e.g., hanging out, alcohol use, syringe acquisition, drug use, sexual activity).

Reliability and Validity of Diaries Compared to Other Methods

Several studies have measured reliability and validity of diaries compared to other methods of data collection. In measuring frequency of alcohol consumption, Lemmens *et al.* (1988) discovered that diaries were more reliable in documenting a person's drinking behaviors than questionnaires.

Diaries may be completed retrospectively, with participants documenting previous days' events that they recall from memory, or longitudinally, with participants documenting events shortly after they occur on a day-to-day basis. In comparing these two types of diaries among women who drank alcohol, Corti *et al.* (1990) found that longitudinal diaries yielded a significantly higher level of alcohol consumption than retrospective diaries. In another study on alcohol consumption in which researchers compared longitudinal diaries with retrospective interviews, a strong correlation was detected between the two methods, but more frequent drinking was reported with the longitudinal

diary (Leigh *et al.*, 1998). Shakeshaft *et al.* (1999) compared computer-administered retrospective diaries (RDs), which allowed participants to electronically enter the number of drinks they had imbibed over the course of the previous 7 days, and a computer-administered quantity–frequency index (QFI), which asked about the average amount of alcohol consumed on a typical drinking day (quantity) and the average number of days on which alcohol was consumed (frequency). They found that the RDs obtained higher rates of self-reported alcohol consumption than the QFIs and the RDs detected a greater proportion of both heavy and high-risk drinkers. Webb *et al.* (1991), on the other hand, found that both the quantity–frequency and retrospective diary measures are reliable in measuring alcohol consumption of light drinkers, but both measures are less reliable for heavy drinkers.

Limitations of Diary Keeping in Research

Despite the documented benefits and validity of diaries, several drawbacks may limit their application. The investment of participant time and effort can lower participant recruitment, retention, and compliance (Stone *et al.*, 1991, 2002), particularly with individuals who are less comfortable writing, resulting in an unrepresentative sample (Leigh *et al.*, 1998; Lemmens *et al.*, 1988). Diaries may be more expensive than other research methods due to the training and monitoring of respondents that is required (Leigh *et al.*, 1998), and are subject to longitudinal confounds such as participant fatigue (Mooney, 1962; Norman *et al.*, 1982) and reactivity (Fox *et al.*, 1993; Leigh *et al.*, 1998; Verbrugge, 1980). Another potential limitation is that there is no guarantee that subjects will actually fill in diary entries each day. If entries are written retrospectively, memory of specific events during previous days may falter (Leigh *et al.*, 1998; Lemmens *et al.*, 1988). Longitudinal diaries and elicited daily diaries, in which participants dictate activities of interest to research staff or tape recorders, may help counter this limitation. Neaigus *et al.* (1994), for instance, used orally elicited diaries to ask IDUs with low literacy skills to give detailed oral accounts of daily activities (both risk behaviors and other activities) to research staff on successive days. Finally, if diaries fall into the hands of unintended readers, confidentiality of data may be compromised beyond the control of participants and research staff.

Use of Diaries in Substance Abuse Research

Use of diary keeping in substance abuse research has been limited primarily to alcohol studies. As early as 1970, Spradley began his seminal study of skid row men, *You Owe Yourself a Drunk*, with a year-long diary by a street alcoholic in Seattle. Subsequent use of diaries in alcohol research has focused primarily on the use of this method to record consumption levels. We know of only one study that used diary methodologies with IDUs (Neaigus *et al.*, 1994). Our study was undertaken to assess the feasibility and utility of diary keeping in research on this hard-to-reach, hard-to-track population in Connecticut and Massachusetts.

METHODOLOGY

A subsample of IDUs ($n = 23$) was recruited from the larger SAUD study to complete diaries after they completed survey interviews and/or participant observations with the study team. It is estimated that approximately 50% of IDUs recruited from the larger study chose not to participate in the diary activities for various reasons (e.g., could not write well, not comfortable writing about injection activities, fearful about confidentiality). Participants who expressed interest in completing a written diary were enrolled. Diary participants had a mean age of 40.6 years and were White (43.5%), Black (39.1%), and Latino (17.4%). Nearly two-thirds of the sample was male (65.2%) and 87% of diarists reported injecting heroin. The diary sample was similar to the sample from the SAUD study in terms of age and sex as well as heroin and cocaine injection, but included more white and fewer Latino participants, was more educated, and included fewer speedball injectors (see Table I).

Participants were asked to write diary entries each day for 5–7 days, meeting with a project ethnographer on weekdays to discuss the previous day's entry. Given the unique differences in risk that occur over the weekend (e.g., syringe exchange programs and pharmacies are closed), weekend entries were discussed in detail on the Monday following weekend diary entries. After informed consent was obtained, the IDU and the ethnographer completed a “diary training.” The training consisted of the IDU doing a 24-hr recall of the previous day's events related to injection activity and the ethnographer writing these down in the desired diary format. This first diary entry

Table I. Study Participant Characteristics: Diary Sample vs. SAUD Sample^a

Demographics	Diary sample (<i>N</i> = 23)		SAUD sample (<i>N</i> = 989)	
	<i>n</i>	%	<i>n</i>	%
Sex				
Female	8	34.8	295	29.8
Male	15	65.2	694	70.2
Education				
<High school	8	34.8	431	43.6
High school/GED	6	26.1	385	38.9
>High school	7	30.4	170	17.2
Missing data	2	8.7	13	1.3
Race/ethnicity				
Black	9	39.1	328	33.2
Latino	4	17.4	453	45.8
White	10	43.5	198	20.0
Missing data	—		10	1.0
Age (mean)	40.6 years		38.9 years	
Primary drugs injected during last 30 days ^b				
Heroin	20	87.0	937	94.7
Cocaine	7	30.4	350	35.4
Crack	3	13.0	44	4.4
Speedball	2	8.7	315	31.9

^aSAUD, Syringe Access Use and Discard: Context in AIDS Risk Study.

^bSome participants reported injecting more than one drug during last 30 days so percentages do not add up to 100%.

was used by participants as a guide when completing subsequent entries.

The diary format consisted of noting the date, time, and details of each injection event. Participants also were asked to describe how and where they acquired syringes (as well as related paraphernalia), how they used them, and how they disposed of them. In addition, they were encouraged to include in their entries any information or details that might influence these practices (e.g., access to money, connections, withdrawal symptoms, emotions). Although this was the basic information requested for all diary entries, participants were informed that they were free to write about other events or experiences in their days or lives as they saw fit. Participants were asked to use notation specific enough so that they could recall the previous day's events in detail when discussing them with the researcher, but sufficiently discrete that potential outside readers (such as the police, who might confiscate the diary) would not find incriminating information about people or places. We asked participants, for example, to use initials or pseudonyms for acquaintances and locations that were included in the diary.

Study participants and project staff were scheduled to meet each day (except on weekends) in one-on-one "debriefing" sessions to go over the previous day's entry. At each debriefing, project staff collected the previous day's entry (i.e., removing the pages from the diary) to minimize the risk of other individuals outside the study finding and reading the diary. Project staff read the diaries in the presence of the participant or the participant read the diary entry aloud to the researcher. The researcher then asked about particularly interesting or confusing parts of the entry and the diarist provided more detail. To capture the additional details, the researcher wrote notes on a photocopy of the diary entry and the notes were included, italicized, in the final transcription of the diary.

Participants were paid \$50–\$60 to participate in the study, with increments of the total provided for each completed diary entry. Bonus incentives were available for participants who completed the entire diary.

Three of 23 participants (13%) did not complete a full 5–7 days of diary entries and, on occasion, participants did not participate in debriefing sessions on all weekdays. The reasons for these inconsistencies varied (e.g., participant or researcher cancellation, sickness, arrest of participant by police, entry into drug treatment). Subsequent to initial recruitment, 5 participants (22%) explained that they were not able to write very well and that they therefore preferred to have the ethnographer write down or tape record the information that they dictated. This protocol was similar to that utilized by Neaigus *et al.* (1994) in New York City, where each participant was asked on successive days to give a detailed oral account of his or her daily activities and to identify others with whom he or she had engaged in these activities. Four of the 5 diarists who dictated all or part of their diaries in our study had less than a high school education (see Table II). Dictated diary entries tended to be longer than written diary entries and, if tape recorded, included more context of the days' events, whereas written diaries tended to include more emic (i.e., insider) perspectives. Seventeen (74%) of 23 diaries in our sample were written and the diary entries that follow highlight the most salient trends within these written entries.

Diaries were transcribed and analyzed by ethnographers in all three study sites who critically reviewed diary entries and ethnographer notes to look for repeating themes. Study ethnographers met periodically to discuss trends and themes that were evident across multiple diaries. The most salient findings were categorized into five themes: (1) patterns of drug use and

Table II. Diarist Demographics

Respondent	Sex	Race/ ethnicity	Age (years)	Drugs injected ^a	Education ^b	Days of diary entries ^c	Written/dictated
1	F	L	26	C, H	<HS	7	Dictated
2	F	AA	39	H	<HS	7	Wrote
3	M	W	48	H	>HS	7	Wrote
4	M	W	32	H	<HS	4	Wrote 4 days, then did not return because had difficulty writing
5	M	W	32	H, SB	>HS	4	Wrote 4 days, got arrested, entered drug treatment
6	M	AA	57	H, C	<HS	5	Dictated
7	M	L	34	H	>HS	7	Wrote; entered drug detox program after diary
8	M	L	35	H	>HS	2	Dictated for 2 days then checked into a drug detox program
9	M	W	29	C, SB	<HS	6	Dictated
10	M	AA	40	H	<HS	7	Wrote
11	F	AA	51	H	HS/GED	11	Wrote
12	M	W	43	H	>HS	5	Wrote
13	F	W	48	H	HS/GED	10	Wrote
14	F	L	38	CR	<HS	5	Wrote
15	M	AA	38	H	<HS	5	Wrote 4 days; dictated 1 day
16	M	AA	45	H	missing	6	Wrote
17	F	W	33	CR, H	HS/GED	10	Wrote
18	M	W	50	H, C	HS/GED	7	Wrote
19	F	AA	45	C	missing	7	Wrote
20	F	W	22	H	HS/GED	7	Wrote
21	M	AA	48	C, H	>HS	7	Wrote
22	M	AA	48	H, C	>HS	6	Wrote
23	M	W	54	CR, H	HS/GED	7	Dictated
Total	M = 15 F = 8	AA = 9 L = 4 W = 10	Mean = 40.6 years	H = 20 C = 7 CR = 3 SB = 2	<HS = 8 HS/GED = 6 >HS = 7 Missing = 2	Complete = 20 (87%) Partial = 3 (13%)	Wrote = 17 (74%) Dictated = 5 (22%) Both = 1 (4%)

^aH, Heroin; C, cocaine; CR, crack; SB, speedball (cocaine and heroine injected at same time).

^b<HS, Less than high school; HS/GED, high school graduate or graduate equivalency diploma; >HS, education beyond high school.

^cComplete, completed diary (5–7 days of entries); Partial, incomplete diary (less than 5 days of entries).

other life events, (2) sporadic and high-risk events, (3) exploring a syringe life cycle, (4) emotional correlates of drug use, and (5) the diary as an intervention.

RESULTS

Patterns of Drug Use and Other Life Events

Due to the longitudinal nature of the diary method that we used, we were able to explore how injection behaviors and other life events remained consistent or varied over the course of several days.

One participant in New Haven routinely reported buying several “dimes” (\$10 bags) of crack,

injecting one-half of the total amount,⁶ and giving the other half to his girlfriend to smoke. One of this participant’s diary entries read, “6:00pm—Get to 3rd Avenue and cop [purchase] three bags. Prepared dime and 1/2 for injection.” The other dime and one-half of crack was given to the participant’s girlfriend to be smoked. This sharing pattern occurred for the first 5 days of the diary activity. However, on day 6, when the interviewer probed about a diary entry that mentioned crack use, the participant explained that he had injected all of the crack that he obtained on that particular day and did not share with his partner (ethnographer notes in italics):

⁶In recent years, crack cocaine has been mixed with vinegar and other acidic materials to dissolve the rocklike substance, converting it to an injectable form.

2:00pm—Cop one dime of crack on 3rd Avenue. I shot [using] 30 units of vinegar. *This is different than the normal . . . he shoots 1/2 and gives the other half to his girlfriend to smoke. If he has not done any crack already that day he wants to get a “bang” [bigger high] the first time.*

If we were to capture similar information in a survey or in another method, we would have a more difficult time trying to look at sporadic use patterns that are outliers compared to “usual use.” A New Haven woman’s description of her HIV medications and methadone regimen also highlights the diary’s usefulness in revealing patterns. Despite some indications that IDUs do not adhere to medication regimens, her diary demonstrates the contrary, consistency in taking her medications despite daily scheduling variation. Furthermore, this diary illustrates the juxtaposition of drug use, methadone maintenance, and HIV medication adherence all in the course of a routine day. Part of the participant’s diary entry follows:

Monday 1/10/99.
 7:30am—wake up. ate breakfast.
 7:45am—Daughter came over and dropped off the baby. Partner is babysitting today.
 8:30am—Took HIV meds.
 8:50 caught bus to go to I-91 [Syringe Access] Study . . .
 10:45 . . . cash check waited for bus to go to meth. program . . .
 11:30 walk home eat sandwich look at t.v. then at 12:00 go to [SEP] van give thirty [syringes] get thirty back . . .
 1:00 1st shot one dime [of cocaine]—60 units water for 2 shots of 30 units draw both shots up in two needles. Did one capped the other. Done around two
 4:00 Took medication—methadone take home bottle. 70 mg.
 8:30 p.m. woke up. Took HIV meds. ate dinner . . .
 Tuesday
 7:30 take shower get dress take med.
 8:45 watch t.v. until 10:30 go to store get cig . . .
 11:30 . . . got drop off at program by Pete—got medicated [methadone] . . . I cop I give John three [bags] . . . I get three I give him 2 set of work [syringes] I go in my room . . . fix one dime and do it about a hour later I do the other two.
 Wed.
 8:30 I get up go to bathroom to the same routine get my med out and take it
 . . . For [methadone] program I have group at 12:30
 2:20 I’m on my way home . . .
 7:45 . . . I take my med. Now I going to get high I get my cooker, and water my work out put on table open my dime in cooker drew up . . .

This participant’s diary entries continue in much the same fashion for 4 more days, documenting

the daily routine to which the participant adheres. These examples demonstrate the utility of diaries for exploring daily patterns as well as deviations from these patterns.

Sporadic and High-Risk Events

Diaries were also useful for capturing sporadic and potentially high-risk events. One HIV-infected participant provided an example of one such event in the following entry:

7PM. Syringe broke before shot. Rubber stopper at bottom came off. Used crazy glue and it sealed. Got one shot.

This IDU was in a potentially risky situation when his needle broke at 7 p.m. At this time of day, the local needle exchange was no longer operating and the nearest pharmacy was already closed. Prior to repairing the worn syringe, the participant recorded in his diary that he had searched for his HIV-positive girlfriend’s syringe (“This is the only needle in the house. Sandra’s needle is lost.”). When unable to find it, he resorted to the repair of his damaged syringe. Had the participant’s gluing efforts failed, he and his girlfriend may have been forced to seek out syringes from friends or acquaintances, to buy some illicitly on the street, or hunt for discarded syringes in IDU injecting sites (e.g., abandoned buildings). All of these are potentially dangerous options. This entry illustrates the risk that surrounds crisis events in the lives of IDUs and the benefit of the diary method. Diaries enable the capture of unintended, unplanned events, the very type of pattern disruption that is most likely to put IDUs at risk for adopting emergency coping strategies that carry a high potential for HIV transmission.

Life Cycle of a Syringe

Early in the HIV epidemic, Kaplan and Heimer (1994) formulated a “circulation theory” for syringes. Their theory asserts that the longer a syringe remains in circulation (on the streets), the greater the opportunity for the syringe to become contaminated with a potentially deadly virus and the greater the possibility that the same syringe will be shared with another IDU, thus contributing to viral transmission. Reduced syringe circulation time will decrease opportunities for transmission of HIV and hepatitis. Consequently, a very important objective in exploring HIV risk is understanding the “life cycle” of a syringe, including

where the syringe is acquired, how it is used and by whom, where it is stashed, and how it is discarded. Because many IDUs use a syringe for multiple injections over the course of several days, a longitudinal method is most appropriate for tracking the life cycle of a syringe. The diary method provides a window into this life cycle. A Springfield woman described her experiences with a syringe that was already well used before she began the diary activity. In her diary, we can see the level of risk she and her partner experienced because of a scarcity of syringes (syringe exchange and pharmacy sale of syringes without a prescription are illegal in Springfield):

[Thursday] 4-13-00 Went to cop last night, nobody was around. So we went all over and found some [drugs] finally. Me + John used that one needle I have. It's really messed up. But after 20 minutes of trying he shot me with 3 bags. He then used my works. He didn't clean them or anything. My works are bad. The tip is all bent.

Fri. April 14th. The works wouldn't draw up the dope so we were going to put some cream on the black tip [the syringe plunger] so it wouldn't jam up and [would] slide easier. We continued to have the problem of the works not drawing up. They'd start sucking up the dope then would stop. Finally it sucked everything from the spoon and he hit me . . . the works are in bad shape. So it take him longer to get it in the vein. But he finally did then we shared spoon and cotton and works and he did himself next which took a while too because the shape of the needle. It has a burr in it. but we did it.

After two days of entries, we are already able to learn about the extensive use of a single syringe. In addition, we are able to witness high-risk activities related to syringe sharing among the drug using couple. The diary continues:

Sat. Had hard time works no good. I went first, then John. Shared everything in box . . . Needle is bent and we had to grease them again. There [needle] ready to snap. Sun. Came back to my house and now it takes us longer to get off then to cop the dope. Because works are so bad.

Mon. 4-17-00. We dropped off the guy [dealer] and headed towards my house. I asked him for some works or where I could get some. he said he didn't know . . . So I was going to snort it because of my works but it just isn't as good so I attempted to hit myself after several tries I just skin popped [injecting the drugs intradermally, without finding a vein]. You still feel it but not as good. But it was better than having the works break with my dope in it. I called John today. He said he's going to see about getting me some used [syringes] but it's better than nothing.

The repetitive challenges that this couple endures in using and sharing a damaged syringe reveal the consequences on the street of limited sterile syringe access. Not only does their risk for buying or borrowing a potentially infected syringe go up with each injection occasion, but the risk for causing an injection site infection does as well.

4-18-00 Tues. John stopped by the [train] tracks and did his with this old pair he has hidden at the tracks. he shot his pretty quick considering where and what we had. Then the nightmare began at my house. The works broke the black piece stayed in there I had to keep using the plunger to try to suck the black piece back up. About a half hour later I got it out and put vaseline around it check it once and said I'm going to take a chance and hope they work in my arm. They did alright. But I need new ones The needle is so dull it bearyl pokes thru your skin there so *dull*. Need new ones bad. If the needle breaks in my arm I'm screwed.

As this entry shows, the syringe has made it through various stages of the syringe "life cycle" and it continues to deteriorate with each use, and yet the participant is not willing to part with it because of syringe scarcity. With each passing day, the couple appears to be willing to do whatever is necessary to extract yet another use from the syringe despite the growing level of pain incurred by the use of a dull syringe.

4-21-00 Friday Bad day couldn't get a hold of anybody . . . Came home and used D's set. His is in a lot better shape than min. He has Hep. C too. He told me when we first started doing stuff together. So we always share the needle + cooker + cotton. I figure he can't give me something I already have. And we trust each other as far as that's all we have is Hep C.

Of course, there is no way to know, without testing for seropositivity, that D is HIV-negative, and the participant writing this entry may be putting herself at risk for other infectious diseases every time she shares syringes with D.

This series of entries demonstrates the strength of the diary method for documenting the life cycle of a syringe and for situating HIV risk in a temporal context. If this participant had recounted only the events of 4-21-00 in a retrospective, cross-sectional interview, we might not have fully understood the context surrounding the participant's decision to inject with D's used syringe. Furthermore, the IDU perspective of risk and vulnerability related to damaged syringes is evident in the foregoing diary entries. Despite the fact that old syringes hold higher risks related to viral transmission, abscesses, and the possibility of the needle breaking inside of human tissue, IDUs do not

perceive many alternatives. This diary reminds us of the ripple effect that inadequate access to sterile syringes has on IDUs and overlapping populations in Springfield. These entries also illustrate that diaries can capture insightful information that may not be obtained in open-ended interviews because diaries include data and areas of inquiry that even a seasoned ethnographer of drug use would not necessarily think to pursue. It is worth noting, however, that diaries can only report on the part of the syringe's experiences that the diarist documents. If a syringe is stashed, for example, and someone uses it in the diarist's absence, this is unlikely to get recorded.

Emotional Correlates of Drug Use

Diaries also provided valuable insight into the feelings IDUs experienced relative to their drug use habits, hustles (money-making strategies), and life in general. Although some participants used the diary to discuss feelings unrelated to drug use, several documented how their emotional state may have influenced their drug use and vice versa. A participant in Hartford, whose diary frequently contained statements about feelings of guilt and depression, at times alluded to the need to inject in order to diminish such negative sentiments:

10:00am. [in bus station] Sat down next to a kid that just got out of jail and told him that I have been here for two days. I asked him for four dollars and he gave it to me. Feel bad at having to take money from good people so I can get high. What life I'm living . . . I hope I don't get arrested for doing this [hustling]. Don't feel like I fit out here in this life. Feeling sad and mad about myself. Want to cry. Want my mother to hold me and take the pain away. This is wrong. Need to get high.

An example from another participant's diary in Hartford portrays similar sentiments: "I stole \$20.00 out of my mom's pocket book which I feel like shit about. I just wanted to be numb. I hate myself sometimes." Entries such as these highlight the strength of the diary method for capturing feelings and emotions while perhaps documenting the use of substances to self-medicate (Baer *et al.*, 1998) and to escape undesirable feelings.

Potential Intervention Effect

Research from several domains indicates that writing about one's thoughts and feelings can be

physically and mentally beneficial (Esterling *et al.*, 1999). Over the last decade, multiple studies have confirmed that writing produces benefits across diverse social classes and major racial/ethnic groups (Pennebaker and Seagal, 1999). The demonstrated beneficial effects have included t-helper cell growth and antibody response (Esterling *et al.*, 1999; Petrie *et al.*, 1995), greater health improvement among asthma and rheumatoid arthritis patients (Stone *et al.*, 2000), lower levels of depression; higher academic grades; faster time in getting a new job (Pennebaker and Seagal, 1999); and a trend toward increased self-reported adherence to HIV medications (Mann, 2001). Writing has also been cited as an effective therapeutic strategy. Pennebaker and Seagal (1999) explained that forming a personal story, or disclosure, is unequivocally at the core of therapy and when people put their emotional upheavals into words, their physical and mental health improves markedly. Whereas recording events and emotions may lead to short-term distress in the hours after writing (Smyth, 1998), narratives that include increased use of words associated with insightful and causal thinking and higher use of positive-emotion words have been linked to improved physical health (Pennebaker, 1997). Smyth (1998) cautioned, however, that the relation between written emotional expression and health is moderated by a number of variables including participant personal characteristics, duration of writing (dose), and the quality of writing instructions for participants.

Preliminary findings from our research suggest that diary keeping might serve as an intervention with some substance users. Several participants noted the desire to quit using drugs in their diaries and three diarists enrolled in a drug treatment program during the course of the diary study or shortly thereafter (Table II). We are uncertain whether the diary writing itself was primarily responsible for the apparent intervention effect or whether time spent with participants on a day-to-day basis supported the effect. Future studies should test whether diary keeping by itself has an intervention effect or whether the multiple meetings/counseling sessions in which study ethnographers listen and read with nonjudgmental ears and eyes are responsible for this.

ETHICAL ISSUES

An important responsibility in human subject research, especially research with marginalized, vulnerable groups, is to fully assess, address, and remedy, to

the greatest degree possible, any ethical issues that might arise during the research. A variety of ethical challenges in qualitative drug use research have been identified (Buchanan *et al.*, 2002; Singer *et al.*, 1999). In using diaries with IDUs, three ethical challenges were encountered by our research team: (1) handling knowledge of ongoing risk behavior produced by lack of access to sterile syringes, (2) protecting participants from incriminating evidence recorded in the diaries, and (3) reducing the risk that diary keeping could produce emotional crisis for study participants. Each of these challenges and our response to them are discussed in turn.

The first issue of how to balance the promotion of harm reduction with the collection of accurate data on existing behavior is not unique to research involving diary keeping. However, because of the longitudinal nature of the method, it is particularly relevant for this study. As noted in the case cited in the discussion of the life cycle of a syringe, there were several days during which the participant documented using an old and dilapidated syringe. Each day, as researchers read the diary entry, they were reminded that the participant was highly at risk for acquiring and using a potentially infected syringe. This particular diary was recorded by a participant in Springfield, a city in which distributing sterile syringes to drug users without a prescription is against city law and in which city police aggressively enforce drug paraphernalia laws. In fact, during meetings with project staff, the Springfield police were insistent that they would arrest members of our research team if they were caught in possession of syringes without a prescription [part of our research methodology involved the collection of discarded syringes for laboratory bioassay (Singer *et al.*, 2000)]. Furthermore, federal funding regulations supporting our project prohibited syringe exchange or syringe distribution using grant dollars. Consequently, whereas distribution of sterile syringes to participants engaged in high-risk behaviors could have lowered the potential for the transmission of HIV and hepatitis, legal restrictions criminalized this behavior and would put project staff at risk for arrest and prosecution. A middle-road harm reduction option for research locations like Springfield is to provide study participants with bleach kits that include all injection paraphernalia except syringes. This was done with several of the diarists in Springfield and diary entries indicated that this bleach was used to clean syringes.

The situation is even more complicated in Hartford and New Haven, where the legal sale of

up to 10 syringes is permitted in pharmacies without the need for a doctor's prescription. Although we are still prohibited from purchasing syringes with federal dollars, we are not prohibited from distributing syringes purchased with monies from other sources during hours when staff were not being paid with federal research dollars. In this situation, the primary ethical dilemma lies in the potential conflict of motives: maintaining the integrity of research data versus doing whatever is necessary, including distributing sterile syringes, to prevent viral transmission. From a research perspective, it is imperative to understand how existing access to syringes affects HIV and hepatitis risk. We sought to use unbiased data from the diaries to promote awareness of policy and programmatic changes that would enhance the public health of IDUs and related communities. Distribution of sterile syringes to IDUs, although providing safer injection equipment in the short term, would distort our ability to learn about unbiased syringe acquisition, injection patterns, and related risk behaviors. In light of ethical considerations, it was the policy of our project to inform participants about the availability of sterile syringes from the syringe exchange program and from pharmacies. Risk reduction kits containing bleach and other prevention materials were also provided. Although providing such kits was potentially as much a data-biasing intervention as providing syringes would have been, we were legally able to provide risk reduction kits without syringes in both Connecticut and Massachusetts and felt obligated to do so.

Second, given the research interests of our project, participants were asked to record information in their diaries concerning various illegal behaviors (e.g., acquiring syringes without a prescription in Massachusetts, possessing drug paraphernalia, using illicit drugs). Furthermore, participants might choose to record other incriminating information in their diaries that was not requested by the project (e.g., illegal activities conducted to raise money to purchase drugs). Once recorded in their diaries, this information could put participants at risk for legal action should the diary be confiscated by legal authorities. In fact, in one instance this did happen when a participant waiting outside the door of our building was taken into custody for an outstanding warrant. During this process, a police officer took possession of the diary and flipped through it. Although the diary was returned to the participant without action by the police, the incident alerted project staff to the potential risk at which we were placing study participants (Buchanan *et al.*, 2002). As a result of this incident, participants

were requested to turn in their diary recording each day (i.e., tearing out and handing in recent entries to research staff), thus reducing the chance that they would be caught in possession of diary entries that could put them at legal risk. We also learned that drug users could be provided with a code system to use in writing about illegal behaviors (e.g., "bought apples" to refer to drug purchase).

Finally, there is the issue of provoking emotional crisis among study participants as a result of keeping a daily record of highly risky behaviors. Smyth (1998) found that diary keeping could lead to short-term distress in study participants. Indeed, for some of our participants this did appear to be the case, although always at a mild level. In fact, such distress occurs among some drug users even during interviews about their drug use and risk behaviors. In our study, the result was that these individuals asked project staff for help in entering into a drug treatment program or in acquiring other health assistance. In other words, the diaries helped participants recognize that they were, in fact, putting themselves at risk on a daily basis. Assistance and referrals were provided to participants, on their request, using our existing net of contacts with drug treatment and social service providers.

In sum, while diary keeping, like all research methods, raises the potential for a number of ethical challenges, there are approaches available to researchers to minimize the risks to study participants and staff inherent in the use of this method. Moreover, if risks are minimized, it is clear that the benefits of the approach (e.g., assisting drug users to recognize their level of HIV risk) significantly outweigh the risks involved.

DISCUSSION

The IDU diary methodology described in this study was employed successfully as a qualitative research tool that complemented other methodologies. Diaries allowed us to capture information regarding frequency of drug use, risk behaviors surrounding use, sources of drug use equipment, and contextual lifestyle information in an ongoing fashion. Diaries provided significant insights into patterns of injection drug use, sporadic and high-risk events, life cycles of syringes, and emotional correlates of drug use. The diaries appeared to facilitate increased self-reflection (e.g., "Don't feel like I fit out here in this life. Feeling sad and mad about myself"), which may have led a number of IDUs to change risky injection behav-

iors and to increase their desire to enter drug treatment programs (the participant just quoted entered drug treatment shortly after completing his diary). This finding suggests that, whereas the diary is a valuable data collection instrument, it may also serve as an intervention tool to help drug users evaluate and change their lifestyles. In order to test for potential intervention effects in future studies, we suggest that researchers systematically assess participants' thoughts and reflections (e.g., "What did you like and dislike?") about the diaries, how they change over time, and how they potentially influence risky behaviors.

Although our experiences with IDU diaries were quite positive, we did encounter a number of challenges while employing the methodology and a number of lessons were learned while overcoming such challenges. First, the diaries required a considerable commitment on the part of participants and research staff. In order to conduct debriefings on a daily basis, it was necessary for ethnographers and diarists alike to plan to set aside 30–60 min per day (much less than that required for standard ethnography) for a week or longer to meet and discuss the previous day's entry and activities. This, we found, was the most effective way of obtaining consistent and detailed diary entries, particularly with participants who possessed less formal education. It was helpful to have several ethnographers involved in diary data collection in order to assure that debriefings could take place even if one staff member was out sick or involved in other research activities during scheduled debriefing time slots. It was more difficult for diarists to write on successive days without daily debriefing sessions and fewer details were included in diaries when debriefings did not take place, especially with participants with low literacy skills. Inclusion of weekend entries was essential to understand the variation in injectors' schedules and activities, but it was more challenging to conduct debriefings on weekends given research work schedules. Flexible work schedules for research staff that include weekend hours are recommended for future diary studies.

Provision of participant incentives (\$50–\$60) was essential in facilitating recruitment, retention, and participation in our diary study. The total amount of such incentives was higher than those provided to participants for other methods (e.g., in-depth interviews, observations) in our study but the diaries allowed us to capture more detailed information on injection activities over a longer period of time than did the other methods. Providing incentives at the end of each debriefing session proved to be quite effective in

motivating diarists to continue writing in subsequent days, and increasing incentives over weekends and providing bonus incentives for complete diaries (5–7 days of entries) were also effective in facilitating data collection.

Admittedly, although our diary sample was diverse, it included more White and more educated participants than those in our larger study, with an underrepresentation of Latinos (despite the fact that participants were encouraged to record their diaries in English or Spanish). Diary participants with a lower educational level were more likely to dictate their daily diary entries to ethnographers than were participants with higher educational levels. In order to reduce sampling biases related to educational and socioeconomic status, future IDU diary studies should consider using multiple diary collection methods that will facilitate the participation of IDUs with low literacy skills. Offering the option of written, orally elicited (dictated), or tape-recorded diaries to participants at study initiation might facilitate recruitment of low-literacy participants and better capture variations in activities and risk behaviors across a representative sample of IDUs. We also suggest that study teams encourage participants to write or dictate diary entries in the participants' preferred language because some participants may be more comfortable writing in their native language than in English.

We found that diaries were more effective than other methods employed in our larger study in capturing sporadic risk events (e.g., the breaking of a syringe in the middle of the night). This is precisely the type of event that is not likely to be captured by quantitative interviews and in-depth interviews unless very specific and carefully worded questions are developed to ask about the numerous intricacies and potential road blocks to safe injection over a long period of time. Standard ethnography can capture similar emergency events but it is quite challenging and costly for ethnographers to cover 24-hr time periods with consistency over the course of a week. Whereas Neaigus and colleagues (1994) utilized ethnographic interviews that were conducted over several days, a method that is quite similar to the dictated diaries utilized in our study, we found that the written diary entries that three-fourths of our participants completed were unique in research among IDUs and may have provided more detailed emic (insider) perspectives surrounding syringe acquisition, use, and discard than did dictated diaries. Triangulating data from other research methods with diary data is recommended in order to confirm salient behaviors that are discovered

and to facilitate the collection of complementary data from multiple methods.

We also learned that even a 5- to 7-day diary may be too short for some research activities with IDUs. As evidenced in our discussion of the syringe life cycle, one syringe is often used for more than 5–7 days, particularly in Springfield, where syringe access is more limited, and even the 1-week diary was not always able to track a syringe from initial acquisition to final disposal. Several participants were interested in continuing their diary writing past the 1-week time period and wrote for 10 or more days. Future diary studies should consider longer diary periods depending on the activity of interest.

Finally, we learned that diary entries helped to put a human face on the often faceless drug user who, it is often assumed in the popular imagination, has no feelings and no remorse, no doubt in the endless need to get high (Waterston, 1993). Other qualitative and ethnographic research methods can capture such detail and sentiment, but we found there was a richness and fluidity to the diary data that allowed us to better understand the interrelatedness of daily IDU activities, interests, emotions, and HIV risk behaviors than was possible with other methods.

CONCLUSION

Diaries and written narratives have been used as methods of data collection and as means to successful interventions and therapy for a wide spectrum of health issues and were effective when used with IDUs in Connecticut and Massachusetts. Further use of diaries is recommended for research with injection-drug-using populations to facilitate detailed data collection and harm reduction efforts. Research that focuses more rigorously and systematically on the intervention effect of diaries would be particularly valuable in testing the different aspects of the method (i.e., actual writing in diaries vs. debriefing sessions and time spent listening to participants) and their relative influence in bringing about change in the lives of IDUs.

ACKNOWLEDGMENTS

We thank Claudia Santelices, Glenn Scott, Mark Kinzly, Kevin Irwin, Anthony Givens, Rasika Jaya, Anna Marie Nicolaysen, Julie Eiserman, George Barton, and Cara Siano for their efforts in recruiting

participants and collecting data during various stages of the research. We also acknowledge the support and guidance provided by Drs. David Buchanan and Robert Heimer throughout the duration of the study. We thank two anonymous reviewers whose comments and suggestions added substantially to the final version of this paper. Finally, and most importantly, we are indebted to the participants who shared their day-to-day activities and thoughts with us. Funding for this research was provided by the National Institute on Drug Abuse grant # RO1 DA12569, Merrill Singer, Principal Investigator.

REFERENCES

- Armstrong, B. K., White, E., and Saracci, R. (1992). *Principles of exposure measurement in epidemiology*. New York: Oxford University Press.
- Baer, H., Singer, M., and Susser, I. (1998). *Medical anthropology and the world system*. Westport, CT: Greenwood.
- Bourgeois, P., Lettiere, M., and Quesada, J. (1997). Social misery and the sanctions of substance abuse: Confronting HIV risk among homeless heroin addicts in San Francisco. *Social Problems, 44*, 155–173.
- Brindle, M., and Ludman, M. D. (1996). A structured diary to promote reflection and active learning. *Academic Medicine, 71*, 527–528.
- Buchanan, D., Khoshnood, K., Stopka, T., Shaw, S., Santelices, C., and Singer, M. (2002). Ethical dilemmas created by the criminalization of status behaviors: Case studies from ethnographic field research with injection drug users. *Health Education and Behavior, 29*, 30–42.
- Carlson, R., Harvey S., and Falck, R. (1995). Qualitative research methods in drug abuse and AIDS prevention research: An overview. In E. Lambert, R. Ashery, and R. Needle (Eds.), *Qualitative methods in drug abuse and HIV research* (pp. 6–26). Washington, DC: National Institute on Drug Abuse.
- Corti, B., Binns, C. W., Howat, P. A., Blaze-Temple, D., and Lo, S. K. (1990). Comparison of 7-day retrospective and prospective diaries in a female population in Perth, Western Australia—Methodological issues. *British Journal of Addiction, 85*, 379–388.
- Coxon, A. P. M. (1996). *Between the sheets: Sexual diaries and gay men's sex in the era of AIDS*. London: Cassell.
- Coxon, A. P. M., Coxon, N. H., Weatherburn, P., Hunt, A. J., Hickson, F. C. I., Davies, P. M., McManus, T. J. (1993). Sex role separation in sexual diaries of homosexual men. *AIDS, 7*, 877–882.
- Cronin, D. (1996). Harm reduction for alcohol-use-related problems among college students. *Substance Use and Misuse, 31*, 2029–2037.
- Esterling, B. A., L'Abate, L., Murray, E. J., and Penedaker, J. W. (1999). Empirical foundations for writing in prevention and psychotherapy: Mental and physical health outcomes. *Clinical Psychology Review, 19*, 79–96.
- Feinberg, S. E., and Tanur, J. M. (1983). Large-scale social surveys: Perspectives, problems, and prospects. *Behavioral Science, 28*, 135–153.
- Fortenberry, J. D., Orr, D. P., Katz, B. P., Brizendine, E. J., and Blythe M. J. (1997). Sex under the influence: A diary self-report study of substance use and sexual behavior among adolescent women. *Sexually Transmitted Diseases, 24*, 313–319.
- Fox, L. J., Bailey, P. E., Clarke-Martinez, K. L., Coello, M., Ordonez, F. N., and Barahona, F. (1993). Condom use among high-risk women in Honduras: Evaluation of an AIDS prevention program. *AIDS Education and Prevention, 5*, 1–10.
- Garry, M., Sharman, S. J., Feldman, J., Marlatt, G. A., and Loftus, E. F. (2002). Examining memory for heterosexual college students' sexual experiences using an electronic mail diary. *Health Psychology, 21*, 629–634.
- Grund, J.-P. C., Kaplan, C. D., and Adriaans, N. F. P. (1991). Needle sharing in Amsterdam: An ethnographic analysis. *American Journal of Public Health, 81*, 1602–1607.
- Huby, G. (1997). Interpreting silence, documenting experience: An anthropological approach to the study of health service users' experience with HIV/AIDS care in Lothian, Scotland. *Social Science and Medicine, 44*, 1149–60.
- Kaplan, E. H., and Heimer, R. (1994). A circulation theory of needle exchange. *AIDS, 8*, 567–574.
- Koester, S., and Hoffer, L. (1994). "Indirect sharing": Additional HIV risks associated with drug injection. *AIDS and Public Policy Journal, 2*, 100–104.
- Larson, R. J., Diener, E., and Emmons, R. A. (1986). Affect intensity and reactions to daily life events. *Journal of Personality and Social Psychology, 51*, 803–814.
- Leigh, B. C., Gillmore, M. R., and Morrison, D. M. (1998). Comparison of diary and retrospective measures for recording alcohol consumption and sexual activity. *Journal of Clinical Epidemiology, 51*, 119–127.
- Lemmens, P., Knibbe, R. A., and Ran, E. S. (1988). Weekly recall and diary estimates of alcohol consumption in a general population survey. *Journal of Studies in Alcohol, 49*, 131–135.
- Mann, T. (2001). Effects of future writing on optimism on health behaviors in HIV-infected women. *Annals of Behavioral Medicine, 23*, 26–33.
- Mooney, H. W. (1962). *Methodology in two California health surveys* (Public Health Monograph No. 70.) Washington, DC: U.S. Government Printing Office.
- Musil, C. M., Ahn, S., Haug, M., Warner, C., Morris, D., and Duffy, E. (1998). Health problems and health actions among community-dwelling older adults: Results of a health diary study. *Applied Nursing Research, 11*, 138–147.
- Neaigus, A., Friedman, S. R., Curtis, R., Des Jarlais, D. C., Furst, T. R., Jose, B., Mota, P., Stepherson, B., Sufian, M., Ward, T., and Wright, J. W. (1994). The relevance of drug injectors' social and risk networks for understanding and preventing HIV infection. *Social Science and Medicine, 38*, 67–78.
- Needle, R., Coyle, S., Normand, J., Lambert, E., and Cesari, H. (1998). HIV prevention with drug-using populations—Current status and future prospects: Introduction and overview. *Public Health Reports, 113* (Supplement 1), 4–18.
- Norman, G. R., McFarlane, A. H., Streiner, D. L., and Neale, K. (1982). Health diaries: Strategies for compliance and relation to other measures. *Medical Care, 20*, 623–629.
- Page, J. B. (1990). Shooting scenarios and risk of HIV-1 infection. *American Behavioral Scientist, 33*, 478–490.
- Penedaker, J. (1997). Writing about emotional experiences as a therapeutic process. *Psychological Science, 8*, 162–166.
- Penedaker, J. W. (1997). Linguistic predictors of adaptive bereavement. *Journal of Personality and Social Psychology, 72*, 863–871.
- Penedaker, J. W., and Seagal, J. D. (1999). Forming a story: The health benefits of narrative. *Journal of Clinical Psychology, 55*, 1243–1254.
- Petrie, K. J., Booth, R. J., Penedaker, J. W., Davison, K. P., and Thomas, M. (1995). Disclosure of trauma and immune response to hepatitis B vaccination program. *Journal of Consulting and Clinical Psychology, 63*, 787–792.
- Poikolainen, K., and Karkkainen, P. (1983). Diary gives more accurate information about alcohol consumption than questionnaire. *Drug and Alcohol Dependence, 11*, 209–216.

- Shakeshaft, A. P., Bowman, J. A., and Sanson-Fisher, R. W. (1999). A comparison of two retrospective measures of weekly alcohol consumption: Diary and quantity/frequency index. *Alcohol and Alcoholism*, *34*, 636–645.
- Singer, M., Romero-Daza, N., Weeks, M., and Pelia, P. (1995). Ethnography and the evaluation of needle exchange in the prevention of HIV transmission. In E. Lambert, R. Ashery, and R. Needle (Eds.), *Qualitative methods in drug abuse and HIV research* (pp. 231–257). Washington, DC: National Institute on Drug Abuse.
- Singer, S., Marshall, P., Trotter, R., Schensul, J., Weeks, M., Simmons, J., and Radda, K. (1999). Ethics, ethnography, drug use and AIDS: Dilemmas and standards in federally funded research. In P. Marshall, and M. Singer, M. Clatts (Eds.), *Cultural, observational, and epidemiological approaches in the prevention of drug abuse and HIV/AIDS* (pp. 198–222). Bethesda, MD: National Institute on Drug Abuse.
- Singer, M., Stopka, T., Siano, C., Springer, K., Gorry de Puga, A., and Heimer, R. (2000). The Social geography of AIDS risk: Qualitative approaches for assessing local differences in sterile-syringe access among injection drug users. *American Journal of Public Health*, *90*, 1049–1056.
- Singer, M., Simmons, J., Duke, M., and Broomhall, L. (2001a). The challenges of street research on drug use, violence, and AIDS risk. *Addiction Research and Theory*, *9*, 365–402.
- Singer, M., Scott, G., Wilson, S., Easton, D., and Weeks, M. (2001b). “War stories”: AIDS prevention and the street narratives of drug users. *Qualitative Health Research*, *11*, 589–611.
- Smyth, J. M. (1998). Written emotional expression: Effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology*, *66*, 174–184.
- Spradley, J. P. (1970). *You owe yourself a drunk: An ethnography of urban nomads*. Prospect Heights, IL: Waveland.
- Sterk-Elifson, C. (1995). Determining drug use patterns among women: The value of qualitative research methods. In E. Lambert, R. Ashery, and R. Needle (Eds.), *Qualitative methods in drug abuse and HIV research* (pp. 267–281). Rockville, MD: National Institute on Drug Abuse.
- Stone, A. A., Kessler, R. C., and Haythornthwaite, J. A. (1991). Measuring daily events and experiences: Decisions of the research. *Journal of Personality*, *59*, 575–607.
- Stone, A. A., Smyth, J. M., Kaell, A., and Hurewitz, A. (2000). Structured writing about stressful events: Exploring potential psychological mediators of positive health effects. *Health Psychology*, *19*, 619–624.
- Stone, A. A., Shiffman, S., Schwartz, J. E., Broderick, J. E., and Hufford, M. R. (2002). Patient non-compliance with paper diaries. *British Medical Journal*, *324*, 1193–1194.
- Trotter, R. T., II, Needle, R. H., Goosby, E., Bates, C., and Singer, M. (2001). A methodological model for rapid assessment, response, and evaluation: The RARE program in public health. *Field Methods*, *13*, 137–159.
- Verbrugge, L. M. (1980). Health diaries. *Medical Care*, *18*, 73–95.
- Waterston, A. (1993). *Street addicts in the political economy*. Philadelphia: Temple University Press.
- Webb, G. F., Redman, S., Gibberd, R. W., and Sanson-Fisher, R. W. (1991). The reliability and stability of a quantity–frequency method and a diary method of measuring alcohol consumption. *Drug and Alcohol Dependence*, *27*, 223–231.
- Witschi, J. C. (1990). Short-term dietary recall and recording methods. In W. Willet (Ed.), *Nutritional Epidemiology* (pp. 52–68). New York: Oxford University Press.