



Drug & Alcohol Services Council
South Australia

Validation of the World Health Organization **Alcohol,
Smoking and Substance Involvement Screening Test**
(ASSIST) and Pilot Brief Intervention: Phase II
Report of results from the Australian site

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TABLE OF CONTENTS

LIST OF TABLES		iv
LIST OF ACRONYMS		vii
ACKNOWLEDGEMENTS		viii
EXECUTIVE SUMMARY		x
SECTION 1	INTRODUCTION	
	1.1	Background 1
	1.2	ASSIST questionnaire structure 4
	1.3	ASSIST derived scores 5
	1.4	Assessing the validity of the ASSIST 5
	1.5	Rationale for the brief intervention pilot study 8
	1.6	Aims of this study 9
SECTION 2	SUBSTANCE USE PATTERNS IN SOUTH AUSTRALIA	10
SECTION 3	METHODOLOGY	
	3.1	Study design 13
	3.2	Recruitment settings 14
	3.3	Participants 16
	3.3.1	<i>Inclusion and exclusion criteria</i> 16
	3.3.2	<i>Recruitment</i> 16
	3.4	Baseline assessment procedures 17
	3.4.1	<i>Interviewer-administered assessments</i> 17
	3.4.2	<i>Hair sampling</i> 20
	3.4.3	<i>Self-administered instruments</i> 20
	3.4.4	<i>Independent clinical evaluation (ICE)</i> 21
	3.4.5	<i>Brief intervention</i> 21
	3.5	Issues encountered during baseline interviews 23
	3.6	Follow-up interview procedures 24
	3.7	Training of interviewers 25
	3.8	Data analysis 26

SECTION 4	Results	
4.1	Demographic details	28
4.2	Baseline data	30
4.3	Follow-up data	36
4.4	Derived scores	42
4.5	Concurrent validity	42
4.5.1	<i>ASI-Current Frequency of Substance Use</i>	43
4.5.2	<i>SDS-Dependence</i>	44
4.5.3	<i>MINI Plus –Substance use, abuse and dependence</i>	44
4.5.4	<i>RTQ-Nicotine Dependence</i>	47
4.5.5	<i>DAST-Illicit Drug Abuse</i>	47
4.5.6	<i>AUDIT-Alcohol use, abuse & dependence</i>	48
4.5.7	<i>ICE-dependence</i>	48
4.6	Construct validity	50
4.6.1	<i>MINI Plus-Diagnoses of ADHD and ASPD</i>	50
4.6.2	<i>ASI-Prior and current drug or alcohol treatment, family ...</i>	51
4.6.3	<i>RISC-Injection behaviour</i>	53
4.6.4	<i>MAP-Physical and psychological symptoms</i>	55
4.7	Discriminative validity	55
4.8	Predictive validity	62
4.8.1	<i>Global Continuum of Substance Risk score</i>	63
4.8.2	<i>Specific Current Substance Involvement score</i>	64
4.8.3	<i>Current Frequency of Substance Use</i>	66
4.8.4	<i>Correlation of follow-up ASSIST Current Frequency of Use with follow-up ASI-lite scores</i>	68
4.9	Brief interventions	69
4.9.1	<i>General results</i>	69
4.9.2	<i>Effectiveness of brief intervention</i>	71
SECTION 4	DISCUSSION	74
	REFERENCES	79

Appendix 1 : ASSIST questionnaire	85
Appendix 2 : Original flier designed to advertise the ASSIST study in Primary Health Care settings	90
Appendix 3 : Research Volunteer Form	91
Appendix 4 : Recruitment Screening Form	92
Appendix 5 : Altered flier designed to advertise the ASSIST study in Primary Health Care settings	95
Appendix 6 : Flowchart of Brief Intervention Protocol	96
Appendix 7 : List of materials distributed to brief intervention participants	97
Appendix 8 : List of ASSIST Domains (scores) and formulae used to derive scores	99
Appendix 9 : Discriminative validity – Description of all variables derived to group participants into use, abuse and dependence groups	101
Appendix 10 : Discriminative validity - Discrimination between use and abuse, abuse and dependence: Range of sensitivity and specificity values shown around proposed cut-off scores (bolded).	115

LIST OF TABLES

SECTION 2	Substance use patterns in South Australia	
Table 2.1.1	Summary of drugs ever used and drugs recently used: proportion of the population aged 14 years and over, Australia 2001	11
Table 2.1.2	Main drug problem for clients in South Australian treatment service agencies, May 2001	12
SECTION 3	Methodology	
Table 3.3.1	Age and Sex distribution of participants in ASSIST Phase II study	17
SECTION 4	Results	
Table 4.1.1	Demographic profile of participants	29
Table 4.2.1	Time in minutes to administer ASSIST by recruitment group	30
Table 4.2.2	Highest scoring drug type by recruitment group	31
Table 4.2.3	Highest scoring illicit drug type by recruitment group	32
Table 4.2.4	Percentage of participants receiving scores in each score category by drug type	33
Table 4.2.5	Mean score for each drug type, including and excluding scores of zero	34
Table 4.2.6	Percentage of participants receiving positive scores for each ASSIST item	35
Table 4.3.1	Time in minutes to administer ASSIST follow-up by recruitment group	36
Table 4.3.2	Highest scoring drug type at follow-up by recruitment group	37
Table 4.3.3	Highest scoring illicit drug type at follow-up by recruitment group	38
Table 4.3.4	Percentage of participants receiving scores in each score category at follow-up by drug type	39
Table 4.3.5	Mean score for each drug type at follow-up, including and excluding scores of zero	40

SECTION 4	Results (contd)	
Table 4.3.6	Percentage of participants receiving positive scores for each ASSIST follow-up item	41
Table 4.4.1	Descriptive statistics for ASSIST Derived scores	42
Table 4.5.1	Current frequency of substance use – correlation between ASSIST and ASI results	43
Table 4.5.2	Substance use, abuse and dependence – correlation between ASSIST and MINI Plus results	45
Table 4.5.3	Comparison of mean (sd) ASSIST scores divided according to the presence or absence of MINI Plus current or lifetime diagnoses of abuse or dependence	47
Table 4.5.4	Comparison mean (sd) ASSIST scores divided according to the presence or absence of ICE diagnoses of current or lifetime substance dependence	49
Table 4.6.1	Comparison of mean (sd) ASSIST scores divided according to presence or absence of MINI Plus diagnoses of ADHD and ASPD	51
Table 4.6.2	Correlation between ASI scores and ASSIST scores	53
Table 4.6.3	Correlation between RISC injection scores and ASSIST scores	54
Table 4.6.4	Correlation between MAP physical and psychological symptoms and ASSIST scores	55
Table 4.7.1	Discrimination between use and abuse using ANOVA and ROC analysis: Range of sensitivity and specificity values are shown around proposed cut-off scores (bolded)	58
Table 4.7.2	Discrimination between abuse and dependence using ANOVA and ROC analysis: Range of sensitivity and specificity values are shown around proposed cut-off scores (bolded)	59
Table 4.7.3	Cut-off points for various ASSIST scores	61
Table 4.8.1	Standardised coefficients for variables entered in the multiple regression equation predicting the follow-up Global Continuum of Risk score	64
Table 4.8.2	Comparison of baseline and follow-up Specific Substance Involvement Score	64

SECTION 4	Results (contd)	
Table 4.8.3	Summary statistics for multiple regression analyses carried out predicting the follow-up ASSIST Specific Substance Involvement score	65
Table 4.8.4	Standardised coefficients for variables entered into the multiple regression equations predicting the follow-up Specific Substance Involvement ASSIST score for specific substances.	66
Table 4.8.5	Comparison of baseline and follow-up Current Frequency of Drug Use scores.	68
Table 4.8.6	Current Frequency of use – Comparison of ASSIST and ASI-lite scores	69
Table 4.9.1	Time taken in minutes to administer brief intervention by drug type	70
Table 4.9.2	Number of brief interventions given and number of brief intervention participants who were followed up by drug type	70
Table 4.9.3	Comparison of baseline and follow-up ASSIST scores for participants receiving a brief intervention	73

LIST OF ACRONYMS

ABS	Australian Bureau of Statistics
ADHD	Attention Deficit/Hyperactivity Disorder
AIHW	Australian Institute of Statistics
ANOVA	Analysis of Variance
ASI	Addiction Severity Index
ASPD	Antisocial Personality Disorder
ASSIST	Alcohol, Smoking and Substance Involvement Screening Test
AUDIT	Alcohol Use Disorders Identification Test
BI	Brief Intervention
DALY	Disability Adjusted Life Years
DASC	Drug and Alcohol Services Council
DAST	Drug Abuse Screening Test
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders
ICD-10	International Classification of Diseases
ICE	Independent Clinical Evaluation
MAP	Maudsley Addiction Profile
MINI Plus	Mini Independent Neuropsychiatric Interview
NHMRC	National Health and Medical Research Council
PHC	Primary Health Care
RISC	Rating of Injection Site Condition
ROC	Receiver Operating Characteristic
RTQ	Revised Fragerstrom Tolerance Questionnaire
SDS	Severity of Dependence Scale
Sd	Standard Deviation

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EXECUTIVE SUMMARY

The present study carried out a quantitative analysis of the concurrent, construct, discriminative, and predictive validity of the WHO Alcohol Substance Involvement Screening Test (ASSIST), and a pilot study of the effectiveness of a brief intervention linked to scores obtained on the ASSIST. The current study was a component of the much larger multi-site phase II study concerned with examining the validity of the ASSIST at seven sites worldwide. This report only presents data collected at the Australian site (Adelaide).

The ASSIST is designed to be used in primary health care settings to screen for problem or risky use of a range of drugs (including alcohol, tobacco, cannabis, cocaine, amphetamines, sedatives, hallucinogens, inhalants, and opiates). A number of scores can be derived for each participant from the results they obtain on the ASSIST. The ASSIST scores that are most likely to be used clinically are the *Specific Substance Involvement* score for each drug type (with a max score of 20) and *Global Continuum of Risk score*, or total substance involvement. Other scores include a Lifetime Substance Use score; Current Frequency of Use score; and Global Abuse and Dependence scores.

One hundred and fifty participants took part in this study. Participants were recruited from drug and alcohol treatment settings (the Treatment group), and primary health care settings (the PHC group) to ensure participants exhibited a range of substance use, from dependence to non-problematic use. There were equal numbers of either gender and the mean age of the participants was 30 years 3 months (sd=8yrs, 5months).

All participants were tested at baseline and 139 were followed-up by phone three months later. At baseline the participants were administered the following test battery: The ASSIST; a shortened version of The Addiction Severity Index (ASI), the ASI-lite; The Severity of Dependence Scale (SDS); The Mini International Neuropsychiatric Interview (Mini Plus); The Rating of Injecting Site Condition (RISC); The Drug Abuse Screening Test (DAST); The Alcohol Use Disorders Identification Test (AUDIT); The Revised Fagerstrom Tolerance Questionnaire for smoking (RTQ); and The Maudsley Addiction Profile (MAP). Participants in the Treatment group also received an independent clinical evaluation (ICE), that integrated

information from a number of clinical sources to arrive at a final diagnosis. Participants in the PHC group who scored between 4 to 15 for either alcohol, cannabis, cocaine, amphetamines, and between 4 to 10 for opiates, for Specific Substance Involvement, were given a brief intervention that comprised feedback of results from the ASSIST and self help material.

At follow up participants were administered the follow-up version of the ASSIST (which excluded any mention of lifetime use of substances), sections of the ASI, and SDS. Participants who received a brief intervention at baseline were also asked for feedback on the perceived effect of the brief intervention using the brief intervention process form.

The ASSIST took an average of 7.7 minutes and 5.1 minutes to administer at baseline and follow-up respectively. Alcohol and tobacco received the highest score by the majority of participants at both baseline and follow-up. The highest scoring illicit drugs (including zero scores), were cannabis and amphetamines at both times.

The concurrent validity of the ASSIST was tested by comparing its scores with scores obtained from other instruments co-administered at baseline and that offer alternate measures of the same concepts. Results indicated the substantial concurrent validity of the ASSIST. Global Continuum of Risk and Specific Substance Involvement scores were significantly correlated with scores obtained from the ASI-lite, SDS, AUDIT, and DAST. ASSIST scores were also significantly greater for those participants that received a diagnosis of abuse or dependence on the MINI-Plus.

Construct validity of the ASSIST was investigated by comparing ASSIST scores with measures that provide circumstantial evidence for substance abuse and dependence. Global Continuum of Risk, and other ASSIST scores, were significantly correlated with measures of a number of risk factors for the development of alcohol and drug problems, such as those derived from the RISC, MAP and ASI that reflect physical, psychological or social problems associated with substance use. Furthermore, participants diagnosed with Attention Deficit Hyperactivity Disorder or Anti Social Personality Disorder had significantly greater ASSIST scores than those not diagnosed with the disorder(s).

The discriminative validity of the ASSIST was examined by grouping participants into three groups according to known standard of dependence, abuse and non-problematic substance use and then comparing ASSIST scores using both ANOVA and ROC analysis. Overall the results show that the ASSIST can discriminate between groups, but that it better discriminates between use and abuse, than between abuse and dependence. ANOVA and post hoc Scheffes tests showed that there were significant differences between use and abuse, and abuse and dependence for Global Continuum of Risk scores. With regard to Specific Substance Involvement scores there were significant differences between use and abuse for alcohol, cannabis, amphetamines, sedatives, and opiates, but there were insufficient cases in the cocaine, inhalants and hallucinogen categories to undertake analyses. There were significant differences between abuse and dependence for alcohol, cannabis, amphetamines, and opiates, but not for sedatives, and there were insufficient cases to perform analyses for cocaine, inhalants and hallucinogens. ROC curve analysis showed that the ASSIST was able to discriminate between use and abuse for Global Continuum of Risk with 90% sensitivity and 78% specificity, and between substance abuse and dependence with 82% sensitivity and 72 % specificity. With regard to Specific Substance Involvement, sensitivity between abuse and use ranged from 71% for alcohol and up to 100% for illicit drugs (amphetamines, sedatives and opiates); while specificity ranged from 64% for cannabis and up to 89% for amphetamine. A series of cutoff scores were obtained from ROC analysis to determine abuse and dependence for alcohol and illicit drugs (cannabis, amphetamines, sedatives and opiates) using both global continuum of risk and Specific Substance Involvement scores.

The predictive validity of the ASSIST was investigated by comparing ASSIST scores from the same participant at two different time points. This reflects the capability of the ASSIST to predict future scores on the ASSIST in the absence of an intervention. The results are limited because of the small sample size used, ie, only participants in the PHC group who did not receive a brief intervention were included in the analysis (n=20), and so there were insufficient cases in many drug categories (inhalants, hallucinogens and opiates) to carry out analyses. However, the available data indicate that the ASSIST has good predictive validity. Paired group comparisons of Global Continuum of Risk scores and Specific Substance Involvement scores, and Current Frequency of Drug Use for specific substances, showed no significant differences between baseline and follow-up. Furthermore, follow-up ASSIST Current Frequency of Use scores were significantly correlated with ASI-lite frequency of use score.

A series of multiple regression analyses showed that for all groups investigated, except alcohol, the baseline ASSIST scores investigated were significant predictors of the relevant follow-up score.

The pilot brief intervention study examined how PHC participants who screened positive for drug abuse responded to advice and brief counselling as well as self-help information. Brief interventions were administered to 80 participants, the majority (55%) were for alcohol, the remainder for cannabis (29%), and other illicit drugs (opiates (5%) and amphetamines (2%)). Over half the participants reported that they believed the brief intervention had led them to modify their behaviour in some way. The results of a series of ANOVAs show that the follow-up ASSIST score for any of the targeted brief intervention drugs (alcohol, cannabis, cocaine, amphetamine and opiates) that received the highest drug involvement score, and for alcohol alone, were significantly different from baseline scores. While not statistically significant, illicit drug scores did decrease at follow-up. These data provides preliminary evidence for the effectiveness of linking a brief intervention to the results of the ASSIST.

In conclusion, the results of this study indicate that the ASSIST is a valid screening test for psychoactive substances in individuals who use a number of different substances and have varying degrees of substance involvement in the Australian context. In addition there is preliminary evidence for the efficiency of linking a brief intervention, particularly for alcohol, to the results of the ASSIST. These findings would suggest that the ASSIST is capable of obtaining accurate information concerning the use of a number of substances and varying degrees of substance use.

1.1 Background

Psychoactive substance use is a prevalent and widespread problem worldwide. It is associated with significant morbidity and mortality and represents a significant public health burden. The World Health Organisation has identified alcohol, tobacco, and illicit drugs as among the top 20 risk factors for ill health (WHO, 2002). It has estimated that tobacco is responsible for 9% of all deaths and 4.1% of the global burden of disease (measured as number of years spent living with a disease – and expressed as disability adjusted life years - DALYs), illicit drugs as responsible for 0.4 % of deaths and 0.8% of DALYs, and alcohol as responsible for 3.2% of deaths and 4.0% of DALYs. Moreover, excessive alcohol and other substance use are significant risk factors for a wide variety of social, financial and legal problems for individuals and the community.

There is considerable value in devising screening instruments that are capable of detecting hazardous (ie., continuing substance use that will result in harm) or harmful substance use (ie., substance use that has already resulted in adverse mental or physical effects) or indeed if an individual is already dependent on a particular substance. The result of such screening can be used to determine if individuals require further assessment, referral to specialist treatment, or simply advice (brief intervention) concerning the behaviour that is of concern. As a consequence screening has the potential to detect health problems or risk factors early before they have caused serious disease and other problems.

The limitations of existing screening tests have recently been outlined (McPherson and Hersh, 2002; Babor, 2002). Many existing instruments, such as the Addiction Severity Index (ASI) and expanded Substance Abuse Module of the CIDI (CIDI-SAM: World Health Organisation, 1988) are very comprehensive and are too time consuming to be administered in primary care

settings. On the other hand, some of the briefer instruments available, such as the CAGE-AIDS: Brown and Rounds, 1995), have a focus on dependence which is less useful for detecting problematic or risky drug use in non-dependent persons. Moreover, the available self-report screening tests also have a number of limitations from a cross-cultural perspective (Babor, 2002). Most were developed in the United States of America and do not have demonstrated sensitivity and specificity for use in other cultures. Importantly many of these tests have not been extensively validated, and indeed some have been validated unfavourably (Babor, 2002).

In 1982 The WHO initiated a program to develop a screening test for hazardous and harmful alcohol use and dependence. This program led to the development of the Alcohol Uses Identification Test (AUDIT) (Saunders et al., 1993). The AUDIT has been found to be both a reliable and valid instrument (Allen et al., 1997) and has been used extensively as part of a general public health approach to screening and early intervention for alcohol-related problems (Higgins-Biddle et al., 1997). The success of the AUDIT, and the recognition of the need for a cultural relevant and valid screening instrument capable of detecting psychoactive substance use, abuse and problems in primary care settings has led to the WHO's current program of developing the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) (WHO ASSIST Working Group, 2002).

The ASSIST was devised to be administered by primary health care providers in primary health care settings, such as general medical practices and community health centres, where there is a potential for such problems to go unnoticed. Primary health care settings are ideal to undertake screening for the following reasons; 1) primary health care settings are often the first contact with the health system for a large majority of people; 2) primary health care workers are trusted and credible sources of information about health matters, and people expect to be asked about lifestyle risk factors, such as substance use by health professionals in such settings; and 3) there is evidence that the rate of alcohol problems and probably illicit drug use, such as amphetamine

use, is high amongst people seeking health care, and that many medical problems may be exacerbated by such substance use. Therefore this context provides a good opportunity to provide education about the risks of excessive alcohol or other substance use.

A three phase research program was outlined by the WHO for the development of the ASSIST. Phase I was carried out during 1997/98 and involved the development of the initial instrument and a quantitative analysis of the test-retest reliability of the ASSIST at an item level and scale level, as well as the collection of qualitative data on feasibility and acceptability of the ASSIST (WHO ASSIST Working Group, 2002). This phase of the program was coordinated by the Department of Community Medicine, University of Connecticut Health Centre, Framington, USA. Two-hundred and thirty-six sets of test-retest interviews were completed by researchers from sites around the world wide, including Australia (Adelaide). Sixty percent of the sample was recruited from drug and alcohol treatment settings, while the remainder came from primary health care settings. Data were examined according to question stem, substance class and data collection setting in order to provide recommendations for improving the instrument. Test-retest kappa coefficients of agreement (*K*-values) for both question stem and drug category were computed. The average test-retest reliabilities (Kappas) were in the range of good to excellent ranging from a low of 0.58 to a high of 0.90 for question stems; and from 0.61 for sedatives to 0.78 for opiates. A *K*-level of 0.40 is considered moderate, and a coefficient above 0.60 is considered substantial. On the basis of these findings revisions to the ASSIST instrument were made that included shortening it from the initial 12 questions to 8 questions covering tobacco, alcohol, cannabis, cocaine, amphetamines type stimulants, inhalants, hallucinogens, opiates, and other drugs . Researchers concluded that the ASSIST was reliable and feasible to use as screening test for substance use and abuse.

Phase II was carried out during 2000/2002 and constituted a multi-site international validation of the ASSIST in a variety of health care settings and in

a number of different cultures. The concurrent, construct, predictive, and discriminative validity of the items in the questionnaire were examined. Validation is a particularly important step in the development of an instrument, such as the ASSIST, as clinicians must be confident that it measures what it was designed to measure. Furthermore, for the ASSIST to have clinical utility it is important to assess the validity of the ASSIST in relation to therapeutic intervention that is linked to the output of the instrument. Thus a major aim of this study was to also develop an appropriate brief intervention and referral procedure for persons who screen positive for substance abuse and dependence. Adelaide took over as the coordinating site for phase II and the data collected at the Australian site are the focus of this monograph.

Phase III of this project will consist of a more formal randomised clinical trial of brief interventions with persons at low and intermediate risk levels who screen positive for substance abuse and dependence.

1.2 ASSIST questionnaire structure

The ASSIST consists of eight questions that were designed to be answered by most subjects in less than three minutes. The ASSIST screens for tobacco, alcohol, cannabis, cocaine, amphetamines, inhalants, sedatives, hallucinogens, opiates and any other drug used by the participant. Question 1 asks about lifetime use of substances. Question 2 asks about frequency of use during the prior three months. Responses to this question are rated on a five-point frequency scale ranging from "never" (in the past three months) to "daily or almost daily." This question provides critical information about the substances most relevant to the respondent's current health status. If none of the targeted substances have been used in the past three months, the interviewer can skip to the last three questions which enquire about lifetime and recency of usage patterns. If any substance has been used during the past three months, Questions 3, 4 and 5 are asked, before concluding with questions 6 to 8. Question 3 is a measure of psychological dependence and asks about frequency of compulsion to use substances in the prior three months. Question 4 is a measure of harmful use. Question 5 asks whether

participants have failed to meet role obligations. Questions 6 to 8 ask about lifetime and recent problems, including whether concern has been expressed by friends or relatives, prior attempts at controlling drug use, and prior injection of drugs. A shorter version of the ASSIST that excluded question 1 was administered over the phone as part of the follow-up interview. See Appendix 1 for the full version of the ASSIST questionnaire.

1.3 ASSIST Derived Scores

Several different scores or domains can be derived for each participant, from their results on the ASSIST. For each drug type, a '*Specific Substance Involvement score*' can be derived. The Specific Substance Involvement Scores for alcohol, cannabis, cocaine, amphetamines and opiates were used in Phase II by the researchers to decide which participants qualified for a brief intervention.

As part of a review of Phase I, several other useful scores were identified that could be derived from the results of the ASSIST. These derived scores include the following:

- a *Lifetime Substance Use score* which indicates the total number of substances used in the participant's lifetime;
- a *Global Continuum of Risk score* or Total Drug Involvement;
- a *Current Frequency of Substance Use score*;
- a *Global Dependence score*; and
- a *Global Abuse score*.

Appendix 8 presents the formula used to calculate these scores.

1.4 Assessing the validity of the ASSIST

This study used a standard test validation approach, based on the principles of psychological testing (Cronbach, 1970). The ASSIST items outlined in section 1.3 were tested for their *construct, concurrent, discriminative and predictive*

validity where appropriate. This section briefly outlines the rationale for the ASSIST validation study and the general hypotheses explored.

The *concurrent validity* of the ASSIST was measured by statistically comparing its findings with the findings from established and standardised questionnaires or assessments designed to measure the same phenomenon. In this study ASSIST scores were compared to scores obtained from the Addiction Severity Index (ASI), The Severity of Dependence Scale (SDS), the Drug Abuse Screening Test (DASC), the Alcohol Uses Disorders Identification Test (AUDIT), and the Revised Fragerstrom Tolerance Questionnaire (RTQ) - All these instruments will be described in detail in the methodology section (section 3). For the ASSIST to have concurrent validity its scores should correlate significantly with scores obtained from the previously mentioned instruments. In addition, scores divided according to the absence or presence of criteria used to diagnose abuse or dependence for each substance used should be significantly different.

The *Construct validity* of the ASSIST was assessed by comparing its results with the results of other instruments designed to measure theoretically-related phenomenon or constructs to those of interest. Very often there is no single indicator for the phenomenon of interest, such as drug dependence, and so evidence for construct validity is generally circumstantial. For example, evidence of substance abuse or dependence may be ascertained by increases in legal or financial problems, increased physical and psychological symptomatology, or presentation to drug or alcohol treatment units. Questionnaires such as the ASI and Maudsley Addiction Profile (MAP) provide a number of variables that can be used as indicators of the abovementioned problems commonly associated with drug abuse and dependence. For the ASSIST to have construct validity its scores should be significantly correlated with scores from instruments such as the MAP and ASI. In addition the results of the Rating of Injection Site Condition Site Scale (RISC: Marsden et al, 1998), which provides a measure of the nature and extent of injection relate morbidity, should also correlate with ASSIST scores.

Furthermore, as the variables measured within the ASSIST, such as frequency of drug use, are readily identifiable indicators of hazardous and harmful substance use, it is expected that they should be associated with a range of risk factors (such as familial substance abuse, childhood attention deficit disorder, and psychopathic personality traits), because persons with these markers are theoretically at higher risk of developing substance-related disorders (Babor et al., 1989a). Thus the construct validity of the ASSIST was also examined by comparing ASSIST results divided according to the absence or presence of criteria used to diagnose Attention Deficit/Hyperactivity Disorder and Antisocial Personality Disorder by the MINI International Neuropsychiatric Interview (MINI Plus) . It would be expected that individuals diagnosed with such disorders would obtain significantly higher scores on the ASSIST than those who did not.

Discriminative validity refers to the ability of a test to discriminate whether or not participants have a given characteristic or condition. As the ASSIST was intended to differentiate between substance use, abuse and dependence, the discriminative validity of the ASSIST was assessed by investigating whether clear cut-off scores exist that separate participants into each of the three categories (use, abuse and dependence). Participants were separated into the three categories using factual information such as their recruitment group (treatment versus primary health care) and the results of the MINI Plus substance abuse and dependence diagnoses (see methodology section for description of the MINI-Plus instrument). Their ASSIST scores were then compared to explore whether there were clear cut-off scores separating the groups.

Predictive validity refers to the ability of a screening test to indicate future risk or disease development in the absence of a clinical intervention. Thus it was necessary to perform follow-up testing of participants who had not received any treatment or intervention at baseline. For the ASSIST to have good predictive validity there should be no significant difference between baseline

and follow-up scores. ASSIST Global and Specific Frequency of Drug use scores were also correlated with appropriate follow-up ASI scores that are also indicators of frequency of drug use.

To test the concurrent, construct, predictive and discriminative validity of the ASSIST screening items a comprehensive test was administered to all participants. Furthermore, as the ASSIST was designed to be used in a primary care settings where clients range from non-substance users to those with substance dependence and abuse problems, it was important to validate the ASSIST using a sample that displayed the same range of substance use. Therefore participants were recruited from drug and alcohol treatment agencies, where subjects were receiving treatment and had been diagnosed with substance dependence, as well as primary health care settings, to include participants who had never used drugs, except alcohol and tobacco, as well as participants who may have used drugs without experiencing any problems and those who may be at risk or, were already experiencing substance abuse.

1.5 Rationale for the Brief Intervention pilot study

There is evidence that brief interventions are particularly effective for alcohol problems in primary health care settings (Bien et al., 1993; Heather, 1996; WHO Brief Intervention Study Group, 1996; Senft et al., et al,1997; Cordoba et al., 1998; Maisto et al., 2001; Miller & Willbourne., 2002). Senft and colleagues (1997) revealed that a 15 minute brief intervention (including self help materials) given to hazardous drinkers in a primary health care setting, was associated with a reduction in the frequency of drinking at 6 and 12 months. The WHO Brief Intervention Group (1996) found that five minutes of simple advice were as effective as 20 minutes of counselling in reducing alcohol consumption in men. Moreover, brief interventions have been shown to be a cost effective way of reducing alcohol consumption and associated problems (Fleming et al., 2000; Wutzke et al., 2001). There is also evidence that brief interventions are effective in reducing tobacco related problems (Ockene et al., 1994; Solberg et al., 1990).

While there is little research addressing brief interventions for illicit drugs, the available evidence suggests that brief intervention can work for cannabis (Copeland et al., 2001), benzodiazepines (Bashir et al., 1994), amphetamines (Baker et al., 2001), opiates (Saunders et al., 1995) and cocaine (Stotts et al., 2001). For example, Bashir and colleagues gave patients with a chronic benzodiazepine problem brief advice lasting a few minutes and a self help book, as part of a routine doctors visit. They found that the brief advice group significantly reduced their benzodiazepines use and showed improved general health after 3 and 6 months after the advice was given. The current study constituted a pilot study of the feasibility of linking screening for substance abuse with a brief intervention carried out in Australian primary care settings. Pilot data will provide a basis for the full-scale clinical trial of brief interventions that is proposed for a future Phase III study.

The protocol used to administer the brief intervention was developed using the principles discussed by Miller and Rollnick (1991). This includes the FRAMES components (feedback, responsibility, advice, a menu of options, empathy and self-efficacy) found to be effective in interventions with smokers and problem drinkers (Bien et al., 1993). Only participants who had not received treatment and were members of the primary health care group received a brief intervention. The type of brief intervention provided to participants was determined by the Specific Substance Involvement score obtained and will be outlined in the methodology section. Finally, a three month follow-up was conducted to evaluate the outcome of the brief intervention.

1.6

Aims of the study

The current study had the following broad aims;

- To determine if the ASSIST demonstrates adequate validity for use in primary care practice in the Australian context.
- To develop a pilot brief intervention and referral procedure for persons who screen positive for drug abuse and to determine how feasible it is to link drug abuse screening with brief intervention. It is proposed to undertake a trial of these procedures with a small sample of drug users.

SECTION 2 SUBSTANCE USE PATTERNS IN SOUTH AUSTRALIA

In order to set the context for discussion of the results collected at the Australian site the following section provides background information concerning substance use patterns in South Australia.

At the latest census Australia had a population of approximately 19 million people with a median age of 35 years. The life expectancy of an Australian male is around 77 years, while for females it is around 82 years. The majority of people living in Australia are Australian-born (71.8%), and speak English as the first language (79.1 % of the population). The other most common language spoken is Italian (1.9% of population). Just over two percent (2.2%) of the population identify as being of Aboriginal descent (ABS data, 2002).

The current study was conducted in Adelaide, the capital of the state of South Australia. South Australia has the fifth largest population in Australia with 1.5 million people. Just under three quarters (73%) of the population live in the Metropolitan region of Adelaide.

In South Australia, alcohol and tobacco are both legal drugs. While the use of all other drugs for recreational purposes is criminal and illegal, the possession of cannabis for personal use is decriminalised. If a person is caught with a small amount of cannabis or with its associated equipment, or is caught cultivating one outdoor cannabis plants, the person receives an on the spot fine (Cannabis Expiation Notice). If the fine is expiated within the specified period, the incident is not recorded on their criminal record. Cultivation of larger amounts of hydroponic cannabis, or possession for sale, is a criminal offence.

The results of the 2001 National Drug Strategy Household Survey, conducted across Australia with almost 27,000 participants aged 14 years and over, gives some indication of the prevalence of drug use in Australia (AIHW data, 2002). See Table 2.1.1 for the estimated prevalence of drug use in Australia in 2001.

When asked to name the drug they thought of when people talked about a drug problem, just over half of those interviewed (50.1%) identified heroin as the most problematic drug in Australia, while 23.7% thought cannabis was the most problematic drug. Alcohol was thought to be most problematic by 7.8% of those interviewed, and was the most widely accepted drug with 74.7% reporting that regular alcohol use by adults is acceptable.

With regard to South Australian substance use trends - the Alcohol and Drug Information Service, a telephone counselling service run by DASC, received a total of 7282 telephone calls during the 2000/2001 financial year. Most telephone calls were related to alcohol (28.4%), followed by cannabis (18.8%), amphetamines (14.9%) and opiates (10.9%).

Table 2.1.1 Summary of drugs ever used and drugs recently used: proportion of the population aged 14 years and over, Australia 2001

<i>Drug</i>	<i>Ever used^a (%)</i>	<i>Recent use^b (%)</i>
Tobacco	49.4	23.1
Alcohol	90.4	82.4
Cannabis	33.1	12.9
Cocaine	4.4	1.3
Amphetamines	8.9	3.4
Ecstasy	6.1	2.9
Inhalants	2.6	0.4
Tranquillisers /sleeping pills	3.2	1.1
Barbiturates	0.9	0.2
Hallucinogens	7.6	1.1
Opiates ^c	3.1	0.5
Analgesics	6.0	3.1
Any illicit drug	37.7	16.9
Injecting drug use	1.8	0.6

^a Refers to non-medical use only.

^b Reported use in last 12 months

^c Refers to heroin, methadone and other opiates

A census of clients of South Australian drug and alcohol treatment agencies conducted in May 2001 identified the main drug problem for each client (Shand & Mattick, 2001). The main problematic drug was alcohol for 38.2% of the total client population, followed closely by opiates at 37.5%. See Table 2.1.2 for a breakdown of the main drug problem for clients by drug type.

Table 2.1.2 *Main drug problem^a for clients in South Australian treatment service agencies, May 2001*

<i>Drug Type</i>	<i>% of clients</i>
Alcohol	38.2
Opiates	37.5
Amphetamines ^b	10.0
Cannabis	4.6
Cocaine	0.4
Benzodiazepines	1.5
Hallucinogens and Inhalants	0.0
Poly-drug use	6.6

^a Total may exceed 100% as some agencies nominated more than one main drug per client

^b Includes amphetamine-related substances, e.g. ecstasy

SECTION 3 METHODOLOGY

3.1 Study Design

Ethical approval was obtained from the Research Ethics Committee at the Royal Adelaide Hospital.

In order to test the construct, concurrent, discriminative and predictive validity of the ASSIST screening items the ASSIST was administered to two groups of patients recruited from primary health care settings (referred to hereafter as the PHC group) and specialised treatment settings (referred to hereafter as the Treatment group). This was to ensure that patients reflected the continuum of substance use, from non-problematic use, harmful use through to dependence. Where appropriate validity was evaluated for each domain outlined in section 1.3.

A comprehensive test battery was administered to participants from both subject groups and comprised the ASSIST, a number of interviewer administered questionnaires and self report assessments that are outlined in detail later. All participants were administered the same battery of tests. Participants from the Treatment group also received an independent clinical evaluation (ICE) of current and lifetime dependence from an expert clinician who was blind to the scores of other tests.

Those participants in the PHC group who scored between 4 and 15 on the ASSIST for either alcohol, cannabis, cocaine, amphetamines, or between 4 and 10 for opiates were administered the readiness to change questionnaire to gauge their motivation to change (stage of change). They also received a brief intervention and related written material from the interviewer as outlined in section 3.4.

All subjects were contacted by phone three months after their baseline assessment, and were re-interviewed using a condensed test battery

consisting of the ASSIST and two other short instruments which are detailed in section 3.6. Those subjects who received a brief intervention were also asked for feedback on the perceived effects of the brief intervention using a structured questionnaire.

3. 2 Recruitment Settings

As already mentioned the aim of recruitment from two different types of treatment setting was to test the ASSIST on a broad spectrum of substance users. It was intended that the sample consist of the following groups of people:

- Nonproblematic users or current abstainers who had never been treated for a drug or alcohol problem.
- Current drug users who were abusing drugs, some of whom were in the early stages of dependence. Individuals in this group may have received treatment for substance problems in the past, but where not currently in treatment or seeking treatment.
- High level or dependent users who had been in treatment for no longer than one month prior to recruitment.

Participants in the Treatment group were recruited from two settings which form the Withdrawal Management Unit (The Warinilla Clinic and Alcohol Unit) run by Drug and Alcohol Services Council (DASC). Both units offer a medical detoxification from alcohol and other drugs in an inpatient setting. The Warinilla Clinic has ten beds and primarily admits people who use intravenous drugs (usually opiates and amphetamines). The Alcohol Unit has 12 beds and admits people who usually misuse alcohol, cannabis or benzodiazepines and not intravenous drug users. The process of recruiting participants from these units was as follows: Initially the interviewer examined the case notes of prospective participants prior to approaching them. If the participant met the study inclusion criteria, they were approached and asked if they would like to

participate in the study. The study was explained to the client as outlined on the Informed Consent Procedures and Participant Information sheet. If the client agreed to take part in the study, he or she was given a copy of the WHO ASSIST Information Sheet to read before signing the Consent Form (see Component II, Module B 'Informed consent Procedures and Patient Information' from the ASSIST Phase II Protocol).

Participants in the PHC group were recruited from ten Primary Health Care settings, which included, five general medical practitioners' offices and five community health centres situated throughout the city and suburbs of Adelaide. Fliers advertising the study (see Appendix 2 for a copy of the flier) were placed on noticeboards around the waiting rooms. In some cases prospective participants were notified of the study by a staff member at the setting. Interested clients were asked to phone the ASSIST Project Officer regarding the study and leave a message on the answering machine. They could also fill in a 'Research Volunteer Form' which was then faxed to the ASSIST Project Officer by staff at the setting (see Appendix 3 for a copy of the Research Volunteer Form). Potential participants were rung back by the ASSIST Project Officer and were read a short explanation of the study before being asked a series of questions to make sure they were suitable to take part in the study (see Appendix 4 for a copy of the Recruitment Screening Form).

Approximately half way into collecting data from the PHC group it was evident that the majority of the participants had not used any drugs apart from alcohol, tobacco and occasionally cannabis. To rectify this, fliers were altered to encourage persons that had used illicit drugs to volunteer for the study (see Appendix 5 for a copy of the altered flier).

Participants were paid a total of AUS\$40 for their participation in the baseline and the follow-up interviews.

3.3 Participants

3.3.1 *Inclusion and exclusion criteria*

Participants in this study were volunteers between the ages of 18 and 45 who were:

- members of the main ethnic group(s)
- able to communicate proficiently in English (the national language)
- physically well enough to participate in a one and a half hour assessment including a physical examination
- and had at least 3 cm of hair on their head.

The following were excluded from the study:

- Those with severe cognitive impairment or mental retardation
- Those with severe behaviour disturbances or psychotic symptoms
- Those who were intoxicated or going through withdrawal from alcohol or drugs
- Those who had been in treatment or incarceration longer than one month (30 days).

3.3.2 *Recruitment*

In total, 150 participants were recruited for the current study, 50 were recruited from Treatment settings and 100 were recruited from Primary Health Care settings. Participants in the Treatment group were all recruited from the Withdrawal Management Unit. The participants in the PHC group were recruited from a General Medical Practitioner's office (n=41), from a Community Health Centre (n=10), and the remaining were recruited from advertisements in General Practitioner's offices or Community Health Centres (n=48). One participant was recruited from another setting.

A stratified sampling procedure was used to ensure that adequate numbers of both gender were represented and that there were adequate numbers of participants in each age range. The upper age limit was set at 45 as the

prevalence of drug dependence is low beyond this age. Table 3.3.1 shows the age and sex distribution that was achieved.

Table 3.3.1 Age and Sex distribution of participants in ASSIST Phase II study

<i>Sex</i>	<i>18 to 25 years</i>	<i>26 to 35 years</i>	<i>36 to 45 years</i>	<i>Total</i>
<i>Male</i>	25	25	25	75
<i>Female</i>	25	25	25	75
<i>Total</i>	50	50	50	150

3.4 Baseline Assessment procedures

A comprehensive test battery, comprising a number of interviewer administered and self-administered instruments and a biological test, was administered to all participants in this study. Instruments were chosen that were standardised to ensure comparability of findings, that measured multiple domains, produced a number of outcome criteria and had sound psychometric properties (reliability and validity). Most of the instruments focused on events that occurred over the last three months, and lifetime experiences, except the MINI Plus which also assessed events that occurred over the last year. Initially a number of forms relating to the recording of participants' consent for the study, personal contact details, and details of potential follow-up locators, were completed. All participants were administered the same battery of test in the following order.

3.4.1 Interviewer – administered assessments

3.4.1.1 Demographic Information Form

This form collected basic information on sociodemographic variables, including marital status, religion, ethnicity, and educational and occupational status.

3.4.1.2 The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)

The ASSIST was the first instrument to be administered.

3.4.1.3 The Addiction Severity Index (ASI) -Lite

The Addiction Severity Index (ASI) assesses client functioning in a number of areas - The ASI-Lite is a condensed version of the ASI. The alcohol and drug use section of the ASI-Lite was used in the present study. The focus of the substance use section is on lifetime and recent use, as well as problems associated with drug use. In addition, a section from the ASI on family history of drug, alcohol and psychiatric problems was used. Relevant questions from the ASI-Lite were also used in the follow-up questionnaire. The reliability and validity of the ASI has been previously established (McLellan et al., 1985).

3.4.1.4 The Severity of Dependence Scale (SDS)

The SDS is a five-item interviewer-administered questionnaire that focuses on psychological aspects of drug dependence. It takes a very short time to administer, and provides a score indicating the severity of dependence. The SDS was included in both the baseline interview and in the follow-up interview. All participants were asked to complete the SDS with their most problematic substance in mind. The test-retest reliability and validity of the SDS has been recently established (Gossop et al., 1997; Gossop et al., 1995).

3.4.1.5 The MINI International Neuropsychiatric Interview (MINI Plus)

Selected sections of the MINI Plus were used in the baseline interview. The MINI Plus is an abbreviated structured diagnostic interview which uses decision tree logic to assess the major adult Axis I disorders in DSM-IV and ICD-10. It's diagnostic algorithms are consistent with those of DSM-IV and ICD-10. It is designed to be administered by trained interviewers who do not necessarily have training in psychiatry or psychology. The drug and alcohol use section of the MINI Plus was used to assess the presence or absence of diagnoses of:

- Dependence and or abuse
- On alcohol

- On the two most frequently used or most problematic drugs (amphetamine type stimulants, cocaine, hallucinogens, cannabis, benzodiazepines/ barbiturates and any 'other drug' not included in the above list).
- Whether the diagnosis was one that was current (in last 12 months) and/ or a lifetime diagnosis (anytime in life – may or not be current).

For substances other than alcohol, the two most frequently used substances or the main ones causing problems for the participant were explored (unless only one drug class was used). All drug types apart from nicotine could be explored. A diagnosis of dependence was made if subjects fulfilled at least 3 of the 7 dependence criteria and a diagnosis of abuse was made if subjects fulfilled at least 1 of the 4 abuse criteria. The severity of the abuse or dependence was also be obtained by summing the number of criteria fulfilled for the diagnosis.

Other psychiatric disorders relevant to substance use problems were investigated through the use of the sections of the MINI Plus relating to Attention Deficit/Hyperactivity Disorder and Antisocial Personality Disorder. The reliability and validity of the MINI Plus interview has also been recently established (Lecrubier et al., 1997; Sheehan et al., 1998).

3.4.1.6

Rating of Injecting Site Condition (RISC)

The RISC is a brief, clinician administered assessment of visible injection stigmata and related complications (scarring, abscess, infection, active infection etc.) (Marsden et al., 1998). Severity assessments from the scale are based on observations of the arms, hands, legs and feet of drug users with approximate counts of needle track marks, and ratings of the injection site morbidities. The RISC assessment was conducted as part of the baseline interview for anyone who reported recent IV drug use. The RISC provided data on recent (last 3 month) injecting status and also on life time status in relation to mode of venous access and other complications arising from long term injecting.

3.4.2 *Hair Sampling*

To supplement and corroborate the information gathered through interviews and questionnaires, data were also collected from hair tests to determine the presence or absence of certain drugs. The results of hair sampling will not be presented in this monograph as it was considered that no meaningful conclusions could be made regarding the Australian sample because of the small sample size.

3.4.3 *Self-administered instruments*

3.4.3.1 The Drug Abuse Screening Test (DAST)

The DAST is a self-report assessment consisting of ten true-false statements describing medical, social, and behavioural events common to the careers of drug users (Skinner., 1982). The DAST has demonstrated a considerable degree of validity in distinguishing between known groups of drug users. Although derivation of the DAST was apparently not related to any systematic theory of addiction, factor analytic studies suggest that a broad underlying dimension of dependence may be what is measured by the test. All participants were asked to complete the DAST during the baseline assessment. The diagnostic validity of the DAST was established by Gavin and colleagues (1989).

3.4.3.2 The Alcohol Use Disorders Identification test (AUDIT)

The inclusion of the AUDIT self-report questionnaire (Babor et al., 1989b; Saunders et al., 1993) allows comparison of the ASSIST alcohol questions with a validated screening test linked for alcohol. Questions were asked for the three month period. Saunders and colleagues (1993) established the reliability and validity of the AUDIT.

3.4.3.3 The Revised Fagerstrom Tolerance Questionnaire (RTQ)

The RTQ is a ten item self-report questionnaire designed to measure nicotine dependence (Tate & Schmitz., 1993) and supplements information on drug use collected via the ASI-Lite (which does not incorporate tobacco use). All participants were asked to complete the RTQ during the baseline assessment.

The reliability and validity of the RTQ was established by Tate and Schmitz (1993).

3.4.3.4 Maudsley Addiction Profile (MAP)

The MAP is a self report questionnaire which provides a functional assessment of physical health, anxiety and depression (Marsden, et al., 1998). The ten-item physical health symptoms scale assesses the past three-month frequency of health problems across five functional system domains (general, gastro-intestinal, musculoskeletal, neurological, cardiovascular). The ten-item psychological health scale assesses the past three-month frequency of generalised anxiety and depression symptoms. The questions were asked for the prior three month period. The reliability and validity of the MAP was investigated by Marsden and colleagues (1998).

3.4.4 *Independent clinical Evaluation (ICE) for subjects recruited from drug treatment settings*

The concurrent and discriminative validity of ASSIST was evaluated against the diagnoses provided by an expert's independent clinical evaluation (ICE) that integrated information obtained from one or more interviews, clinical observations, and other sources of information, such as medical records and collateral informant reports, to arrive at a final diagnostic determination. Diagnoses of current and lifetime dependence were made for alcohol, opiates, cannabis, benzodiazepine, cocaine, amphetamine and nicotine dependence. It was usually completed within 24 hours of the baseline interview and only for patients recruited from the treatment setting.

3.4.5 *Brief intervention for subjects recruited from primary care settings*

3.4.5.1 Readiness to Change Questionnaire – Drugs (RCQ-D)

The RCQ-D is a brief 11-item self-report questionnaire that seeks information on views regarding changing drug use behaviours (Hile & Adkins., 1998). It was used to determine how ready participants were to change and how their expectations correlated with any observable changes in behaviour. Only those primary health care participants who were screened as being eligible to receive the trial brief intervention procedure were asked to complete the RCQ-D, which

was to be completed before the brief intervention. Subjects were classified as being in the pre-contemplative, contemplative or action stage of change. Hile and Adkins (1998) have established the reliability and validity of the RCQ-D.

3.4.5.2 Administration of brief intervention

A short (approximately 15 minute) intervention was developed which could be used in primary health care settings. To guide interviewers through the steps to be taken in each brief intervention a flowchart (see Appendix 6) was designed.

Only participants in the Primary Health care group were targeted for brief interventions. The provision of a brief intervention was determined by the Specific Substance Involvement score obtained by participants. A score of 3 or below on the ASSIST for any of the drugs targeted for brief intervention (alcohol, cannabis, cocaine, amphetamines or opiates), required no intervention. Instead participants were asked if they would like any information regarding drugs and alcohol and the interview session was ceased. If participants in the PHC group scored between 4 and 15 on the ASSIST for alcohol, cannabis, cocaine, and amphetamines and between 4 and 10 for opiates, they would be given a brief intervention. A motivational interviewing style was utilised throughout the interviews employing strategies identified as essential for this approach – including reflective listening, creating ambivalence, rolling with resistance and eliciting self motivational statements (Miller and Rollnick, 1991). The interviewer began the brief intervention by drawing attention to screening results that indicated the current level of drug use and the possible problems that had been (or could be) associated with it. Generally this was followed by weighing up the pros and cons of drug use and determining the level of concern. When appropriate, the brief intervention focused on setting goals, strategies to achieve the goals and practical ways of obtaining the resources needed. In some situations the session also included a review of the participant's interpersonal support system and how those relationships were being or could be drawn upon to support the participant's goals. Before ending the session, the participant received self-help material

aimed at the substances most commonly used. For the full list of materials distributed during the brief intervention pilot study, see Appendix 7

As the focus of the brief intervention was on at-risk substance users, for whom advice and self-help material would be appropriate, substance users who scored highly on the ASSIST (16 or above, or 10 or above for opiate users), were referred to specialist treatment. In addition participants who reported intravenous drug use in the past three months were also referred to specialist treatment. Of the 100 participants in the PHC group, 80 were given a brief intervention. Following the delivery of the brief intervention the interviewer completed the *Interviewer Rating of Expected Outcomes* which rated their expectations of the outcomes of the intervention for that participant

All participants completed the consent, participant information and locator forms and the interviewer-administered assessments. The RISC assessment was completed for the 62 participants who reported IV drug use. All participants completed the self-report questionnaires. Eighty participants completed the RCQ-D and received a brief intervention. ICE forms were completed for all of the 50 participants in the Treatment group.

3.5 Issues encountered during baseline interviews

The ASSIST interview and the administration of the brief intervention generally went smoothly except for two recurring problems. The first problem concerned Question 7 of the ASSIST, "Have you ever tried to control, cut down or stop using (DRUG)?" . This question did not always seem to elicit the response that was intended. Several participants who admitted to being heavy users indicated that they that never bothered trying to cut down. This therefore did not add any extra points to their total ASSIST score. Conversely, several participants responded that they had successfully cut down or stopped using a particular drug and therefore added one or two points to their total ASSIST score. It was suggested at a meeting of the international ASSIST steering committee in March 2002, that Q7 required clarification.

The second problem concerned the provision of the brief intervention. Several participants who scored a 4 on the ASSIST for alcohol use, and therefore were qualified to receive a brief intervention, were actually using alcohol at safe levels. For example a participant could respond that they drink one glass of alcohol, five nights a week, and the participant would receive a score of 4 on the ASSIST for alcohol. The NHMRC guidelines for safe drinking levels state that females should drink an average of two alcoholic drinks a day, males four alcoholic drinks a day, and that everyone should have at least two alcohol-free days a week. It was suggested by the Australian group to the ASSIST steering committee that it would be more appropriate to have a higher cut-off score indicating that the respondent is drinking at harmful levels.

3.6 Follow-up interview procedures

The follow-up had two purposes. First, to evaluate the predictive validity of the ASSIST and, secondly, to determine the effectiveness of the brief intervention. The follow-up generally occurred at three months after the initial assessment. All participants were contacted by telephone and were re-interviewed using a condensed test battery that took approximately 20 minutes to complete. For the purpose of testing predictive validity participants were readministered the following battery consisting of, in the order that they were administered:

- the follow-up version of the ASSIST (with the exception of Q1 which asks about lifetime use of substances).
- sections of the ASI
- the SDS

Participants who received a brief intervention at baseline were also asked for feedback on the perceived effect of the brief intervention using the *Brief Intervention Process Rating Form*. This form asked participants how much the brief intervention and the written materials that they received following the brief intervention influenced their behaviour in the three months following the baseline interview.

Of 150 participants interviewed at baseline, 139 people were located and agreed to participate in the follow-up. Of the 11 participants who were not located, four participants had moved from their place of residence just after their baseline interview and their whereabouts were unknown. After several failed attempts at contacting the remaining seven, they were also deemed uncontactable. In addition two people gave false names at the baseline interview. They were especially suspicious of what would be done with the information they were providing. Despite getting their correct names and contact details they remained elusive and still proved to be un-contactable.

Follow-ups were conducted over the phone unless the participant requested for the follow-up to be done in person. One participant in the Primary Health Care group and three in the Treatment group were interviewed face-to-face. The mean time from baseline interview to follow-up interview was 104 days (SD = 14.9 days) with a minimum of 78 days and a maximum of 181 days (median = 101 days).

3.7

Training of interviewers

Three interviewers participated in the study at different stages. The ASSIST Project Coordinator conducted several baseline interviews and assisted in conducting other interviews when needed. The ASSIST Project Officer conducted the majority of the baseline interviews and just under half of the follow-up interviews. The third interviewer, a Project Officer at DASC, conducted the majority of the follow-up interviews. The interviewers read and studied the ASSIST protocol until they were familiar with its contents. The interviewers then had two hours training by a clinician experienced in brief interventions and watched the six-part video series, 'Motivational Interviewing: Professional Training Videotape Series' by Miller and Rollnick. The text, 'Motivational Interviewing', also by Miller and Rollnick (1991), was also consulted by all interviewers. Interviewers were observed during their first few interviews by the Project Coordinator and received feedback on their adherence to the protocol. Problems were resolved by consulting the Phase II

protocol, or if a resolution was not clear, the Project Coordinator was consulted.

3.8 Data Analysis

As outlined in the introduction several scores can be derived for each participant, from their results on the ASSIST. The Substance Involvement Scores have a maximum score of 20 for all drugs except tobacco, where the maximum score is 16 because question 5 is not suitable to ask for tobacco. Other derived scores include:

- a *Lifetime Substance Use score* (calculated by the addition of responses to question 1 for all drug types), which indicates the total number of substances used in the participant's lifetime, with a maximum score of 10;
- a *Global Continuum of Risk score* (calculated by the addition of all items for all substances on the ASSIST, for all drug types), which has a maximum score of 208;
- a *Current Frequency of Substance Use score* (calculated by the addition of responses to question 2, frequency of use in the past three months, for all drug types except tobacco and 'other drugs'), which has a maximum score of 32;
- a *Global Dependence score* (calculated by the addition of responses to those questions indicating substance dependence – questions 1, 2, 3, 6 and 7 – for all drug types), which has a maximum score of 130; and
- a *Global Abuse score* (calculated by the addition of responses to those questions indicating substance abuse – questions 1, 2, 4, 5 and 6 – for all drug types), which has a maximum score of 146.

The validity of the Specific Substance Involvement score and the Global Continuum of Risk Score were examined in detail as they are likely to be used clinically for screening and to determine the level of intervention required. Other domains (scores) were examined where appropriate. A large number of analyses were necessary to test the hypotheses presented earlier, hence for

clarity the data analysis procedure undertaken for each type of validity will be outlined at the start of each relevant results section.

Each parent domain incorporated all substances (tobacco, alcohol, cannabis, amphetamines, inhalants, sedatives, hallucinogens and opiates), but a sub-domain score was also calculated which incorporated only illicit substances (excluding alcohol and tobacco). It will be noted when this was used – please refer to Appendix 8 for a complete list of all domains(scores) used in data analysis.

The statistical Package for Social Sciences (SPSS for Windows – Version 10.10: SPSS inc. 2000) was used to manage the data. To ensure the quality of the data, all data were double entered, cleaned and matched using purpose written syntax programs to detect discrepancies and common errors. A procedural manual for data entry was used.

SECTION 4 RESULTS

4.1 Demographics

As already mentioned 75 males and 75 females were recruited for this project. The mean age of the participants was 30 years 3 months (sd = 8 yrs 5 months). Participants had an average of 12.3 years of education (sd = 2.8, median = 11.5, min = 7, max = 24), 61% were categorised as unemployed, 27% as employed part time, and 12% as full time. The demographic profile of the participants is summarised in Table 4.1.1.

Table 4.1.1 Demographic profile of participants

	Number	Percentage
<i>Race</i>		
<i>White/Caucasian</i>	143	95.3
<i>Asian/Indian/Pacific Islander</i>	4	2.7
<i>Aboriginal/Torres Strait Islander</i>	2	1.3
<i>Other</i>	1	0.7
<i>Religion</i>		
<i>Protestant</i>	18	12.0
<i>Catholic</i>	11	7.3
<i>Christian</i>	11	7.3
<i>Other religion</i>	5	3.3
<i>No religion</i>	105	70.0
<i>Employment Status</i>		
<i>Employed – Full-time</i>	18	12.0
<i>Employed – Part-time</i>	40	26.7
<i>Not employed</i>	92	61.3
<i>Marital Status</i>		
<i>Currently married</i>	25	16.7
<i>Cohabiting (De Facto)</i>	17	11.3
<i>Separating</i>	9	6.0
<i>Divorced</i>	9	6.0
<i>Never been married</i>	90	60.0
<i>Place of Residence</i>		
<i>Own home or family's home</i>	60	40.0
<i>Rented apartment/house</i>	70	46.7
<i>Room</i>	2	1.3
<i>Halfway house</i>	1	0.7
<i>No fixed address</i>	3	2.0
<i>Other place of residence</i>	14	9.3
Total	150	100.0

4.2 Baseline data

The ASSIST took an average of 7.7 minutes to administer. Two interviews that took longer than 30 minutes to administer were considered outliers and therefore not included in this calculation. The ASSIST took longer to administer for the Treatment group ($X = 9.3$ mins) than for the Primary Health Care group ($X = 6.9$ mins). See Table 4.2.1 for details.

Table 4.2.1 Time in minutes to administer ASSIST by recruitment group

Group	Mean	sd	Median	Min	Max
<i>PHC</i>	6.9	3.8	6.0	1	25
<i>Treatment</i>	9.3	9.3	8.0	4	20
Total	7.7	4.1	7.0	1	25

The highest mean Specific Substance Involvement score when all drugs are taken into account was 12.0 (sd = 5.5). Alcohol was given the highest Current Drug Involvement score by 35.3% of the sample, followed by tobacco and amphetamines by 23.3% and 14.7% of the sample respectively.

When recruitment groups were considered separately, the mean highest Specific Substance Involvement score on the ASSIST varied considerably, with the PHC group having an mean highest score of 9.4 (sd = 4.8) and the Treatment group having an mean highest score of 17.1 (sd = 2.4). Table 4.2.2 presents a breakdown of the drug types that received the highest score on the ASSIST at baseline.

Table 4.2.2 Highest scoring drug type by recruitment group

<i>Drug type</i>	<i>Total sample</i>		<i>Treatment sample</i>		<i>PHC sample</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
<i>Tobacco</i>	35	23.3	0	0.0	35	35.0
<i>Alcohol</i>	53	35.3	9	18.0	44	44.0
<i>Cannabis</i>	16	10.7	3	6.0	13	13.0
<i>Cocaine</i>	2	1.3	2	4.0	0	0.0
<i>Amphetamines</i>	22	14.7	20	40.0	2	2.0
<i>Inhalants</i>	1	0.7	1	2.0	0	0.0
<i>Sedatives</i>	4	2.7	2	4.0	2	2.0
<i>Hallucinogens</i>	0	0.0	0	0.0	0	0.0
<i>Opiates</i>	17	11.3	13	26.0	4	4.0
<i>Total</i>	150	100.0	50	100.0	100	100.0

Considering the illicit drugs (not including alcohol or tobacco), the mean highest Specific Illicit Substance involvement score was 10.3 (sd = 6.7). This score excluded any zero scores due to 'no current drug' use or lifetime drug use problems (n=121). Separating recruitment groups, the PHC group had a mean highest drug involvement score of 6.6 (sd = 5.1) while the Treatment group had a mean highest score of 16.2 (sd = 4.3). Cannabis was given the highest score by 38.0% of the sample, amphetamines by 18.0% and opiates by 14.7%. Nineteen percent of the sample reported having not used illicit drugs. Table 4.2.3 lists the illicit drugs and the proportion of participants that gave each drug the highest drug involvement score.

Table 4.2.3 Highest scoring illicit drug type by recruitment group

<i>Illicit Drug type</i>	<i>Total sample</i>		<i>Treatment sample</i>		<i>PHC sample</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
<i>Cannabis</i>	57	38.0	5	10.0	52	52.0
<i>Cocaine</i>	2	1.3	2	4.0	0	0.0
<i>Amphetamines</i>	27	18.0	20	40.0	7	7.0
<i>Inhalants</i>	2	1.3	1	2.0	1	1.0
<i>Sedatives</i>	10	6.7	5	10.0	5	5.0
<i>Hallucinogens</i>	1	0.7	0	0.0	1	1.0
<i>Opiates</i>	22	14.7	14	28.0	8	8.0
<i>No illicit drug use</i>	29	19.3	3	6.0	26	26.0
<i>Total</i>	150	100.0	50	100.0	100	100.0

Specific Substance Involvement scores obtained by participants for each drug can be broken down into four separate score categories: zero scores, indicating that participants had not used the drug in the last three months and/or had lifetime prevalence of use, but did not report any associated problem; scores of 1 to 3, signifying that participants did not qualify for a brief intervention; scores of 4 to 15, indicating that participants qualified for a brief intervention (if in the PHC group); and scores of 16 or above where participant were referred to specialist treatment (if in the PHC group). Table 4.2.4 shows the percentage of participants who received scores in the different score categories, by drug type.

Table 4.2.4 Percentage of participants receiving scores in each score category by drug type

<i>Drug type</i>	<i>% scoring 0</i>	<i>% scoring 1 to 3</i>	<i>% scoring 4 to 15</i>	<i>% scoring 16 to 20</i>	<i>Total</i>
<i>Tobacco</i>	14.7	19.3	65.3	0.7	100.0
<i>Alcohol</i>	4.0	38.0	50.7	7.3	100.0
<i>Cannabis</i>	28.0	23.3	41.3	7.3	100.0
<i>Cocaine</i>	88.0	8.7	2.7	0.7	100.0
<i>Amphetamines</i>	49.3	25.3	10.7	14.7	100.0
<i>Inhalants</i>	91.3	6.0	2.0	0.7	100.0
<i>Sedatives</i>	71.3	12.0	12.7	4.0	100.0
<i>Hallucinogens</i>	82.7	16.0	1.3	0.0	100.0
<i>Opiates</i>	66.0	13.3	12.7	8.0	100.0

In order to determine the 'expected score' for the less commonly used drugs, only positive scores were included, providing a more reliable indication of the mean score. Considering the mean ASSIST score for each drug type, tobacco was the highest scoring drug type both overall and when only positive scores (scores above 0) were considered. The mean score for opiates is relatively low overall, but when scores of 0 were discounted, opiates became the second highest scoring drug type. This demonstrates that while only few participants received a score for opiates, these participants tended to score quite highly. See Table 4.2.5 for the breakdown of mean Specific Substance Involvement scores for each drug type, including and excluding scores of zero.

Table 4.2.5 Mean ASSIST score for each drug type, including and excluding scores of zero

Drug type	Mean (sd) Score (including scores of 0): N=150	Mean (sd) Score (excluding scores of 0)	N positive scores
<i>Tobacco</i>	7.9 (5.4)	9.3 (4.6)	128
<i>Alcohol</i>	5.7 (4.9)	6.0 (4.8)	144
<i>Cannabis</i>	5.5 (5.8)	7.6 (5.6)	108
<i>Cocaine</i>	0.4 (1.9)	3.6 (4.3)	18
<i>Amphetamines</i>	4.0 (6.6)	7.8 (7.4)	76
<i>Inhalants</i>	0.3 (1.7)	3.8 (4.8)	13
<i>Sedatives</i>	2.2 (4.7)	7.5 (6.2)	43
<i>Hallucinogens</i>	0.3 (0.8)	1.8 (1.2)	26
<i>Opiates</i>	3.0 (5.8)	8.9 (6.7)	51

Each ASSIST question was considered separately to examine how applicable each question was to the participants. Table 4.2.6 presents the percentage of participants obtaining positive scores (scores above 0) for each of the ASSIST items. Question 8, which asks about injecting behaviour, was the least likely question to be answered, with only 41.3% of participants giving a positive response. Question 5, which asks about whether the participant has failed to do what was normally expected of them because of their drug use, was the second least likely to be answered, with 51.3% giving a positive response.

Table 4.2.6: Percentage of participants receiving positive scores for each ASSIST item

<i>ASSIST item</i>	<i>% of positive scores</i>
Q1	100.0
Q2	99.3
Q3	83.3
Q4	64.0
Q5	51.3
Q6	83.3
Q7	88.0
Q8	41.3

4.3 Follow-up data

At follow-up the ASSIST took a mean of 5.1 minutes to administer. The ASSIST took slightly longer to administer for the Treatment group ($X = 6.4$ mins) than for the Primary Health Care group ($X = 4.5$ mins). See Table 4.3.1 for details.

Table 4.3.1 Time in minutes to administer ASSIST follow-up by recruitment group

Group	Mean	sd	Median	Min	Max
PHC	4.5	2.7	4.0	0.5	14
Treatment	6.4	5.3	5.0	1	30
Total	5.1	3.8	4.0	0.5	30

The highest mean current Substance Involvement score at follow-up when all drugs were taken into account was 9.9 (sd = 4.7). Tobacco was given the highest substance involvement score by 37.4% of participants, alcohol by 32.4% and cannabis by 12.9%. One participant reported no substance use at all in the past three months and scored 0 for every drug type. When recruitment groups were considered separately, the highest mean Specific Substance Involvement score on the ASSIST follow-up was 8.5 (sd = 4.4) for the PHC group and 12.7 (sd = 3.9) for those in the treatment group. See Table 4.3.2 for a breakdown of the drug types that were given the highest Substance Involvement score on the ASSIST follow-up.

Table 4.3.2 Highest scoring drug type at follow-up by recruitment group

<i>Drug type</i>	<i>Total sample</i>		<i>Treatment sample</i>		<i>PHC sample</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
<i>Tobacco</i>	52	37.4	19	42.2	33	35.1
<i>Alcohol</i>	45	32.4	5	11.1	40	42.6
<i>Cannabis</i>	18	12.9	4	8.9	14	14.9
<i>Cocaine</i>	1	0.7	1	2.2	0	0.0
<i>Amphetamines</i>	14	10.1	10	22.2	4	4.3
<i>Inhalants</i>	0	0.0	0	0.0	0	0.0
<i>Sedatives</i>	2	1.4	1	2.2	1	1.1
<i>Hallucinogens</i>	0	0.0	0	0.0	0	0.0
<i>Opiates</i>	6	4.3	5	11.1	1	1.1
<i>No drug use</i>	1	0.7	0	0.0	1	1.1
<i>Total</i>	139	100.0	45	100.0	94	100.0

Considering the illicit drugs, the mean highest Specific Substance Involvement score on the ASSIST was 7.3 (sd = 5.4). Cannabis was given the highest drug involvement score by 40.3% of the participants, amphetamines by 20.1% and opiates by 10.8%. Twenty two percent of participants had not used any illicit drugs in the past three months. Table 4.3.3 lists the illicit drugs and the proportion of participants that gave particular drugs the highest drug involvement score

Table 4.3.3 Highest scoring illicit drug type at follow-up by recruitment group

<i>Illicit Drug type</i>	<i>Total sample</i>		<i>Treatment sample</i>		<i>PHC sample</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
<i>Cannabis</i>	56	40.3	11	24.4	45	47.9
<i>Cocaine</i>	2	1.4	1	2.2	1	1.1
<i>Amphetamines</i>	28	20.1	16	35.6	12	12.8
<i>Inhalants</i>	0	0.0	0	0.0	0	0.0
<i>Sedatives</i>	7	5.0	4	8.9	3	3.2
<i>Hallucinogens</i>	0	0.0	0	0.0	0	0.0
<i>Opiates</i>	15	10.8	9	20	6	6.4
<i>No drug use</i>	31	22.3	4	8.9	27	28.7
Total	139	100.0	45	100.0	94	100.0

Table 4.3.4 shows the percentage of participants who received scores in the different score categories, by drug type.

Table 4.3.4 Percentage of participants receiving scores in each score category at follow-up by drug.

<i>Drug type</i>	<i>% scoring 0</i>	<i>% scoring 1 to 3</i>	<i>% scoring 4 to 15</i>	<i>% scoring 16 to 20</i>	<i>Total</i>
<i>Tobacco</i>	17.3	18.7	61.2	2.9	100.0
<i>Alcohol</i>	5.0	39.6	54.0	1.4	100.0
<i>Cannabis</i>	34.5	25.9	36.7	2.9	100.0
<i>Cocaine</i>	90.6	7.2	1.4	0.7	100.0
<i>Amphetamines</i>	52.5	29.5	12.9	5.0	100.0
<i>Inhalants</i>	92.1	7.2	0.7	0.0	100.0
<i>Sedatives</i>	72.7	16.5	10.1	0.7	100.0
<i>Hallucinogens</i>	84.2	15.8	0.0	0.0	100.0
<i>Opiates</i>	71.2	16.5	10.8	1.4	100.0

Considering the 'expected' score for all drugs (ie, excluding scores of zero) in the Australian population, tobacco was the highest scoring drug type both overall and when only positive scores (scores above 0) were considered. See Table 4.3.5 for the breakdown of mean scores for each drug type, both including and excluding scores of zero.

Table 4.3.5 Mean score for each drug type at follow-up, including and excluding scores of zero

Drug type	<i>Mean (sd) Score (including scores of 0) N = 139</i>	<i>Mean (sd) Score (excluding scores of 0)</i>	<i>N positive scores</i>
<i>Tobacco</i>	7.5 (5.6)	9.0 (4.8)	115
<i>Alcohol</i>	4.7 (3.4)	5.0 (3.3)	132
<i>Cannabis</i>	4.0 (4.7)	6.1 (4.6)	91
<i>Cocaine</i>	0.3 (1.6)	3.2 (4.5)	13
<i>Amphetamines</i>	2.4 (4.4)	5.1 (5.3)	66
<i>Inhalants</i>	0.2 (0.7)	2.0 (1.7)	11
<i>Sedatives</i>	1.3 (3.1)	4.7 (4.5)	38
<i>Hallucinogens</i>	0.2 (0.5)	1.3 (0.5)	12
<i>Opiates</i>	1.5 (3.5)	5.1 (4.9)	40

Table 4.3.6 shows the percentage of participants receiving positive scores (scores above 0) for any of the drug types, for each of the ASSIST follow-up items. The two lowest scoring questions were question 4, which asks if the participant had failed to do what was expected of them because of their drug use, with 28.1% giving a positive response, and question 7, which asks about injecting behaviour, with 37.4% giving a positive response. These two questions were also the lowest scoring questions in the baseline interview.

Table 4.3.6 Percentage of participants receiving positive scores for each ASSIST follow-up item

<i>ASSIST item</i>	<i>% of positive scores</i>
Q1	96.4
Q2	76.3
Q3	43.9
Q4	28.1
Q5	87.8
Q6	92.1
Q7	37.4

4.4 Derived Scores

As discussed in Section 1.3, several useful derived scores apart from Specific Substance Involvement can be calculated using the results from the ASSIST.

Table 4.4.1 presents some descriptive statistics for these derived scores.

Table 4.4.1 Descriptive statistics for ASSIST Derived Scores

<i>Derived score</i>	<i>Mean</i>	<i>sd</i>	<i>Median</i>	<i>Min</i>	<i>Max</i>
<i>Lifetime Substance Use (1A)</i>	5.7	2.4	6.0	1	10
<i>Global Continuum of Risk (2A)</i>	35.9	23.9	30.5	2	110
<i>Current Frequency of Substance Use (4A)</i>	7.12	4.6	6.0	0	22
<i>Global Dependence (5A)</i>	29.5	17.3	28.0	2	75
<i>Global Abuse(6A)</i>	24.8	15.9	22.0	2	79

The mean Lifetime Substance Use score indicates that the mean number of substances that participants had tried was 5.7 out of a possible maximum of 10. The mean Global Continuum of Risk score was 35.9; the maximum score was 110, out of a possible 208 (which can only be achieved by receiving the maximum possible score for every question in the ASSIST). Refer to Appendix 10 for a list of domains used in analysis and the formulae used to calculate scores.

4.5 Concurrent Validity

Concurrent validity was tested by comparing ASSIST scores with scores obtained from other instruments, such as the ASI, SDS, MINI Plus, RTQ, DAST, and the AUDIT which were measured concurrently and that offer alternate measures of the same concepts. The scores that are of interest in the current study are the Specific Substance Involvement score for each drug type, the Lifetime Substance Use score, the Global Continuum of Risk score,

the Current Frequency of Substance Use score, the Global Dependence score and the Global Abuse score.

4.5.1 *ASI - Current Frequency of Substance Use*

The ASI measures the frequency of use for each substance over the three months prior to the interview and is similar to the information yielded by question 2 of the ASSIST. Table 4.5.1 shows the correlations between the scores obtained from corresponding questions from the ASI and the ASSIST.

Table 4.5.1 *Current frequency of substance use – correlation between ASSIST and ASI results*

<i>Substance Type</i>	<i>Pearson's Correlation</i>	<i>Probability</i>
<i>Alcohol</i>	<i>r =.78</i>	<i>p <. 001</i>
<i>Cannabis</i>	<i>r =.89</i>	<i>p <.001</i>
<i>Cocaine</i>	<i>r =.73</i>	<i>p <.001</i>
<i>Amphetamines</i>	<i>r =.89</i>	<i>p <. 001</i>
<i>Inhalants</i>	<i>r =.71</i>	<i>p <. 001</i>
<i>Sedatives</i>	<i>r =.84</i>	<i>p <. 001</i>
<i>Hallucinogens</i>	<i>r =.89</i>	<i>p <. 001</i>
<i>Opiates</i>	<i>r =.85</i>	<i>p <. 001</i>

The correlations shown in table 4.5.1 are strong and positive, indicating that question 2 of the ASSIST has good concurrent validity. The total number of days of use in the last three months for all substances on the ASI were cumulated to create a variable that could be compared with the ASSIST Total Current Frequency of Substance Use score (Question 2 all substances). Note that the ASI groups substances differently to the ASSIST, and has two questions concerning sedatives (barbiturates, and sedatives in general), and three containing opiates. For each of these drug categories the highest frequency reported was incorporated. This comparison revealed a strong positive correlation of $r =.89$ ($p <.001$), indicating that the ASSIST Current Frequency of Substance Use score is a valid measure of frequency of current substance use.

4.5.2 *SDS –Dependence*

The SDS offers an alternative measure of psychological dependence and was completed for the substance that was the most problematic for each participant and had been used the most often. This score was compared with the Global Continuum of Risk score, achieving a strong positive correlation of $r = .67$ ($p < .001$) and the Global Dependence score, also achieving a moderately strong positive correlation of $r = .59$ ($p < .001$). These results would indicate that the ASSIST is a concurrently valid measure of severity of dependence for the Australian sample.

4.5.3 *MINI Plus – Severity of Substance use, abuse and dependence*

The MINI Plus provides current and lifetime diagnoses of alcohol abuse and dependence as well as abuse and dependence for a number of other substances (excluding tobacco). The sum of the individual positive items used to make the diagnostic decisions in the MINI Plus was calculated to create a MINI Plus severity score, which was compared with the ASSIST Global Continuum of Risk score. Similarly MINI Plus severity scores for each substance were calculated and compared to Specific Substance Involvement Scores. Table 4.5.2 presents the correlation between ASSIST scores and their corresponding MINI Plus scores.

Table 4.5.2 Substance use, abuse and dependence – correlation between ASSIST and MINI Plus scores

<i>MINI Plus severity score</i>	<i>ASSIST score^a</i>	<i>Pearson's Correlation</i>
<i>Sum of all responses</i>	Global Continuum of Risk	$r = .78, p < .001$
<i>Sum of responses to alcohol questions</i>	Specific Substance Involvement score for Alcohol	$r = .41, p < .001$
<i>Sum of responses to cannabis questions</i>	ASSIST Cannabis Involvement score	$r = .62, p < .001$
<i>Sum of responses to cocaine questions</i>	ASSIST Cocaine Involvement score	$r = .86, p < .001$
<i>Sum of responses to amphetamine questions</i>	ASSIST Amphetamine Involvement Score	$r = .74, p < .001$
<i>Sum of responses to inhalant questions</i>	ASSIST Inhalant Involvement score	$r = .89, p < .001$
<i>Sum of responses to sedative questions</i>	ASSIST Sedatives Involvement score	$r = .60, p < .001$
<i>Sum of responses to hallucinogen questions</i>	ASSIST Hallucinogen Involvement score	$r = .31, p < .001$
<i>Sum of responses to opiate questions</i>	ASSIST Opiate Involvement score	$r = .78, p < .001$
<i>Sum of responses to dependence questions</i>	ASSIST Global Substance Dependence	$r = .79, p < .001$
<i>Sum of responses to abuse questions</i>	ASSIST Global Substance Abuse	$r = .77, p < .001$
<i>Total number of substances ever used</i>	Lifetime Substance Use	$r = .93, p < .001$

^aASSIST Domains used in analysis:- see Domains table (Appendix 10)

Lifetime Substance Use (all substances)

Global Continuum of risk (all substances)

Global Substance dependence (all substances)

Global Substance abuse (all substances)

All correlations were positive and moderately to very strong, except for analyses involving hallucinogens and inhalants, which were weak. This result probably reflects that very few participants reported using hallucinogens and inhalants. Apart from hallucinogens and inhalants, the concurrent validity tests against the MINI Plus results suggest that the ASSIST is a valid measure of Specific Substance Involvement and abuse and dependence. It also appears that with respect to the Australian sample that the ASSIST provides valid measures of lifetime substance use and global substance risk.

Subjects were also divided into two groups according to the presence or absence of MINI Plus diagnoses of current or lifetime diagnoses of abuse or dependence for each specific substance. Table 4.5.3 shows the results of Independent samples t-test's that compared Specific Substance Involvement scores from each group. Except for inhalants, the ASSIST scores were significantly greater for those receiving a diagnosis of abuse or dependence. With the exception of inhalants, these results would suggest that Current Substance Involvement scores accurately reflect the participant's diagnosis of dependence or abuse.

Table 4.5.3 Comparison of mean (sd) ASSIST scores divided according to the presence or absence of MINI plus current or lifetime diagnoses of abuse or dependence.

ASSIST Score	MINI-plus current or lifetime diagnosis of abuse or dependence		t value, p value
	Present	Absent	
ASSIST Alcohol Involvement score	6.3(5.1)	3.6(2.9)	t=-3.94, p < .001
ASSIST Cannabis Involvement score	7.9(5.8)	2.7(4.4)	t=-6.24, p<.001
ASSIST Cocaine Involvement score	7.4(6.9)	0.2(0.75)	t=-2.34, p<.001
ASSIST Amphetamine Involvement score	9.5(7.5)	0.9(2.8)	t=-7.76, p<.001
ASSIST Inhalants Involvement score	11.5(9.2)	0.2(0.8)	t=-1.74, p=.332
ASSIST Sedatives Involvement score	8.7(7.0)	1.0(3.0)	t=-5.16, p<.001
ASSIST Hallucinogens Involvement score	1.0(1.3)	0.3(0.8)	t=-2.62, p=.01
ASSIST Opiates Involvement score	11.5(6.2)	0.4(1.4)	t=-10.65, p<.001

4.5.4 RTQ – Nicotine Dependence

The RTQ provides a comparative measure for tobacco dependence. The ASSIST Substance Involvement score for Tobacco was correlated with the RTQ total score. A strong positive correlation of $r = .85$ ($p < .001$) was found, indicating that the ASSIST tobacco score is a valid measure of nicotine dependence.

4.5.5 DAST – Illicit Drug Abuse

The DAST provides a comparative measure for abuse of illicit drugs. The ASSIST Global Abuse (illicit drugs only – excluding alcohol and tobacco) score

was correlated with the DAST total score. A strong positive correlation of $r = .80$ ($p < .001$) was found, providing further evidence that the ASSIST Global Abuse score is a valid measure of illicit drug abuse

4.5.6 *AUDIT – harmful, hazardous & dependent alcohol use.*

The AUDIT is a comprehensive measure of alcohol risk associated with alcohol use. The Alcohol Involvement score was correlated with the AUDIT score. A strong significant positive correlation was found of $r = .84$ ($p < .001$), indicating that the Alcohol Involvement score is also a good comprehensive measure of the level of risk associated with alcohol use.

4.5.7 *ICE – Dependence*

The ICE concerned the diagnosis (either current and/or lifetime), of the presence or absence of dependence on a range of substances, and was undertaken by a clinician blind to the results recorded by the ASSIST and other instruments. Only participants in the treatment group received this evaluation. These participants were divided into two groups according to the presence or absence of these ICE diagnoses. Table 4.5.4 presents the results of Independent Samples t-test used to compare ASSIST Current Substance Involvement scores from both groups. Note that no diagnosis of inhalant or hallucinogen dependence is made using the ICE.

Table 4.5.4 Comparison of mean (sd) ASSIST scores divided according to the presence or absence of ICE diagnoses of current or lifetime substance dependence.

ASSIST Specific Substance Involvement Score	ICE diagnosis of current or lifetime substance dependence		t value, p value
	Present	Absent	
Specific Involvement Score for Tobacco	11.4(2.1)	7.1(5.1)	$t=-2.8, p=.019$
Specific Involvement Score for Alcohol	14.5(4.6)	3.4(3.9)	$t=-8.48, p<.001$
Specific Involvement Score for Cannabis	14.8(3.8)	3.7(4.5)	$t=-9.12, p<.001$
Specific Involvement Score for Cocaine	11.3(6.0)	0.5(1.2)	$t=-3.11, p=.089$
Specific Involvement Score for Amphetamine	16.0(4.7)	1.5(3.1)	$t=-12.62, p<.001$
Specific Involvement Score for Sedatives	11.8(6.4)	1.1(2.1)	$t=-6.48, p<.001$
Specific Involvement Score for Opiates	14.8(4.35)	1.7(2.9)	$t=-12.95, p<.001$

There were significant differences in ASSIST scores for all drugs, except cocaine. The results for cocaine may reflect the small size of the treatment sample and that cocaine is not a commonly used drug in Australia, and thus it is likely that very few participants were dependent on cocaine. Overall, the results suggest that the ASSIST Specific Substance Involvement scores provide a valid measure of dependence for each drug.

The total number of ICE diagnoses of current and lifetime dependence can be used as a general measure of substance dependence. When this new measure was compared with the ASSIST Global Continuum of Risk score, a strong positive correlation was found ($r = .70, p <.001$). In addition, when the new measure is compared with the ASSIST Global Dependence score, a strong positive correlation was also found ($r = .76, p <.001$).

4.6 Construct Validity

Construct validity was tested by the statistical comparison of ASSIST scores with those obtained from other instruments that are designed to measure theoretically related concepts or phenomena and which thus provide circumstantial evidence for the constructs measured by the ASSIST. The domains from the ASSIST that could be tested for construct validity include; Global Continuum of Risk, Global Substance Dependence and Global Substance Abuse, Global Current Frequency of Use, and Current Drug Involvement scores for each drug. Circumstantial evidence for substance abuse or dependence include the diagnosis of Attention Deficit/Hyperactivity Disorder (ADHD) and Antisocial Personality Disorder (ASPD), family histories of psychological problems or drug or alcohol problems, physical and psychological health symptoms, financial and emotional burden of drug use, history of drug or alcohol treatment and injection behaviour. The following instruments were used to measure these concepts.

4.6.1 MINI Plus – Diagnoses of ADHD and ASPD

The MINI Plus includes a section that provides diagnoses of ADHD and ASPD. Both disorders have been identified as closely associated with drug and/or alcohol abuse and dependence. Subjects were divided into two groups according to the presence or absence of diagnoses of ADHD and ASPD. Table 4.6.1 shows the results of independent t-test's used to compare ASSIST scores between these groups.

Table 4.6.1 Comparison of mean (\pm sd) ASSIST divided according to the presence or absence of MINI plus diagnoses of ADHD and ASPD.

ASSIST Score ^a	MINI plus ADHD Diagnosis		t value, p value
	Present	Absent	
Global Continuum of Risk	61.44(14.1)	34.26(23.5)	t=-3.42, p=.001
Global Substance Dependence	45.44(10.38)	28.52(17.17)	t=-2.92, p=.004
Global Substance Abuse	42.56(11.15)	23.62(15.53)	t=-3.60, p<.001
	MINI plus ASPD Diagnosis		
	Present	Absent	
Global Continuum of Risk	57.97(23.58)	30.38(20.67)	t=-6.36, p<.001
Global Substance Dependence	44.70(15.59)	28.75(15.56)	t=-5.96, p<.001
Global Substance Abuse	39.23(16.85)	21.13(13.59)	t=-6.24, p<.001

^aGlobal Continuum of risk (all substances)
 Global Substance dependence (all substances)
 Global Substance abuse (all substances)

As can be seen subjects diagnosed with ADHD had significantly higher ASSIST scores than those without the disorder; similarly subjects diagnosed with ASPD had higher ASSIST scores than those without ASPD diagnosis.

4.6.2 ASI – Prior and current drug or alcohol treatment, family history, financial burden of drug or alcohol use, emotional burden of drug or alcohol use

The ASI provides a variety of information about drug and alcohol use and concepts related to drug and alcohol use, which can be used to test the construct validity of the ASSIST. These include prior and current drug or alcohol treatments, family history of psychological, drug or alcohol problems, reported financial costs of drugs and alcohol and the reported emotional

consequences of drug or alcohol problems. Table 4.6.2 shows the correlations found between the various ASI scores and their respective conceptually similar ASSIST scores.

The concept with the strongest relationship to the ASSIST scores was the participants' self-reported emotional burden of drug or alcohol use – measured by number of days in the past three months with drug or alcohol problems and the degree of trouble experienced because of the problems. The correlations related to financial burden are mostly relatively weak, apart from the relationship between money spent on alcohol and the ASSIST Current Alcohol involvement score. Overall these results would indicate that the ASSIST has good construct validity with reference to the ASSIST domains investigated.

Table 4.6.2 Correlation between ASI scores and ASSIST scores

<i>ASI score</i>	<i>ASSIST^a score</i>	<i>Pearson's Correlation</i>
<i>Number of times ever treated for alcohol abuse</i>	Specific Substance Involvement Score for Alcohol	$r = .35, p < .001$
<i>Number of psychological, drug and alcohol problems in family history</i>	Global Continuum of Risk	$r = .40, p < .001$
<i>Financial burden of drug and alcohol use</i>	Current Frequency of Substance Use	$r = .18, p = .024$
<i>Financial burden of drug and alcohol use</i>	Global Continuum of Risk	$r = .21, p = .009$
<i>Financial burden of alcohol use</i>	Current Alcohol Involvement	$r = .59, p < .001$
<i>Financial burden of drug use</i>	Global Substance Dependence -illicits	$r = .23, p = .005$
<i>Financial burden of drug use</i>	Global Substance Abuse - illicits	$r = .21, p = .009$
<i>Emotional burden of drug and alcohol use</i>	Global Continuum of Risk	$r = .70, p < .001$
<i>Emotional burden of alcohol use</i>	Current Alcohol Involvement	$r = .66, p < .001$
<i>Emotional burden of drug use</i>	Global Substance Dependence -illicits	$r = .70, p < .001$
<i>Emotional burden of drug use</i>	Global Substance Abuse - illicits	$r = .74, p < .001$

^a *Global Continuum of Risk - all substances*
Current Frequency of Substance Use - including alcohol, excluding tobacco
Global Continuum of Risk - all substances
Global Substance Dependence - illicits (excluding alcohol & tobacco)
Global Substance Abuse – illicits (excluding alcohol and tobacco)

4.6.3 RISC – Injection behaviour

The RISC provides a measure of behaviour and problems associated with the injection of illicit drugs, such as infection and blood borne viruses. Using drugs by injection is thought to be both a clear indication of drug abuse and a risk factor in developing dependence on the injected substances. Table 4.6.3

shows the correlations between RISC injecting scores and the conceptually related Global Continuum of Risk score.

Table 4.6.3 Correlation between RISC injection scores and ASSIST scores

<i>RISC score</i>	<i>ASSIST score^a</i>	<i>Pearson's Correlation</i>
<i>Sum of recent injection areas</i>	Global Continuum of Risk	<i>r = .70, p <.001</i>
<i>Sum of recent injection area frequency</i>	Global Continuum of Risk	<i>r = .81, p <.001</i>
<i>Sum injecting area damage</i>	Global Continuum of Risk	<i>r = .56, p <.001</i>
<i>Number of days injected in past 90 days</i>	Global Continuum of Risk	<i>r = .69, p <.001</i>
<i>Number of times injected in typical day</i>	Global Continuum of Risk	<i>r = .58, p <.001</i>
<i>Number of injection sites ever used</i>	Global Continuum of Risk	<i>r = .64, p <.001</i>

^a Global Continuum of Risk Score– illicit (excluding alcohol and tobacco, including injecting behaviour)

All correlations are positive and moderate to strong, providing further evidence that the Global Continuum of Risk score (illicit) of the ASSIST has good construct validity.

4.6.4 MAP – Physical and psychological symptoms

The MAP measures physical and psychological health symptoms that are thought to be commonly experienced by people dependent on drugs. Table 4.6.4 shows the correlations between the latter variables and ASSIST scores.

Table 4.6.4 Correlation between MAP physical and psychological symptoms and ASSIST scores

<i>MAP score</i>	<i>ASSIST score</i>	<i>Pearson's Correlation</i>
<i>Sum of physical and psychological health symptoms</i>	Global Continuum of Risk (all substances)	$r = .57, p < .001$
<i>Sum of physical and psychological health symptoms</i>	Current Frequency of Substance Use – Total	$r = .39, p < .001$
<i>Sum of physical and psychological health symptoms</i>	Global Substance Dependence (all substances)	$r = .55, p < .001$
<i>Sum of physical and psychological health symptoms</i>	Global Substance Abuse (all substances)	$r = .55, p < .001$

4.7 Discriminative Validity

For the ASSIST to be a valid screening test for problematic substance use it should be possible to use ASSIST scores to differentiate non-problematic substance use, abuse and dependence. These categories correspond to individuals who are at low, moderate and high risk of developing harms associated with their substance use, respectively. Accordingly, appropriate ASSIST cut-off scores for non-problematic use, abuse and dependence would provide primary health care clinicians with an indication of those patients who should be referred to specialist treatment services (high risk), and those who would be better suited to receive a brief intervention for their substance use (moderate risk). The ASSIST scores that are likely to be used for this purpose

are the Specific Current Substance Involvement Score for each substance, and in some cases the Global Continuum of Risk score.

To perform a test of discriminative validity, participants were split into the three groups according to a number of variables based on known criteria for dependence, abuse and non-problematic drug use. The dependent group were classed as those subjects who were recruited from specialist drug and alcohol treatment settings and met ICE or MINI plus criteria for current dependence on specific substances. Subjects recruited from primary health care settings were classified as substance abusers or non-problematic users according to the presence of such a diagnosis on the MINI plus. One Way ANOVA's were used to establish that the groupings were successful. A significant difference between the groups indicated that the ASSIST was able to discriminate between groups. ASSIST scores from the three groups were then compared to determine whether clear cut-off points exist that could clearly distinguish between groups.

Two cut-off points were required, one that distinguished the non-problematic use group from the abuse group and the other that distinguished the abuse group from the dependence group. A good cut-off point has high sensitivity and specificity. Sensitivity, or true positive fraction, refers to the proportion of cases correctly identified as positive by the test. Conversely, specificity, or true negative fraction, refers to the proportion of cases correctly identified as negative by the test. Sensitivity and specificity are both expressed as a fraction, or percentage. Where the fractions for sensitivity and specificity are as high as possible, then the point is the best cut-off point. Receiver Operating Characteristic (ROC) analysis was used to identify suitable cut-off points as it calculates the ASSIST's sensitivity and specificity at all possible cut-off points. ROC analysis utilised the same groupings as used for ANOVA. ROC analysis was carried out in two stages – first by comparing non-problematic drug use to drug abuse, and secondly by comparing drug abuse to dependence. The closer the area under the curve is to 1, the more disparate the groups. When deciding on cut-off points for each group it was deemed

clinically appropriate to lean towards scores that maximised sensitivity (ie, true positives).

Tables 4.7.1 and 4.7.2 show discrimination between use and abuse, and abuse and dependence respectively. The cut-off scores that best separate use from abuse, and abuse from dependence are presented in bold type; a range of sensitivities and specificity values are presented that surround each cut-off score. The last column shows the results of the one way ANOVA and post hoc Scheffes test. For the sake of consistency the results shown in the abovementioned tables were obtained using the very same criteria to group participants as those used by researchers to analyse the pooled data from all phase II sites. Appendix 9 lists all the variables that were derived to separate participants into use, abuse and dependence groups and the results of discriminative analyses using all variables.

While recruitment group and a current diagnosis on the MINI plus was deemed the most appropriate way to classify groups, the authors recognise that there were other tests and criteria that could have been used to classify groups. For example subjects recruited from primary health care settings could also be classified as substance abusers or non-problematic users according to the presence of such a diagnosis of the DAST, or the Audit. For the sake of completion, these results are presented in Appendix 9. However, it is notable that these data are provided as a matter of process and methodology, and all sites involved in this study have used the grouping criteria as outlined in tables 4.7.1 and 4.7.2.

Table 4.7.1 Discrimination between **use** and **abuse** using ANOVA and ROC analysis:
 Range of sensitivity and specificity values are shown around proposed cut-off scores (bolded)

Assist Score	ROC area under the curve	ROC sensitivity	ROC specificity	ASSIST cut-off score	ANOVA Mean diff between groups, p level (Scheffes)
<i>Global Continuum of Risk</i>	0.89	95	65	12.50	21.2, $p < .001$
		91	73	13.50	
		90	78	15.00	
		88	78	17.50	
<i>Specific Substance Involvement Score for Alcohol</i>	0.76	77	46	3.50	4.10, $p < .001$
		71	63	4.50	
		61	75	5.50	
		58	88	6.50	
<i>Specific Substance Involvement Score for Cannabis</i>	0.92	92	72	1.50	6.57, $p < .001$
		85	83	2.50	
		77	86	3.50	
		74	90	4.50	
<i>Cocaine</i>	Too few cases to undertake analyses				
<i>Specific Substance Involvement Score for Amphetamines</i>	0.87	100	69	0.5	5.12, $p < .001$
		60	82	1.50	
		40	89	2.50	
<i>Inhalants</i>	Too few cases to undertake analyses				
<i>Specific Substance Involvement Score for Sedative</i>	0.94	100	83	0.5	8.62, $p < .001$
		67	89	1.5	
		67	92	250	
<i>Hallucinogens</i>	Too few cases to undertake analyses				
<i>Specific Substance Involvement Score for Opiates</i>	100	100	91	0.5	12.44, $p < .001$
		100	96	1.50	

Table 4.7.2 Discrimination between **abuse** and **dependence** using ANOVA and ROC analysis: Range of sensitivity and specificity values are shown around proposed cut-off scores (bolded)

Assist Score	ROC area under the curve	ROC sensitivity	ROC specificity	ASSIST cut-off score	ANOVA Mean diff between groups, p level (Scheffes)
<i>Global Continuum of Risk</i>	0.83	82	68	38.50	23.4, $p < .001$
		82	72	39.50	
		80	75	40.50	
<i>Specific Substance Involvement Score for Alcohol</i>	0.83	80	79	42.00	6.34, $p < .001$
		86	77	10.50	
		71	81	12.00	
<i>Specific Substance Involvement Score for Cannabis</i>	0.86	64	84	13.50	6.90, $p < .01$
		95	64	9.50	
		85	64	10.50	
		75	69	11.50	
<i>Cocaine</i>	Too few cases to undertake analyses				
<i>Specific Substance Involvement Score for Amphetamine</i>	0.86	93	70	9.00	10.06, $p < .001$
		89	80	11.50	
		85	80	12.50	
		85	90	13.50	
<i>Inhalants</i>	Too few cases to undertake analyses				
<i>Specific Substance Involvement Score for Sedatives</i>	0.56	81	67	9.00	2.48, $p = .512$
		68	67	10.50	
<i>Hallucinogens</i>	Too few cases to undertake analyses				
<i>Specific Substance Involvement Score for Opiates</i>	0.68	74	43	13.50	2.27, $p = .038$
		58	71	14.50	
		53	71	15.50	
		37	86	16.50	

Analyses for cocaine, inhalants and hallucinogens could not be carried out because there were too few cases. For the remaining domains investigated there were significant differences in ASSIST scores between the groups with the exception of sedative abuse and dependence. Overall, the results show that with regard to data obtained from Australian participants, and with the exception of sedatives, that the ASSIST can discriminate between groups for all the domains investigated. However, it appears that the ASSIST is a better discriminator of use and abuse than for abuse and dependence. Table 4.7.3 presents a summary of the cut-off scores that best separate the three groups for each relevant ASSIST score obtained from Australian participants.

Note as there is no test for tobacco abuse (ie, the RFT is a test for dependence) that it not was not possible to determine the ability of the ASSIST to discriminative between groups for tobacco. Readers should also note that because of the relatively small sample size used in the current study the cut-off scores shown in table 4.7.3 will differ from those presented in the ASSIST pooled technical report. The cut-off scores found in the latter report will be more reliable and therefore should be utilised in preference to the scores presented here to determine the type of intervention required by individuals who score positively on the ASSIST.

Table 4.7.3 Cut-off points for various ASSIST scores

ASSIST score	<i>Range of scores for 'Use' group</i>	<i>Range of scores for 'Abuse' group</i>	<i>Range of scores for 'Dependence' group</i>
Global Continuum of Risk	0 to 14	15 to 39	40 to 208
Specific Substance Involvement Score for Alcohol	0 to 4	5 to 10	11 to 20
Specific Substance Involvement Score for Cannabis	0 to 2	3 to 9	10 to 20
Cocaine	Not possible due to too few cases		
Specific Substance Involvement Score for Amphetamines	0	1 to 11	12 to 20
Inhalants	Not possible due to too few cases		
Specific Substance Involvement Score for Sedatives	0	1 to 10	11 to 20
Hallucinogens	Not possible due to too few cases		
Specific Substance Involvement Score for Opiates	0 to 1	2 to 14	15 to 20

4.8 Predictive Validity

The predictive validity of a screening test refers to the capacity of the test to indicate future risk or development or maintenance of a condition in the absence of a clinical intervention. Predictive validity was only computed using ASSIST scores obtained from PHC participants who did not receive a brief intervention, as an intervention may have affected drug use and thus ASSIST scores. Similarly subjects recruited from specialist drug and alcohol treatment settings were excluded as their treatment may also have affected ASSIST scores. Thus the forthcoming analyses were limited to scores obtained from a small number (n=20) of subjects who did not receive a brief intervention nor were part of the treatment group. In view of the small sample size used in these analyses readers are advised that the following results should be interpreted with caution.

The predictive validity of the ASSIST was assessed in number of ways. First, by comparing the ASSIST scores for all domains of interest, in particular Specific Substance Involvement Scores and Current Frequency of Use scores for each substance, obtained from subjects at baseline and then from the same subjects at follow up. For the ASSIST to have good predictive validity there should be no significant differences between baseline and follow up ASSIST scores. Scores obtained at baseline and follow-up should also be significantly positively correlated.

Secondly, as another indicator of predictive validity, Global Current Frequency of Use, and Current Frequency of Use for each substance type, obtained from the follow up ASSIST, were compared with the appropriate follow-up ASI-lite scores. For the ASSIST to have predictive validity the two group of scores should be significantly positively related as they were at baseline. Similarly, follow-up Global Continuum of Risk should also be correlated with scores obtained from the follow-up SDS (a measure of dependence).

Finally, multiple regression analysis was used to determine the degree to which baseline ASSIST scores (Global Continuum of Risk and Specific Drug Involvement), and other factors, such as age and gender, that might influence follow-up scores, could be used to predict follow-up ASSIST scores.

4.8.1

Global Continuum of Substance Risk score

The Global Continuum of Risk score, which excludes the lifetime component of the ASSIST (ie, Q1), as question 1 was not asked at follow up, was used for this analysis. A paired groups comparison showed that there was no significant difference in Global Continuum of Risk scores between baseline (Mean=7.15, sd= 5.7) and follow-up (Mean = 8.25, sd=6.5), ($t=-1.68$, $p=0.11$). There was also a significant positive correlation between the two group of scores ($r=0.60$, $p=.006$).

A multiple regression analysis was carried out which included the follow-up Global Continuum of Risk score as the dependent variable and the baseline Global Continuum of Risk score, gender and age as independent variables in the equation. All independent variables accounted for 80.5% of the total variance (R^2) of the follow-up ASSIST score ($R=0.89$, $F(3)=21.95$, $p<.001$). Table 4.8.1 displays the standardised coefficients (beta) for each of the variables entered into the regression equation. These results indicate that the baseline Global Risk score was the only significant predictor of the follow-up Global Risk score. Moreover, the Global Continuum of Substance Risk score was also positively correlated with the follow-up Severity of Dependence Score ($r=0.60$, $p=.006$). Despite the small sample size used in these analyses these results would indicate that the ASSIST has good predictive validity.

Table 4.8.1 Standardised coefficients for variables entered into the multiple regression equation predicting the follow-up Global Continuum of Risk score

Variable	Standardised Coefficient (Beta)	t value	p value
Baseline Global Risk Score	0.875	7.83	p<.001
Gender	-.069	-.592	p=.562
Age	-.178	-1.55	p=.141

4.8.2 Specific Current Substance Involvement.

Table 4.8.2 shows mean baseline and follow-up Specific Substance Involvement scores for each substance type, and the associated comparison statistics. There were no significant differences between scores obtained at baseline and follow-up for tobacco, cannabis, and amphetamines. Further, for these substances, scores in both groups were significantly positively correlated. Note that there was insufficient data to perform analyses on inhalants, sedatives, hallucinogens and opiates.

Table 4.8.2 Comparison of baseline and follow-up Specific Substance Involvement scores

	ASSIST Scores by Substance Type. Mean (\pm sd)		Pearson correlation	t value p value
	Baseline	Follow-Up		
Tobacco	3.5(4.9)	3.3(4.7)	r=.93, p<.001	t=0.49, p=.63
Alcohol	2.4(0.9)	3.1(1.5)	r=.42, p=.068	t=2.21, p=.04
Cannabis	0.8(1.0)	1.3(2.0)	r=.78, p<.001	t= -1.76, p=.09
Cocaine	0.0 (0)	0.1 (0.2)	—	t= -1.00, p=.33
Amphetamine	0.2 (0.8)	0.3 (0.9)	r=.96, p<.001	t= -1.45, p=.16
Inhalants	0.0	0.0	—	Insufficient data
Sedatives	0.2(0.4)	0.2(0.4)	—	Insufficient data
Hallucinogens	0.0	0.0	—	Insufficient data
Opiates	0.5(0.2)	0.5(0.2)	—	Insufficient data

Table 4.8.3 shows the results of multiple regression analyses carried out with each of the follow-up Specific Substance Involvement scores for tobacco, alcohol, cannabis and amphetamines. Analyses could not be carried out for cocaine, inhalants, sedatives, hallucinogens and opiates because of insufficient data. The follow-up Specific Substance Involvement score was entered as the dependent variable and the baseline Specific Substance Involvement score, gender and age as independent variables. With the exception of alcohol, the independent variables entered into the equations accounted for significant proportions of the variance (range of $R^2 = 0.62-0.95\%$) of the follow up ASSIST score.

Table 4.8.3 Summary Statistics for multiple regression analyses carried out predicting the follow-up ASSIST Specific Substance Involvement score.

Substance	R	R²	F value	p value
<i>Tobacco</i>	.93	.86	33.68	<i>p</i> <.001
<i>Alcohol</i>	.60	.35	2.92	<i>p</i> =.066
<i>Cannabis</i>	.79	.62	8.82	<i>p</i> =.001
<i>Amphetamine</i>	.97	.95	96.23	<i>p</i> <.001

Table 4.8.4 displays the standardised coefficients (beta) for each of the variables entered into the regression equation for each substance type. With the exception of alcohol, the baseline ASSIST score was the only significant predictor of the follow-up ASSIST score for each substance type. Furthermore, none of the independent variables were significant predictors of the alcohol follow-up ASSIST score. Despite the result for alcohol, it appears the ASSIST has good predictive validity for the other substances investigated.

Table 4.8.4 Standardised coefficients for variables entered into the multiple regression equations predicting the follow-up Specific Substance Involvement score for specific substances.

Substance	Variable	Standardised Coefficient (Beta)	t value	p value
Tobacco	Baseline Specific Substance involvement	.930	9.85	$p < .001$
	Gender	-.009	-.096	$p = .93$
	Age	-.010	-1.03	$p = .92$
Alcohol	Baseline Specific Substance involvement	.298	1.41	$p = .18$
	Gender	-.091	-.433	$p = .676$
	Age	-.41	-1.86	$p = .081$
Cannabis	Baseline Specific Substance involvement	.74	4.62	$p < .001$
	Gender	-.01	-.063	$p = .951$
	Age	-.15	-.94	$p = .363$
Amphetamines	Baseline Specific Substance involvement	.93	15.1	$p < .001$
	Gender	-.113	-1.85	$p = .083$
	Age	-.24	-.39	$p = .703$

4.8.3 Current Frequency of Substance Use

With reference to the Global Current Frequency of Drug Use (all drugs) score, there was no significant difference between frequency of use at baseline (Mean=3.35, sd=2.89) and frequency of use at follow up (Mean=3.75,

sd=2.99), $t(19)=-1.45$, $p=.163$. Furthermore, there was a significant positive correlation between both groups of scores ($r=.913$, $p<.001$).

Table 4.8.5 shows mean baseline and follow-up Specific Current Frequency of Drug use scores and the associated comparison statistics for tobacco, alcohol, cannabis and amphetamines. There were no significant differences between scores obtained at baseline and follow-up for any of these substances, and scores in both groups were significantly positively correlated.

There was insufficient data to perform analyses on the frequency of use of specific illicit drugs (ie, cocaine, inhalants, sedatives, hallucinogens and opiates), therefore a Global Current Frequency of Use score (incorporating just illicit drugs) was computed to pool the data available for analysis. The results of this analysis showed that there was no significant difference between frequency of use at baseline (Mean= 0.55, sd=1.25), and frequency of use at follow up (Mean=0.80, sd=1.4), ($t(19) =-1.75$, $p=.096$) for any of these substances. Furthermore, both groups of scores were significantly positively correlated ($r=.89$, $p<.001$). However, in view of the sample size it is suggested that the latter result be treated with caution. Even considering this caveat these results would indicate that the ASSIST has good predictive validity for frequency of substance use.

Table 4.8.5 Comparison of baseline and follow-up Current Frequency of Drug Use scores

Substance	ASSIST Scores by Substance Type. Mean (\pm sd)		Pearson's correlation	t value P value
	Baseline	Follow-Up		
Tobacco	1.0(1.6)	1.0(1.6)	$r=.92, p<.001$	identical
Alcohol	1.9(1.0)	2.0(1.0)	$r=.83, p<.001$	$t=-1.14, p=0.27$
Cannabis	0.5(0.9)	0.7(1.0)	$r=.86, p<.001$	$t=-1.71, p=.104$
Amphetamine	0.1(0.5)	0.1(0.3)	$r=.69, p<.001$	Identical

4.8.4 Correlation of follow-up ASSIST Current Frequency of Use scores with follow-up ASI-Lite Frequency of Use scores

The ASI-lite provides an alternative measure of the Current Frequency of Drug use for all substances, except for tobacco, and also asks subjects to report the frequency of their drug use over the last 90 days. Table 4.8.6 shows the correlations obtained between ASSIST and corresponding ASI-lite current frequency of use scores. There were significant positive correlations between both groups of scores for the Total Current Frequency of Use (illicit) scores ASSIST score, and for the following substances, alcohol, cannabis, and amphetamine. There was insufficient data to perform analyses on cocaine, inhalants, hallucinogens, sedatives and opiate scores for both instruments.

Table 4.8.6 Current Frequency of Use – comparison of ASSIST and ASI-lite scores

<i>ASSIST Current Frequency of Use Score</i>	<i>ASI-lite score</i>	<i>Pearson's Correlation Probability</i>
<i>Total (illicit drugs)</i>	Sum of all responses – cannabis, amphetamines, cocaine, inhalants, sedatives, hallucinogens and opiates use over past 90 days	$r=.92, p<.001$
<i>Alcohol</i>	Number days alcohol use over past 90 days	$r= .70, p<.001$
<i>Cannabis</i>	Number days cannabis use over past 90 days	$r=.83, p=.001$
<i>Amphetamine</i>	Number days amphetamine use over past 90 days	$r=.94, p<.001$

Overall these results would indicate that the ASSIST scores investigated have good predictive validity. There was insufficient data to perform analyses on scores for some of the illicit drugs, however, the significant correlation between the baseline and follow-up Global Current Frequency of Use score (amphetamines, cocaine, inhalants, sedatives, hallucinogens and opiates) would indicate that this score could be used to predict illicit substance use in general.

4.9 Brief Interventions

4.9.1 General results

Of the 80 brief interventions that were administered, 68 of these were timed, and took on average 6.2 mins (sd = 2.7 mins). There was a significant positive correlation between the highest ASSIST score for the five brief intervention drugs (alcohol, cannabis, cocaine, amphetamines and opiates) and the length of time of the brief intervention ($r = 0.54, p < .001$). On average, brief interventions for alcohol took less time than brief interventions for the other

drugs ($t(66) = -3.44, p = .001$). See Table 4.9.1 for the average time taken to administer the brief interventions by drug type.

Table 4.9.1: Time taken in minutes to administer brief intervention by drug type

<i>Drug</i>	<i>Mean</i>	<i>sd</i>	<i>Minimum</i>	<i>Maximum</i>
<i>Alcohol (n = 35)</i>	5.2	2.3	3	10
<i>Other drugs (n = 33)</i>	7.2	2.7	3	15

Over half of the brief interventions (55%) provided were for alcohol use. No participants received a brief intervention for cocaine. While two participants received a brief intervention for amphetamine use, these two participants were not located at follow-up. In total, 74 of the 80 participants who received a brief intervention were followed up, a follow-up rate of 92.5%. Table 4.9.2 shows the number of brief interventions provided and the number of participants who received a brief intervention and who were followed up.

Table 4.9.2 Number of brief interventions provided and number of brief intervention participants who were followed up by drug type

<i>Drug type</i>	<i>Number (%) of brief interventions</i>	<i>Number (%) of brief interventions where participant was followed up</i>
<i>Alcohol</i>	44 (55.0)	43 (58.1)
<i>Cannabis</i>	29 (36.3)	27 (36.5)
<i>Cocaine</i>	0 (0.0)	0 (0.0)
<i>Amphetamines</i>	2 (2.5)	0 (0.0)
<i>Opiates</i>	5 (6.3)	4 (5.4)
<i>Total</i>	80 (100.0)	74 (100.0)

With regard to the drugs targeted for brief intervention, and for participants that actually received a brief intervention, the mean highest ASSIST score at

baseline (Mean 8.6: sd = 4.0) was significantly higher than the score participants received at follow-up (Mean 7.2: sd = 3.9; $t(73) = 3.10, p = .003$).

At follow-up, over half (51.4%: n=38) of the brief intervention participants who were interviewed reported that the brief intervention had an effect on their subsequent behaviour. Of those participants, 56.8% (n=21) reported that they believed that the brief intervention had led them to decrease their drug or alcohol use, 27.0% (n=10) reported that their awareness of their drug use had been raised, 13.5% (n=5) reported that they were practising safer drug use habits and 2.7% (n=1) reported that they had sought counselling.

4.9.2

Effectiveness of the brief intervention

This constituted a pilot investigation of the effectiveness of the brief intervention provided to participants. Changes in drug use behaviour occurring as a result of the brief intervention are likely to be reflected in a decrease in follow-scores. Data obtained from participants in the PHC group who received a brief intervention for a specific substance and those who did not receive a brief intervention (n=20) were included in the analysis. The latter group constituted a quasi 'control' group. As seen in Table 4.8.2 there were no differences in between baseline and follow-up Specific Substance Involvement scores obtained from participants who did not receive a brief intervention. The only exception was for alcohol, where ASSIST scores were significantly higher at follow-up than at baseline ($p=.04$). Thus the inclusion of such a group as a 'control' was considered warranted to control for the effect of time (ie, baseline to follow-up).

Two-way repeated measures Analysis of Variance (ANOVA) were used to compare data obtained from both groups (No brief intervention, brief intervention) and at both times (baseline, follow-up). Separate ANOVA's were carried out for the highest Specific Substance Involvement score obtained at baseline for the five substances targeted for brief intervention (alcohol, cannabis, cocaine, amphetamines, and opiates), for the Specific Substance involvement score for Alcohol, and for the highest Specific Substance

involvement score for the illicit drugs (cannabis, cocaine, amphetamines, and opiates). Given that ASSIST Specific Substance Involvement scores obtained from the 'control' group did not differ between baseline to follow-up, a significant interaction effect would likely indicate a significant change in ASSIST scores for the brief intervention group. Furthermore a significant between-groups effect would also be expected as subjects were not randomly allocated to groups and had differing baseline scores. Table 4.9.3 shows the relevant ASSIST scores obtained for each group at baseline and at follow-up.

4.9.2.1 *Highest baseline Specific Substance Involvement score for targeted brief intervention substances.*

For this group there was a 16 % reduction in ASSIST scores from baseline to follow-up. Results from the ANOVA revealed no significant effect of time ($F(1,92)=.876, p=.4$), a significant between groups effect ($F(1,92)=.43.03, p<.001$), and a significant time by group interaction ($F(1,92)=4.93, p=.029$) indicating that this change in ASSIST scores was significant.

4.9.2.2 *Specific Substance Involvement score for alcohol*

There was 15% reduction in ASSIST scores from baseline to follow-up. The results from the ANOVA revealed no significant effect of time ($F(1,61)=.38, p=.542$), a significant between groups effect ($F(1,61)=35.71, p<.001$), and a significant time by group interaction ($F(1,61)=7.83, p=.007$) indicating that this change in ASSIST scores was significant.

4.9.2.3 *Specific Substance Involvement score for illicit substances.*

For this group there was a 17% reduction in ASSIST score from baseline to follow-up. Results from the ANOVA revealed no significant effect of time ($F(1,49)=1.38, p=.25$), and a significant between groups effect ($F(1,49)=89.49, p<.001$). The interaction between time by group ($F(1,49)=3.57, p=.065$) neared significance.

Table 4.9.3 Comparison of mean (sd) baseline and follow-up Specific Substance Involvement Scores for participants receiving a brief intervention

Score	N	Baseline score	Follow-up score	ANOVA Interaction term <i>p</i> value
Highest Specific Substance Involvement score (BIs for alcohol, cannabis, cocaine, amphetamines and opiates)	74	8.6 (4.0)	7.2 (3.9)	<i>p</i> =.029
Control – No Brief Intervention	20	2.4 (0.9)	3.0 (1.5)	
Specific Substance Involvement score for subjects receiving Alcohol BI	43	7.6 (3.7)	6.5 (3.2)	<i>p</i> =.007
Control – No Brief Intervention	20	2.4 (0.9)	3.1 (1.5)	
Specific Substance Involvement score for subjects receiving non-alcohol BI (ie cannabis or opiates)	31	9.9 (4.2)	8.2 (4.7)	<i>p</i> =.065
Control – No Brief Intervention	20	0.8 (0.95)	1.2 (1.6)	

The above results indicate that Specific Substance Involvement scores were significantly different at follow-up than at baseline for the highest baseline Assist Score for the targeted brief intervention substances and for the Specific Substance Involvement Score for alcohol, but not for the highest ASSIST score for the illicit drugs.

In psychological testing, validity typically refers to how well an instrument, such as the ASSIST measures what it is designed to measure (Cronbach, 1970). Ensuring that an instrument is valid is an important step in its development, and subsequent acceptance, as clinicians need to be confident of its output before administering a therapeutic intervention and/or referral procedure. The results of this study indicate that the ASSIST is a valid screening test for psychoactive substances in individuals who use a number of different substances and have varying degrees of substance involvement in the Australian context. In addition the current study found preliminary evidence for the effectiveness of a brief intervention procedure linked to scores obtained on the ASSIST.

The results show, except for some minor discrepancies, the substantial validity of the ASSIST. Its concurrent validity is evident in the significant correlations obtained between ASSIST scores (Global Continuum of Risk and Specific Substance Involvement score) and a range of instruments, such as the ASI, SDS, AUDIT and DAST, that provide collateral validation of substance use, abuse and dependence. Notably participants diagnosed with substance dependence or abuse by the MINI plus could be differentiated on the basis of their Specific Substance Involvement score, thus indicating that this score reflects the underlying diagnosis of dependence or abuse.

Similarly there is substantial evidence for the construct validity of the ASSIST. As expected, the relationships between ASSIST scores and other measures where not as strong as those found with concurrent validity as the constructs under comparison were not the same, but instead where theoretically related to each other. Nevertheless, there were significant positive correlations between ASSIST scores and a number of measures that are considered risk factors for the development of substance use disorders or are associated with substance use, including recent injecting behaviour and scores reflecting a number of physical, psychological or social problems. Furthermore, the significant

correlations between ASSIST scores and severity of ADHD and ASPD derived from the MINI Plus and the finding that participants diagnosed with either disorder could be differentiated on the basis of their ASSIST score is further evidence for the construct validity of the ASSIST.

Evidence for the predictive validity of the ASSIST is less comprehensive as the small sample resulted in insufficient cases to undertake data analysis in many drug categories (inhalants, sedatives, hallucinogens and opiates). However, the available data indicate that the ASSIST has good predictive validity, especially with respect to paired group comparison between baseline and follow-up Specific Substance Involvement Scores and Global Continuum of Risk scores, and the significant correlations between Frequency of Use scores and corresponding ASI-lite scores.

Overall the results show that the ASSIST can discriminate between substance use, abuse, and dependence for Global Continuum of Risk and Specific Drug Involvement scores. However, it appears that the ASSIST better discriminates between use and abuse than between abuse and dependence. ROC curve analysis was able to provide a series of cutoff scores, for an Australian sample, with acceptable sensitivities and specificities for most substance types, with the exception of cocaine, inhalants and hallucinogens.

Results show preliminary evidence for the effectiveness of a brief intervention that was linked to the results of the ASSIST. Follow up Specific Substance Involvement scores for any one of the targeted brief intervention substances (alcohol, cannabis, cocaine, amphetamines, and opiates) that received the highest score, and for alcohol alone, but not for illicit drugs, were significantly reduced from baseline. These results are consistent with participant's feedback on the effectiveness of the brief intervention. Over half of the subjects reported that they believed that the brief intervention had led them to modify their behaviour in a positive way. A 'quasi' control group, comprising those participants in the primary health care group who had not receive a brief intervention, was included in the analysis to control for time. However,

participants were not randomly allocated to groups and were not equivalent at baseline, as reflected in the different mean ASSIST scores for both groups at baseline (see Table 4.9.3). A larger more controlled study, such as a RCT, where participants who are eligible to receive a brief intervention are randomly allocated to different treatment groups is warranted to confirm that the changes seen in ASSIST scores at follow-up are due to the effects of a brief intervention.

Nevertheless, the impact of brief intervention on alcohol use, as reflected in the change in Specific Substance Involvement for alcohol seen in this study, is consistent with that found in previous studies (Senft et al., 1997; WHO Brief Intervention Study Group, 1996). The WHO Brief Intervention Study Group (1996) showed that patients in simple advice and brief counselling groups reduced their daily alcohol consumption by approximately 27% and 21% respectively from baseline to follow-up. In the present Australian study Specific Substance Involvement scorers for alcohol were significantly reduced by 15% from baseline to follow-up. While these changes may not be large, the WHO authors point out that they should be considered in terms of the impact such changes in alcohol consumption can have on public health. Indeed, in the context of screening primary health care clinicians need to be assured that their intervention will likely have long standing impact on patients' health.

The WHO Intervention Group (1996) also demonstrated that 5 minutes of brief advice, was equally as effective as brief counselling (15 minutes) and extended counselling (up to 3 sessions) on the amount of alcohol consumed per session and the average amount consumed in male drinkers. The effect was less pronounced with female drinkers. The brief intervention for alcohol provided in this study took on average 5 minutes (range 3 to 10 minutes) to deliver. Given that the combined time to administer both the alcohol brief intervention (approximately 5 minutes) and the baseline ASSIST (approximately 7 minutes) was less than 15 minutes, it is expected that primary health care professionals will be able to incorporate this combination brief treatment into busy PHC settings.

The finding with regard to the impact of brief intervention on illicit substance use was inconclusive in the Australian setting. In the present study, the mean follow-up Specific Substance Involvement score for all illicit drugs was not significantly different from the baseline score (interaction term, $p=.065$) for those participants who received a brief intervention. This result probably reflects Type II error, or the lack of sufficient statistical power to detect a difference. Indeed, preliminary analyses of data pooled from both Australian and Brazilian sites revealed that, in comparison to control subjects, a brief intervention was associated with a significant decrease in follow-up Specific Substance Involvement scores for both alcohol ($p<.001$) and also illicit substances (cannabis, opiates, cocaine; $p<.001$). Furthermore, the majority of participants in the illicit group that received a brief intervention were cannabis users (27 out of 31). Given that there is evidence for the effectiveness of brief intervention for cannabis users (Copeland et al., 2001), it is probable that increasing the size of the cannabis using sample would result in a significant effect. Moreover, given the absence or small numbers of participants in the illicit substance categories, and the general paucity of research on the effect of brief intervention for illicit drugs, further research is warranted that examines the effectiveness of brief intervention with a range of such substances.

There are major caveats to this study and certainly there is a need for further research in this area. The current study reports data obtained from only 150 participants from the Australian site. As previously mentioned the number within certain drug categories were too small to undertake many of the analyses required (ie, for hallucinogens, inhalants, and cocaine). In particular it was not possible to determine scores that could be used to discriminate between use and abuse, and abuse and dependence for these drugs. Certainly the data pooled from all the other sites ($n= 1047$) engaged in the multinational study will provide such cutoff scores, which are expected to be comparable with the findings from the Australian site. Furthermore, there is a need to test participants who use a range of illicit substances so that the

efficacy of using a brief intervention for such drug use can be more thoroughly examined.

The use of a reliable and valid screening instrument is considered a key aspect of a public health approach to early intervention for drug related problems (WHO ASSIST Working Group, 2002). Previous work has already established that the scores derived from the ASSIST are reliable and that it is feasible to use the ASSIST in a variety of settings, cultures and that the instrument can be used to screen for a variety of drugs (WHO ASSIST Working Group, 2002). The current study provides extensive evidence of the validity of the ASSIST in the Australian context and provides preliminary evidence of linking a brief intervention, particularly for alcohol, to the results of the ASSIST. While the evidence is less compelling for the effectiveness of BI for illicit drugs, the overall impact of these substances on the health of individuals and social harm caused by these drugs would warrant further investigation. These findings would suggest, with few minor discrepancies, that the ASSIST is capable of obtaining accurate information concerning the use of a number of substances and varying degrees of substance use.

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REFERENCES

- Allen, J.P., Litten, R.Z., Feertig, J.B. & Babor, T.F. (1997). A review of research on the Alcohol Use Disorders Identification Test (AUDIT). *Alcoholism: Clinical and Experimental Research*, 21(4), 613-619.
- Australian Bureau of Statistics (2002). 2015.0: *Census of Population and Housing: Selected Characteristics, Australia*. Canberra: ABS.
- Australian Institute of Health and Welfare (2002). *2001 National Drug Strategy Household Survey: First Results*. Canberra: AIHW.
- Babor, T.F., Kranzler, H.R. & Lauerman, R.J. (1989a). Early detection of harmful alcohol consumption: Comparison of clinical, laboratory and self-report screening procedures. *Addictive Behaviors*, 14, 139–157.
- Babor, T.F., de la Fuente, J.R., Saunders, J. & Grant, M. (1989b). *AUDIT, The Alcohol Use Disorders Identification Test: Guidelines for use in primary health care*. WHO/MNH/DAT 89.4, Geneva: World Health Organization.
- Babor, T.F. (2002). Is there a need for an international screening tests? The Middle East as a case in point. In: Isralowitz, R. & Rawson. R., eds. *Drug Problems, Cross Cultural Policy and program Development*, pp. 165-179. Westport, CT: Auburn House.
- Baker, A., Bloggs, T.G. & Lewin, T.J. (2001). Randomised controlled trial of brief cognitive-behavioural interventions among regular users of amphetamine. *Addiction*, 96, 1279-1287.
- Bashir, K., King, M. & Ashworth, M. (1994). Controlled evaluation of brief intervention by general practitioners to reduce chronic use of benzodiazepines. *British Journal of General Practice*, 44, 408-412.

- Bien, T.H., Miller, W.R. & Tonigan, S. (1993). Brief intervention for alcohol problems: A review. *Addiction*, *88*, 315–336.
- Brown, R.L., & Rounds, L.A. (1995). Conjoint screening questionnaires for alcohol and other drug abuse: criterion validity in a primary care practice. *Wisconsin Medical Journal*, *94*. 135-140.
- Copeland, J., Swift, W., Roffman, R., & Stephens, R. (2001). A randomized controlled trial of brief cognitive-behavioral interventions for cannabis use disorder. *Journal of Substance Abuse Treatment*, *21*, 55-64.
- Cronbach, L.J. (1970). *Essentials of psychological testing*. New York: Harper & Row.
- Cordoba, R., Delgado, M.T., Pico, V., Altisent, R., Fores, D., Monreal, A., Frisas, O. & Lopez del Val, A. (1998). Effectiveness of brief intervention on non-dependent alcohol drinkers (EBIAL): a Spanish multi-centre study. *Family Practice*, *15* (6), 562-588.
- Fleming, M.H., Mundt, M.P., French, M.T., Manwell, L.B., Stauffacher, E.A. & Barry, K.L. (2000). Benefit-cost analysis of brief physician advice with problem drinkers in primary care settings. *Medical Care*, *38* (1), 7-18.
- Gavin, D., Ross, H. & Skinner, H. (1989). Diagnostic Validity of the Drug Abuse Screening Test in the assessment of DSM-III drug disorders. *British Journal of Addiction*, *84*, 301-307
- Gossop, M., Best, D., Marsden, J & Strang, J.(1997). Test-retest reliability of the Severity of Dependence Scale. *Addiction*, *92* (3), 353.

Gossop, M., Darke, S., Griffiths, P., Hando, J., Powis, B., Hall, W., Strang, J. (1995). The Severity of Dependence Scale (SDS): Psychometric properties of the SDS in English and Australian samples of heroin, cocaine and amphetamine users. *Addiction*, 90(5), 607-614.

Green, L.W. & Lewis, F.M. (1986). *Measurement and Evaluation in Health Education and Health Promotion*. Palo Alto, California: Mayfield Publishing.

Heather, N (1996) The Public Health and brief intervention for excessive alcohol consumption: the British experience. *Addictive Behaviours*, 21, 857-868.

Heather, N. & Rollnick, S. (1993). *Readiness to change questionnaire: users' manual*. Sydney: National Drug and Alcohol Research Centre.

Higgins-Biddle, J.C., Babor, T.F., Mullahy, J., Daniels, J. & McRee, B. (1997). Alcohol screening and brief interventions: Where research meets practice. *Connecticut Medicine*, 61(9), 565-575.

Hile, M.G. & Adkins, R.E. (1998). The impact of substance abusers' readiness to change on psychological and behavioral functioning. *Addictive Behaviors*, 23(3), 365-370.

Lecrubier, Y., Sheehan, D., Weiller, E., Amorim, P., Bonora, I., Sheehan, K., Janavs, J., Dunbar, G. (1997). The MINI International Neuropsychiatric Interview (M.I.N.I.) A short diagnostic structured interview: Reliability and validity according to the CIDI. *European Psychiatry*, 12, 224-231.

Maisto, S.E., Conigliaro, J., McNeill, M., Kraemer, K., Conigliaro, R.L. & Kelly, M.E. (2001). Effects of two types of brief intervention and readiness to change on alcohol use in hazardous drinkers. *Journal of Studies on Alcohol*, 62(5), 605-614.

Marsden, J., Farrell, M., Finch, E., Cummins, M. & Strang, J. (1998). *The Rating of Injection Site Condition Scale (RISC): An assessment of injecting related morbidity and complications amongst drug misusers*. Unpublished scale. London: National Addiction Centre.

Marsden, J. Gossop, G. Stewart, D. Best, D. Farrell, M. Lehmann, P. Edwards, C. & Strang, J. (1998) The Maudsley Addiction Profile (MAP): A brief instrument for assessing treatment outcome, *Addiction* 93(12): 1857-1867.

McLellan, A., Luborsky, L., Cacciola, J. & Griffith, J.E. (1985). New data from the Addiction Severity Index: Reliability and validity in three centres, *Journal of Nervous and Mental Disorders*, 173, 412-423.

McPherson, T.L., & Hersh, R.K. (2000). Brief substance use screening instruments for primary care settings: A review. *Journal of Substance Abuse Treatment*, 18, 193-202.

Miller, W.R. & Rollnick, S. (1991). *Motivational interviewing: Preparing people to change addictive behaviors*. New York, Guilford Press.

Miller, W.R. & Wilbourne, P.L. (2002) Mesa Grande: a methodological analysis of clinical trials of treatments for alcohol use disorders (review). *Addiction*, 97 (3), 265-277.

Ockene, J.K., Kristeller, J., Pbert, L., Hebert, J.R., Luippold, R., Goldberg, R.J., Landon, J. & Kalank. (1994) The physician delivered smoking intervention project: Can short-term intervention produce long-term effects for a general outpatient population, *Health Psychology*, 13(3), 278-81.

Saunders, B., Aasland, O.G., Babor, T.F., de la Fuente, J.R. & Grant, M.(1993). Development of the Alcohol Uses Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption II. *Addiction*, 88, 791-804.

Saunders, B., Wilkinson, C. & Phillips, M. (1995). The impact of a brief motivational intervention with opiate users attending a methadone programme. *Addiction, 90*, 415-424.

Senft, R.A., Polen, M.R., Freeborn, D.K. & Hollis, J.F. (1997). Brief intervention in a primary care setting for hazardous drinkers. *American Journal of Preventative Medicine, 13* (6), 464-470.

Shand, F.L. & Mattick, R.P. (2001). *Clients of treatment service agencies: May 2001 census findings*. AGPS Canberra. In preparation.

Sheehan, D., Lecrubier, Y., Harnett-Sheehan., Amorim, P., Janavs, J., Weiller, E., Hergueta, T., Baker, R. & Dunbar, G. (1998). The MINI International Neuropsychiatric Interview (M.I.N.I.): The development and validation of a structured Diagnostic Psychiatric Interview, *Journal of Clinical Psychiatry, 59* (20), 22-33.

Skinner, H.A. (1982). The Drug Abuse Screening Test. *Addictive Behaviors, 7*, 363-371.

Solberg, L.I., Maxwell, P.L., Kottke, T.E., Gepner, G.J. & Biecke, M.L., (1990) A systematic primary care office based smoking cessation program. *Journal of Family Practice, 30*(6), 647-54.

Stotts, A.L., Schmitz, J.M., Rhoades, H.M. & Grabowski, J.(2001). Motivational interviewing with cocaine-dependent patients: a pilot study. *Journal of Consulting and Clinical Psychology, 69*(5), 858-862.

Tate, J. C. & Schmitz, J. M. (1993). A proposed revision of the Fagerstrom Tolerance Questionnaire. *Addictive Behaviours, 18*, 135-143.

WHO ASSIST Working Group (2002) the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. *Addiction*, 97, 1183-1194.

WHO ASSIST Working Group (2003). Validation of the Alcohol Smoking and Substance Involvement Screening Test (ASSIST) and Pilot Brief Intervention: Phase 11. WHO Technical Report (In Press).

WHO Brief Intervention Study Group. (1996). A cross-national trial of brief interventions with heavy drinkers. *American Journal of Public Health*, 96, 948-955.

World Health Organisation. (1988). The WHO/ADAMHA CIDI. Geneva

World Health Organisation (2002). *The World Health Report 2002, Reducing Risks, Promoting healthy Life*. WHO Geneva.

Wutzke, S.E., Shiell, A., Gomell, M.K., Conigrave, K.M. (2001). Cost effectiveness of brief interventions for reducing alcohol consumption. *Social Science & Medicine*, 52 (6), 863-87

Appendix 1: ASSIST questionnaire

ASSIST v2.0

PARTICIPANT ID: ___/___/___/___/___

INTERVIEWER ID: ___/___/___/___

CRU: ___/___

DATE: DAY/MO/YR

Record Start Time: _____

SESSION: ___ (0) baseline

INTRODUCTION:

Thank you for agreeing to take part in this brief interview about alcohol, tobacco products and other drugs. I am going to ask you some questions about your experience of using these substances across your lifetime and in the past three months. These substances can be smoked, swallowed, snorted, inhaled, injected or taken in the form of pills (show drug card).

Some of the substances listed may be prescribed by a doctor (like amphetamines, sedatives, pain medications). For this interview, we will not record medications that are used as prescribed by your doctor. However, if you have taken such medications for reasons other than prescription, or taken them more frequently or at higher doses than prescribed, please let me know. While we are also interested in knowing about your use of various illicit drugs, please be assured that information on such use will be treated as strictly confidential.

Note: Before asking questions, give ASSIST Drug Cards to participant

Question 2.1

In your life, which of the following substances have you ever used? (NON-MEDICAL USE ONLY)	No	Yes
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	1
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	1
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	1
d. Cocaine (coke, crack, etc.)	0	1
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	1
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	1
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	1
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	1
i. Opiates (heroin, morphine, methadone, codeine, etc.)	0	1
j. Other - specify:	0	1

Probe if all answers are negative:
 “Not even when you were in school?”

If "No" to all items, stop interview.

If "Yes" to any of these items, ask Question 2.2 for each substance ever used.

Note: For all questions, if participant is currently in treatment, ensure they consider the three month period prior to inpatient care.

Question 2.2

In the past three months, how often have you used the substances you mentioned (<i>FIRST DRUG, SECOND DRUG, ETC</i>)?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	1	2	3	4
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	1	2	3	4
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	1	2	3	4
d. Cocaine (coke, crack, etc.)	0	1	2	3	4
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	1	2	3	4
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	1	2	3	4
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	1	2	3	4
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	1	2	3	4
i. Opiates (heroin, morphine, methadone, codeine, etc.)	0	1	2	3	4
j. Other - specify:	0	1	2	3	4

If "Never" to all items in Question 2.2, skip to Question 2.6.

If any substances in Question 2.2 used in the previous three months, continue with Questions 2.3, 2.4 & 2.5 for each substance used.

Question 2.3

During the past three months, how often have you had a strong desire or urge to use (<i>FIRST DRUG, SECOND DRUG, ETC</i>)?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	1	2	3	4
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	1	2	3	4
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	1	2	3	4
d. Cocaine (coke, crack, etc.)	0	1	2	3	4
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	1	2	3	4
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	1	2	3	4
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	1	2	3	4
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	1	2	3	4
i. Opiates (heroin, morphine, methadone, codeine, etc.)	0	1	2	3	4
j. Other - specify:	0	1	2	3	4

Question 2.4

During the <u>past three months</u>, how often has your use of (<i>FIRST DRUG, SECOND DRUG, ETC</i>) led to health, social, legal or financial problems?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	1	2	3	4
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	1	2	3	4
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	1	2	3	4
d. Cocaine (coke, crack, etc.)	0	1	2	3	4
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	1	2	3	4
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	1	2	3	4
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	1	2	3	4
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	1	2	3	4
i. Opiates (heroin, morphine, methadone, codeine, etc.)	0	1	2	3	4
j. Other - specify:	0	1	2	3	4

Question 2.5

During the <u>past three months</u>, how often have you failed to do what was normally expected of you because of your use of (<i>FIRST DRUG, SECOND DRUG, ETC</i>)?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products					
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	1	2	3	4
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	1	2	3	4
d. Cocaine (coke, crack, etc.)	0	1	2	3	4
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	1	2	3	4
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	1	2	3	4
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	1	2	3	4
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	1	2	3	4
i. Opiates (heroin, morphine, methadone, codeine, etc.)	0	1	2	3	4
j. Other - specify:	0	1	2	3	4

Ask Questions 2.6 & 2.7 for all substances ever used (ie. those endorsed in Question 2.1)

Question 2.6

Has a friend or relative or anyone else <u>ever</u> expressed concern about your use of (FIRST DRUG, SECOND DRUG, ETC.)?	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	2	1
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	2	1
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	2	1
d. Cocaine (coke, crack, etc.)	0	2	1
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	2	1
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	2	1
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	2	1
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	2	1
i. Opiates (heroin, morphine, methadone, codeine, etc.)	0	2	1
j. Other – specify:	0	2	1

Question 2.7

Have you <u>ever</u> tried to control, cut down or stop using (FIRST DRUG, SECOND DRUG, ETC.)?	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	2	1
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	2	1
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	2	1
d. Cocaine (coke, crack, etc.)	0	2	1
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	2	1
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	2	1
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	2	1
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	2	1
i. Opiates (heroin, morphine, methadone, codeine, etc.)	0	2	1
j. Other – specify:	0	2	1

Question 2.8

	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
Have you <u>ever</u> used any drug by injection? (NON-MEDICAL USE ONLY)	0	2	1

Record End Time: _____

Record relevant comments below:

Part 2.9:

Scoring Q2.2-Q2.7

	Aggregate Score? (Q2.2 – 2.7)	No intervention Or referral	Receive brief intervention	Referred for specialist treatment
a. Alcohol		0–3	4–15	16–20
b. Cannabis		0–3	4–15	16–20
c. Cocaine		0–3	4–15	16–20
d. ATS*		0–3	4–15	16–20
e. Opioids		0–3	4–10	11–20

*Amphetamine Type stimulants

Scoring Q2.8

Score of 2 → Specialist treatment

Appendix 2: Original flier designed to advertise ASSIST study in Primary Health Care Settings



RESEARCH VOLUNTEERS NEEDED!

Drug & Alcohol



Services Council

If you are willing to participate in a two-part interview, then we would like to hear from you!



If you are chosen to participate, you will be given \$40 for your time.

What is the study about?

The *Drug and Alcohol Services Council* and the *World Health Organisation* are collaborating to conduct a research study to learn how people answer questions about their experiences with tobacco, alcohol, medicines and other drugs. The study will continue until February, 2002.

The information you provide is **confidential and anonymous**, and therefore will not be shared with anyone.

If you are interested in being a volunteer in this study, then either **ring the number below** to speak to a Research Officer about the study, or **ask at the Reception desk for a 'Research Volunteer' form**, fill in the form and return it to the Reception desk.

Someone from our staff will contact you to tell you more about the interview and arrange a time for the interview if you are suitable.

Chelsea Hallett, Research Officer Ph. 8274 3342

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Research Officer
8274 3342

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Research Officer
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Appendix 3: Research Volunteer Form



RESEARCH VOLUNTEER FORM

Thankyou for showing interest in this study.

Please provide the following details so that we can determine whether you are suitable for the study.

Please print your full name:

_____ (first name) _____ (last name)

How old are you today? _____ years

Are you male or female? (please circle) Male

Female

What is your phone number? *(Please provide as many details as possible so that we can contact you if you are suitable for the study.)*

Home phone number: _(____) _____

Work phone number: _(____) _____

Mobile phone number: _____

Email address: _____

What is the best time of day to contact you?

I understand that participation in the study is completely voluntary, confidential and anonymous. If I am asked to participate, I may decline at any time.

Signature: _____ Today's date: ____/____/____

Appendix 4: Recruitment Screening Form

DATE _____ TIME OF CALL _____

CONTACT PERSON _____

Subject calling CC? CC calling subject?

SUBJECT NAME: _____ AGE _____ M / F

PHONE NO.s _____

Brief description of study:

This is a World Health Organisation research study which is being conducted in Australia, as well as Brazil, India, Thailand, the United Kingdom, the United States, and Zimbabwe. The Australian component is being conducted in collaboration with the Drug and Alcohol Services Council. The purpose of the study is to learn how people answer questions about their experiences with tobacco, alcohol, medicines and recreational drugs.

This study consists of two sessions. The first session is the major one and is conducted face to face with an interviewer. During this session, the interviewer will ask you set questions regarding use of medicines, drugs, alcohol and tobacco, and their effects. You will then be asked to complete a set of questionnaires on your own, although the interviewer can read these questions to you if you wish. Following this, you may also be provided information about your use of drugs. This first session will last about 90 minutes and you will be compensated \$40 for your time. During the first session, you will also be asked to provide a hair sample.

You will be scheduled for a second session approximately three months later. This is a telephone interview. During the second interview you will be asked similar questions about your use of medicines, drugs, alcohol and tobacco. This second interview will last approximately 20 minutes. The \$40 you received in the first interview is also payment for this interview.

Your name will not be recorded anywhere on the interview. In order to preserve confidentiality, only an anonymous subject number will be associated with the information provided.

Participation is completely voluntary. You are free to withdraw from this study at any time without penalty.

There are no foreseeable risks to those who participate in this type of research. The possible benefits include gaining an awareness of your alcohol, tobacco and other drug use patterns, and whether substance use is having an effect on your life.

PROCEEDING WITH INTERVIEW? Y / N Other queries/caveats?_____

WHICH PHC SETTING/FOUND OUT ABOUT STUDY?_____

RESPONDING TO FLYER / R.V.F / OTHER?

TYPE OF PHC WORKER SEEN? (ie. doctor, nurse, physio etc.)_____

EVER USED ALCOHOL? Y / N LAST TIME USED?_____

EVER USED ANY REC. DRUGS? Y / N LAST TIME USED?_____

EVER USED SEDATIVES (eg Valium etc.)? Y / N? LAST TIME USED?_____

EVER SMOKED CIGARETTES? Y / N LAST TIME USED?_____

EVER RECEIVED TREATMENT FOR DRUG/ALCOHOL PROBLEM? (EXCLUDING CIGARETTES) Y / N Details_____

ARE YOU CURRENTLY SEEKING TREATMENT FOR D & A PROBS? Y / N

ARE YOU CURRENTLY EXPERIENCING ANY PHYSICAL OR MENTAL HEALTH PROBLEMS THAT WOULD PROHIBIT YOU FROM TAKING PART IN A 90 MINUTE INTERVIEW?_____

HAVE YOU BEEN IN AN ENVIRONMENT IN THE LAST 3 MONTHS WHERE YOU WERE NOT FREE TO COME AND GO AS YOU PLEASE?_____

HOW LONG IS HAIR ON HEAD?_____

WHERE WERE YOU BORN?_____

(If born outside Australia)

HOW LONG HAVE YOU LIVED IN AUSTRALIA?_____

(If born in Australia)

DO YOU IDENTIFY YOURSELF AS ATSI? Y / N

INTERVIEWER COMMENTS RE: SUITABILITY? (English skills, cognitive impairment, mental health problems etc.)

SUITABLE / UNSUITABLE / UNSURE AT THIS STAGE

INTERVIEW DAY/DATE: _____ TIME: _____

LOCATION: _____ OTHER: _____

INFORMED RE: UNSUITABILITY? Y / N NA OTHER



RESEARCH VOLUNTEERS NEEDED!



\$40 compensation

Do you use marijuana, or speed, or ecstasy, or any other recreational drugs?

Are you...

- Between 36 and 45
- Willing to take part in a 90-minute interview, and a 20-minute follow-up interview, on your use of alcohol, medications, recreational drugs and tobacco

What is the study about?

The *Drug and Alcohol Services Council* and the *World Health Organisation* are collaborating to conduct a research study to learn how people answer questions about their experiences with tobacco, alcohol, medicines and other drugs. The study will continue until February, 2002.

The information you provide is **confidential and anonymous**, and therefore will not be shared with anyone.

*If you are interested in being a volunteer in this study, then **ring the number below** to speak to a Research Officer about the study.*

Someone from our staff will tell you more about the interview and arrange a time for the interview if you are suitable.

Chelsea Hallett, Research Officer Ph. 8274 3342

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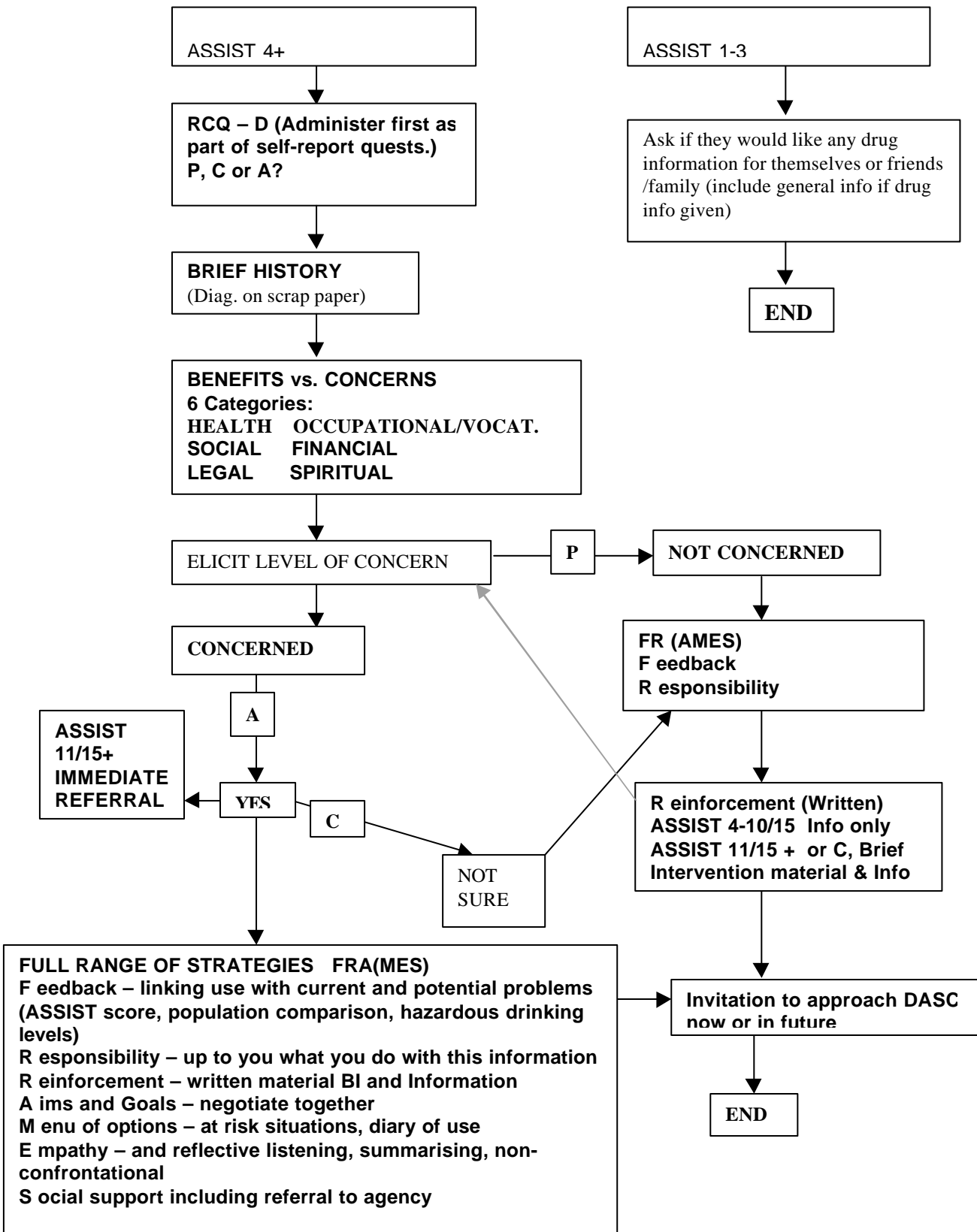
Chelsea Hallett
Research Officer
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Appendix 6: Flowchart of Brief Intervention Protocol

MODEL FOR BRIEF INTERVENTION FOR PRECONTEMPLATORS (P), CONTEMPLATORS (A) AND ACTION (A).
NOTE: ASSIST Score 4-15 (or 10 for opiates): drug/alcohol use could lead to or already have lead to harms
 ASSIST Score 16+ (or 10+) for opiates or a score of 2 on Q2.8: probable dependence and harms



Appendix 7: List of materials distributed to Brief Intervention Participants

General Information

Drug and Alcohol Services in South Australia Directory
Australian Drug Information Network (website) business card
Alcohol and Drug Information Service (24-hour phone number) business card

Alcohol Information

Alcohol Information Sheet
Alcohol Go Easy 'Know your standard drinks' fridge magnets (spirits, wine, regular beer, light beer)
Alcohol Go Easy large yellow fridge magnet
'Alcohol Related Brain Injury' pamphlet
'Standard Drinks' wallet card
'Do you know when to stop? A driver's guide to staying under the .05 BAC limit' pamphlet

Cannabis Information

Marijuana Information Sheet
'Mulling it Over' booklet
'Cannabis – it's illegal' fact sheet

Amphetamines Information

Amphetamines Information Sheet
'A User's Guide to Speed' booklet

Ecstasy Information

Ecstasy Information Sheet
'Ecstasy: Facts and Fiction' booklet

Heroin Information

'Heroin: Understanding Overdose and What to Do' pamphlet
Heroin fridge magnets ('When you ring an ambulance', 'What to do if someone drops' and 'When someone drops')
'If someone drops...' sticker

Cocaine Information

'Cocaine' booklet

Inhalants Information

'Inhalants: How drugs affect you' pamphlet

Cigarettes Information

'Quit: Because you can' booklet

Other Information

'Steroid Facts' booklet

Alcohol Brief Intervention Materials

'Getting Through Alcohol Withdrawal' booklet

'The Drinker's Guide to Cutting Down or Cutting Out' booklet

(For women only) 'Women's Drinking Guide' booklet

Cannabis Brief Intervention Materials

'Marijuana: A guide to quitting' booklet

'Cannabis: Quitting?' booklet

Amphetamines Brief Intervention Materials

'Getting Through Amphetamine Withdrawal' booklet

Heroin Brief Intervention Materials

'Getting Through Heroin Withdrawal' booklet

'Heroin' booklet

Benzodiazepine Brief Intervention Materials

'An Injecting Drug User's Guide to Benzos' booklet

Other Brief Intervention Materials

Yellow Drug Diary

Appendix 8: List of ASSIST domains (scores) and formulae used to calculate scores

Domain Number	Description of Domain	ASSIST Formula
1A	Lifetime substance use – including alcohol & tobacco	$\Sigma Q1a + 1b + 1c + 1d + 1e + 1f + 1g + 1h + 1i + 1j$ (Max Score: 10)
1B	Lifetime illicit drug use – excluding alcohol & Tobacco	$\Sigma Q1c + 1d + 1e + 1f + 1g + 1h + 1i + 1j$ (Max Score: 8)
2A	Global continuum of substance risk score - including alcohol & tobacco	$\Sigma Q1a - j + 2a - j + 3a - j + 4a - j + 5a - j + 6a - j + 7a - j + 8$ (Max Score: 208)
2B	Global continuum of illicit drug risk score - excluding alcohol & tobacco	$\Sigma Q1c - j + 2c - j + 3c - j + 4c - j + 5c - j + 6c - j + 7c - j + 8$ (Max Score: 170)
3A	Specific Substance Involvement – Tobacco	$\Sigma 2a + 3a + 4a + 6a + 7a$ (Max Score: 16)
3B	Specific Substance Involvement – Alcohol	$\Sigma 2b + 3b + 4b + 5b + 6b + 7b$ (Max Score: 20)
3C	<u>Specific Substance Involvement – Cannabis</u>	$\Sigma 2c + 3c + 4c + 5c + 6c + 7c$ (Max Score: 20)
3D	<u>Specific Substance Involvement – Cocaine</u>	$\Sigma 2d + 3d + 4d + 5d + 6d + 7d$ (Max Score: 20)
3E	Specific Substance Involvement – Amphetamines	$\Sigma 2e + 3e + 4e + 5e + 6e + 7e$ (Max Score: 20)
3F	<u>Specific Substance Involvement – Inhalants</u>	$\Sigma 2f + 3f + 4f + 5f + 6f + 7f$ (Max Score: 20)
3G	<u>Specific Substance Involvement – Sedatives</u>	$\Sigma 2g + 3g + 4g + 5g + 6g + 7g$ (Max Score: 20)
3H	Specific Substance Involvement – Hallucinogens	$\Sigma 2h + 3h + 4h + 5h + 6h + 7h$ (Max Score: 20)
3I	<u>Specific Substance Involvement – Opiates</u>	$\Sigma 2i + 3i + 4i + 5i + 6i + 7i$ (Max Score: 20)
3J	<u>Specific Substance Involvement – Other</u>	$\Sigma 2j + 3j + 4j + 5j + 6j + 7j$ (Max Score: 20)

4A	Current Frequency of Substance Use - total including alcohol, *excluding tobacco & 'other drugs'	$\Sigma Q2b - I$ (Max Score: 32)
4B	Current Frequency of Illicit Drug Use - total *excluding alcohol, tobacco & 'other drugs'	$\Sigma Q2c - I$ (Max Score: 28)
4C	Current Frequency alcohol use	Q2b (Max Score: 4)
4D	Current Frequency cannabis use	Q2c (Max Score: 4)
4E	Current Frequency cocaine use	Q2d (Max Score: 4)
4F	Current Frequency amphetamine use	Q2e (Max Score: 4)
4G	Current Frequency inhalant use	Q2f (Max Score: 4)
4H	Current Frequency sedative use	Q2g (Max Score: 4)
4I	Current Frequency hallucinogen use	Q2h (Max Score: 4)
4J	Current Frequency opiate use	Q2i (Max Score: 4)
5A	Global Dependence – all substances including alcohol & tobacco	$\Sigma Q1a - j + 2a - j + 3a - j + 6a - j + 7a - j$ (Max Score: 130)
5B	Global Dependence –illicit drugs excluding alcohol & tobacco	$\Sigma Q1c - j + 2c - j + 3c - j + 6c - j + 7c - j$ (Max Score: 104)
6A	Global Abuse – all substances including alcohol & tobacco	$\Sigma Q1a - j + 2a - j + 4a - j + 5a - j + 6a - j$ (Max Score: 146)
6B	Global Abuse – illicit drugs, excluding alcohol & tobacco	$\Sigma Q1c - j + 2c - j + 4c - j + 5c - j + 6c - j$ (Max Score: 120)

*tobacco and 'other drugs' were excluded from this domain because of the lack of independent data available for comparison

Appendix 9 – Description of variables used to place participants into use, abuse and dependence groups prior to carrying out ANOVA and ROC analyses.

Note that results presented in section 4.7 were obtained from analyses using the criteria that are presented in bold type for Global Continuum of Risk and Specific Substance Involvement for each drug type.

a) Global continuum risk score - including alcohol/tobacco

VAR101

- **Treatment group (dependence)**
- **PHC group, diagnosis of current abuse on the MINI Plus for any substance including alcohol (this group may or may not have a current diagnosis of substance dependence on the MINI Plus)**
- **PHC group, no diagnosis for either current abuse or current dependence for any substance on the MINI Plus (but can have a lifetime diagnosis)**

VAR102

- Treatment group (dependence)
- PHC group, diagnosis of current or lifetime abuse on the MINI Plus for any substance including alcohol (this group may or may not have a current or lifetime diagnosis of substance dependence on the MINI Plus)
- PHC group, no diagnosis for either current or lifetime abuse or current or lifetime dependence for any substance on the MINI Plus

VAR103

- A current dependence diagnosis on the MINI Plus for any substance (this group may or may not have an abuse diagnosis) **VAR105**.
- A current abuse diagnosis on the MINI Plus for any substance, but not a diagnosis of current dependence **VAR 106**.

- No diagnosis for either current abuse or current dependence for any substance on the MINI Plus (can have a lifetime diagnosis) **VAR107.**

VAR104

- A current or lifetime dependence diagnosis on the MINI Plus for any substance (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for any substance, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for any substance on the MINI Plus

b) Global continuum risk score - excluding alcohol/tobacco

VAR105

- Treatment group (with current ICE diagnosis for dependence on any substance except alcohol or tobacco)
- PHC group, diagnosis of current abuse on the MINI Plus for any drug excluding alcohol & tobacco (this group may or may not have a current diagnosis of drug dependence on the MINI Plus)
- PHC group, no diagnosis for either current abuse or current dependence for any drug on the MINI Plus (but can have a lifetime diagnosis or diagnosis for alcohol/tobacco)

VAR106

- Treatment group (with current or lifetime ICE diagnosis for dependence on any substance except alcohol or tobacco)
- PHC group, diagnosis of current or lifetime abuse on the MINI Plus for any drug excluding alcohol & tobacco (this group may or may not have a current or lifetime diagnosis of drug dependence on the MINI Plus)
- PHC group, no diagnosis for either current or lifetime abuse or current or lifetime dependence for any drug on the MINI Plus (but can have diagnosis for alcohol/tobacco)

VAR107

- A current dependence diagnosis on the MINI Plus for any drug excluding alcohol/tobacco (this group may or may not have an abuse diagnosis)
- A current abuse diagnosis on the MINI Plus for any drug excluding alcohol/tobacco, but not a diagnosis of current dependence
- No diagnosis for either current abuse or current dependence for any drug on the MINI Plus (can have a lifetime diagnosis or diagnosis for alcohol/tobacco)

VAR108

- A current or lifetime dependence diagnosis on the MINI Plus for any drug excluding alcohol/tobacco (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for any drug excluding alcohol/tobacco, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for any drug on the MINI Plus (but can have a diagnosis for alcohol/tobacco)

VAR109

- Treatment group (with ICE diagnosis for current dependence on any substance except alcohol or tobacco)
- PHC group, DAST score 4-10
- PHC group, DAST score 0-3

VAR110

- Treatment group (with current or lifetime ICE diagnosis for dependence on any substance except alcohol or tobacco)
- PHC group, DAST score 4-10
- PHC group, DAST score 0-3

VAR111

- Treatment group, a current dependence diagnosis on the MINI Plus for any drug excluding alcohol/tobacco (this group may or may not have an abuse diagnosis)
- PHC group, DAST score 4-10
- PHC group, DAST score 0-3

VAR112

- Treatment group, a current or lifetime dependence diagnosis on the MINI Plus for any drug excluding alcohol/tobacco (this group may or may not have an abuse diagnosis)
- PHC group, DAST score 4-10
- PHC group, DAST score 0-3

Specific Current Drug Involvement - Can't do tobacco, because no test for abuse (RFT is for dependence)

1) Alcohol**VAR113**

- **Treatment group (with current ICE diagnosis for dependence on alcohol, can also have ICE diagnosis for other substances)**
- **PHC group, diagnosis of current alcohol abuse on the MINI Plus (this group may or may not have a current diagnosis of alcohol dependence on the MINI Plus)**
- **PHC group, no diagnosis for either current alcohol abuse or current alcohol dependence on the MINI Plus (but can have a lifetime diagnosis or diagnosis for other drugs)**

VAR114

- Treatment group (with current or lifetime ICE diagnosis for alcohol dependence, can also have ICE diagnosis for other substances)
- PHC group, diagnosis of current or lifetime alcohol abuse on the MINI Plus (this group may or may not have a current or lifetime diagnosis of alcohol dependence on the MINI Plus)
- PHC group, no diagnosis for either current or lifetime abuse or current or lifetime dependence for alcohol on the MINI Plus (but can have diagnosis for other substances)

VAR115

- A current dependence diagnosis on the MINI Plus for alcohol (this group may or may not have an abuse diagnosis)
- A current abuse diagnosis on the MINI Plus for alcohol, but not a diagnosis of current dependence
- No diagnosis for either current abuse or current dependence for alcohol on the MINI Plus (can have a lifetime diagnosis or diagnosis for other drugs)

VAR116

- A current or lifetime dependence diagnosis on the MINI Plus alcohol (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for alcohol, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for alcohol on the MINI Plus (but can have a diagnosis for other drugs)

VAR117

- Treatment group (with current ICE diagnosis for dependence on alcohol, can also have ICE diagnosis for other substances)
- PHC group, AUDIT score 8-40
- PHC group, AUDIT score 0-7

VAR118

- Treatment group (with current or lifetime ICE diagnosis for dependence on alcohol, can also have ICE diagnosis for other substances)
- PHC group, AUDIT score 8-40
- PHC group, AUDIT score 0-7

VAR119

- Treatment group, a current dependence diagnosis on the MINI Plus for alcohol (this group may or may not have an abuse diagnosis)
- PHC group, AUDIT score 8-40
- PHC group, AUDIT score 0-7

VAR120

- Treatment group, a current or lifetime dependence diagnosis on the MINI Plus alcohol (this group may or may not have an abuse diagnosis)
- PHC group, AUDIT score 8-40
- PHC group, AUDIT score 0-7

2) Cannabis

VAR121

- **Treatment group (with current ICE diagnosis for dependence on cannabis, can also have ICE diagnosis for other substances)**
- **PHC group, diagnosis of current cannabis abuse on the MINI Plus (this group may or may not have a current diagnosis of cannabis dependence on the MINI Plus)**
- **PHC group, no diagnosis for either current cannabis abuse or current cannabis dependence on the MINI Plus (but can have a lifetime diagnosis or diagnosis for other drugs)**

VAR122

- Treatment group (with current or lifetime ICE diagnosis for cannabis dependence, can also have ICE diagnosis for other substances)
- PHC group, diagnosis of current or lifetime cannabis abuse on the MINI Plus (this group may or may not have a current or lifetime diagnosis of cannabis dependence on the MINI Plus)
- PHC group, no diagnosis for either current or lifetime abuse or current or lifetime dependence for cannabis on the MINI Plus (but can have diagnosis for other substances)

VAR123

- A current dependence diagnosis on the MINI Plus for cannabis (this group may or may not have an abuse diagnosis)
- A current abuse diagnosis on the MINI Plus for cannabis, but not a diagnosis of current dependence
- No diagnosis for either current abuse or current dependence for cannabis on the MINI Plus (can have a lifetime diagnosis or diagnosis for other drugs)

VAR124

- A current or lifetime dependence diagnosis on the MINI Plus cannabis (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for cannabis, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for cannabis on the MINI Plus (but can have a diagnosis for other drugs)

3) Cocaine

VAR125

- **Treatment group (with current ICE diagnosis for dependence on cocaine, can also have ICE diagnosis for other substances)**
- **PHC group, diagnosis of current cocaine abuse on the MINI Plus (this group may or may not have a current diagnosis of cocaine dependence on the MINI Plus)**
- **PHC group, no diagnosis for either current cocaine abuse or current cocaine dependence on the MINI Plus (but can have a lifetime diagnosis or diagnosis for other drugs)**

VAR126

- Treatment group (with current or lifetime ICE diagnosis for cocaine dependence, can also have ICE diagnosis for other substances)
- PHC group, diagnosis of current or lifetime cocaine abuse on the MINI Plus (this group may or may not have a current or lifetime diagnosis of cocaine dependence on the MINI Plus)
- PHC group, no diagnosis for either current or lifetime abuse or current or lifetime dependence for cocaine on the MINI Plus (but can have diagnosis for other substances)

VAR127

- A current dependence diagnosis on the MINI Plus for cocaine (this group may or may not have an abuse diagnosis)
- A current abuse diagnosis on the MINI Plus for cocaine, but not a diagnosis of current dependence
- No diagnosis for either current abuse or current dependence for cocaine on the MINI Plus (can have a lifetime diagnosis or diagnosis for other drugs)

VAR128

- A current or lifetime dependence diagnosis on the MINI Plus cocaine (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for cocaine, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for cocaine on the MINI Plus (but can have a diagnosis for other drugs)

4) Amphetamines

VAR129

- **Treatment group (with current ICE diagnosis for dependence on amphetamines, can also have ICE diagnosis for other substances)**
- **PHC group, diagnosis of current amphetamine abuse on the MINI Plus (this group may or may not have a current diagnosis of amphetamine dependence on the MINI Plus)**
- **PHC group, no diagnosis for either current amphetamine abuse or current amphetamine dependence on the MINI Plus (but can have a lifetime diagnosis or diagnosis for other drugs)**

VAR130

- Treatment group (with current or lifetime ICE diagnosis for amphetamine dependence, can also have ICE diagnosis for other substances)
- PHC group, diagnosis of current or lifetime amphetamine abuse on the MINI Plus (this group may or may not have a current or lifetime diagnosis of amphetamine dependence on the MINI Plus)
- PHC group, no diagnosis for either current or lifetime abuse or current or lifetime dependence for amphetamines on the MINI Plus (but can have diagnosis for other substances)

VAR131

- A current dependence diagnosis on the MINI Plus for amphetamine (this group may or may not have an abuse diagnosis)
- A current abuse diagnosis on the MINI Plus for amphetamine, but not a diagnosis of current dependence
- No diagnosis for either current abuse or current dependence for amphetamine on the MINI Plus (can have a lifetime diagnosis or diagnosis for other drugs)

VAR132

- A current or lifetime dependence diagnosis on the MINI Plus amphetamine (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for amphetamine, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for amphetamine on the MINI Plus (but can have a diagnosis for other drugs)

5) Inhalants

Note: No ICE diagnosis is made for inhalant dependence, therefore groupings involving ICE diagnoses cannot be made.

VAR133

- **A current dependence diagnosis on the MINI Plus for inhalants (this group may or may not have an abuse diagnosis)**
- **A current abuse diagnosis on the MINI Plus for inhalants, but not a diagnosis of current dependence**
- **No diagnosis for either current abuse or current dependence for inhalants on the MINI Plus (can have a lifetime diagnosis or diagnosis for other drugs)**

VAR134

- A current or lifetime dependence diagnosis on the MINI Plus inhalants (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for inhalants, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for inhalants on the MINI Plus (but can have a diagnosis for other drugs)

6) Sedatives

VAR135

- **Treatment group (with current ICE diagnosis for dependence on sedatives, can also have ICE diagnosis for other substances)**
- **PHC group, diagnosis of current sedative abuse on the MINI Plus (this group may or may not have a current diagnosis of sedative dependence on the MINI Plus)**
- **PHC group, no diagnosis for either current sedative abuse or current sedative dependence on the MINI Plus (but can have a lifetime diagnosis or diagnosis for other drugs)**

VAR136

- Treatment group (with current or lifetime ICE diagnosis for sedative dependence, can also have ICE diagnosis for other substances)
- PHC group, diagnosis of current or lifetime sedative abuse on the MINI Plus (this group may or may not have a current or lifetime diagnosis of sedative dependence on the MINI Plus)
- PHC group, no diagnosis for either current or lifetime abuse or current or lifetime dependence for sedatives on the MINI Plus (but can have diagnosis for other substances)

VAR137

- A current dependence diagnosis on the MINI Plus for sedatives (this group may or may not have an abuse diagnosis)
- A current abuse diagnosis on the MINI Plus for sedatives, but not a diagnosis of current dependence
- No diagnosis for either current abuse or current dependence for sedatives on the MINI Plus (can have a lifetime diagnosis or diagnosis for other drugs)

VAR138

- A current or lifetime dependence diagnosis on the MINI Plus sedatives (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for sedatives, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for sedatives on the MINI Plus (but can have a diagnosis for other drugs)

7) Hallucinogens

Note: No ICE diagnosis is made for hallucinogen dependence, therefore groupings involving ICE diagnoses cannot be made.

VAR139

- **A current dependence diagnosis on the MINI Plus for hallucinogens (this group may or may not have an abuse diagnosis)**
- **A current abuse diagnosis on the MINI Plus for hallucinogens, but not a diagnosis of current dependence**
- **No diagnosis for either current abuse or current dependence for hallucinogens on the MINI Plus (can have a lifetime diagnosis or diagnosis for other drugs)**

VAR140

- A current or lifetime dependence diagnosis on the MINI Plus hallucinogens (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for hallucinogens, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for hallucinogens on the MINI Plus (but can have a diagnosis for other drugs)

8) Opiates

VAR141

- **Treatment group (with current ICE diagnosis for dependence on opiate, can also have ICE diagnosis for other substances)**
- **PHC group, diagnosis of current opiate abuse on the MINI Plus (this group may or may not have a current diagnosis of opiate dependence on the MINI Plus)**
- **PHC group, no diagnosis for either current opiate abuse or current opiate dependence on the MINI Plus (but can have a lifetime diagnosis or diagnosis for other drugs)**

VAR142

- Treatment group (with current or lifetime ICE diagnosis for opiate dependence, can also have ICE diagnosis for other substances)
- PHC group, diagnosis of current or lifetime opiate abuse on the MINI Plus (this group may or may not have a current or lifetime diagnosis of opiate dependence on the MINI Plus)
- PHC group, no diagnosis for either current or lifetime abuse or current or lifetime dependence for opiates on the MINI Plus (but can have diagnosis for other substances)

VAR143

- A current dependence diagnosis on the MINI Plus for opiates (this group may or may not have an abuse diagnosis)
- A current abuse diagnosis on the MINI Plus for opiates, but not a diagnosis of current dependence
- No diagnosis for either current abuse or current dependence for opiates on the MINI Plus (can have a lifetime diagnosis or diagnosis for other drugs)

VAR144

- A current or lifetime dependence diagnosis on the MINI Plus opiates (this group may or may not have an abuse diagnosis)
- A current or lifetime abuse diagnosis on the MINI Plus for opiates, but not a diagnosis of current or lifetime dependence
- No diagnosis for either current or lifetime abuse or current or lifetime dependence for opiates on the MINI Plus (but can have a diagnosis for other drugs)

Appendix 10: Discriminative validity - Results of all ROC and ANOVA analyses using variables listed in appendix H to allocate participants to use, abuse and dependence groups.

Table A Discrimination between use and abuse using ANOVA and ROC: Range of sensitivity and specificity values: [Proposed cut off scores are bolded].

	Grouping variable - see appendix 8 for description	ROC Area under Curve	ROC Sensitivity	ROC Specificity	Assist Cut-Off Score	ANOVA Scheffes diff between groups, p level
Global Continuum of Risk *	101	0.89	95 91 90 88 84	65 73 78 78 78	12.50 13.50 15.00 17.50 19.50	21.2, p<.001
	102	0.94	88 86 85 83 76	80 80 90 90 90	9.50 10.50 11.50 12.50 13.50	21.7, p.001
	103	0.79	73 73 64 64	73 78 78 81	13.50 15.00 18.00 21.00	9.22, p=.374
	104	0.87	93 93 87 73	60 80 80 80	5.50 6.50 8.00 9.50	9.73, p=.55
Global Continuum of Risk #	105	0.93	94 92 86 82 78	71 78 82 84 88	4.50 5.50 6.50 7.50 8.50	15.5, p<.001
	106	0.90	89 81 77 73	61 83 89 94	1.50 2.50 3.50 4.50	12.3, p=.005
	107	0.83	82 77 65 53	71 76 82 84	4.50 5.50 6.50 7.50	5.01, p=.41
	108	0.77	73 58 49	55 80 85	1.50 2.50 3.50	3.4, p=.75

	109	0.75	77 74 69 62	62 66 69 71	6.50 7.50 8.50 9.50	11.51, p<.001
	110	0.75	80 77 74 69	56 62 66 69	5.50 6.50 7.50 8.50	11.52, p<.001
	111	0.75	80 77 74 69	56 62 66 69	5.50 6.50 7.50 8.50	11.52, p<.001
	112	0.75	80 77 74 69	56 62 66 69	5.50 6.50 7.50 8.50	11.52, p<.001
Alcohol involvement	113	0.76	77 71 61 58	46 63 75 88	3.50 4.50 5.50 6.50	4.1, p<.001
	114	0.55	61 48 35	31 62 71	3.50 4.50 5.50	1.2, p=.584
	115	0.86	77 77 77 69	59 71 81 90	3.50 4.50 5.50 6.50	5.3, p<.001
	116	0.55	83 56 50	29 39 55	1.50 2.50 3.50	0.84, p=.84
	117	0.79	94 81 69 56	33 56 75 87	2.50 3.50 4.50 5.50	3.65, p<.001
	118	0.79	81 69 56 44	56 75 87 90	3.50 4.50 5.50 6.50	3.65, p<.001
	119	0.79	81 69 56 44	56 75 87 90	3.50 4.50 5.50 6.50	3.65, p<.001
	120	0.79	81 69 56 44	56 75 87 90	3.50 4.50 5.50 6.50	3.65, p<.001

Cannabis Involvement	121	0.92	92 85 77 74	72 83 86 90	1.50 2.50 3.50 4.50	6.57, p<.001
	122	0.84	89 76 69 63	60 76 86 91	0.50 1.50 2.50 3.50	5.10, p<.001
	123	0.77	100 81 69 56 50	47 62 71 76 80	0.50 1.50 2.50 3.50 4.50	2.29, p=.134
	124	0.68	86 64 59 50	50 63 71 77	0.50 1.50 2.50 3.50	1.3, p=.581
Cocaine	Too few cases					Too few cases for analysis
Amphetamine	129	0.87	100 60 40	69 82 89	0.5 1.50 2.50	5.12, p<.001
	130	0.88	92 58 33	82 92 93	0.5 1.50 2.50	3.55, p=.001
	131	0.78	100 29	64 81	0.50 1.50	0.83, p=.80
	132	0.76	83 25	74 88	0.5 1.50	0.65, p=.89
Inhalants	Too few cases					Too few cases for analysis
Sedatives	135	0.94	100 67 67	83 89 92	0.5 1.50 2.50	8.62, p<.001
	136	0.93	100 60 40	87 90 91	0.5 1.50 2.50	5.52, p=.014
	137	Too few cases				
	138	0.94	—	—	—	5.52, p =.14
Hallucinogens	Too few cases					

Opiates	141	100	100 100	91 96	0.50 1.50	12.44,p<.001
	142	0.99	100 83	95 98	0.5 1.50	8.93,p<.001
	143	Too few cases				
	144	Too few cases				

* includes alcohol and tobacco, and lifetime prevalence and injecting behaviour

excludes alcohol and tobacco, includes lifetime prevalence and injecting behaviour

Table B. Discrimination between abuse and dependence using ANOVA and ROC: Range of sensitivity and specificity values, with proposed cut-off scores bolded.

	Grouping variable (see appendix 8)	ROC Area under Curve	ROC Sensitivity	ROC Specificity	Assist Cut-Off Score	ANOVA Scheffes diff between groups, p level
Global Continuum of Risk *	101	0.83	82 82 80 80	68 72 75 79	38.50 39.50 40.50 42.00	23.4, p<.001
	102	0.87	82 82 82 80	76 78 80 83	37.50 38.50 39.50 40.50	28.6,p<.001
	103	0.84	80 77 74 71	55 64 91 91	26.50 27.50 29.00 30.50	23.77, p<.001
	104	0.83	82 81 77 74	60 67 73 73	19.50 20.50 22.50 24.00	23.77, p<.001
Global Continuum of Risk #	105	0.88	93 91 91 89	74 76 78 78	22.00 23.50 24.50 25.50	23.95, p<.001
	106	0.91	91 89 89 87	79 81 84 85	20.50 21.50 22.50 23.50	27.79, p<.001

	107	0.95	90 89 85 81	77 88 94 94	12.50 13.50 14.50 15.50	25.45, p<.001
	108	0.92	87 84 81 78	79 82 85 88	8.50 9.50 10.50 11.50	24.45, p<.001
	109	0.86	91 91 87 86	72 74 74 74	23.50 24.50 25.50 26.50	24.53, p<.001
	110	0.84	89 87 87 72	72 72 74 74	22.50 23.50 24.50 25.50	23.08, p<.001
	111	0.86	91 91 89 86	72 74 74 74	23.50 24.50 25.50 26.50	24.53, p<.001
	112	0.84	87 87 85 83	72 74 74 74	23.50 24.50 25.50 26.50	23.08, p.001
Alcohol involvement	113	0.83	93 86 71 64	67 77 81 84	9.50 10.50 12.00 13.50	6.34, p<.001
	114	0.62	69 62 55 55	39 52 65 71	3.50 4.50 5.50 6.50	3.37, p<.001
	115	0.47	51 49 47 40	31 46 46 69	6.50 7.50 8.50 9.50	0.24, p=0.98
	116	0.64	77 63 52 42	44 50 61 72	2.50 3.50 4.50 5.50	2.25, p=0.18
	117	0.86	93 93 86 71	65 79 83 85	8.50 9.50 10.50 11.50	7.27, p<.001

	118	0.54	52 52 52 45	63 65 79 83	7.50 8.50 9.50 10.50	1.77, p=.226
	119	0.66	65 65 65 55	63 65 79 83	7.50 8.50 9.50 10.50	3.82, p.003
	120	0.47	47 47 44 44	44 56 63 65	5.50 6.50 7.50 8.50	0.69, p=0.78
Cannabis Involvement	121	0.86	95 95 85 75	56 64 64 69	8.50 9.50 10.50 11.50	6.90, p<.001
	122	0.72	77 68 65 62 56	58 65 69 74 74	6.50 7.50 8.50 9.50 10.50	4.72, p<.001
	123	0.88	86 80 73 66	69 81 88 94	6.50 7.50 8.50 9.50	6.85, p<.001
	124	0.78	78 69 69 60	59 64 82 86	4.50 5.50 6.50 7.50	5.49, p<.001
Cocaine	Too few cases					Too few cases for analysis
Amphetamine	129	0.86	93 89 85 85	70 80 80 90	9.00 11.50 12.50 13.50	10.06, p<.001
	130	0.84	81 81 81 78	75 83 88 92	5.50 8.50 10.50 11.50	10.08, p<.001
	131	0.99	100 96 93	71 86 86	1.50 3.00 5.50	13.93, p<.001
	132	0.91	90 76 73 71	75 83 92 92	1.50 2.50 3.50 4.50	10.25, p<.001

Inhalants	Too few cases					Too few cases for analysis
Sedatives	135	0.56	81 81 68 63	33 67 67 67	4.50 9.00 10.50 12.50	2.48, p=.512
	136	0.57	60 56 56 52	60 60 80 80	4.00 6.50 8.50 9.50	2.32, p= .502
	137	Too few cases				Too few cases for analysis
	138	Too few cases				Too few cases for analysis
Hallucinogens	Too few cases					Too few cases for analysis
Opiates	141	0.68	74 58 53 37	43 71 71 86	13.50 14.50 15.50 16.50	2.27, p=.038
	142	0.64	62 58 54 42	50 58 58 83	11.00 12.50 13.50 14.50	2.69, p=.099
	143	Too few cases				Too few cases for analysis
	144	Too few cases				Too few cases for analysis

* includes alcohol and tobacco, and lifetime prevalence and injecting behaviour

excludes alcohol and tobacco, includes lifetime prevalence and injecting behaviour

