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Collecting Drug Use Data from Different Populations

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1. INTRODUCTION

The primary goal of surveys investigating drug use behavior is to obtain valid and accurate measures of drug use that contribute to our knowledge, and, in turn, can be used to inform policy. Whether this goal can be fully realized is partly based on the interplay among the sampling methods used, the mode of interview, and the nature of the population under study. This chapter reviews the current state of the application of survey data collection methods employed for various populations.

2. GENERAL POPULATION SURVEYS

Drug use estimates derived from general population surveys are considered essential for surveillance programs (Griffiths and McKetin, 2003). The key strengths of general population surveys include (1) random probability sampling that allows for generalization to the population, (2) the use of samples to capture the largest segment of the total population, and (3) the ability to calculate errors. Although surveys are powerful epidemiologic tools, when applied to substance abuse, they are subject to potential errors because of (1) self-reported drug use, (2) non-response, and (3) the exclusion of various groups from the target population (e.g., homeless).

Summarizing the expansive literature on the collection of drug use data from general population surveys is a task that goes well beyond the scope of this chapter. Indeed, during the past twenty years, methodological studies on general population surveys have increased in both scope and sophistication. If there is a gold standard of general population surveys it would be the U.S. National Survey on Drug Use and Health (NSDUH), formerly the National Household Survey on Drug Abuse, sponsored by Substance Abuse and Mental Health Services Administration (Substance Abuse and Mental Health Services Administration, 2004). Using a multi-stage area probability sample, about 68,000 respondents aged 12 years and older are surveyed every year. Interviews are conducted in-person, using a combination of computer-assisted personal interviewing (CAPI) and audio computer-assisted self-interviewing (ACASI) for sensitive drug use questions. The methods employed in this survey are based on an on-going methodological program that has identified the need for self-administered questions (Turner et al., 1992).

The NSDUH, however, is a survey of such a large scope and necessary resources, that few countries or regions can emulate it. Indeed, international principles of data collection of drug use information argue that data sources should be not only timely and relevant, but feasible and cost-efficient for sponsors (Griffiths and McKetin, 2003). It is for this reason that data collection methods for general population surveys can vary widely within and among countries.

Many of the data collection issues related to substance use surveys have been driven by changing technological capabilities. One of the earlier developments was the growth in random digit dialing (RDD) telephone surveys. Given the important advantages of telephone surveys compared to in-house interviews, such as lower costs, lower sampling error, many on-going surveillance surveys now employ telephone methods as their mode of data collection (Centers for Disease Control and Prevention, 2004; Grulich et al., 2003; Hall et al., 1991; Kilpatrick et al., 2003; MacNeil and Webster, 1997; Midanik and Greenfield, 2003; Wallisch, 2001; Wilkins et al., 2003).

The earlier research literature comparing telephone to face-to-face methods suggested that telephone methods generally fared well (de Leeuw and van der

Zouwen, 1988; Groves et al., 2004). However, research on drug use self-reports during the 1980s and 1990s clearly showed that self-administered methods provided higher drug use reports compared to telephone interviews (Aquilino, 1992; Aquilino, 1994; Gfroerer and Hughes, 1992; Gfroerer and Hughes, 1991; Schober et al., 1992; Turner et al., 1992). Turner et al. (1992), for example, found that respondents were about 2.5 times more likely to report past month cocaine use in a self-administered format than by telephone. Also noteworthy, was that this mode difference declined as the reporting period increased to past year use and to lifetime use. These empirical studies have also shown that this mode difference is nominal or non-existent for drugs such as alcohol and cannabis. It is also important to note that several studies have not found such differences (de Leeuw and van der Zouwen, 1988; Mangione et al., 1982), and some have found higher drug use estimates in telephone interviews (Sykes and Collins, 1988).

Despite the limitations of telephone surveys, it is likely that they will continue to be employed, especially by addiction professionals and public health organizations that require cost-efficient, timely data. Moreover, some recent research suggests that reporting error in telephone surveys can be improved with the use of telephone audio computer-assisted self-interviewing (T-ACASI). In this method, a human interviewer screens eligible respondents, but then transfers the respondent to a computer-controlled, pre-recorded questions read to the respondent, who then provides responses by touch tone entry. Limited pilot studies suggest that such technologies improve the reporting of sensitive behaviors (Gribble et al., 2000; Turner et al., 1996).

3. SPECIAL POPULATION SURVEYS

3.1. School Surveys

Perhaps the most salient of the special population surveys is students. Indeed, student surveys have many important advantages, including (1) the relative ease of developing full-probability sampling methods, (2) the cost-efficiency of school-based sampling, (3) good response rates, (4) the prevention importance among the adolescent population, (5) the anonymity of classroom administration, and (6) the cost efficiency is feasible for countries or regions that cannot afford a large general population survey (Griffiths and McKetin, 2003; Smart et al., 1980; United Nations Office on Drugs and Crime, 2003). These advantages explain the long history and dominance of school surveys in substance use epidemiology (Adlaf and Paglia, 2003; Centers for Disease Control and Prevention, 2004; Hibell et al., 2000; Johnston, O'Malley and Bachman, 2002; Smart and Osborne, 2000). Yet, school surveys are not without their weaknesses, which include (1) the absence of dropouts from the target population, (2) non-respondent loss due to absent students,

(3) the increasing requirement for active parental consent forms, (4) the increasing difficulties in obtaining permission to survey students from school authorities, and (5) the underreporting of drug use by students (United Nations Office on Drugs and Crime, 2003).

Yet unlike general population surveys, mode variation is generally minimal in school surveys, with group-based self-administered questionnaires being the mode of choice. There are important reasons for this. First, individualized interviewing is costly and is seen as a complication for school authorities compared to classroom or group administration. Second, the empirical literature has consistently shown that school-based drug estimates are typically higher compared to other methods (Gfroerer, 1985; Gfroerer et al., 1997; Rootman and Smart, 1985; Sudman, 2001). The overwhelming basis for this finding is the perceived anonymity of self-administered questionnaires generally (Turner et al., 1992) and class-administration specifically (Gfroerer et al., 1997; O'Malley et al., 2000; Sudman, 2001).

Two issues are particular to student surveys—the impact of absent students and the loss due to consent form requirements. Although there is some research on these issues, given the frequent inability to incorporate full experimental control and the absence of strong theoretical models underlying survey participation in school surveys, we still lack an understanding of potential error caused by these sources. For example, although there is strong evidence that absent students differ from students that are present on the day of the survey, drug use differences between these two groups have been nominal or inconsistent (Guttmacher et al., 2002; Johnston and O'Malley, 1985).

The impact of consent form loss also complicates the character of potential bias in student surveys. Indeed, more and more Research Ethics Boards and school authorities are requiring the use of active parent consent forms (i.e., the student is allowed to participate only if the parent agrees in a signed consent form) than passive consent forms (i.e., the student is allowed to participate as long as the parent does not object) which were more commonly used in the past. The published literature in this area centers on three issues: the magnitude of the loss; the differential characteristics of students with and without consent; and the impact of consent loss on drug use estimates.

Assessing the overall magnitude of the loss due to parental consent, be it active or passive, is difficult given that many surveys do not report this loss (Hallfors and Iritani, 2002). The Ontario Student Drug Use Survey, for example, found that 16 percent of 7th- to 12th-graders in 2003 did not participate due to the absence of active parental consent, and that this percentage increased with increasing requirements of active parental consent, which averaged 4 percent between 1985 and 1991 (Adlaf and Paglia, 2003). It is also important to note that the impact of consent form loss is complex since it tends to interact with absenteeism. For example, while active parental consent form loss declined with grade, from 25 percent

in grade 7 to 9 percent in grade 12, loss due to absent students increased from 7 percent in grade 7 to 19 percent in grade 12 (Adlaf and Paglia, 2003).

The research literature regarding the differential characteristics between active consent and passive consent samples has generally demonstrated notable differences suggesting that compared to passive consent samples, active consent samples have higher grades and fewer missed days of school (Henry et al., 2002), and are more likely to live with both parents, have a higher socio-economic status, and are more likely to be White (Dent et al., 1993).

Yet, despite these sample differences, research on the impact of consent form loss on drug use estimates is far from conclusive, given that some studies have found large differences in drug use between active consent and non-consent students, while others have found no differences (Dent et al., 1997; Severson and Ary, 1983). The literature does seem to suggest, however, that the impact of consent on drug use estimates is greater for younger students, and minimal for older students (Anderman et al., 1995; Dent et al., 1997; White et al., 2004).

In sum, the literature on the validity of drug use reported in school surveys indicates that, although self-reported drug use will underestimate the "true" usage, survey estimates have sufficient validity and reliability for epidemiological purposes (Brener et al., 2003; Johnson and Mott, 2001; Medina-Mora et al., 1981; O'Malley and Johnston, 2002; O'Malley et al., 2000).

Several challenges will face drug use researchers who work in the school setting. First, and foremost, will be to maintain response rates given increasing requirements of active parental consent forms, the need for independent Research Ethics approval by school authorities, and competing for limited class time. Some researchers have suggested that greater resources be used, such as greater school and parental contact, in order to increase consent form approval and response rates (Harrington et al., 1997; O'Donnell et al., 1997). As well, in 2003, the Monitoring the Future study began to pay participating schools as an incentive (Johnston et al., 2004). A second challenge will be to improve the data quality provided by participating students. Although there has been substantial research on the reliability and validity of self-reported drug use of students, we have yet to make significant gains in practice.

3.2. Campus Surveys

Another special population in the substance use area is college students. Although many campus surveys have a strong focus on heavy drinking, many also provide epidemiological estimates of drug use. (Abdullah et al., 2002; Adlaf et al., 2003; Bell et al., 1997; Kerber and Wallisch, 1999; Mangweth et al., 1997; Martinez et al., 1999; Meilman et al., 1990; Mohler-Kuo et al., 2003; O'Malley and Johnston, 2002; Pope et al., 2001; Prendergast, 1994; Strote et al., 2002; Webb, 1996).

Dedicated validity studies of self-reported drug use in this population are generally fewer compared to elementary and secondary school students, where experimental manipulation is easier. Moreover, as O'Malley and Johnston (2002) have argued, the extensive literature indicating the practical utility of self-reports should hold for university as well as younger students.

In the college population, the dominant mode of data collection has been self-administered mail questionnaires (e.g., Gliksman et al., 2000; Mohler-Kuo et al., 2003). The strengths of this method include the following: (1) self-administered questionnaires provide better responses to sensitive behaviors compared to the more expensive face-to-face interviews, (2) given the natural clusters of universities and classes, sampling designs are generally straightforward and cost-efficient, and (3) universities are generally willing to provide the necessary mailing lists to researchers. Of course, mail surveys are not without their difficulties. Mail surveys tend to (1) obtain lower response rates compared to other methods, (2) lack control over whether the intended respondent completed the questionnaire, (3) lack control over proper questionnaire skips and item non-response, and (4) require greater post survey data cleaning. In addition, regardless of the mode of administration, college surveys can be hampered by the quality of the sampling frames provided by universities, and, for multi-site surveys, multiple research ethics board approvals are a growing requirement.

More recently, given the high internet coverage of college students, web-based survey methods are becoming more frequently employed (Pealer and Weiler, 2003) and evaluated (McCabe et al., 2002). The strengths of web-based methods for college students include (1) reduced costs, (2) shorter data collection periods, (3) automatic data entry, and (4) excellent population coverage. On the other hand, the weaknesses include (1) perceived security issues, (2) sample frame access—not all universities allow distribution or access to their email lists, (3) a sizeable percentage of students do not regularly use their university affiliated URL, and (4) higher non-response rates.

Several evaluations have suggested that web methods are feasible, especially for the college population that has full access to the internet (Couper, 2000; Pealer and Weiler, 2003). The dominant concern regarding the web methodology is the potential bias caused by lower response rates of web surveys compared to mail surveys (Couper, 2000), although some studies have found the opposite (McCabe et al., 2002).

More critical to our concern is the nature of mode differences for alcohol and other drug use. Again, the evidence remains somewhat mixed. Although there is a notable mode difference showing higher reports of drug use for self-administered versus computer-assisted methods (Wright et al., 1998), such a difference seems to be less pervasive in the college population. Indeed, several studies have noted minimal drug use differences between web and mail methods (Bongers et al., 1998; Miller et al., 2002). The most notable of these studies is based on a survey of

7,000 undergraduates attending a large Midwestern university in 2001 (McCabe et al., 2002). Students were randomly assigned to either the web or mail mode. The results showed that, compared to the mail mode, the web sample more closely matched the target population and also had a higher response rate. Moreover, after controlling for design differences, there were no significant mode differences in data quality or in rates of alcohol and other drug use.

In sum, the use of web-based methods comes with its own unique set of difficulties for substance use researchers, but it is likely that such methods will become more commonly employed and developed and improved.

4. HIGH RISK AND HIDDEN POPULATION SURVEYS

We have noted that a serious limitation of general population surveys is that the “hard-to-reach”, “hidden” and “high-risk” populations are often excluded either by design, such as being excluded from the target population (e.g., students not enrolled in school, individuals without a permanent home), by respondent loss (e.g., absent students, non-participating respondents), or by the unreported drug use of respondents. In the drug use field this includes populations such as the homeless, street youth, prison detainees, HIV positive individuals and even mainstream drug-using populations (e.g., white-collar executives). Indeed, the stigmatization of some drug-using populations makes them difficult to list, locate and interview when approached by unknown researchers (Lambert, 1990).

Consequently, in order to gain access to such populations, it is often necessary to employ non-probability methods such as convenience or judgment samples. Indeed, such studies have made important contributions to the drug use field historically (Becker, 1953; Goode, 1970; Lindesmith, 1947), and more currently as well (Birnacki, 1986; Murphy et al., 1989; Williams, 1989; Zinberg, 1984).

Clearly, the major weakness of non-probability based convenience samples is their inability to generalize to the population. Yet, although there have been technical means to draw probability samples from hidden populations (e.g., Goodman, 1961; Sudman et al., 1988), there are several reasons for the use of convenience samples (Faugier and Sargeant, 1997). Indeed, many contend that traditional random sampling methods are not viable for many drug-using populations (Griffiths et al., 1993; Hendricks and Blanken, 1992; Wiebel, 1990).

Methodologically, random surveys generally miss the hidden groups that typically have higher rates of drug use, and the standardized interview methods are not conducive to the flexibility and extensiveness of data collection typically conducted in convenience samples. Practically, random surveys require extensive resources. As well, they do not have the same capacity as convenience methods to encourage drug users to cooperate (Griffiths et al., 1993), and it is difficult to accumulate large numbers of deviant drug users.

In the drug use field, non-random samples include a wide array of strategies, the most common of which have been link-tracing studies, such as snowball sampling (Adler, 1990; Biernacki, 1986; French, 1993; Inciardi, 1993), and respondent-driven sampling (Heckathorn, 1997), and privileged access interviews (Griffiths et al., 1993). It is comforting to some that comparisons between convenience and representative samples have found many similarities (Erickson et al., 1994; Topp et al., 2004); yet, we must recognize that the absence of randomization means that we cannot be sure to what extent samples differ with respect to unmeasured variables.

A more critical issue to be considered by researchers is whether the substantive nature of the study requires generalization to the population, and hence a random sample. If the research objective is to study local social processes related to drug use, there is no need for a random sample. Indeed, there is a growing movement that probability and non-probability methods be viewed as complementary since the weaknesses of one are the strengths of the other (Faugier and Sargeant, 1997).

5. NEEDS AND CHALLENGES

The current state of data collection methods used in drug-use surveys has been discussed above. The needs and challenges facing drug use researchers require additional attention. More work needs to be done in developing and validating drug-use harm screeners similar to the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al., 2001). Many of the large-scale surveys incorporate DSM (American Psychological Association, 1994) symptoms and perhaps diagnoses, but many drug users experience drug-related harms, and cause harms to others, that are not captured by DSM criteria. Moreover, it is important to assess the magnitude of harm before it develops into a clinical disorder. Fortunately, there is some work developing in this area (Adamson and Sellman, 2003), one example of which is a screener being developed by the World Health Organization (WHO ASSIST Working Group, 2002).

We need more research assessing trends in the relationship between the self-reporting of drug use and societal stigma. We tend to hold the assumption that, although our estimates of drug use are downwardly biased, that our estimates of trends over time are unbiased—which should be the case if the level of under-reporting remains constant. Yet, there is little empirical work to substantiate this assumption and the impact of changes of public perceptions about drug use.

There are also perennial challenges facing drug use researchers. The key challenge is to maintain, and where possible increase, response rates. Although we know that non-respondents often differ from respondents, we still lack a complete understanding regarding their impact on drug-use estimates, and to what extent we could employ such knowledge to increase participation.

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