A Comparison of Alternative Approaches for Screening for Substance Abuse in Two Community Mental Health Services

Brian Rush

Natasha Zaslavska

and

Scott Veldhuizen

Centre for Addiction and Mental Health
Health Systems Research & Consulting Unit

August 2005

Table of Contents

Acknowledgements

We would like to thank Karen O'Connor, Sonja Grebvski and the other managers and staff at Community Mental Health Association, Toronto Branch and the Mental Health and Addiction Services at the Windsor Regional Hospital Western Campus for their support in participant recruitment and project implementation. We would also like to thank the many consumers in these two programs that gave of their time to support this project.

Our thanks also go to Christine Bois, Knowledge Exchange Manager for Concurrent Disorders at CAMH for financial support for the project, helping establish the overall project direction; and for facilitating various knowledge exchange processes with key stakeholders. The interest and input from the CAMH regional system planners across the province is also much appreciated. Special thanks also go to Mark Erdeylan for support in overall project monitoring and liaison with the Windsor site, and to Susan Smithers for liaison support with the Toronto site.

Finally, we are especially grateful to Beth Powell and Cindy Smythe for their considerable assistance in editing earlier drafts of the report.

1.0 BACKGROUND

The high rate of co-occurrence of mental and substance use disorders has been known for over a decade within community samples (e.g., Reiger et al., 1990; Kessler et al., 1996), and among those seeking help from either addiction or mental health services (e.g., Brooner et al., 1997; Mueser et al., 1990; Hien et al., 1997; Ross et al., 1988). Although prevalence estimates differ widely based on varying methods, measures and settings, it is beyond question that having any substance use disorder implies a robust increase in the likelihood of having another mental disorder and vice versa. In the case of specific associations there is considerable evidence from different cultures and countries that drug dependence, among all the substance use disorders, holds the strongest association with other mental disorders (Farrell et al., 2001; Merikangas et al., 1996; Merikangas et al., 1998; Ross & Shirley, 1997; Ross et al., 1988). Distinct substances also have different patterns of comorbidity with mental disorders and, different mental disorders may be associated with certain patterns of substance use (Degenhardt et al., 2001; Russell et al., 1994). For example, there is an increased likelihood of substance use disorders among people with anxiety (Goldenberg et al., 1995; Deas-Nesmith et al., 1998) or mood disorders, either bipolar (Strakowski & DelBello, 2000), or depressive (Swendsen & Merikangas, 2000).The overlap in the population with severe and persistent mental disorders, typically defined as including schizophrenia and bipolar illness, is often estimated at 40-60% (RachBeisel et al., 1999; Cuffel, 1996) but has been shown to be as high as 75% in some studies (Ananth et al., 1989).

The outcome of mental health treatment and support for clients with concurrent substance use disorders is adversely affected, especially in the areas of community adjustment and quality of life (Ford et al., 1992; Drake et al., 1996). It has also been recognized for some time that people with co-occurring disorders have worse outcomes from treatment for substance abuse (McLellan et al., 1983; Rounsaville et al., 1982; 1986; Project Match Research Group, 1997; Weisner et al., 2003). Recent evidence suggests this may be more important for men compared to women, at least for outcomes associated with treatment for drugs other than alcohol (Compton et al., 2003). There is also a wide range of risk factors associated with co-occurring disorders including, but by no means limited to, homelessness (Drake et al., 1991); AIDS/HIV (Rosenberg et al., 2001); victimization (Mueser et al., 1998) and incarceration (Drake & Brunette, 1998). These risks, in turn, contribute significantly to the high utilization and cost of health and other services (Bartels et al., 1993; Curran et al., 2003).

Despite the high degree of overlap of mental and substance use disorders and the solid evidence concerning the impact on a range of health outcomes there is considerable evidence that mental health and addiction service providers consistently underdetect the co-morbidity and therefore fail to

take it into account in their treatment and support plans (e.g., Ananth et al., 1989; Barnaby et al., 2003). Such findings have spurred the interest in identifying, and widely disseminating, empirically supported treatments and best practice guidelines in order to increase identification rates, improve outcomes, and reduce associated consequences and costs to individuals, families and society as a whole (e.g., Ries, 1994; Health Canada, 2001; SAMHSA, 2002; Center for Substance Abuse Treatment, 2005).

Given the impact on health-related outcomes and costs, a consistent recommendation in best practice documents is the need for better processes for identifying concurrent disorders among those people already in contact with the mental health or substance abuse treatment services. An important distinction is made between *screening* (identifying possible cases) and *assessment* (confirming the co-morbidity for purposes of treatment and support planning as well as outcome determination) (Rach Beisel et al., 1999; Center for Substance Abuse Treatment, 2005). In the Health Canada best practice report (Health Canada, 2001) the recommendation was put forth for universal screening of mental disorders in substance abuse services and, conversely, universal screening for substance use disorders in mental health services. The report also went further and recommended that a wider variety of screening procedures be validated and made available for potential application depending, for example, on the nature of the service delivery setting and the time and resources available for screening.

The general function of a screening tool is to raise red flags for more detailed assessment and treatment/support planning. Thus, screening can be viewed as the beginning stage of the assessment process (Carey, 1997). More technically speaking, if a screening tool is to be a good diagnostic aid it must be high in sensitivity (i.e. a “positive” case is likely to be “positive” if followed up with a more comprehensive (and costly) assessment). In addition, a screening tool should also be high in negative predictive value (i.e., a “negative” case is likely “negative” and need not be assessed more closely (Zimmerman, 2001a). Thus, when screening for substance use disorders the goal is to determine “probable” substance use disorder, and therefore the need for more comprehensive follow-up assessment. This assessment would cover, for example, quantity and frequency of alcohol and specific drug use; confirmation of abuse versus dependence diagnosis; high risk situations and relapse potential; motivation for change, drinking and drug use social networks, and nature and extent of past attempts to reduce consumption or be abstinent. Further, since semi-structured psychiatric assessments have been shown to be particularly poor at identifying the co-morbid conditions (Zimmerman, 2003), a screening tool should assist in identifying both the principal diagnosis (i.e., related to the presenting complaint) as well as additional co-morbidity (Zimmerman &

Mattia, 2000; Zimmerman & Sheeran, 2003). For substance abuse there is, therefore, the need for the screening tool to cover alcohol as well as other drugs of abuse.

Some screening tools are “dimensional” as opposed to “diagnostic” in nature. The former are scaled measures of, for example, quantity and frequency of alcohol/drug consumption, problem areas, functional status, mental wellbeing, service use history. Diagnostic measures on the other hand map onto the categorical criteria of DSM –IV (American Psychiatric Association, 1994). There is a growing consensus that screening for mental disorders is best accomplished by diagnostic-based tools as this will maximize the efficiency of subsequent assessment. This issue has not been explored with respect to screening for substance use disorders specifically, and there is a rich tradition of dimensional assessment of substance use, consequences and dependence.

With respect to the screening for substance abuse in mental health service delivery settings there is a strong list of candidate screening tools in terms of reliability, validity and practicality for universal screening. Examples include the AUDIT (Saunders et al., 1993); the CAGE and CAGE-AID (Mayfield et al., 1974; Brown, 1992); MAST (Selzer, 1971); DAST (Skinner, 1982); the DALI (Rosenberg et al., 1998); and brief case manager ratings (Barry et al., 1995). While all of these options have been tested individually within mental health treatment populations they differ widely in terms of the nature and scope of information collected, staff time and expertise required and potential usefulness of the information for subsequent assessment and treatment planning. Also, the Centre for Addiction and Mental Health’s (CAMH) has developed a Concurrent Disorder Screener which can function as much as a screening tool for substance use disorders as well as mental disorders, since it covers almost the full spectrum of DSM-IV Axis I disorders (Negrete et al., 2004). However, the CD Screener has been evaluated only in the context of screening for mental disorders. The CAMH Concurrent Disorder screener is also of particular interest since it is computer-administered. This feature brings both potential advantages and disadvantages to widespread uptake and application (e.g., rapid, accurate scoring and feedback to both therapist and client *versus* computer hardware needs and training required to increase comfort level with the computer). Overall, there is a lack of field studies comparing the performance of the various options for screening for substance abuse in mental health settings, including exploration of therapist and client attitudes toward, and satisfaction with, the various alternatives.

1.1 Research Objectives

The objectives of this project were to:

- evaluate the performance of various approaches to screening for substance use disorders among consumers involved with community mental health programs;

- assess consumer attitudes toward, and satisfaction with, the various alternatives for screening which differ in terms of length of time, directness of the questions and mode of administration (paper versus computer assisted);

- assess staff attitudes, satisfaction and confidence using the various screening alternatives and the perceived value of the resulting information for more detailed subsequent assessment and treatment planning.

2.0 METHODOLOGY:

2.1 Study Sites:

Two community mental health services in Ontario agreed to participate in the project – one located in a large urban setting (Toronto) and another in a smaller urban setting (Windsor). Each site agreed to provide a "lead hand" for the project and this person was the primary link between the site and the research team. Below is a brief description of each site.

Toronto site:

The participating service in Toronto was the Toronto Branch of the Canadian Mental Health Association. Specific programs for the recruitment of consumers to the project were the three Assertive Community Treatment (ACT) teams – one in North York and two in Scarborough. The fourth one was a Case Management program.

The ACT teams operate to provide rehabilitation, treatment and support services needed by people with severe and persistent mental illness in order to live in the community. The teams consist of social workers, occupational therapists, psychiatrists, employment specialists, addiction specialists, peer support workers and case managers. Team members bring services to consumers in their home and communities and assist them to identify their needs, establish goals and work toward them. Service is available 24 hours a day, seven days a week. Two of the ACT teams have been in operation for three years and the third for over 10 years. The Case Management Program has been in operation for approximately eight years. Case management support focuses primarily on providing rehabilitation and support and works with both formal and informal supports to coordinate services with the client. Services are provided in the client's home and communities. Some of the Case Management resources are linked directly to court support programs and hospital inpatient units.

Referrals to both programs tend to come from Schedule I hospitals, the courts and the Centre for Addiction and Mental Health. Consumers undergo an intake and assessment process that assesses their level of functioning, substance use, physical health issues, involvement in the justice system, history of mental illness, treatment and supports. ACT assessments tend to be more in depth given their focus on serving the most seriously mentally ill. Diagnoses typically include schizophrenia and bi-polar affective disorder. Service use for ACT for the year prior to the study period was 225 clients. Case management served roughly 500 clients. Approximately 6-9 new consumers join the ACT program each month and 10 clients on average for community support. The active caseload for the three ACT teams is about 210 clients with an average (mean) tenure of 3-4 years. The caseload for case management is 450 clients with an average length of service of 2-3 years.

Windsor site:

The participating service in Windsor is part of Specialized Programs at the Mental Health and Addictions Service at the Windsor Regional Hospital Western Campus. Specialized Programs include Remedial Measures, Addictions Assessment and Referral, Dual Diagnosis, Mood and Anxiety and Concurrent Disorders. Only the latter two programs were involved in the research project.

The Concurrent Disorders Treatment Program (CDTP) started off as a substance abuse program and began to focus more exclusively on clients with both addictions and mental health problems in 1996-97. In 2001 it officially changed its name to CDTP. Referrals come from hospitals, psychiatrists/physicians, addiction assessment services, and community mental health agencies. There are some direct referrals to the CDTP program whereas other consumers appropriate for the program are identified through the intake and assessment process for the overall Mental Health and Addictions Service, or other sub-programs such as Mood and Anxiety or Addictions Assessment and Referral. Consumers must be 16 years of age and hold a valid Ontario health card. There is an integrated approach to treatment in the CDTP, which is defined as simultaneous treatment of all disorders by trained clinicians who are competent to treat both mental health and substance abuse issues. Treatment is through a consumer-centred approach and a treatment plan is developed with the consumer that identifies their needs and the complexities of the illness. In the past not all consumers have benefited from a full psychiatric assessment. Recently a local psychiatrist has begun offering case consultation and works within the program two times a month. Other staff include two therapists (MSW and BSW) and a .3 FTE Manager. CDTP offers three levels of service - Individual Therapy, Group Therapy and an optional Aftercare component. Group treatment is a four-month, 32 session program with a certificate of completion at the end. The group meets for two half

days per week plus individual counseling. In 2001-02 there were 105 admissions to CDTP and 91 discharges. In 2002-03 there were 65 admissions. At the time the research project began there were 21 clients in the program and approximately 4 new consumers admitted to the program each month.

The Mood and Anxiety Program offers outpatient psychotherapy for individuals 16 and older who are suffering from a Mood and/or Anxiety Disorder. Treatment services include intake/assessment and individual therapy. An in person interview is scheduled with a registered and certified staff (1 psychologist, 1 MSW and 2 BSW's) and this assessment determines appropriateness for the services of this program. During the assessment individuals can expect to discuss their background, employment, family, health and issues of concern. After case consultation, if appropriate for services the individual will be assigned a therapist. There were 189 admissions in 2001-2 and 245 discharges. When the research project commenced there were 170 active clients and 21 new admissions per month.

2.2 Participant Selection:

The study design called for recruitment of up to 50 consumers from each of the two community mental health services over a two to three month period. The data collection phase of the study started in April 2004 at both sites. The Toronto site finished its data collection by the middle of July 2004 (three and a half months). The Windsor site was only able to recruit 22 consumers and further attempts were terminated at the end of November 2004 (eight months).

The sampling procedures were organized around a goal to recruit 20 consumers who were new to their program (selected via consecutive admissions) and 30 consumers from the current caseload from each service (selected randomly, based on the existing consumer roster). In the Toronto site, the sample was stratified by gender and the length of involvement in the program, with a benchmark of three years. It was felt that long term familiarity with a consumer could impact the performance of some of the screening procedures. The Windsor sample was only stratified by gender. All consumers were compensated for their time with $25.00 and transportation money, as well as provided with light lunch or refreshments when they came in for the interview.

Staff members involved in consumer screenings were asked to provide feedback on their experience of asking direct questions about alcohol and drug use, interpreting consumer responses to the various screening procedures, and providing feedback to the consumer.

2.3 Informed Consent and Confidentiality:

A project Research Assistant described the project to the client, explained risks and benefits using the consent forms and asked the consumer about her/his willingness to participate both in the screening and follow-up interviews.[1]

Consumer confidentiality was achieved by the use of 3-digit numbers as identifiers on all questionnaires and computer-based tests used in the study. For the follow-up telephone interview the consumer's first name was used, or an alias provided by the consumer. The consumer's telephone number was put in pencil on each telephone follow-up interview guide and erased after either completion of the interview, or the consumer's refusal of the interview.

2.4 The Screening Tools

The goal of the data collection protocol was to compare approaches to screening for substance use disorders that differed in terms of administration time and approach, and demands on both staff and consumers. These alternatives are:

Direct face-to-face questions: This screening process involved seven simple and direct questions incorporated into face-to-face interview (e.g., intake/assessment or routine case management contact). Four of the items are drawn from the CAGE-AID (Brown, 1992) and these are:

- Have you ever thought you ought to cut down on your drinking or drug use?
- Have people annoyed you by criticizing your drinking or drug use?
- Have you felt bad or guilty about your drinking or drug use?
- Have you ever had a drink or used drugs first thing in the morning to steady your nerves or get rid of a hangover or to get the day started?

The CAGE-AID differs from the original set of CAGE items (Mayfield et al., 1974) only insofar as the questions have been slightly modified to cover both alcohol and other drugs. This dual coverage is an important criteria for a substance abuse screening tool. A positive response to <u>two or more</u> of these four items has been established as a cut-off for a potential substance use disorder (abuse or dependence). The CAGE has been validated with a sample of people with severe and persistent mental illness and in the initial studies found to have reasonably high sensitivity and specificity (Teitelbaum & Carey, 1996). However, Wolford et al., (1999) compared the performance of the CAGE to several screening measures and, although it outperformed clinical variables, laboratory

[1] Information and consent forms to participate are available from the first author.

tests and collateral reports, the sensitivity and specificity were more modest than found in earlier research (60.9% and 69.5% respectively). Importantly, the CAGE and CAGE-AID collect information related to *lifetime* (i.e., "ever experienced") rather than *current* substance use problems.

The remaining three items incorporated into the consumer interview were recommended in the Health Canada best practice report on the basis of discussion and consensus of the expert advisory panel:

- Have you ever had any problems related to your use of alcohol or other drugs?
- Has a relative, friend, doctor or other health worker been concerned about your drinking or other drug use or suggested cutting down?
- Have you ever said to another person " No, I don't have (an alcohol or drug) problem, when around the same time, you questioned yourself and FELT, "maybe I do have a problem?

Staff rating*:* In mental health settings that maintain contact with consumers for several weeks, months or even years, case managers can ask themselves a few questions about the consumer to screen for a substance use disorder. This can also been done at the point of initial intake/assessment for a new consumer although the information available to make this rating is more limited (e.g., previous diagnosis of a substance use disorder, treatment history noted in the referring information, appearance, alcohol on the breath, history of suicide or violence, other risk factors).

A staff rating of the probability of an alcohol or drug problem is a simplified version of a more comprehensive longitudinal assessment that brings to bear all the existing information and observations relevant to substance abuse; the so-called Longitudinal Expert All Data Procedure (LEAD) (Drake et al., 1990; Kranzler et al., 1994). It is also similar to the case manager ratings underlying the Alcohol Use Scale (AUS) and the Drug Use Scale (DUS) (Drake et al., 1996) which, again, are more comprehensive assessment tools that bring to bear all available information related to substance use disorders. Since our focus was on less complex screening measures we employed the one question found by Barry et al., (1995) to be the best predictor of a consumer's meeting the DSM-IV criteria for a substance use disorder:

- Do you think the client has ever had a drinking or other drug problem? Would you say definitely, probably or not at all?

We repeated this rating to ask about the probability of a current as opposed to "lifetime" problem.

The Dartmouth Assessment of Lifestyle Instrument (DALI): The DALI is a comprehensive, dimensional measure of substance abuse developed specifically for screening for substance abuse in people with severe and persistent mental illness (Rosenberg et al., 1998). It is comprised of 18 items that are interviewer-administered. The DALI focuses on alcohol, cannabis and cocaine use and related problems as these were considered by the developers to be the most common drugs of abuse among people with severe and persistent mental illness. The items were drawn from several existing tools. In the original validation study the DALI outperformed several other screening tools, including for example, the CAGE and the MAST. Cut-off scores are reported for both alcohol and drugs. Time frames vary for particular items but most of the alcohol and drug items are based on the past six-months. Although some alcohol and drug items provide for separate responses for longer time frames (e.g., "less than five years ago " and more than five years ago" for last period of voluntary absence). The overall summary score on the DALI is intended to yield a picture of substance abuse problems in the past six months.

Substance Abuse and Dependence Scale (SADS): The Substance Abuse and Dependence Scale (SADS), a DSM-IV based, clinician-administered tool that is part of a comprehensive assessment package for evaluating nature and severity of substance use/abuse and related problems. The overall package is referred to as the GAIN (Dennis, 1999; Dennis et al., 2002).. The SADS is a set of 16 items related to substance *dependence* (tolerance, withdrawal, inability to control use) and *abuse* (consequences of use) that are mapped onto DSM-IV. Like the CAGE-AID and the DALI it covers both alcohol and drug–related consequences and behaviours. It is administered by a clinician using response cards to facilitate answering the questions. Scoring is based on the DSM-IV criteria for substance abuse or substance dependence. Responses to the SADS items are based on different time frames allowing for analysis of prevalence rates for substance abuse and dependence over the past month, past year or greater than one year.

CAMH Concurrent Disorder Screener: The CD Screener includes 18 separate modules, 12 of which screen for substance use disorders, and cover various drug categories such as alcohol, cannabis, cocaine, opiods, etc. (Negrete et al., 2004). The individual items, repeated in each module, map onto the abuse and dependence criteria as defined in DSM-IV (American Psychiatric Association, 1994). When the DSM-IV threshold is met for the disorder being screened, the person is considered "positive" and the computer program skips to the next problem domain. If all answers are "no", there are 22 questions in total. While we are particularly interested in the items concerning substance abuse, the study participants completed the full CD Screener since, in practice it would probably be used in its entirety as a full screen for co-morbid mental disorders. Thus, it is important

to evaluate the substance abuse screening section in the full context in which the instrument is likely to be used. Scoring is done automatically by the computer and is based on the DSM-IV criteria to yield substance abuse or substance dependence. The time frame for each item is “lifetime”. An additional item in each module asks if any of the endorsed symptoms have been experienced in the past month. However, this does not mean the criteria for abuse or dependence for that drug category have been met in the past month.

The CD Screener is currently included in TREAT, an electronic roster of assessment and outcome measures developed by CAMH in partnership with HINext, a private sector health information management and technology company. TREAT requires a Pentium compute, standard Web browser and high speed Internet access both of which were within the present computer capability of the two study sites. The CD Screener is accessed via the Web browser and the results stored on a remote hard disk in a secured database accessible only by the research team via user identification and password. Anonymized responses to the CD Screener were provided to the research team by the TREAT database administrator.

The CAMH Screener was developed for application in substance abuse treatment settings and, in such settings, considerable information would also be available on drug use patterns and related problem areas. The entry process of the alcohol and other drug modules of the Screener, therefore, require pre-determination of which substances are “problem substances” (typically entered by the therapist) and the client then proceeds with the self-administered items that map onto DSM-IV criteria of abuse and dependence. In our application of the Screener in this project the client answered a Drug History Questionnaire in order to first determine which modules of the Screener were relevant (i.e., if the person reported any use of alcohol, cannabis, and cocaine, these would the three substance abuse modules completed.

Psychiatric Diagnostic Screening Questionnaire (PDSQ): The “gold standard” for comparison of the above alternatives was the substance use disorder section of the PDSQ, a self-report screening and diagnostic aid that has been validated in outpatient mental health settings. The PDSQ is a copy written instrument developed by Mark Zimmerman and colleagues (Zimmerman & Mattia, 2001a, 2001b) and distributed on a pay-per-use basis by Western Psychological Services. The PDSQ covers almost all AXIS I mental disorders within DSM-IV and has undergone extensive test development procedures including readability, understandability, reliability and validity testing. There are six items covering alcohol abuse/dependence and another six items covering drug abuse/dependence. These two subscales performed well in a sample of 994 psychiatric outpatients

(e.g., test-retest reliabilities were .89 and .93; Chronbach's alpha of .87 and .89; correlation with similar measures comprising a validity scale of .61 and .53) (Zimmerman & Mattia, 2001b). In a separate validation study with 630 psychiatric outpatients a cutoff score of one on either of the alcohol or drug scales came closest to achieving 90% sensitivity. This cut-off was recommended for case identification in clinical practice (Zimmerman & Mattia, 2001a). Scores beyond the cut-off point are considered indicative of probable substance use disorder. The time frame for answers to the two alcohol and drug scales is the past six months.

Participants completed the full PDSQ (111 items) so as to capture the information on alcohol and drug problems in the context of the overall screening tool in which the relevant scales were validated.

Other Data Collection Tools and Forms: In addition to the above formal instruments we also captured in the data collection process the consumers' lifetime and current diagnoses as established by a qualified mental health professional and recorded either in the person's file or the forwarded referral information. All information concerning substance use that had been recorded in the file or referral information was also abstracted in order to establish a base rate of case identification prior to instituting any of the experimental screening procedures.

Finally, we asked about the use of alcohol and drugs in the past 24 hours and, in the event of clear signs of intoxication at the time of the interview, re-scheduled the appointment for completion of the research instruments.

2.5 Data Collection Procedures:

The following summarizes the three components to the data collection protocol and the sequence in which they were implemented.

PART A: Client Characteristics

Part A of the study data collection protocol recorded age, gender, lifetime and current diagnoses, referral source, length of time in the program, and a space for comments where the therapist/case manager could summarize information concerning known substance use involvement (e.g., previous treatment, concerns noted by other mental health professionals in the team or outside). On this form (Form A) the therapist/case manager also made their personal rating of no/probable/certain substance use disorder using the staff rating item described above. It was essential that this rating be made before the consumer provided more self-report information to the therapist/case manager specifically for the research study. The data collection process was such that the consent was

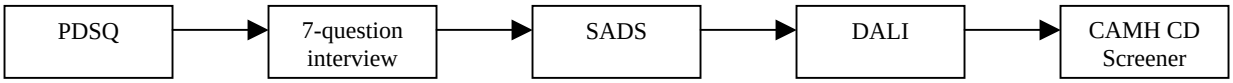
obtained and a follow-up appointment scheduled within a week. The staff rating was completed during this interval.

For current as opposed to new consumers, Form A was completed by the therapist/case manager after informed consent for participation in the research was obtained, and prior to the scheduling of a specific appointment to ask questions about substance use and consequences and complete the research instruments. Again, this ensured time between the person's enrolment in the study and the collection of non-routine information about substance use and consequences.

PART B: Screening Tools

This second part of the data collection protocol was administered during a scheduled appointment time. Consumers were asked during a face-to-face interview about their use of any drugs during the past 24 hours. If there were evidence of intoxication they were asked to return for another appointment**.** For 50% of the clients, the administration of the gold standard (the self-administered PDSQ) *preceded* the completion of all these measures, including the direct questions, and *followed* the completion of these measures for the remaining 50%. This ordering followed a pre-determined and randomized schedule and can be seen below.

PDSQ First:



PDSQ Last:

The research assistant supervised the administration of the PDSQ and CAMH CD Screener while the staff member administered all other tests in the form of an interview. In some cases the research assistant had to administer the PDSQ and CD Screener (read out the questions and mark answers for the consumer) because consumers were not able to do it on their own for various reasons. This included being afraid/inexperienced with the computer to having eye problems, shaking hands or having problems of concentration.

Approximately two hours were required for consumers to complete the data collection process over and above their normal psychosocial assessment during that same day. A staff person trained in the

data collection protocol was available to answer any questions about the instruments or otherwise support the person in their completion. Using Form A, the staff person also recorded the time for completion of each of the screening tools. Breaks were allowed if the person was getting tired and needed to take a rest. Refreshments were available at all times and light lunch was provided if the appointment bridged a routine lunch hour.

PART C: Consumers and Staff Attitudes and Satisfaction

Consumers: Part C of the data collection protocol for consumers involved a brief telephone interview by the Research Coordinator to assess their attitudes toward and satisfaction with the various alternatives for screening. This interview was conducted within 2-3 days of the screening interview.

Consumers were contacted at their home telephone number in the majority of cases. Overall, consumers were interested and willing to participate in a follow-up interview. Of the 72 on-site interviews, 63 telephone follow-ups were conducted; an 87% response rate. The nine consumers who did not participate could not be reached after leaving repeated telephone messages, or their phones did not answer or were answered by someone who could not speak English. The follow-up interview took approximately 10 minutes to complete.

Staff: This last component of Part C of the study protocol was the process and form used to assess staff attitudes, satisfaction and confidence using the various screening alternatives. This included only those therapists/case managers involved with consumers who had given permission for them to receive the test results. Questions were asked about the feedback they had obtained from the various screening tools and their value for subsequent assessment and treatment and support planning. This staff input was obtained by a confidential, semi-structured interview using an interview guide sent out ahead of time to assist the staff member in preparing for the interview.

At the Toronto site, all 21 staff members who were involved with the project consented to the follow-up interviews, however, only 17 could be interviewed because of busy schedules. No follow-up staff interviews were conducted in the Windsor site due to delays in their recruitment and screening of clients.

The staff questionnaire focused on their confidence in asking consumers questions about alcohol and drug use, how and when to ask those questions, their initial judgements and educated guesses about consumer substance use, barriers existing in the organization to introducing such a practice

into a routine, and methods of asking questions. On average, the staff follow-up interview took about 20 minutes.

2.6 Challenges to data collection

As mentioned above, the major challenges to timely data collection were delays at the Windsor site. Reasons given to the research team included high staff turnover and scheduled vacations during the summer months, consumers' no show for scheduled appointments, and difficulty reaching consumers for interviews.

During the data collection process some problems were also experienced with the administration of the computerized TREAT system. In three cases in Windsor TREAT was down for maintenance at the time of the interview. In one additional case in Windsor the CD Screener was not administered because the site Research Assistant failed to follow the right procedure. For 22 other cases where the CD screener was not administered, TREAT testing was not applicable because these consumers did not report using any drugs for the past 12 months. Out of these 22 cases, 15 were in Toronto, 7 in Windsor. The CD Screener was fully answered by 51 consumers (37 in Toronto, 14 in Windsor).

2.7 Analysis procedures

All quantitative data were analyzed using SPSS Version 12**.** Frequency distributions were prepared for all client demographic and diagnostic data as well as "positive" and "negative" cases based on established cut-offs for each of the screening tools. These distributions of "caseness" according to different tools were then used to calculate standard test performance statistics such as sensitivity, specificity and predictive value. Open-ended questions and comments were examined qualitatively for themes.

3.0 RESULTS

3.1 Consumer Profile

Table 1 illustrates characteristics of the consumers who participated in the study. Large site differences in current psychiatric diagnoses of consumers reflected the differing mandates of the programs involved in the two sites (e.g. Toronto – 61.5% Schizophrenia or other Psychotic Disorders; Windsor - 72% Mood Disorder. No doubt these site differences in diagnoses also underlie the gender differences by site (more males in Toronto); the varying age of male and female consumers in each site (younger males in Toronto); and the average length of involvement in the program which also varied by site (longer in Toronto). On average, almost two-thirds of the consumers were existing (i.e., current) program participants (63.5%) and this proportion didn't vary substantially by site.

Similarly, the number of previous admissions to the program did not vary substantively by site with about one-third having had one previous admission.

Table 1. Characteristics of Study Sample across Sites

	Toronto N= 52	Windsor N=25	Total N=77
Gender (%, N)			
Male	53.8% (28)	34.8% (8)	48.0% (36)
Female	46.2% (24)	65.2% (15)	52.0% (39)
Age (Average # of years and SD)			
Male	37.3 (SD=9.7)	52.0 (SD=10.1)	40.7 (SD=11.5)
Female	46.1 (SD=12.4)	38.8 (SD=14.0)	43.3 (SD=13.3)
Site total	41.4 (SD=11.8)	43.4 (SD=14.0)	42.0 (SD=12.5)
Admission Status (%, N)			
New	39.2% (20)	30.4% (7)	36.5% (27)
Current	60.8% (31)	69.6% (16)	63.5% (47)
Previous Admissions to the Program (%, N)			
0	61.5% (32)	64% (16)	62.3% (48)
1	36.5% (19)	28% (7)	33.8% (26)
2	0 % (0)	4% (1)	1.3% (1)
Unknown	2 % (1)	4% (1)	2.6% (2)
Length of Involvement in the Program (Average # weeks and SD)			
Male	66.4 (93.6)	23.1 (18.5)	57.5 (85.3)
Female	69.0 (90.4)	45.3 (38.6)	59.9 (75.1)
Site Total	67.6 (91.2)	38.3 (34.7)	58.7 (79.4)
Current Psychiatric Diagnosis (%, N)			
Mood Disorder (including Bipolar and Other MD)	32.7 %(17)	72 % (18)	45.5 % (35)
Anxiety Disorder	7.7 % (4)	28 % (7)	14.3 % (11)
Schizophrenia/Other Psychotic Disorder	61.5 % (32)	4 % (1)	42.9 % (33)
Personality Disorder	3.8 % (2)	8 % (2)	5.2 % (4)
Developmental Disability	1.9 % (1)	0 % (0)	1.3 % (1)
Substance Use Disorder	7.7 % (4)	0 % (0)	5.2 % (4)
Other	17.3 % (9)	20 % (5)	18.2 % (14)

Table 2 shows the recorded prevalence of substance use disorders as well as previous treatment for these disorders by site. While 20% of consumers, across both sites combined, reported having a previous diagnosis, a much smaller percentage had a current diagnosis documented in the files (5.2%). Also, in contrast to the 20% with a previous diagnosis, only 10.5% of the total sample had received previous treatment for a substance use disorder. Considerable site variation is also evident, for example, 25.5% (13 individuals) of the Toronto participants had a previous diagnosis of substance use disorder and 11.5% had been in treatment. This compared to 8% (2 individuals) with a diagnosis in the Windsor site, all of whom had been in treatment.

Table 2. Diagnosis and Previous Treatment of Substance Abuse/Dependence across Sites.

	Toronto N= 52	Windsor N=25	Total N=77
Previous (Lifetime) Diagnosis of Substance Use Disorder (%, N)			
Yes	25.5 % (13)	8.0% (2)	20.0% (15)
No	55 % (28)	92 % (22)	66.7 % (50)
Not sure	19.5 % (10)	0% (0)	13.3 % (10)
Current Diagnosis of Substance Use Disorder (%, N)			
Yes	7.7 % (4)	0 % (0)	5.2 % (4)
No	92.3% (48)	96 % (24)	93.5 % (72)
Not sure	0 % (0)	4 % (1)	1.3 % (1)
Previous Treatment for Substance Use Disorder (%, N)			
Yes	11.5 % (6)	8 % (2)	10.5 % (8)
No	71.2 % (37)	92 % (22)	77.6% (59)
Not sure	17.3 % (9)	0 % (0)	11.8 % (9)

3.2 Documented Concerns about Substance Abuse

Of the 77 consumers in the study, there were 25 notes on some form of substance use documented in their files; five in Windsor and 20 in Toronto. Some of the notes reported potentially innocuous use of alcohol, for example “used to drink beer when had money”, while other notes referred more clearly to evidence of substance abuse or dependence; for example:

- “the client drinks daily”
- “addiction to heroin and cocaine”
- “addiction is on and off – he gets clean for a while and then gets addicted again”.

3.3 Prevalence of substance abuse according to different measures

Focusing first on the variation in prevalence rates, we see the lowest identification rates were obtained for the DALI (5%) and up to 40% for the CD Screener, with a considerable spread among the other options. The difference in the two rates for the SADS depended on the sub-selection of abuse or dependence criteria (12% and 22% respectively). The 4-item CAGE-AID yielded a prevalence rate of 31% based on the usual cut-off of 2+ positive responses. Among the three individual items drawn from the Best Practice report, the prevalence rates were 16%, 24% and 16%,

the highest rate being derived from the question: *has anyone suggested that you should cut down on drinking or drug use*. This item parallels closely one of the four items in the CAGE-AID.

Table 3. Prevalence of Substance Abuse According to Different Measures and Across Sites

	Toronto N= 52	Windsor N=25	Total N=77
Current/6-month/12 month measures			
Staff rating prior to new measures (current)	17%	5%	14%
PDSQ *(past six-months)*	31%	27%	30%
DALI *(past six months)*	8%	0%	5%
Substance Abuse and Dependence Scale			
• past-12 months -dependence	13%	10%	12%
• past-12 months -dependence or abuse	25%	14%	22%
Lifetime measures			
Staff rating prior to new measures (lifetime)	46%	19%	38%
CAGE-AID	31%	32%	31%
Health Canada Best Practice Items			
• ever thought ought to cut down on drinking or drug use	19%	9%	16%
• anyone suggested cutting down on drinking or drug use	29%	14%	24%
• ever felt that have problem /w drinking while told someone you don't	17%	14%	16%
Substance Abuse and Dependence Scale			
• lifetime -dependence	40%	52%	44%
• lifetime- dependence or abuse	52%	71%	58%
Concurrent Disorder Screener	40%	57%	44%

In Table 3 we examine the prevalence of substance abuse in the study population as determined by the different measures employed in the project and organized according to those measures based on recent substance-related problems (current to 12 months) from those measures assessing problems on a lifetime basis. Based on the PDSQ, our gold standard, the six-month period prevalence was 30% for the sample as a whole with little variation across the two sites (Toronto, 31% and Windsor, 27%). Of the remaining measures in the "recent" category, the 12-month SADS (abuse and dependence combined) comes closest to the identification rate achieved with the PDSQ, although with this measure the prevalence rate was about twice as high in Toronto as compared to Windsor. The staff rating of current substance abuse problem approximates that of the 12-month SADS rating (dependence), suggesting that staff may be most sensitive to current problems among those with the most severe problems. Finally, in terms of the "recent' measures the DALI yielded the lowest rates (5% overall) and the largest site difference (8% compared to 0%).

In the lower part of Table 3 we examine the prevalence rates obtained by the "lifetime" measures. As one would expect these rates are substantively higher than those obtained with measures based on

a more recent time frame. For example the staff rating of lifetime problems was #8% for the whole sample, almost three times that of their rating of "recent" problems. The lifetime SADS rate increases to 58% for substance abuse and dependence combined and 44% based only on the dependence criteria. This compares to the 12-month SADS rates of 22% and 12%. The lifetime SADS also produced the highest rate of 71% in the Windsor sub-sample. The CD Screener also yields high rates of 44% overall, and 40% in the Toronto site and 57% in the Windsor site. The CAGE-AID (based on 2 positive answers to the four questions) produced a prevalence rate of 31% overall, and almost no site difference. Between 16% and 24% of study participants responded affirmatively to the individual Health Canada items the slightly lower rates no doubt reflecting the difference one obtains with single item versus multiple item measures.

3.4 Performance of the Screening Tools

While these prevalence rates and their comparison to the rate from the gold standard are of interest, the level of agreement and the direction of disagreement are more important for the assessment of performance of the various options for screening for substance abuse. By "direction of disagreement" we mean that a person positively identified on the gold standard (PDSQ) may be a negative on the comparison tool (i.e., a false negative), and vice versa, a person negative on the gold standard may be a positive on the comparison tool (i.e., a false positive).

Table 4 shows the distribution of false positives and false negatives and related summary statistics for each of the screening tools and the individual Best Practice screening items. In these summary statistics we are particularly interested in "sensitivity" (the ability of the screening option to correctly identify cases who are also screened positive on the PDSQ, a true positive). It is important to note that the sensitivity and specificity of any particular tests are conditional values that result from the investigators' choice of cut-off scores, and the balance sought between potentially over–identifying and under-identifying cases. We are also particularly interested in "negative predictive validity" (the ability of the screening option to rule out cases who are also negative on the PDSQ, a true negative). For screening tools, it is the negative predictive value that is particularly important as it assesses the ability of the screening tool to correctly determine that the person screened does not have the index condition being screened. Thus, a measure that performs well on this criterion purportedly saves resources by accurately identifying people who do not require additional follow up investigation. For example, in the original research, with the PDSQ, in its comparison to a detailed, structured, diagnostic interview for diagnosis (SCID), the alcohol and drug sub-scales of the PDSQ had NPV's of .98 and .99 respectively, based on a cut-off of one positive answer among the six items comprising each scale. We are also interested in the "efficiency" statistic as it represents a balance of positive

and negative predictive validity, namely the ability of the measure to correctly *rule in* positive cases and *rule out* negative cases.

In drawing these comparisons with the PDSQ we are also cognizant of the differing time frames underlying the various measures. We are assessing the level of agreement and the direction of disagreement of the various measures of "recent" and "lifetime" substance abuse problems with the six-month measure of substance abuse obtained via the PDSQ. Although from the outset we might expect that the various measures of "recent" problems will perform better than the various lifetime measures, this may not necessarily be the case if lifetime measures of substance abuse are themselves highly correlated with recent problems (as would be the case with any chronic health problem).

In Table 4 we again separate out the screening alternatives based on "recent" problems (top section of the table) from lifetime problems (bottom section). Among the "recent" measures the best performance is achieved with the 12-month SADS measure of dependence and abuse combined (62% sensitivity, 86% negative predictive value and 85% efficiency). This, however, is only a marginally acceptable level of sensitivity with 38% of cases positive on the PDSQ being missed with this measure of 12-month problems. The 12-month SADS measure based only on dependence does not perform very well, no doubt because of the more stringent dependence criteria when compared to the PDSQ which is aimed at identifying substance use disorders including both abuse and dependence. The poorest performer is the DALI with only 14% sensitivity. Also, the staff rating of current substance related problems does not do well when assessed against the PDSQ (43% sensitivity). The column labeled "false negatives" shows the high number of false negatives for the staff rating, the DALI and also the 12-month SADS.

Many of the "lifetime" measures perform better than the "recent' measures when contrasted with the PDSQ gold standard. In terms of sensitivity, the best measure is the lifetime SADS (dependence or abuse) with 90% sensitivity, followed closely by the staff rating of lifetime problems (86%). Both these alternatives do well in terms of negative predictive value (94% and 93% respectively, and the lifetime staff rating has an edge in terms of overall efficiency (82%) which also takes into account positive predictive value.

The other lifetime SADS measure (dependence criteria only), the CAGE-AID and the CD Screener all obtained sensitivity scores between 70% and 75%, and negative predictive values around 80% to 90%. Thus, they all performed moderately well. The individual Health Canada items by contrast did

not perform well in contrast to the other options (e.g., sensitivity values between 29% and 52%), again reflecting the challenge with screening tools based on single items.

In Tables 5 and 6 we extend our analysis to examine test performance across both “new” and current” clients, an important distinction since some screening approaches may make work well among current clients based on available information and past experience with the client, but not do particularly well for new clients where no relationship has yet been established. The first important observation to make when comparing Tables 5 and 6 is that the test results are substantially poorer for all measures for new versus the current clients, especially in terms of the sensitivity values. The only screening measure with a sensitivity value approaching an acceptable level is the 75% value obtained with the lifetime SADS (abuse or dependence), although the overall efficiency score is only 62%. In contrast, the same lifetime SADS measure does much better with current clients, achieving a perfect sensitivity score of 100%, a negative predictive value of 100% and an improved efficiency score of 69%.

For current clients the 12-months SADS also performs reasonable well and better than for the new and current clients combined (shown previously in Table 4). For the sub-group of current clients we obtained a sensitivity rating of 75% (compared to 62%) and a negative predictive value of 92% compared to 86%. For the lifetime measures the SADS measures did extremely well, as already mentioned, as well as the staff ratings (perfect sensitivity and negative predictive values and an overall efficiency rating of 87%. Both the CAGE- AID and the CD Screener also performed reasonably well with the current clients. The various Health Canada items also performed better with the current clients compared to the new clients but still fell far short of the performance of the other measures.

Table 4. Performance of the Various Screening Alternatives Against the PDSQ Gold Standard.

Measure	False positive	False negative	Agreement (Cohen's Kappa)	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Efficiency
Current/6-month/12 month measures								
Staff rating - current	1	12	0.49	0.43	0.98	0.90	0.81	82%
DALI (6- months)	1	18	0.16	0.14	0.98	0.75	0.74	74%
Substance Abuse and Dependence Scale								
• past-12 months -dependence	1	13	0.44	0.38	0.98	0.89	0.80	81%
• past-12 months -dependence or abuse	3	8	0.60	0.62	0.94	0.81	0.86	85%
Lifetime measures								
Staff rating - lifetime	10	3	0.61	0.86	0.81	0.64	0.93	82%
4-item CAGE-AID	8	6	0.55	0.71	0.85	0.65	0.88	81%
Health Canada Best Practice Items								
• ever thought ought to cut down on drinking or drug use	6	15	0.20	0.29	0.89	0.50	0.76	72%
• anyone suggested cutting down on drinking or drug use	7	10	0.41	0.52	0.87	0.61	0.82	77%
• ever felt that have problem /w drinking while told someone you don't	4	13	0.35	0.38	0.92	0.67	0.79	77%
SADS Lifetime: Dependence	16	5	0.39	0.76	0.69	0.50	0.88	71%
SADS Lifetime: Dependence or abuse	23	2	0.36	0.90	0.56	0.45	0.94	66%
CD Screener (Toronto only)	9	4	0.46	0.75	0.75	0.57	0.87	75%

Table 5. Performance of the Various Screening Alternatives Against the PDSQ Gold Standard: New Clients Only (n=26)

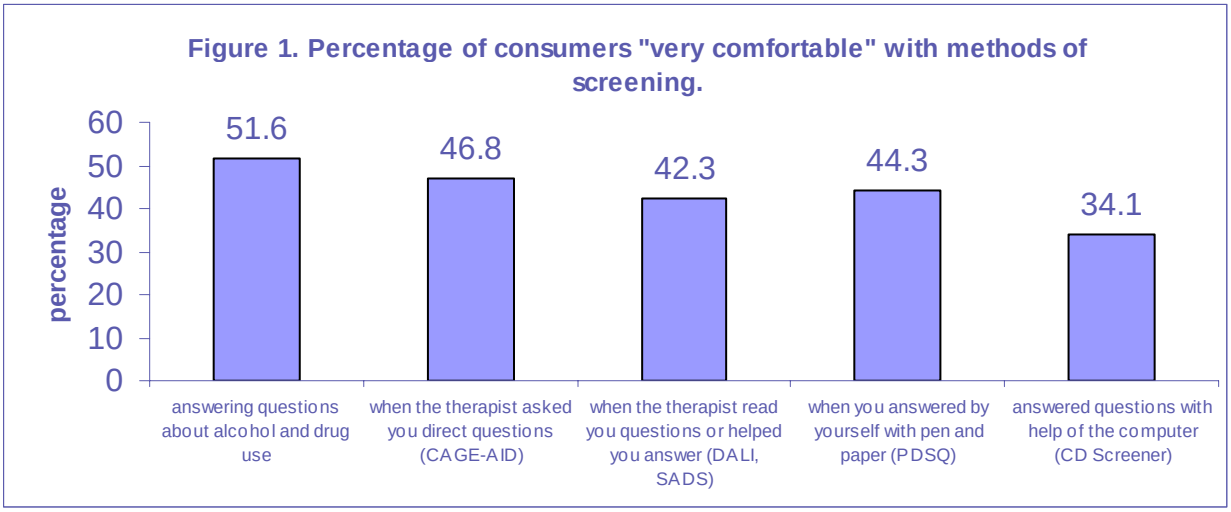
Measure	False positive	False negative	Agreement (Cohen's Kappa)	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Efficiency
Current/6-month/12 month measures								
Staff rating - current	1	6	0.23	0.25	0.94	0.67	0.73	72%
DALI (6- months)	1	8	0.06	0.11	0.94	0.50	0.67	65%
Substance Abuse and Dependence Scale								
• past-12 months -dependence	0	7	0.27	0.22	1.00	1.00	0.71	73%
• past-12 months -dependence or abuse	1	5	0.43	0.44	0.94	0.80	0.76	77%
Lifetime measures								
Staff rating - lifetime	3	4	0.38	0.56	0.81	0.63	0.76	72%
4-item CAGE-AID	3	3	0.49	0.67	0.82	0.67	0.82	77%
Health Canada Best Practice Items								
• ever thought ought to cut down on drinking or drug use	2	5	0.36	0.44	0.88	0.67	0.75	73%
• anyone suggested cutting down on drinking or drug use	2	6	0.24	0.33	0.88	0.60	0.71	69%
• ever felt that have problem /w drinking while told someone you don't	1	7	0.19	0.22	0.94	0.67	0.70	69%
SADS Lifetime: Dependence	7	4	0.13	0.56	0.59	0.42	0.71	58%
SADS Lifetime: Dependence or abuse	8	2	0.27	0.78	0.53	0.47	0.82	62%
CD Screener (Toronto only)	4	2	0.16	0.50	0.69	0.33	0.82	65%

Table 6. Performance of the Various Screening Alternatives Against the PDSQ Gold Standard: Current Clients Only (n=47)

Measure	False positive	False negative	Agreement (Cohen's Kappa)	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Efficiency
Current/6-month/12 month measures								
Staff rating - current	0	6	0.63	0.54	1.00	1.00	0.85	87%
DALI (6- months)	0	11	0.21	0.15	1.00	1.00	0.75	76%
Substance Abuse and Dependence Scale								
• past-12 months -dependence	1	6	0.54	0.50	0.97	0.86	0.84	84%
• past-12 months -dependence or abuse	2	3	**0.71**	0.75	0.94	0.82	0.92	89%
Lifetime measures								
Staff rating - lifetime	6	0	**0.72**	1.00	0.82	0.68	1.00	87%
4-item CAGE-AID	4	3	0.63	0.77	0.88	0.71	0.91	85%
Health Canada Best Practice Items								
• ever thought ought to cut down on drinking or drug use	3	10	0.17	0.23	0.91	0.50	0.75	72%
• anyone suggested cutting down on drinking or drug use	4	4	0.57	0.69	0.88	0.69	0.88	83%
• ever felt that have problem /w drinking while told someone you don't	2	6	0.53	0.54	0.94	0.78	0.84	83%
SADS Lifetime: Dependence	8	1	0.42	0.92	0.76	0.58	0.96	80%
SADS Lifetime: Dependence or abuse	14	0	0.57	1.00	0.58	0.46	1.00	69%
CD Screener (Toronto only)	4	2	0.58	0.80	0.81	0.67	0.89	81%

3.5 Consumer Feedback

Consumers were asked, in a feedback telephone interview, about their experiences with the various screening tools, their opinion about the administered tests and how truthful their answers were for different tests. In Figure 1 we first summarize consumers' reported comfort with the various methods of screening.



About half the consumers (51.6%) were "very comfortable" with answering questions about their alcohol and drug use. Data not shown in Figure 1 showed an additional 37.1% reported being "comfortable." The approach based on use of the computer (CD Screener) received the lowest ratings in terms of comfort level (34.1%, very comfortable). The other approaches fell between these two points on the continuum, for example, when the questions were answered by the consumer with pen and paper (PDSQ)-44.3% very comfortable).

Sixteen consumers added additional comments about the different approaches. Concerning their general experience with the screening process, positive comments were that the process was easier to participate in than they previously thought. They also expressed hope that it will help other people like themselves. Negative comments included concerns about the length of the overall research interview, cigarette cravings and the fact that some questions were predominantly closed-ended, without the possibility to give an elaborated answer (e.g., PDSQ). Others expressed concerns that the questions evoked memories of negative events that occurred in the past and were associated with substance use.

Comments concerning tests administered either with the "help of a therapist" (DALI, SADS) or "direct questions" (CAGE-AID and the best practice items) were similar to those above. Several consumers also remarked they were asked to repeat questions several times and were uneasy about this.

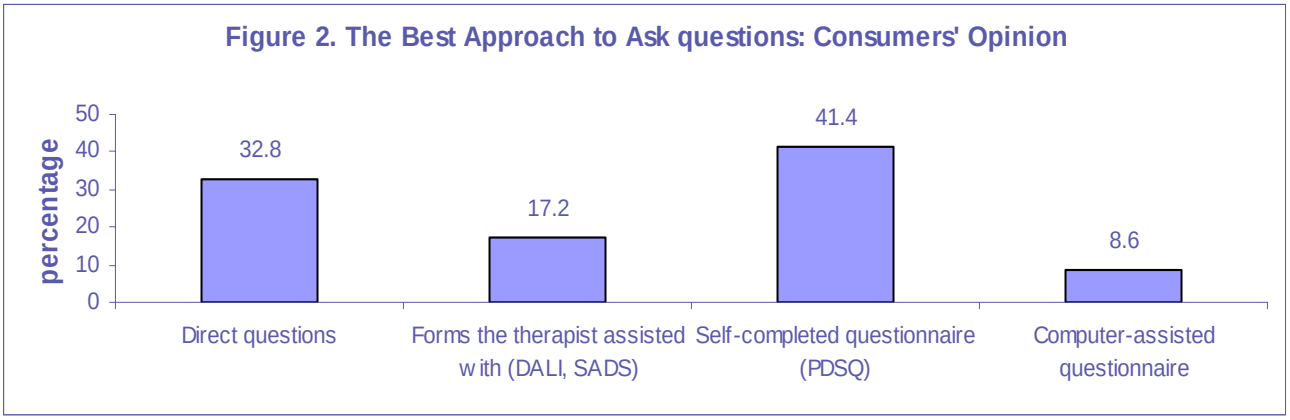
Positive comments were that consumers knew the therapist very well for a number of years and felt very comfortable answering all questions.

Comments concerning the self-completed paper and pencil option (PDSQ) were about the binary answer options which consumers found limiting, especially on the psychiatric part of the questionnaire. Consumers wanted to see “sometimes” or “maybe” options and the opportunity to add open-ended comments. Other concerns were that it was hard to remember what had happened as far back as six months ago. Positive comments were that the questionnaire was very thorough, easy and asked precise questions. Several consumers mentioned that for them it is better to answer written questions such as these because their mental illness causes lack of concentration during a conversation with a real person or difficulty in understanding oral questions.

The major concerns expressed about the computer-based CD Screener were feelings of incompetence with the computer and physical inability to use it. The most frequent comment recorded was “I don’t even know how to use a mouse. I needed help”. In some cases the Research Assistant had to read the computer questions aloud for the consumer and click the right answer on the computer screen. Inability to use computers were related to health issues such as eye problems/blurred vision, lack of concentration and shaking hands that hamper using a mouse. Clients also mentioned that they prefer conversation with a real person. On the positive side, one consumer said he preferred the computer to other tools because it was less personal and the questions are deeper.

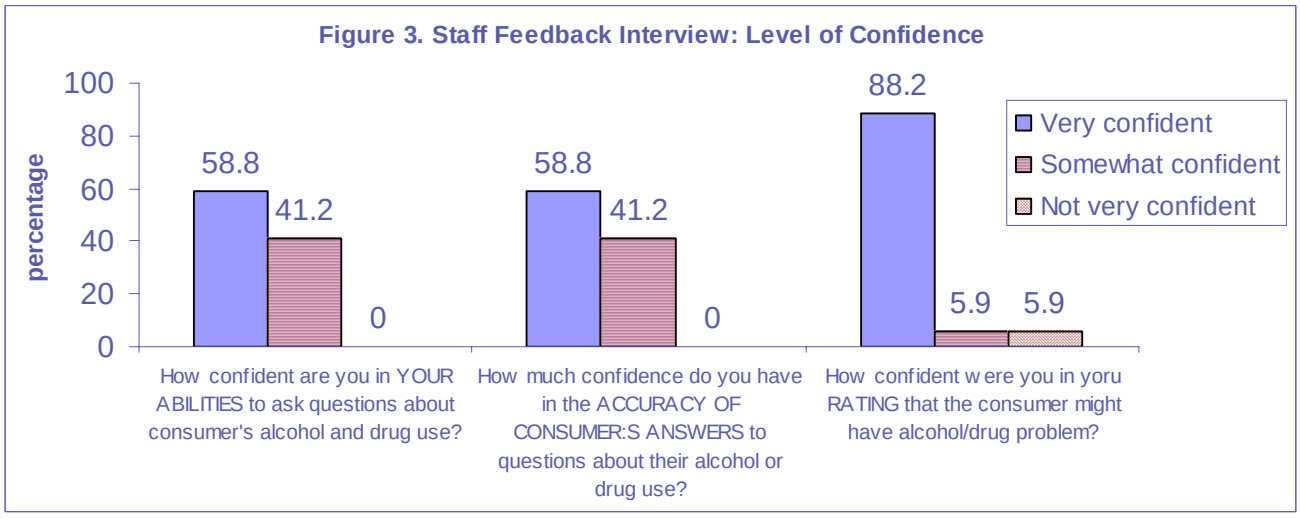
Finally, we received some comments that the mode of asking questions did not matter at all.

We also asked consumers’ opinions about the best way to ask them questions about substance use and abuse. Figure 2 shows the resulting data for both sites combined. The self-completed paper and pencil questionnaire (PDSQ) received the highest endorsement (41.4%), followed by the “direct questions” (CAGE-AID and the best practice items) (32.8%). The option least likely to be endorsed as “the best way” was the computer assisted alternative (CD screener).



3.6 Staff Feedback

Data provided by the staff members were collected only at the Toronto site due to difficulties at the Windsor site to complete all data collection from consumers.



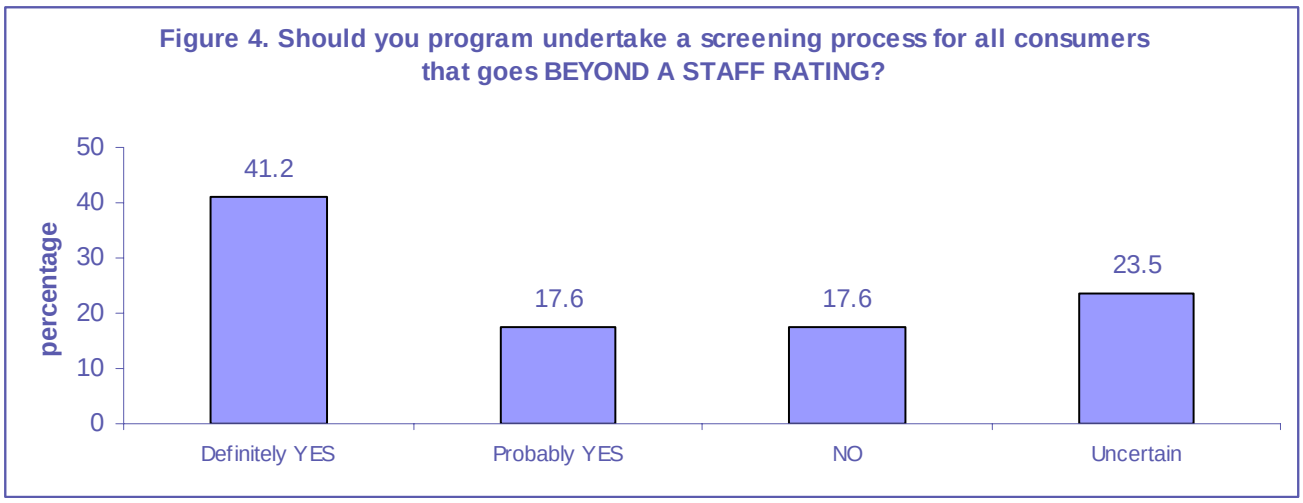
As seen in the left side of *Figure 3* all of the therapists or community caseworkers who we interviewed were “confident” (41%) or “very confident” (59%) in their own abilities to ask questions about substance use. For some of the therapists this experience was part of their daily routine, but others commented on their lack of training in how to ask questions about alcohol and drug use and problems. Therapists indicated that with current consumers the process of asking questions was easier than with the consumers new to their program.

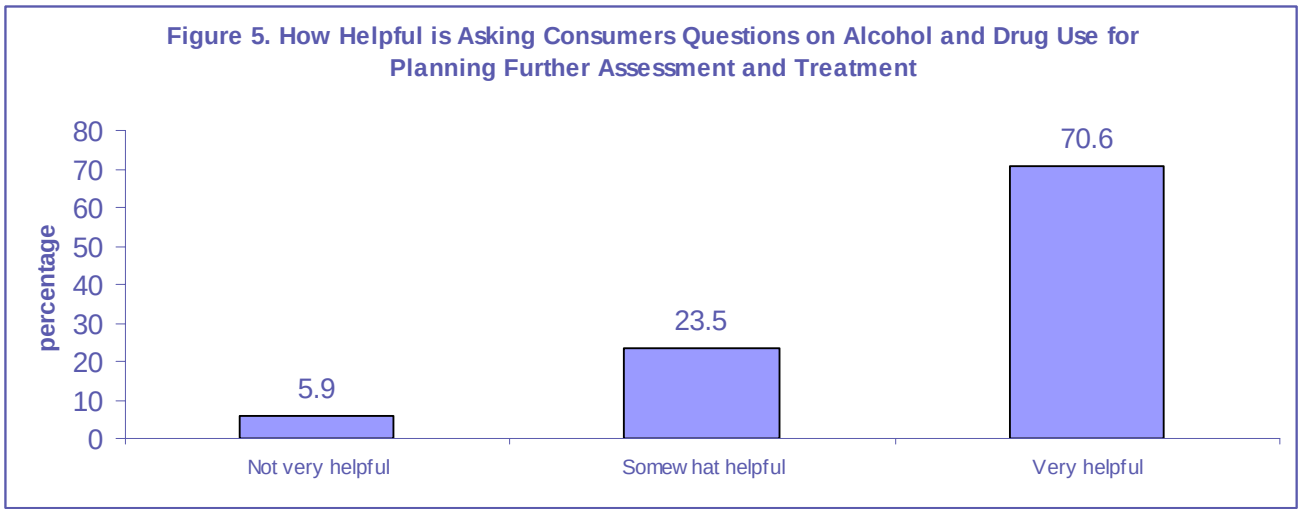
The middle part of *Figure 3* represents therapists’ answers to a question on their confidence in the accuracy of consumers’ answers to interview questions. Similar to the ratings of their confidence in asking screening questions, all the staff expressed some confidence in the accuracy of consumers’ answers to questions about their alcohol or drug use (41% somewhat confident; 59% very confident).

Those therapists who provided additional comments on this question said that, first of all, it depends on how long and how well you know the consumer, if you have a good and trusting relationship with him or her, and if you can get collateral information about this consumer from other sources (family, place of previous treatment, etc.) Several therapists indicated that information from consumers can be inaccurate due to their mental health problems (e.g. some exaggerated a single drug episode, some tried to hide a serious problem), or on their mood and well-being at the time of the interview. One of the therapists said it was quite obvious when consumers were seriously thinking about their answers and when they were not.

The right side of *Figure 3* depicts the distribution of answers on the question of confidence in the initial rating that staff members gave before any instruments were administered. A small percentage (6%) were "not very confident" in this rating and another small percentage (6%) "somewhat confident". The large majority (88%) were "very confident". Staff members also commented that with new consumers, or with consumers whom they did not know too well, it was difficult to be confident about their alcohol or drug use situation. Therapists who knew the consumer very well and for a long time, as well as having access to their records, were very confident in their initial rating.

We also asked staff if their program should undertake a substance abuse screening process for all consumers that goes beyond a staff rating like they had given before any other screening tools were implemented. As can be seen in Figure 4, almost 60% were favourably disposed to the idea (40% definitely, 18% probably) and 24% were uncertain. Almost everyone commented that the short screen that was presently used in the program (CAGE) would be a good place to start, but there was also a need for more thorough in-depth screening for those who screened positive. People also commented that there is a need for a specialist in addictions who can address consumers' alcohol or drug problems professionally since, for current caseworkers, it is just a small part of their work. They commented that a consumer with an addictions problem should be referred for additional services with specialists in the field.

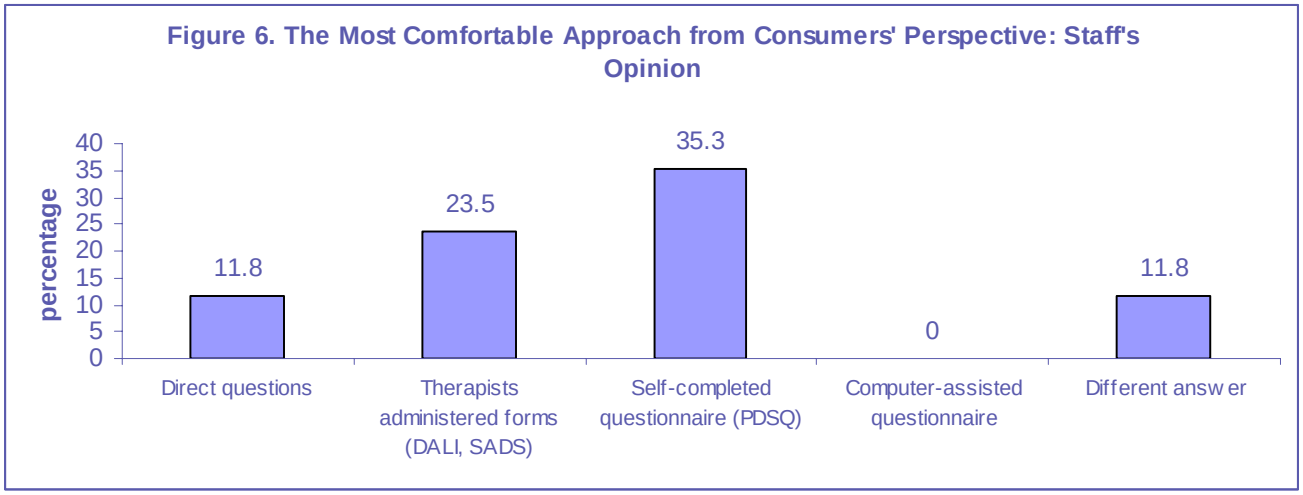




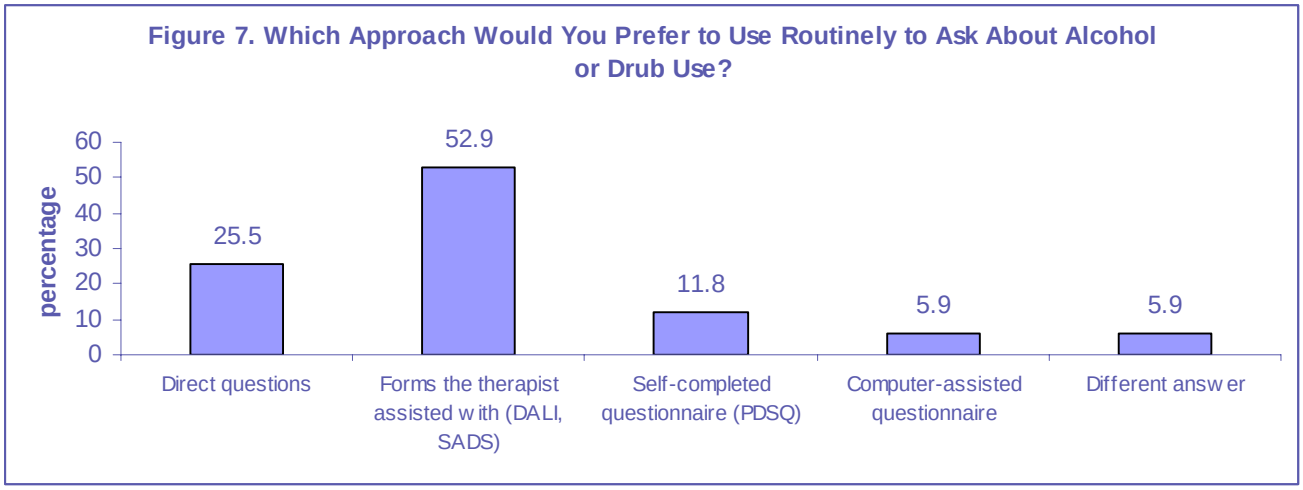
As shown from *Figure 5,* the majority of caseworkers interviewed (71%) also believed it is "very helpful" to screen for substance abuse in mental health programs. For those few who found it "not very helpful", one staff stated that *"there is no need for formalized methods as far as they turn the clients off"* and *"consumers can lie about their use"*. Another caseworker commented that *"drug treatment is lacking in our business"* and others mentioned the need for an addiction specialist in their program. One person commented *"it is important to not to isolate mental health and addictions, but view them in a holistic way"*.

Figure 6 below illustrates the staff's opinion on what consumers would feel was the most comfortable approach to asking consumers questions about their alcohol and drug use. As can be seen, 35% of staff felt consumers were most comfortable with the PDSQ and 0% felt that consumers were comfortable with the CD Screener. It was felt that from the consumers' perspective, the PDSQ was best because of its privacy, straightforwardness and simplicity. However, they commented that, with this self-report tool, assistance should always be provided to consumers to clarify confusing

questions if necessary. Several staff members mentioned that if the consumer is not abusing any of the substances, it is not important what test to administer, all of them will give the same result.



When asked which approach they would prefer to use routinely to ask about alcohol or drug use, 53% of staff members indicated the therapist assisted forms were the most preferred approach (DALI, SADS), followed by direct questions from the therapist (24%) (CAGE-AID and the best practice items). The computer-assisted questionnaire (CD Screener) received support only among 6% of the therapists and 12% cited the self-administered questionnaire (PDSQ).

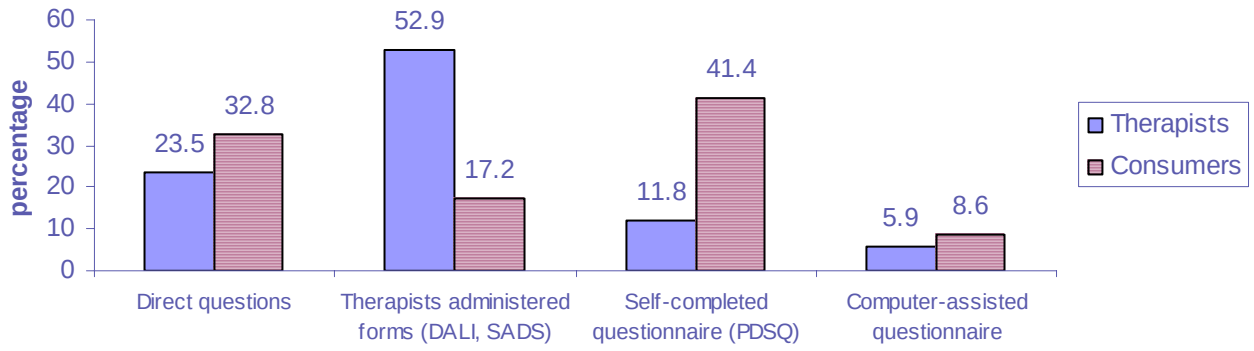


Comments from therapists included a preference for having a variety of tools available for different types of consumers (for example, verbal vs. nonverbal), having assistance available, using the tools when relationships with the consumer are already established, and ideally the tests should be available in languages other than English.

3.7 Comparison of client and therapist preferences

Figure 8 illustrates more directly the comparison of the approach preferred by consumers (shown previously Figure 2) and the approach preferred by therapists (shown previously in Figure 7). Considerable discrepancy was observed with respect to the self-completed questionnaire (PDSQ) as well as the therapist administered forms (DALI, SADS). The approaches with the most agreement between the consumers and staff were the computer-assisted questionnaire (comparatively low endorsement) and asking direct questions (moderate endorsement).

Figure 8. Comparison of consumer opinion or best approach and therapist perspective on consumers preferences.



3.8 Additional comments from staff members

At the end of the staff interview we asked for other comments or suggestions. Below are highlights.

- Question forms administered by the therapist were mentioned again as the best option for many consumers because of mental health and language issues (for some consumers mastery of English was said to be very basic). It was also mentioned that questionnaires should be short for consumers with mental health problems (around 20 minutes). Tests should be easy to answer and score to immediately obtain summary information on site.
- The necessity of screening for substance use in this population was also reiterated. One respondent mentioned that, in the majority of cases, addiction programs turn down mentally ill patients and the only place where they can go to receive services is programs like ACT at CMHA, Toronto branch. Screening for alcohol and drug was said to help in developing a working and targeted treatment plan very early in the intervention. "It is necessary to know consumer's situation with alcohol or drugs for the treatment planning." "There is a need for gradual screening."
- Other comments focused on the need for building a system of referrals to addiction specialists or to have some resources on-site since many of consumers have substance use issues.

- Relationship between the consumer and a caseworker was also cited as important since better information on alcohol or drug use will be obtained.

3.9 Completion times for the various options

Table 7 shows the average completion times for each of the screening alternatives we examined. Results ranged from a high of 7.9 minutes for the CD Screener and the required filter questionnaire (DHQ), to the brief CAGE-AID combined with the three individual best practice items (1.8 minutes). The alcohol and drug sub-scales of the gold standard PDSQ required an average 2.9 minutes for completion, with the remaining tools falling between at around 4 to 6 minutes.

Table 7. Average completion time of screening instruments (n=46)

	Average (Minutes)	Standard Deviation (Minutes)
CAGE-AID plus - 3 best practice items	1.8	2.0
Substance Abuse - Dependence Scale	5.6	5.0
DALI	4.2	4.0
CD Screener	5.6	4.0
CD Screener plus DHQ	7.9	6.0
PDSQ[1]	2.9	1.8

[1]As participants averaged 22 minutes to complete the full 90 item PDSQ (SD=13.2), we pro-rated the completion time for the 12 alcohol and drug items at 2.9 minutes (SD=1.8)

4.0 Discussion

This project was undertaken with the following objectives in mind:

- evaluate the performance of various approaches to screening for substance use disorders among consumers involved with community mental health programs;

- assess consumer attitudes toward, and satisfaction with, the various alternatives for screening which differ in terms of length of time, directness of the questions and mode of administration (paper versus computer assisted);

- assess staff attitudes, satisfaction and confidence using the various screening alternatives and the perceived value of the resulting information for more detailed subsequent assessment and treatment planning.

It was anticipated that the results would contribute to our knowledge base on screening tools for substance abuse in the context of community mental health services. Beyond this broad research goal per se, it was also expected that the findings would contribute to a collaborative process underway during the same time period for the selection of one or more screening tools for province-wide dissemination in Ontario's mental health system. A parallel process is underway with respect to screening tools for mental health disorders/problems for selection and dissemination across the province's alcohol and drug treatment sector. While the selection process includes a full literature review and analysis process by a broad stakeholder based committee, it was considered important to introduce some Ontario-specific feedback on the performance of alternative screening tools into the process and, importantly, to complement such performance data with staff and consumer feedback from Ontario-based mental health services.

As we proceed into this summary section of our project report, it may be of some value to pause and reflect on the criteria by which one would determine the potential value of a given screening tool for substance abuse for local and/or system-wide application. These criteria would include:

- Brief and practical; low investment in staff time and other resources;

- Consistency with a staged approach to screening and assessment (i.e., increasing time and other investment yields increasingly valuable information for integrated treatment and support planning);

- Screening test should be high in sensitivity (identifying real cases which will subsequently be confirmed as positive) and high in negative predictive value (identifying people who do not have the index condition and who therefore need not be followed up with scarce assessment resources);

- Same screening tool or tools will work for both alcohol and other drugs;

- Ideally the same tool will work for both new and current clients given that many people currently engaged with long- term community support programs may also have unrecognized substance abuse problems;

- Another important but not critical criteria is that the same screening tool would identify substance abuse and mental disorders, (albeit with different sections of the tool), thereby

facilitating communication and referral across the mental health and substance abuse service delivery systems.

It is against this contextual background that we embarked on our comparison of the various options for screening for substance abuse in community mental health services. We have been challenged in two important ways in addressing our research objectives. Firstly, budgetary constraints impeded our selection of the "best" gold standard for the comparison to our shopping list of tools, namely a full structured psychiatric face-to-face interview implemented by a trained clinician or researcher (i.e. SCID). Such a detailed psychiatric interview would yield probable diagnoses of substance abuse or dependence, according to DSM-IV criteria, and in well-defined time frames.

Our next best option as the gold standard was the PDSQ, given its strong validation research against the SCID and excellent psychometric properties with respect to identifying substance abuse (i.e. sensitivity of .85 and negative predictive values of .98 and .99; based on a cut-off of a positive response to any one of the six items on each of the alcohol or drug subscales. (Zimmerman & Mattia, 2001)

Our other major constraint in the analysis phase was the varying time frames used by the different measures and which preclude strong statements of concurrent validity, at least in so far as results from a given screening tool agree or disagree with "caseness" as defined by the gold standard, and exactly within the same time period. We have handled this as much as possible by separating out "lifetime" and "recent" measures in the statistical tables and organizing our interpretation of the results around these two broad distinctions. That said, the nature of the statistical analysis is such that, in some instances, we are determining the level of agreement of a "lifetime" measure (i.e. CAGE-AID), with a measure of substance abuse over the past six months (i.e., the PDSQ). For a chronic health issue such as substance abuse, with its "ups" and "downs" across a person's lifespan, this remains an important comparison from a research and clinical point of view. We have also tried to offset some of these technical limitations in the statistical assessment of test performance by formally incorporating consumer and staff feedback into the research plan.

Prevalence Rate of Substance Abuse

Although not a formal research objective per se, the study results do bear on the question of how frequently substance abuse occurs among consumers of community mental health services and, therefore, the extent to which recommendations for systematic screening have basic face validity in terms of their rationale and importance.

The high level of variation in our findings based on the different measures speaks to the variability in administration style, content and time frame within the measures themselves. In other words, it is not helpful to present a "true" prevalence rate as it is ultimately tied to the chosen methodology for identifying caseness. There is also the issue of instrument validity itself which is rarely if ever perfect. We have several ways to estimate the lower boundary of a prevalence rate in the study population. In thisr project one might consider the minimum estimate of prevalence to be reflected in the proportion of the consumers for whom a diagnosis of substance use disorder was documented in the file (5.2% current and 20% lifetime for both study samples combined). Another approach to a minimum estimate may be derived from staff ratings, to the extent that these ratings were based on all available information and made prior to any new information from any of the screening tools. These ratings would yield rates of 14% current and 38% lifetime. The PDSQ itself yielded a six-month point prevalence estimate of 30%, which is just over double the proportion deemed by staff to have "current" problems. The 12-month SADS measure (dependence and abuse) yielded a rate of 22% for the combined samples.

At the other end of the continuum we would suggest that a maximum estimate of lifetime substance related problems in our study sample is best captured by the SADS, and using both the dependence and abuse criteria (58%). A person would score positive on this measure by answering "yes" to any one of the SADS items that map onto the dependence or abuse criteria of DMS-IV (American Psychiatric Association, 1994), *at any point in their lifetime.* Hence, it is the most liberal measure in the test battery employed in both study sites.

The variability in the prevalence rates aside, they lead us to one firm conclusion. Almost all the measures, including systematic but low cost staff ratings based on available information, the single items based on the Health Canada Best Practice Report, and the brief low cost 4-item CASE-AID, identified more cases of substance abuse in both sites than was officially recorded in the consumers files in terms of diagnoses of substance use disorders. Related to this is the even lower proportion of consumers with any record of having ever received treatment for substance abuse (10.5% lifetime). This small percentage receiving treatment represents about one in six of those with potential substance use disorders as determined by the SADS lifetime measures, or one in four of those potentially experiencing more severe substance dependence.

The rationale for introducing systematic screening processes into routine practice is also bolstered by the consumer and staff feedback. In general, most consumers are comfortable answering questions

about their alcohol and drug use or related problems, although staff point out the value of doing so on a foundation of trust and familiarity with the person's overall life situation. The large majority of staff reported that asking some questions about substance use/abuse was helpful for planning assessment, treatment and support. Completion times for the various options ranged from around 2-8 minutes with several options around five minutes or less. Staff were generally confident in their abilities to ask about alcohol and other drugs; confident in the accuracy of consumers' responses; and confident in their own ratings of the likelihood the consumer has a substance abuse problem, especially if it was a consumer already known to them. However, about two-thirds of staff also agreed they should definitely or probably engage in screening processes beyond their own ratings.

What screening tools perform the "best"?

It is difficult to synthesize our statistical assessment of test performance presented in Tables 4-6 to distill a research-based recommendation for the "best" screening tool or tools. We proceed here with a grouping of the various screening options into three categories:

- Red light selections – those screening options that can clearly be ruled out based on poor test performance from a statistical point of view;

- Amber light selections – moderate level performers from a statistical point of view and which may warrant further consideration based on staff and consumer feedback;

- Green light selections – the best performers from a statistical point of view, and which may either remain in the green light zone based on staff and consumer feedback, or which may be moved to the amber light group based on concerns they express.

Red Light Performers:

In this group we would include the DALI based on its very low sensitivity (14%) and moderate negative predictive value (74%). These poor results with the DALI came as a surprise to the research team based on the much more encouraging findings from the research literature (Rosenberg et al., 1998). The DALI, however, was developed and validated for use with people with severe and persistent mental illness and our study population was considerably more diverse in diagnostic terms. Also the DALI only covers a limited range of substance and some of the items appear out-dated and perhaps inappropriate in a Canadian context.

Other screening options we would include in the red light category are the individual items recommended in the Health Canada Best Practice Report on concurrent disorders (Health Canada, 2002). In fairness to the authors recommending these items they were advocated as supplementary screening items to tools such as the CAGE-AID. We also evaluated each of the three items on an individual basis and it would be rare for a single screening item to perform as well as a group of items, however small in number. It was beyond the scope of this report to evaluate the three Health Canada items against the gold standard in various combinations. While we will explore this in future analyses, we suspect on the basis of the individual item results (i.e. sensitivities of 29%, 52% and 38%) and their inter-correlation (data not shown), that their overall grouped item performance is unlikely to match that of, for example, the CAGE-AID.

Into our red light grouping we would also include staff ratings based only on "current" as opposed to lifetime status. For all clients combined, the comparison of the staff's "current problem rating" to the results of the 6-month PDSQ only identified 43% of positive cases. For new clients it identified only 25% of positive cases. Thus, although as discussed earlier in this section, there is some net gain from a systematic staff rating over and above documented diagnoses in the consumers' files, this rating of current problems falls far short of the results of brief screening with a structured self-report tool such as the PDSQ. Qualitative feedback from staff in this project acknowledged the difficulty in screening with new consumers. The difficulty with these staff ratings of current problems with new consumers coming into the program has also been documented in other Ontario-based community mental health services (Rush et al., in preparation) since substance abuse issues may be poorly documented and under-reported by consumers during intake interviews which cover substance abuse in a more informal, unstructured manner. Published research on similar staff ratings of substance abuse have been conducted with consumers engaged for some time in intensive case management programs. In such programs staff may have a fairly intimate knowledge of clients' lifestyle, including alcohol and drug abuse (Barry et al., 1995).

Finally for the red light grouping, and with respect to the SADS 12-month dependence items, we obtained a sensitivity of 38% compared to the PDSQ, no doubt due to the former having comparatively strict criteria based only on alcohol or drug dependence. Clearly, this is too narrow a net to cast for an initial screening tool.

Amber Light Performers:

We would include three of our options into this amber light category: the CAGE-AID, the CAMH CD-Screener, and the SADS 12-month dependence items only.

The CAGE-AID obtained sensitivity value of 71% and a negative predictive value of 88%, a moderate performance level that is consistent with previous research in a severely mentally ill population (Rosenberg et al., 1998). In the present study its performance dropped only marginally with new versus current consumers (i.e. sensitivity ratings of 67% compared to 77%). The CAGE-AID also has the advantages of ease of administration during interviews with consumers, as well as brevity and low cost. It is also a "known," and widely researched tool, for other settings, (i.e. primary care) and this may facilitate more widespread and systematic dissemination in the mental health sector. Its main disadvantage is that it only assesses lifetime as opposed to more recent problems. Despite this latter limitation, we would conclude that the CAGE-AID should be considered for our "tool-kit", with its pros and cons weighed against the green light alternatives discussed bellow.

The CAMH-CD Screener casts a very broad net for substance abuse problems as reflected in the DSM-IV criteria. Technically, one derives lifetime rates of abuse or dependence for a wide range of substances. A supplementary item in each module does inquire as to whether any of the reported problems were experienced in the past 12-months and this could be used to derive 12-month rates of substance abuse but not dependence. Using the lifetime scoring for either abuse or dependence we obtained a moderate sensitivity value of 75% and a negative predictive value of 87%. The CD-Screener, however, was the least preferred option among consumers, in large part because of its "computer-only" administration and the significant issues faced by many consumers with the use of the computer. It was also the least preferred approach among staff members. Other issues and concerns experienced in the project with the CD-Screener included the need to build in a front-end instrument to pre-establish the substance-related module or modules of relevance for the consumer (i.e. the alcohol module, if alcohol was used; the cocaine module, if cocaine was used). This is highly inefficient from a screening point of view and reflects the origin of the screening tool in a substance abuse treatment setting where this information would be readily available. Finally, technical difficulties were experienced with the administration of the Screener through TREAT (i.e. system went down on an unexpected and unannounced basis).

Green Light Performers:

For a variety of reasons the SADS lifetime dependence or abuse measure emerged among our list of top choices. Assessed against the 6-month time frame of the PDSQ this measure achieved the

highest sensitivity values (.90) and highest negative predictive value (.94). The overall efficiency rating was .66, a rating dampened by the much more modest positive predictive value. Thus, the SADS lifetime dependence and abuse measure successfully throws a very wide net for positive cases and successfully rules out true negative cases, but at a cost of some over-identification or false positives. Thus, it needs to be followed up with more detailed assessment procedures in order to determine, for example, the time frame of the most recent problems, extent and pattern of current alcohol/drug use, relationship to functioning etc. The SADS also has the added benefit of being flexible in its time frame within the same instrument. It was also the best performer among new clients at 78% sensitivity, a moderate value but the best with this group among the various alternatives tested. It is also a clinician-administered tool, an approach highly favored by clinicians and on average took 5 to 6 minutes for completion. Since it is based on the full set of symptom counts within DSM-IV it can also serve as an outcome monitoring tool via documentation over repeated administrations of either the total symptom count or problems in specific areas (i.e. legal, relationship, physical dependence). In short, it has a lot going for it.

Our list of "green light performers" also includes the staff rating of lifetime substance abuse problems. In contrast to the rating of current problems, the lifetime rating achieved a sensitivity of 86%, a negative predictive value of 93%, and an overall efficiency rating of 82%. Thus, it outperformed all structured screening tools except the SADS lifetime measure (dependence or abuse), and it was very close in performance to that measure as well. It would be tempting to conclude from these data that there is little to be gained from formal screening tools over-and-above a review of all existing information regarding substance abuse and experienced clinical judgment. However, when we break down the data for new versus current consumers we see the achilles heel of these staff ratings – they do not perform very well at all for new consumers (sensitivity of .56 (new) versus 1.0 (current). This makes sense given the often limited information available vis a vis substance abuse when a consumer first engages with a new program. Both the CAGE-AID and the SADS lifetime significantly outperform the lifetime staff ratings for new consumers.

In summary, we conclude that the lifetime staff ratings have a clear role to play in screening and documenting substance abuse. They are low cost as they take advantage of all existing information. If nothing else a formal process of making a rating of substance abuse on an annual or bi-annual basis will sensitize staff to potential substance abuse among the consumers they support. However, despite staff's confidence in their ability to make these ratings they also endorsed the need for being more systematic.

The last member of our green light group is the PDSQ itself. Although selected in this project as the gold standard comparison tool based on the strength of it's validation against the SCID (Zimmerman & Mattia, 2001), the 12-item substance abuse section of this psychiatric comprehensive screening instrument (6 alcohol items, 6 drug items) is itself a viable option for identifying people with substance abuse problems in mental health services. With a sensitivity of 85% and negative predictive values of .98 and.99, these 12 items do a good job of ruling out substance abuse while casting a wide net for follow-up assessment. When considered against our previously listed selection criteria it meets most of our criteria with the exception perhaps of resource investment since it is a pay-per-use copy-written tool, unlike the others evaluated here. Based on caseload data provided for this project, an estimate of the annual cost of using the PDSQ with all new clients would be $500-$675 for the Toronto site (216 new cases annually) and $700-$940 for the Windsor site (300 new cases annually). The price range reflects optional purchase of a starter kit. We would suggest between $500 and $1000 annually would cover the costs of using the PDSQ to screen for substance abuse and the AXIS I mental disorders within DMS-IV.

One added benefit of the PDSQ over the others is that other sections of the same tool screen for a range mental disorders and thus it has significant potential for application within substance abuse services. Use of the same tool in mental health services would probably facilitate communication and exchange of information across the mental health and substance abuse sectors. A comprehensive screening for mental disorders may also be of considerable value in community mental health services given the extent of unrecognized co-morbidity across mental disorders such as mood, anxiety, psychotic and personality disorders as well as substance use disorders (Zimmerman and Sheeran, 2003).

Table 7.0 Summary of Table of Recommendations

Screening Tool	
Green Light	• SADS Lifetime Abuse and Dependence • PDSQ • Staff Lifetime Ratings
Amber Light	• CAGE-AID • CAMH CD Screener
Red Light	• DALI • Individual Health Canada Items • Staff Ratings Based on Current Problems

A Roadmap of Substance Abuse Screening

Our discussion of the screening options, as well as the resulting prevalence results presented earlier, underscore the point that there is no "perfect" screening tool. Even the options in the amber and green categories have potential disadvantages, and advantages. To complement our summary table, and as a final strategy to illustrate the potential role of these tools, we present a "Roadmap" for a staged approach to screening for substance abuse in the context of community mental health services. The Roadmap is organized from top to bottom according to the question to be answered in the clinical process on the basis of the information from the screening tool or procedure. At the top of the Roadmap, one wants a low investment screening tool that will yield information to help answer the question "Is there evidence of a possible substance abuse problem that requires further investigation?" To address this "first pass" question the results from the staff lifetime rating, the PDSQ, and the CAGE-AID would be helpful with a very low investment in staff time. The 16-item SADS tool (lifetime abuse and dependence) may also be helpful in this initial stage. Although it requires a bit more investment of time (but still only 5-6 minutes) it yields considerably more information.

Another important step in this staged approach is to assess the potential for withdrawal symptoms using an instrument such as the CiWa (reference), a tool not evaluated here due to its fundamentally different purpose beyond screening per se.

Going a little further down the Roadmap the questions to be answered begin to bridge into assessment by asking, “How serious is the problem?” Is it abuse versus dependence?” For these questions the SADS would provide a preliminary breakdown of abuse versus dependence. Another tool known as the AUDIT (Maisto et al., 2000) would also be helpful at this stage although it was not evaluated in the preset project due to its sole focus on alcohol to the exclusion of other drugs.

Going more deeply into the assessment process requires information to address the question, “What is the extent and pattern of substance use and abuse?” This requires much more detailed assessment tools and the assistance of trained addictions workers. Bridging even more comprehensively into the area of treatment planning requires yet additional information and much more experience working with people with addiction-related problems.

In sum, our various screening options are best seen as the beginning steps of a staged approach to screening, assessment and treatment planning requiring increasing levels of time and resource investment, as well as increasing levels of experience clinical training and experience with addictions.

Roadmap for Substance Abuse Screening and Assessment

Step	Question/Issue	Options
Screening  **Assessment**	Is there evidence of a possible substance abuse problem that requires further investigation?	▪ Staff lifetime rating based on all available information ▪ CAGE-AID ▪ PDSQ alcohol/drug items ▪ Possibly the SADS (lifetime abuse and dependence) if time allows ▪ Also ask about lifetime and past year use of all substances
	Is the person in crisis or experiencing withdrawal symptoms?	▪ CiWa
	How serious is the problem? Abuse versus dependence?	▪ SADS ▪ AUDIT - for hazardous or harmful drinking
	What is the extent and pattern of substance use/abuse?	▪ Drug History Questionnaire ▪ Timeline-Follow Back ▪ Addiction Severity Index Assessment
Assessment/Treatment Planning	What is the effect on mental health symptoms and compliance? What is the pay off matrix? Bio-psychosocial issues?	▪ History ▪ Mueser's payoff matrix ▪ Bio/psycho/social dimensions
	Should the possibility that mental health symptoms be substance-induced be explored?	▪ Mental health treatment history and reaction to reduction in substance use
	What would be the appropriate way to structure treatment?	• Exploring integrated treatment options and preferences

References

American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders (DSM – IV). Washington, D.C.: American Psychiatric Association.

Ananth, J., Vandewater, S., Kamal, M., Brodsky, A., Gamal, R., & Miller, M. (1989). Missed diagnosis of substance abuse in psychiatric patients. *Hospital and Community Psychiatry*, 40(3), 297-301.

Barry, K.L., Fleming, M.F., Greenley, J., Widlak, P., Kropp, S., & McKee, D. (1995). Assessment of alcohol and other drug problems in the seriously mentally ill. *Schizophrenia Bulletin*, 21, 315-321.

Barnaby, B., Drummond, C., McCloud, A., Burns, T., Omu, N. (2003). Substance misuse in psychiatric inpatients: comparison of a screening questionnaire survey with case notes. *British Medical Journal*, 327, 783-784.

Bartels, S.J., Teague, G.B., Drake, R.E., Clarke, R.E., Bush, P., & Noordsy, D.L. (1993). Substance use in schizophrenia: service utilization and costs. *Journal of Nervous and Mental Diseases*, 181, 227-232.

Brooner, R. K., King, V. L., Kidorf, M., Schmidt, C. W., Jr., & Bigelow, G. E. (1997). Psychiatric and substance use co-morbidity among treatment-seeking opioid abusers. *Archives of General Psychiatry, 54,* 71-80.

Brown, R.L. (1992). Identification and office management of alcohol and drug disorders. In M.F. Fleming., & Barry, K.L. (Eds.) *Addictive Disorders*, St. Louis: Mosby Yearbook.

Carey, K.B. (1997). Challenges in assessing substance use patterns n persons with comorbid mental and addictive disorders. In L. Onken, J.D. Blane, S. Genser & A.M. Horton (Eds.), *Treatment of Drug-dependent Individuals with Comorbid Mental Disorders*. NIDA Research Monograph 172. NIH Pub. No. 97-4172. Washington, D.C.: National Institute on Drug Abuse, pp. 16-32.

Center for Substance Abuse Treatment. (2005). *Substance Abuse Treatment for Persons With Co-Occurring Disorders.* Treatment Improvement Protocol (TIP) Series 42. DHHS Publication No. (SMA) 05-3922. Rockville, MD: Substance Abuse and Mental Health Services Administration

Compton, W.M. III, Cottler, L.B., Jacobs, J.L., Ben Abdallah, A., & Spitznagel, E.L. (2003). The role of psychiatric disorders in predicting drug dependence treatment outcomes. *American Journal of Psychiatry*, 160(5), 890-895.

Cuffel, B.J. (1996). Comorbid substance use disorder: Prevalence, patterns of use, and course. *New Directions for Mental Health Services*, 70, 93-105.

Curran, G.M., Sullivan, G., Williams, K., Han, X., Collins, K., Keys, J. & Kotrla, K.J. (2003). Emergency department use of persons with comorbid psychiatric and substance abuse disorders. *Annals of Emergency Medicine*, 41(5), 659-667.

Deas-Nesmith, D., Brady, K. T., & Myrick, H. (1998). Drug Abuse and Anxiety Disorders. In H.R.Kranzler & B. Rounsaville (Eds.), *Dual Diagnosis and Treatment* (pp. 203-220). New York: Marcel Dekker Inc.

Degenhardt, L., Hall, W., & Lynskey, M. (2001). Alcohol, cannabis and tobacco use among Australians: a comparison of their associations with other drug use and use disorders, affective and anxiety disorders, and psychosis. *Addiction, 96,* 1603-1614.

Dennis, M.L. (1999). Global appraisal of individual needs (GAIN): Administration guide for the GAIN and related measures (Version 1299). Bloomington, IL: Chestnut Health Systems, Retrieved, from http://www.chestnut.org/li/gain/gadm1299.pdf.

Dennis, M.L., Titus, J.C., White, M., Unsicker, J., & Hodgkins, D. (2002). Global appraisal of individual needs (GAIN). Bloomington, IL: Administration guide for the GAIN and related measures, Retrieved, from http://www.chestnut.org/li/gain/gadm1299.pdf.

Drake, R.E., Osher, F.C., Noordsy, D.L., Hurlbut, S.C., Teaque, G.B., & Beaudett, M.S. (1990). Diagnosis of alcohol use disorders in schizophrenia. *Schizophrenia Bulletin*, 16, 57-67.

Drake, R.E., Osher, F.C., & Wallach, M.A. (1991). Homelessness and dual diagnosis. *American Psychologist*, 46 (11), 1149-1158.

Drake, R.E., Mueser, K.T., & McHugo, G.J. (1996). Clinician rating scales: Alcohol Use Scale (AUS), Drug Use Scale (DUS), and Substance Abuse Treatment Scale (SATS). In L.I. Sederer & B. Dickey (Eds.), *Outcomes Assessment in Clinical Practice*. Belmont, MA: Williams and Wilkins.

Drake, R.E., & Brunette, M.F. (1998). Complications of severe mental illness related to alcohol and other drug use disorders. In M. Galanter (Ed.), *Recent Advances in Alcoholism Vol. 14. Consequences of alcoholism*. New York: Plenum, pp. 285-299.)

Farrell, M., Howes, S., Bebbington, P., Brugha, T., Jenkins, R., Lewis, G., Marsden, J., Taylor, C., & Meltzer, H. (2001). Nicotine, alcohol and drug dependence and psychiatric comorbidity. Results of a national household survey. *British Journal of Psychiatry, 179,* 432-437.

Ford, L., Snowden, L.R., & Walser, E.J. (1992). Outpatient mental health and the dual-diagnosis patiet: Utilization of services and community adjustment. *Evaluation and Program Planning*, 14, 291-298.

Goldenberg, I. M., Mueller, T., Fierman, E. J., Gordon, A., Pratt, L., Cox, K., Park, T., Lavori, P., Goisman, R. M., & Keller, M. B. (1995). Specificity of substance use in anxiety-disordered subjects. *Comprehensive Psychiatry, 36,* 319-328.

Health Canada (2001). Best practices: concurrent mental health and substance use disorders. Ottawa: Health Canada.

Hien, D., Zinberg, S., Weisman, S., First, M.I., & Ackerman, S. (1997). Dual Diagnosis sub-types in urban substance abuse and mental health clinics. *Psychiatric Services*, 48, 1058-1063.

Kessler, R.C., Nelson, C.B., McConagle, K.A., Edlund, M.J., Framk, R.G., & Leaf, P.J. (1996). The epidemiology of co-occurring addictive and mental disorders: Implications for prevention and service utilization. *American Journal of Orthopsychiatry*, 66, 17-61.

Kranzler, H.R., Kadden, R.M., Babor, TF., & Rounsaville, B.J. (1994). Longitudinal, expert, all data procedure for psychiatric diagnosis in patients with psychoactive substance use disorders. *Journal of Nervous and Mental Disorders*, 182, 277-283.

Mayfield, D., Mcleod, G., & Hall, P. (1974). The CAGE questionnaire: Validation of a new alcoholism instrument. *American Journal of Psychiatry*, 131, 1121-1123.

Maisto, S.A., Carey, M.P., Carey, K.B., Gordon, C.M. & Gleason, J.R. (2000). Use of the AUDIT and the DAST-10 to identify alcohol and drug use disorders among adults with a severe and persistent mental illness. *Psychological Assessment*, 12(2), 186-192.

McLellan, A.T., Luborsky, L., Woody, G.E., O'Briend, C.P., & Druley, K.A. (1983). Predicting response to alcohol and drug abuse treatments. *Archives of General Psychiatry*, 40, 620-625.

Merikangas, K. R., Angst, J., Eaton, W., Canino, G., Rubio-Stipec, M., Wacker, H., Wittchen, H. U., Andrade, L., Essau, C., Whitaker, A., Kraemer, H., Robins, L. N., & Kupfer, D. J. (1996). Comorbidity and boundaries of affective disorders with anxiety disorders and substance misuse: results of an international task force. *British Journal of Psychiatry Suppl,* 58-67.

Merikangas, K. R., Mehta, R. L., Molnar, B. E., Walters, E. E., Swendsen, J. D., Aguilar-Gaziola, S., Bijl, R., Borges, G., Caraveo-Anduaga, J. J., DeWit, D. J., Kolody, B., Vega, W. A., Wittchen, H. U., & Kessler, R. C. (1998). Comorbidity of substance use disorders with mood and anxiety disorders: results of the International Consortium in Psychiatric Epidemiology. *Addictive Behaviors, 23,* 893-907.

Mueser, K. T., Yarnold, P. R., Levinson, D. F., Singh, H., Bellack, A. S., Kee, K., Morrison, R. L., & Yadalam, K. G. (1990). Prevalence of substance abuse in schizophrenia: demographic and clinical correlates. *Schizophrenia Bulletin, 16,* 31-56.

Mueser, K.T., Drake, R.E., & Wallach, M.A. (1998). Dual Diagnosis: A review of etiological theories. *Addictive Behaviours*, 23(6), 717-734.

Negrete, J.C, Collins, J., Turner, N.E., & Skinner, W., (2004). The Centre for Addiction and Mental Health Concurrent Disorders Screener. *Canadian Journal of Psychiatry*, 49(12), 843-850.

Project MATCH Research Group (1997). Matching Alcoholism Treatments to Client Heterogeneity: Project MATCH posttreatment drinking outcomes. *Journal of Studies on Alcohol, 58,* 7-29.

RachBeisel, J., Scott, J., & Dixon, L., (1999). Co-occurring severe mental illness and substance use disorders: A review of recent research. *Psychiatric Services*, 50(11), 1427-1434.

Reiger, D.A., Farmer, M.E., & Rae, D.S. (1990). Co-morbidity of mental disorders with alcohol and other drug abuse. Results from the Epidemiological Catchment Area (ECA) study. *Journal of American Medical Association*, 264, 2511-2518.

Ries, R. (1994). (Consensus Panel Chair). *Assessment and Treatment of Patients with Coexisting Mental Illness and Alcohol and Other Drug Abuse, Treatment Improvement* Protocol (TIP) Series No.9. DHHS Publication No. (SMA) 94-2078). Rockville, MD: Centre for Substance Abuse Treatment (http:/www.health.org/pubs/catalog/ordering.htm).

Rosenberg, S.D., Wolford, G.L., Mueser, K.T., Oxman, T.E., Vidaver, R.M., Carrieri, K.L., & Luckoor, R. (1998). Dartmouth Assessment of Lifestyle Instrument (DALI): A substance use disorder screen for people with severe mental illness. *American Journal of Psychiatry*, 155(2), 232-238.

Rosenberg, S.D., Goodman, L.A., Osher, F.C., Swartz, M., Essock, S.M., Butterfield, M.I, Constantine, N.T., Wolford, G.L., & Salyers, M.P. (2001). Prevalence of HIV, Hepatitis B and Hepatitis C in people with severe mental illness. *American Journal of Public Health*, 91(1), 31-37.

Ross, H.E., Glaser, F.B., & Germanson, T. (1988). The prevalence of psychiatric disorders in patients with alcohol and other drug problems. *Archives of General Psychiatry*, 4, 1023-1031.

Ross, H. & Shirley, M. (1997). Life-time problem drinking and psychiatric co-morbidity among Ontario women. *Addiction, 92,* 183-196.

Rounsaville, B.J., Weissman, M.M., Kleber, H.D., & Wilber, C.H. (1982). The heterogeneity of psychiatric diagnosis in treated opiate addicts. *Archives of General Psychiatry*, 39, 161-166.

Rounsaville, B. J., Kosten, T. R., Weissman, M. M., & Kleber, H. D. (1986). Prognostic significance of psychopathology in treated opiate addicts. A 2.5-year follow-up study. *Archives of General Psychiatry, 43,* 739-745.

Russell, M., Mantier, S.S., Sokol R.J., Mudar, P., Bottoms, S., Jacobson, S., & Jacobson, J. (1994). Screening for pregnancy risk-drinking. *Alcoholism: Clinical and Experimental Research*, 18, 1156-1161.

Substance Abuse and Mental Health Services Administration (SAMHSA) (2002). Report to Congress on the prevention and treatment of co-occurring substance abuse disorders and mental disorders. http://www.samhsa.gov/reports/congress2002/execsummary.htm.

Saunders, J.B., Aasland, O.G., Babor, T.F., De La Fuente, J.R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption II, Addiction, 88, 791-804.

Selzer, M.L., (1971). The Michigan Alcoholism Screening Test: The quest for a new diagnostic instrument. *American Journal of Psychiatry*, 127, 1653-1658.

Skinner, H.A., Glaser, F.B., & Annis, H.M. (1982). Crossing the threshold: Factors in self-identification as an alcoholic. *British Journal of Addiction*, 77:51-64.

Strakowski, S. M. & DelBello, M. P. (2000). The co-occurrence of bipolar and substance use disorders. *Clinical Psychology Review, 20,* 191-206.

Swendsen, J.D. & Merikangas (2000). Comorbidity of depression and substance use disorders. *Clinical Psychology Review*, 20, 173-189.

Teitelbaum, L.M., & Carey, K.B. (1996). Alcohol assessment in psychiatric patients. *Clinical Psychology: Science and Practice*, 3(4), 323-338.

Weisner, C., Matzger, H., & Katsukas, L.A., (2003). How important is treatment? One-year outcomes of treated and untreated alcohol-dependent individuals. *Addiction*, 98, 901-911.

Wolford, G.L., Rosenberg, S.D., Drake, R.E., Mueser, K.T., Osman, T.E., Hoffman, D., Vidaver, R.M., Luckoor, R., & Carrieri, K.L. (1999). Evaluation of methods for detecting substance use disorder in persons with severe mental illness. *Psychology of Addictive Behaviours*, 13(4), 313-326.

Zimmerman, M. (2003). What should the standard of care for psychiatric diagnostic evaluations be? *The Journal of Nervous and Mental Disease*, 191(5), 281-286.

Zimmerman, M., & Mattia, J.I. (2000). Principal and additional DSM-IV disorders for which outpatients seek treatment. *Psychiatric Services*, 51(10), 1299-1304.

Zimmerman, M., & Mattia, J.I. (2001a). A self-report to help make psychiatric diagnosis. The psychiatric diagnostic screening questionnaire. *Archives of General Psychiatry*, 58, 787-794.

Zimmerman, M., & Mattia, J.I. (2001b). The psychiatric diagnostic screening questionnaire: Development, reliability and validity. *Comprehensive Psychiatry*, 42(3), 175-189.

Zimmerman, M., & Sheeran, T. (2003). Screening for principal versus comorbid conditions in psychiatric outpatients with the psychiatric diagnostic screening questionnaire. *Psychological Assessment*, 15(1), 110-114.